NOTICE OF INTENT
HOLLY REFINING & MARKETING COMPANY
HEAVY CRUDE PROCESSING PROJECT
MAY 2012

Prepared for:

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By

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Project No. 041211133

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NOTICE OF INTENT

HOLLY REFINING & MARKETING COMPANY-WOODS CROSS REFINERY

HEAVY CRUDE PROCESSING PROJECT

MAY 2012

1.0 INTRODUCTION

Meteorological Solutions Inc. (MSI) was retained by Holly Refining & Marketing Company, referred to as "Holly", to prepare a Notice of Intent (NOI) to accommodate for the processing of heavy black and yellow wax crudes at Holly's Woods Cross Refinery. As part of the increase in crude processing, from the currently permitted 40,000 barrels per day (BPD) to 60,000 BPD, changes to refinery operations including the installation of new equipment, and decommissioning or replacement of, and/or modifications to existing equipment are needed. This facility is an existing major source under Prevention of Significant Deterioration (PSD) and estimated net emission increases for carbon monoxide (CO) will be above the PSD major modification thresholds. Therefore, the requested changes require PSD review for CO.

On July 10, 2012 in a show of support for Gov. Gary R. Herbert's U-CAIR initiative to improve air quality, Holly plans to add pollution control equipment that reduces sulfur dioxide (SO_2) emissions and its corresponding SO_2 State Implementation Plan (SIP) cap by 150 tons per year. This reduction is primarily due to emissions from the existing sulfur recovery incinerator routed to wet scrubber (an estimated reduction of 138 tons) as well as other SO_2 emission reductions that have taken place at the Refinery over the past ten years.

In 2007, the Refinery permitted a number of changes to modernize the refinery and expand processing capacity. Many of those changes have been implemented or are in the process of being implemented. Due to market forces, the Refinery is seeking to modify implementation of certain previously permitted changes. Central to these changes is a revision in the planned nature of the crude oil feed to the refinery. The former modernization included a significant increase in processing of heavier crude oil with higher sulfur content.

This revision replaces that heavier crude with local production primarily from eastern Utah (black wax and yellow wax). This local production is a highly-paraffinic crude oil with lower sulfur content.

For this project, the following changes are proposed as part of the facilities modifications to process black and yellow wax crudes:

- The existing crude unit's capacity will be expanded with the addition of a preflash tower. A previously permitted 35 MMBtu/hr crude feed heater (8H2) will not be constructed.
- A second crude unit with a capacity of 15,000 barrels per day of crude will be installed along with a 60 MMBtu/hr crude heater (24H1).
- To improve recovery of gas oil from the crude distillation bottoms, a vacuum tower and vacuum furnace, with a rating of 130 MMBtu/hr will be installed. A previously permitted 15.2 MMBtu/hr vacuum furnace heater (33H1) will not be constructed. Emissions from the new heater will be controlled using Selective Catalytic Reduction (SCR).
- The existing charge heater on the Gas Oil Hydrocracking Unit (GHC) will be replaced with a 42.1 MMBtu/hr reactor charge heater.
- The Distillate Hydrotreater (DHT) will be expanded to handle the additional distillate by utilizing the GHC charge heater.
- A Fluid Catalytic Cracking Unit (FCCU) with a capacity of processing 8500 barrels per day will be constructed along with a 45 MMBtu/hr feed heater. Emissions from the FCCU will be controlled by a wet gas scrubber.
- A poly gasoline unit equipped with a 14 MMBtu/hr hot oil heater will be constructed to convert olefin to a high octane gasoline blend stock.
- A Hydrocracker/Hydroisom Unit which will produce high-quality lubricants and ultra-low sulfur diesel will be constructed. This unit will be equipped with a 99 MMBtu/hr reactor charge heater. Emissions from this heater will be controlled using SCR.
- An 89.3 MMBtu/hr steam boiler will be installed. Emissions from this boiler will be controlled through Selective Catalytic Reduction (SCR).

- A sour water stripper with a capacity of handling 100 gallons per minute will be constructed. Emissions from this unit will be controlled through the existing sour water stripper/ammonia stripping unit prior to treatment in the existing sulfur recovery unit.
- One new cooling tower will be constructed and one existing cooling tower will be expanded by adding a cell.
- Two previously permitted amine units will not be constructed.
- Two previously permitted Claus sulfur recovery units and tail gas treatment units will not be constructed.
- The 60 MMBtu/hr CO boiler will be decommissioned.
- A previously permitted 15.3 MMBtu/hr asphalt mix heater will no longer be used.
- The previously permitted heaters for the Hydrogen Plant will be controlled using SCR to reduce oxides of nitrogen emissions.
- The previously permitted heater for the Deasphalting Unit hot oil heater will be controlled using SCR to reduce NO_x emissions.
- The previously permitted boiler #8 will be controlled using SCR to reduce NO_x emissions.
- Emissions from existing sulfur recovery incinerator will be routed to a wet gas scrubber.
- 40 previously permitted rail spots for loading fuel oil will be revised to 16 for fuel oil and 24 for lube oil. The 16 fuel oil spots will be reconfigured to load fuel oil or asphalt.
- Two existing biodiesel loading spots will be moved to the west track in the East Tank Farm. The existing biodiesel spots will be converted to fuel oil/asphalt loading.
- An existing LPG rail loading spot on the west track will be converted to load propane.
- The crude truck unloading facilities will be expanded for twelve more truck bays.
- Several storage tanks will be modified, reconstructed or removed as part of this project. Ten (10) new tanks for lubes feed/product, two (2) for gas oil, one (1) for poly gasoline, one (1) for gasoline, two (2) for diesel, four (4) for propane, one (1) for wastewater, and one (1) for sour water feed will be constructed.
- Three asphalt tanks will be equipped with two to four 0.8 MMBtu/hr stab-in heaters each.
- The frozen earth propane storage will be removed.

1.1 Facility Description

The Holly Refining & Marketing Company refinery is located at 393 South 800 West in Woods Cross, Utah. Its Universal Transverse Mercator (UTM) Coordinates for the facility, in NAD27, are 4526.227 kilometers North and 424.00 kilometers East in Zone 12. The refinery is located in Davis County which is non-attainment area for $PM_{2.5}$, maintenance for ozone (O_3) and particulate matter (PM_{10}), and attainment for sulfur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOC), and carbon monoxide (CO). The refinery is located within four miles of Salt Lake County, which is in non-attainment for $PM_{2.5}$, PM_{10}, and SO_2, and a maintenance area for O_3. A map showing the location of the facility is presented as Figure 1.1.

1.2 Company Information

All correspondence regarding this NOI should be directed to:

Mr. Michael S. Astin. P.E.
Environmental Manager
393 South 800 West
West Bountiful, Utah 84087-1435
Phone No. (801) 299-6625
Fax No. (801) 299-6609

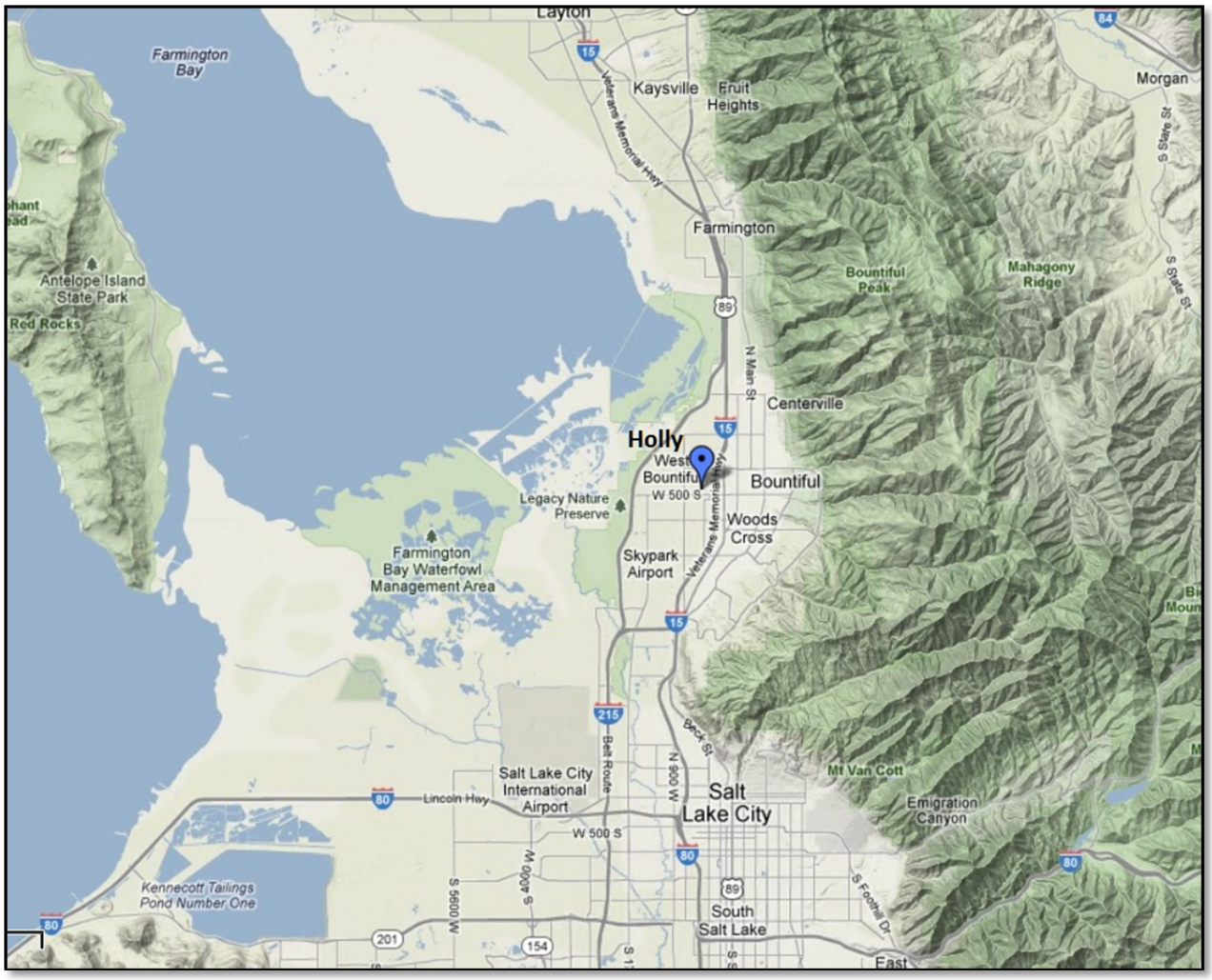


Figure 1.1 Location of Holly Refining & Marketing Company's Woods Cross Refinery

This permit application is organized into the following sections:

- **Section 2.0 – Project Description**. This section contains information including process descriptions, changes to existing operations, new or modified equipment, and equipment to be removed.

- **Section 3.0 – Heavy Crude Processing Project Emissions**. This section presents a detailed review of the Potential to Emit (PTE) emissions from the proposed Heavy Crude Processing Project and existing sources as well as actual to future potential emission estimates.

- **Section 4.0 – Regulatory Review**. This section presents an assessment of applicable state and federal regulations. This section focuses on which regulations are directly applicable to the proposed equipment and how compliance will be demonstrated.

- **Section 5.0 – Best Available Control Technology Demonstration**. This section is a substantial requirement of the Notice of Intent (NOI)/PSD application. A detailed evaluation of control technologies and emission rates is provided. EPA's "top down" best available control technology (BACT) approach was used for these determinations. Lowest achievable emission rate (LAER) controls were reviewed for $PM_{2.5}$ emission sources.

- **Section 6.0 – Near-Field Dispersion Modeling Analyses**. This section summarizes the near-field dispersion modeling conducted to evaluate the potential increased emission impacts on the Significant Impact Levels (SILs), National Ambient Air Quality Standards (NAAQS), PSD Class II increments, and at near-by non-attainment areas. Specifically, this section discusses the modeling input data and the various modeling scenarios evaluated. This section also presents the results of the Class II area analyses performed and compares the calculated impacts to the applicable standards.

- **Section 7.0 – Additional Impact Analyses.** This section summarizes the impact from carbon monoxide emissions on soils and vegetation.
- **Section 8.0 – References**. This section summarizes the references that were used in the preparation of the NOI.

Site work for construction is scheduled to begin as soon as approval to proceed is obtained. Startup of the earliest portions of this project is anticipated to begin in April 2014. Completion of the entire project is projected by December 2016.

2.0 PROCESS DESCRIPTION

The Uinta Basin in Eastern Utah contains abundant resources of black-wax and yellow-wax crude, which are both desirable for their low sulfur content and are suitable for the creation of various refined petroleum products. Because of the paraffinic nature and high pour point of these unique crudes, they become solid wax at ambient temperatures and must be transported to Salt Lake City refineries via insulated tanker trucks and trailers. To be able to accommodate for the additional crude, Holly is expanding its refining capabilities. Thus, the following sections discuss the proposed new equipment and modifications to the existing equipment as part of Holly's Heavy Crude Processing Project.

2.1 Heavy Crude Processing Project

The heavy crude processing project involves changes to existing refinery operations and addition of new process units at the facility including:

1) Expansion of existing crude unit through addition of preflash tower;
2) Installation of second crude unit;
3) Installation of second fluid catalytic cracking unit (FCCU);
4) Installation of Poly Gasoline Unit:
5) Installation of Hydrocracker/Hydroisom Unit;
6) Installation of new and expansion to existing cooling towers;
7) Installation of several process heaters and furnaces; and
8) Installation of a steam boiler.

Other existing facility process units will be modified/removed to accommodate the black and yellow wax crudes. These consist of:

1) Installation of new or modification to existing tanks;
2) Installation of additional truck bays for crude unloading; and

3) Changes to rail loading and unloading locations.
4) Removal of frozen earth propane storage.

A facility-wide plot plan for the heavy crude processing project is presented as Figure 2.1.

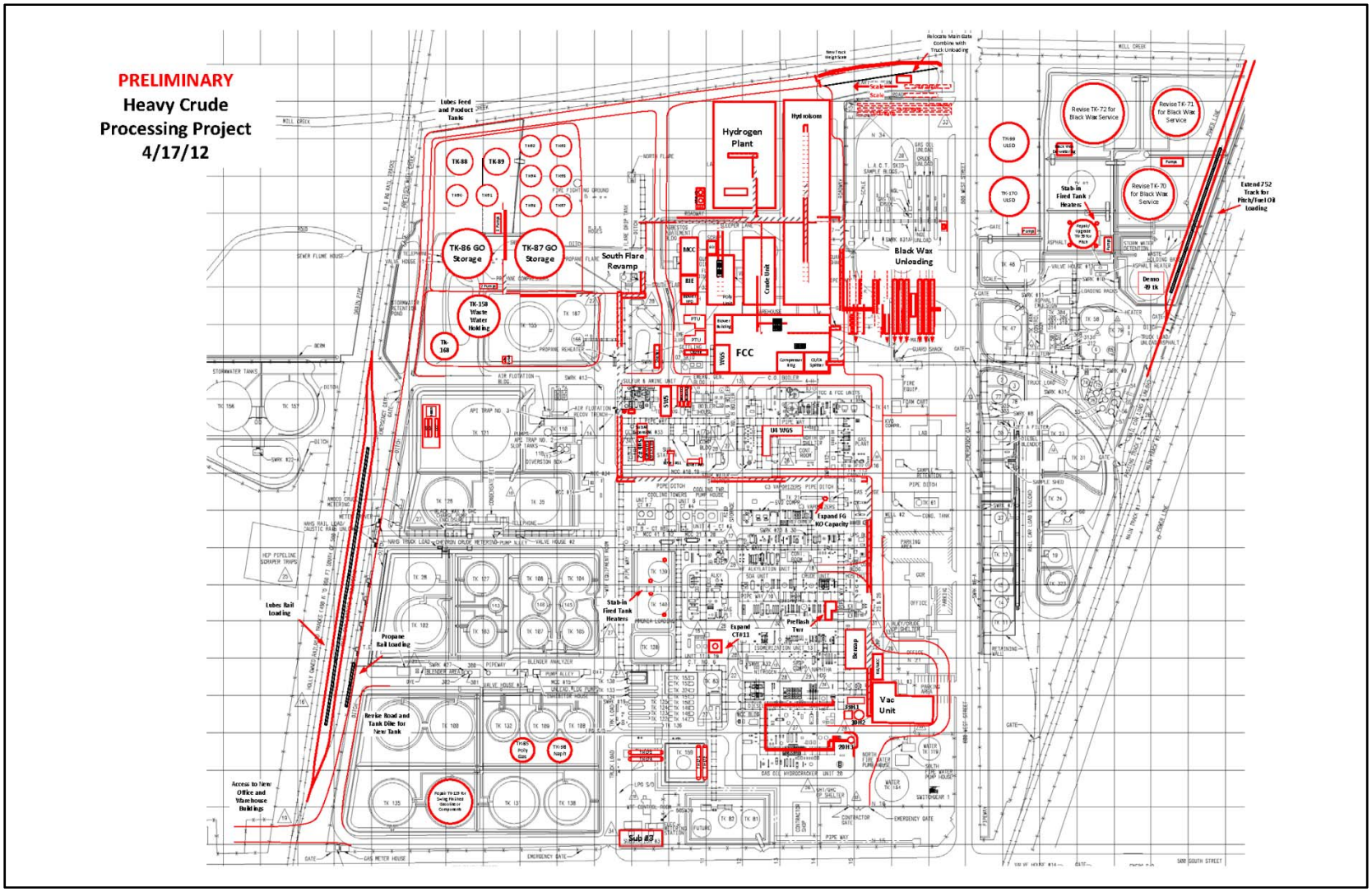


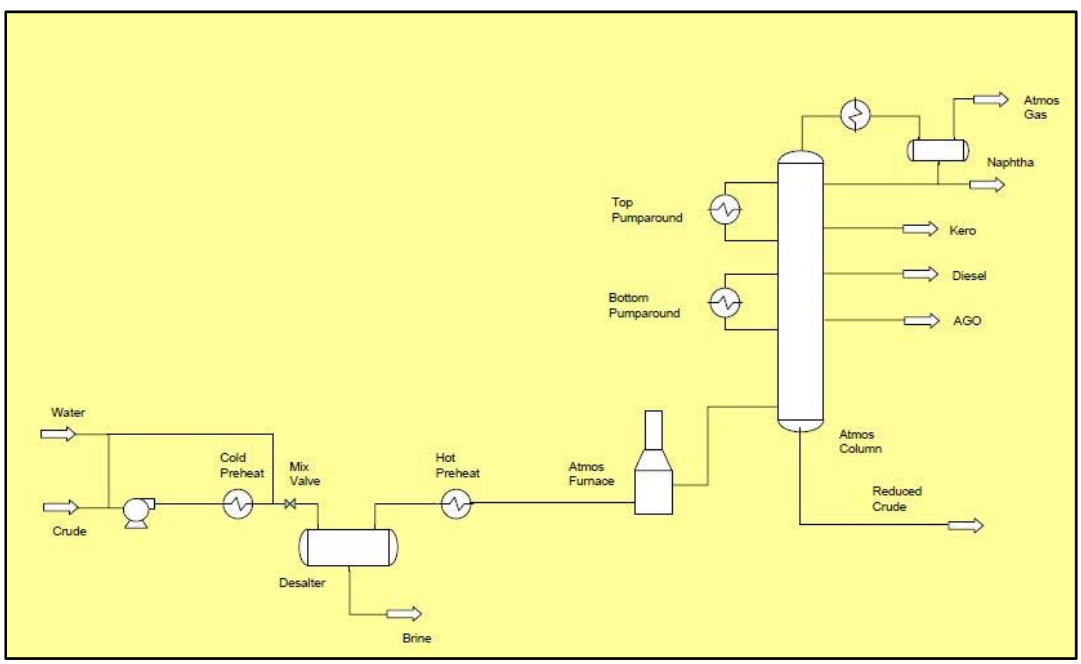
Figure 2.1 Holly Refining & Marketing Company Facility Layout

2.1.1 Existing Crude Unit Expansion

The crude unit is used to pre-treat crude and distill it into several hydrocarbon fractions that are used for sale, blending into sales products, or for further processing to produce saleable products. Holly's existing crude unit (Unit 8) processes 26,000 barrels per day (BPD) of crude. With the proposed change to include the throughput of black wax crude, a preflash tower will be installed on the existing crude unit which will increase the processing capacity of the existing crude unit to 45,000 BPD. A previously permitted 35.0 MMBtu/hr (HHV) crude feed heater (ID 8H2) will not be constructed due to the change in feedstock.

2.1.2 New Crude Unit

A second crude unit capable of processing 15,000 BPD of crude will be installed at the Woods Cross refinery. A 60 MMBtu/hr crude heater (ID 24H1), equipped with ultra-low NO_x burners and fired on refinery plant fuel gas, will be installed on this new crude unit. A general process schematic for a crude unit is presented in Figure 2.2.



Source: www.processengr.com

Figure 2.2 Crude Unit Process Schematic

2.1.3 Vacuum Unit

In order to further improve the recovery of gas oil from the crude distillation bottoms, a vacuum tower and vacuum furnace heater will be installed. The previously permitted vacuum tower unit (Unit 33) will have a capacity of 25,000 BPD. The resulting vacuum tower bottoms will be fed to the existing Solvent Deasphalting (SDA) Unit (Unit 10).

Previously, a 15.2 MMBtu/hr (HHV) vacuum furnace heater (ID 33H1) was proposed to be installed on the vacuum tower. This heater was not constructed. With the change in feedstock, a larger vacuum furnace heater (130 MMBtu/hr (HHV)), to be equipped with low NO_x burners and fired on refinery plant gas, will be installed on the vacuum tower unit. Emissions from the proposed vacuum heater will be controlled by selective catalytic reduction (SCR).

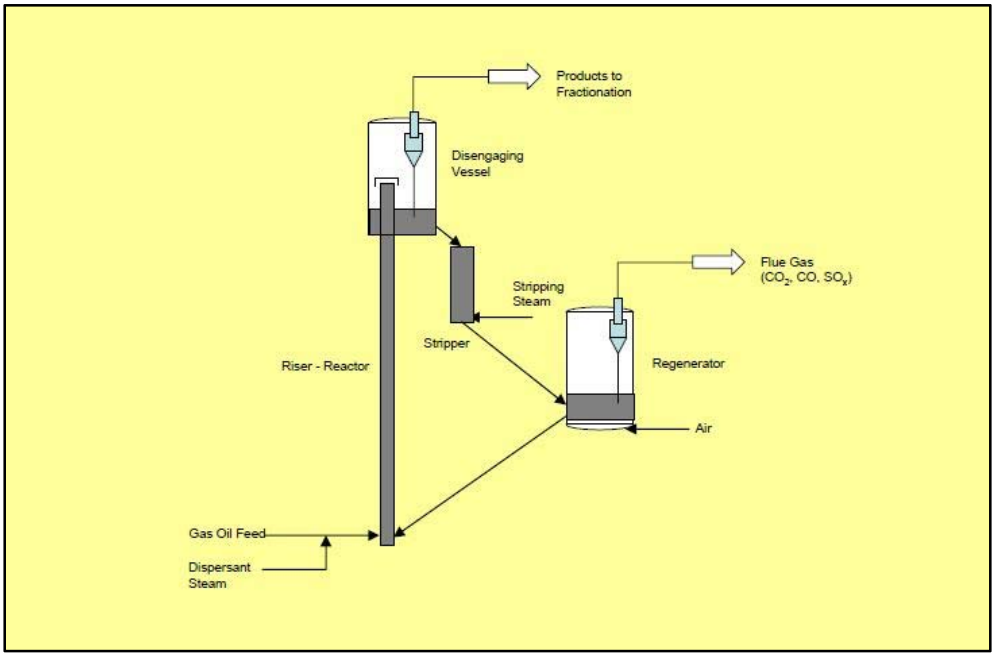
2.1.4 Gas Oil Hydrocracking Unit and Distillate Hydrotreater

With the change to include the processing of black and yellow wax crudes, the existing charge heater (ID 20H1) on the Gas Oil Hydrocracking (GHC) Unit (Unit 20) will be insufficient to run the GHC unit at full capacity. Thus, a larger 42.1 MMBtu/hr (HHV) reactor charge heater (ID 20H3) equipped with ultra-low NO_x burners fired on refinery plant gas will be installed on the GHC.

The Distillate Hydrotreater (DHT) will be expanded to handle the additional distillate that will be produced under the proposed modifications. The existing 14.9 MMBtu/hr (HHV) GHC charge heater (20H1) will be re-piped to provide additional charge heating for the DHT.

2.1.5 Fluid Catalytic Cracking Unit

A Fluid Catalytic Cracking Unit (FCCU) from an idled New Mexico refinery will be relocated to the Woods Cross Refinery. This unit is capable of processing 8500 barrels of gas oil per day and is similar in size to the existing FCCU. This new FCCU will include a 45 MMBtu/hr (HHV) feed heater (ID 25H1) and will be equipped with ultra-low NO_x burners fired on refinery plant gas. A wet gas scrubber will be installed on this unit for emissions control. A general process diagram for a FCCU is presented as Figure 2.3.



Source: www.processengr.com

Figure 2.3 Fluid Catalytic Cracking Unit Process Schematic

2.1.6 Poly Gasoline Unit

A Poly Gasoline Unit will also be relocated to the Woods Cross Refinery. This unit will take olefin produced by both the relocated FCCU and the existing FCCU and convert it to a high octane gasoline blend stock. A 14 MMBtu/hr (HHV) hot oil heater (ID 26H1), equipped with ultra- low NO_x burners and fired on refinery plant gas, will be installed to provide process heat for the poly gasoline unit.

2.1.7 Hydrocracker/Hydroisom Unit

A new Hydrocracker/Hydroisom Unit, that will produce high-quality lubricants and ultra-low sulfur diesel, will be constructed at the Woods Cross refinery. The hydrocracker/hydroisom unit will include a 99 MMBtu/hr reactor charge heater (ID 27H1). This heater will be equipped with low NO_x burners and fired on refinery plant gas. Emissions from the proposed reactor charge heater will be controlled by SCR.

2.1.8 Boiler #11

An 89.3 MMBtu/hr boiler (Boiler #11), equipped with low NO_x burners and fired on refinery plant gas as the primary fuel will be installed to provide steam for the facility. Emissions from this boiler will be controlled by SCR.

2.1.9 Sour Water Stripper

With the additional sour water streams that will be generated, a third sour water stripper, capable of handling up to 100 gallons per minute, will be constructed. The off-gas from the new stripper will be sent to the existing sour water stripper/ammonia stripping unit (Unit 22) to remove ammonia prior to treatment in the existing SRU.

2.1.10 Emergency Generator

A 540 HP diesel-driven emergency generator will be installed to provide support system power to critical systems in the event that electric power is not available from the grid. The diesel engine will meet Tier 3 emissions standards which minimize the NO_x, CO, VOC, and PM emissions by using good combustion controls. The SO_2 emissions from the diesel engines will be minimized by using ultra-low sulfur diesel fuel. Maintenance and readiness testing checks of the diesel engine are necessary to ensure the reliability of the engine. It is anticipated that the emergency diesel generator would be operated 50 hours per year for maintenance and readiness testing purposes.

2.2 Permitted Equipment to be Removed from Air Approval Order

As mentioned previously, the 35.0 MMBtu/hr (HHV) crude feed heater (ID 8H2) and 15.2 MMBtu/hr (HHV) vacuum furnace heater (ID 33H1) will not be installed. With the proposed change to black wax crude processing, Amine Units #2 and #3 (Unit 32 and Unit 35) are no longer necessary and will not be constructed. The existing Sulfur Recovery Unit #1 (Unit 17) and NaSH sour gas treatment Unit (Unit 21) are sized to handle all sulfur removal requirements from the heavy crude processing project.

In addition, two (2) previously permitted Claus sulfur recovery units (SRU) and Tail Gas Treatment Units (TGTU), Units 31 and 34, will also no longer be necessary and will not be constructed. Since ammonia stripping capability is part of the sour water stripper (Unit 22) that has been installed, the modifications to the existing SRU which included the addition of oxygen enrichment will not be made. The effluent from the existing SRU incinerator will, however, be routed to the wet scrubbers for emissions control.

SRU incinerator effluent gases will be hard piped from the SRU incinerator stack to the inlet of the wet gas scrubber. The wet gas scrubber will treat the SO_2 in the effluent gas by reaction with reagent to form an aqueous solution of sodium sulfite that will in turn be treated by the waste water plant. The treatment of the SRU Incinerator effluent gases will be routed to the wet gas scrubber during normal operation and unit upsets. A SRU incinerator emission reduction process flow diagram is presented as Figure 2.4.

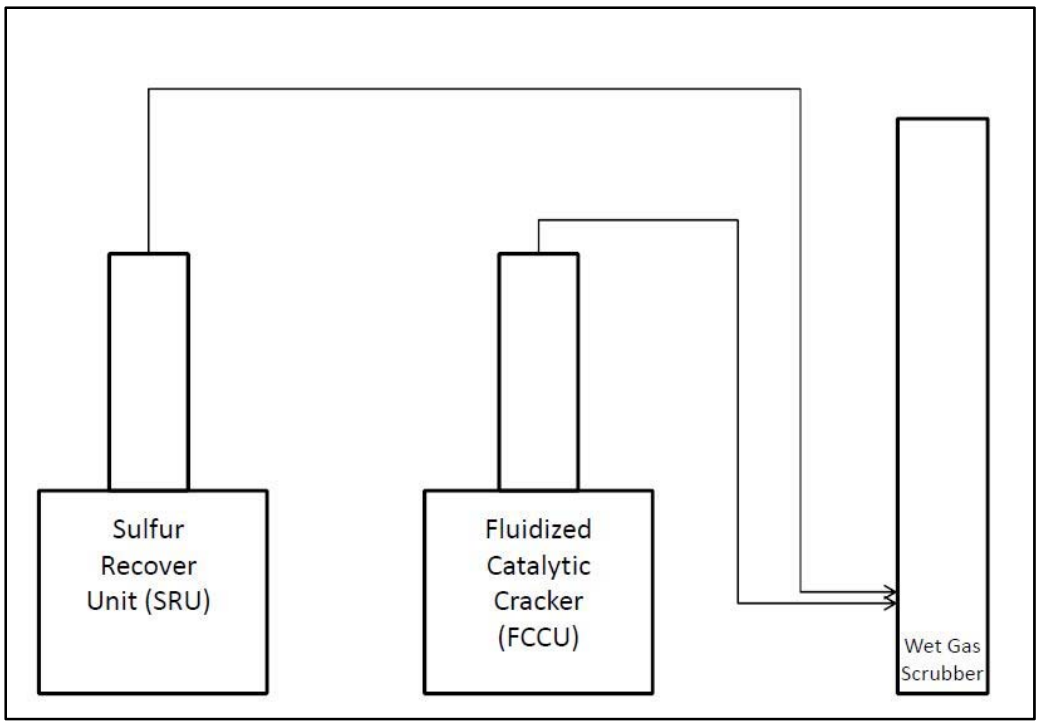


Figure 2.4 SRU Incinerator Emission Reduction Process Flow Diagram

The 60 MMBtu/hr CO boiler (Boiler #6) will be decommissioned because it is beyond its useful life and when the wet gas scrubber becomes operational. An asphalt mix heater (45H1), a 15.3 MMBtu/hr process furnace will also no longer be used.

2.3 Process Support Units

The installation and operation of the proposed new or modified equipment at the Holly Refinery will impact some of the refinery's current operation and existing equipment. The following sections discuss the impacted areas.

2.3.1 Fuel Gas

The new process heaters will use fuel gas that has been treated to contain no more than 162 ppm H_2S based on a three-hour average and 60 ppm H_2S based on an annual average. The majority of fuel gas that is used at the refinery is generated within the refinery process. If the amount generated within the refinery process is inadequate, pipeline-quality natural gas will be utilized.

2.3.2 Cooling Towers

As part of the heavy crude processing project, there will be a new 8,500 gallon per minute cooling tower (cooling tower #10) and expansion of existing cooling tower #11 with the addition of an 8,500 gallon per minute cell. The new and expanded cooling towers will be induced draft, multi-cell counter flow type cooling towers equipped with drift eliminators to control particulate emissions.

2.3.3 Flare

The south flare will be reconstructed and reconfigured as part of the heavy crude processing project.

2.3.4 Loading/Unloading Facilities

The current permit includes 40 rail spots for loading fuel oil. This will be revised to 16 for fuel oil and 24 for lube oil. The 16 rail spots will be reconfigured to load fuel oil or asphalt. Two (2) existing biodiesel loading spots will be moved to the west track in the East Tank Farm and their prior locations will be converted to fuel oil/asphalt loading. One existing LPG rail loading spot on the west track will be converted to load propane. One additional rail spot for loading propane will be constructed on the west track.

A small electric-driven compressor will be added to control loading emissions by recovering displaced relief gas from loading propane into rail cars. In addition, the crude truck unloading facilities will be expanded to accommodate twelve (12) more truck bays.

2.3.5 Storage Tanks

There will be eighteen new tanks (Tanks 89-99, 158, 168), two tanks removed (Tanks 4 and 49), and five existing tanks (Tanks 59, 70-72, 139, and 140) modified as part heavy crude processing project. Four tanks previously permitted (Tanks 85-88) will still be constructed. Two tanks previously permitted, Tanks 80 and 84, will not be constructed. A summary of the tanks to be added, modified or removed as part of the heavy crude processing project is presented in Table 2-1.

Tank 168, a sour water tank, is being added to accommodate the additional sour water that will be generated by the project.

Table 2-1
Summary of Storage Tank Changes

Tank ID	Tank Status	Capacity (barrels)	Type	Description
4	Existing	851	Fixed Roof	To be removed.
49	Existing	55,877	Fixed Roof	To be removed.
59	Existing	30,019	Fixed Roof	To be reconstructed for asphalt storage. Four (4) stab-in heaters to be added.
70	Existing	80,306	Fixed Roof	Tank to be put into black wax crude storage.
71	Existing	67,155	This tank is currently equipped with IFR and primary and secondary seals.	This tank will be converted to black wax crude storage and the IFR removed[1].
72	Existing	106,811	This tank is currently equipped with IFR and primary and secondary seals.	This tank will be converted to black wax crude storage and the IFR removed[1].
80	Will not be built	10,000	Fixed Roof	Two (2) stab-in heaters.
84	Will not be built	10,000	Fixed Roof	Chemical storage.
85	To be constructed	19,600[2]	Previously permitted for heavy HC but will be constructed with IFR.	Poly gas storage.
86	To be constructed	109,660[2]	Cone Roof	Gasoil storage.
87	To be constructed	109,660[3]	Cone Roof	Gasoil storage.
88	To be constructed	26,730[4]	Cone Roof	Lubes feed/product storage.
89	New	26,730	Cone Roof	Lubes feed/product storage.
90-97	New	13,600	Cone Roof	Lubes feed/product storage.
98	New	19,600	IFR	Gasoline
99	New	66,000	Cone Roof	Diesel
139	Existing	14,957	Fixed roof	Two (2) stab-in heaters to be added. Vacuum bottoms stored.
140	Existing	14,857	Fixed roof	Two (2) stab-in heaters to be added. Vacuum bottoms stored.
158	New	64,315	Floating Roof	Waste water storage.
168	New	30,952	Floating Roof	Sour water feed.
170	New	66,000	Cone Roof	Diesel
171-174	New	1,600	Horizontal Elliptical	Propane

[1] IFR – Internal floating roof. Holly proposes to remove the floating roofs on Tanks 71 and 72 and use these tanks for storage of black and yellow wax crude. However, Holly may initially leave the floating roofs in place, because there has been some variation in the vapor pressure of this crude, and although it has not varied enough to require vapor control, further monitoring of the vapor pressure will be conducted prior to removal of the roofs. If the vapor pressure of delivered crude appears to drop to levels that would require vapor controls, the roofs will be left in these tanks, and Holly will address the need to install controls on the remaining waxy crude storage tanks.
[2] Previously permitted for 80,000 bbl.
[3] Previously permitted for 50,000 bbl.
[4] Previously permitted for 13,638 bbl.

2.3.6 Wastewater Treatment and Sewer

As part of the project to increase refinery throughput, a study is being conducted on water conservation and wastewater reduction. Based on the preliminary results of that study, it is anticipated that installation and operation of the proposed new process units will not increase the overall throughput of the existing wastewater treatment plant. The current water supply from existing onsite deep wells will be utilized more efficiently to meet the demand of the existing as well as the new units.

Most of the new or relocated process facilities will be constructed on the north of the existing process units and new process drains will be routed connected to existing drain systems.

A wastewater storage tank (Tanks 158) will be added to provide additional holding time for further separation of oils from the wastewater as well as additional capacity during high water events.

2.3.7 Removal of Frozen Earth Propane Storage

In conjunction with the other changes described herein, Holly will decommission the Frozen Earth Storage (FES) unit that has been used to store liquid propane. This decommissioning will include removal of all stored material and backfilling with suitable material to protect groundwater resources and provide adequate support for future use.

3.0 HEAVY CRUDE PROCESSING PROJECT EMISSIONS

Emission estimates were derived for the proposed heavy crude processing project as well as other proposed changes at the refinery on existing equipment. Emission estimates were based on manufacturer data, EPA guidance as published in *Compilation of Air Pollution Emission Factors, Volume I: Stationary Point and Area Sources or AP-42*, fuel type, and anticipated operating hours. The derived emission estimates presented in this application were used to determine New Source Review (NSR)/PSD and non-attainment NSR (NNSR) applicability.

The NSR permitting program for major sources is implemented in the Utah Rules. Utah Rules R407-403 and R07-405 implement both the federal PSD and NNSR permitting programs. Holly is considered a major PSD source as defined in R307-405 and is located in a non-attainment area for $PM_{2.5}$ and a maintenance area for ozone.

3.1 NSR/PSD Applicability Test

A PSD applicability analysis was conducted to determine if emissions from the proposed heavy crude processing project would be considered a “major modification” under NSR regulations. Because this project involves proposed modifications to existing emission units and addition of new emissions units, the applicability test was conducted to determine if a “significant emissions increase” and a “significant net emissions increase” of a regulated pollutant will occur. An increase is considered “significant” if it exceeds the annual ton per year thresholds which are presented in Table 3-1. For determining applicability as a major modification, the NSR pollutants covered either by PSD or NNSR permitting programs and their associated significant thresholds (Table 3-1) are the same.

Table 3-1

NSR/PSD Significant Emission Rates

Pollutant	Significant Emission Rate (TPY)
PM	25
PM_{10}	15
$PM_{2.5}$	10
SO_2	40
NO_x	40
CO	100
O_3 (VOC)	40
Sulfuric Acid Mist	7
Greenhouse gases (mass basis)	0
Greenhouse gases as carbon dioxide equivalents	75,000

Per the PSD regulation as found in 40 CFR 52.21(a)(2)(v)(f), a hybrid test can be conducted to determine if the sum of the emissions increases for each emission unit, using the methods specified in 40 CFR Part 52.21(a)(2)(iv)(c) through (d) equals or exceeds the significant amount for each pollutant. 40 CFR Part 52.21(a)(2)(iv)(c) through (d) are defined as follows:

> (c) Actual-to-projected-actual applicability test for projects that only involve existing emissions units. A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the projected actual emissions and the baseline actual emissions (defined below), for each existing emissions unit, equals or exceeds the significant amount for that pollutant;
>
> (d) Actual-to-potential test for projects that only involve construction of a new emissions unit(s). A significant emissions increase of a regulated NSR pollutant is projected to occur if the sum of the difference between the potential to emit from each new emissions unit following completion of the project and the baseline actual emissions of these units before the project equals or exceeds the significant amount for that pollutant.

3.1.1 Baseline Actual Emissions

Calculation of baseline actual emissions for the Holly Refining project followed 40 CFR 52.21 (b)(48)(ii) which states: "For an existing emissions unit (other than an electric utility steam generating unit), baseline actual emissions means the average rate, in tons per year, at which the emissions unit actually emitted the pollutant during any consecutive 24-month period selected by the owner or operator within the 10-year period immediately preceding either the date the owner or operator begins actual construction of the project, or the date a complete permit application is received by the Administrator for a permit required under this section or by the reviewing authority for a permit required by a plan, whichever is earlier, except that the 10-year period shall not include any period earlier than November 15, 1990.

(a) The average rate shall include fugitive emissions to the extent quantifiable, and emissions associated with startups, shutdowns, and malfunctions.

(b) The average rate shall be adjusted downward to exclude any non-compliant emissions that occurred while the source was operating above an emission limitation that was legally enforceable during the consecutive 24-month period.

(c) The average rate shall be adjusted downward to exclude any emissions that would have exceeded an emission limitation with which the major stationary source must currently comply, had such major stationary source been required to comply with such limitations during the consecutive 24-month period.

However, if an emission limitation is part of a maximum achievable control technology standard that the Administrator proposed or promulgated under part 63 of this chapter, the baseline actual emissions need only be adjusted if the State has taken credit for such emissions reductions in an attainment demonstration or maintenance plan consistent with the requirements of §51.165(a)(3)(ii)(G) of this chapter.

(d) For a regulated NSR pollutant, when a project involves multiple emissions units, only one consecutive 24-month period must be used to determine the baseline actual emissions for all the emissions units being changed. A different consecutive 24-month period can be used for each regulated NSR pollutant.

(e) The average rate shall not be based on any consecutive 24-month period for which there is inadequate information for determining annual emissions, in tons per year, and for adjusting this amount if required by paragraphs (b)(48)(ii)(b) and (c) of this section."

For this permit, baseline actual emissions from project-affected sources were based on the average annual emissions that occurred during any consecutive two-year period in the past 10 years as reported in the required Holly annual emissions inventories. The existing sources to be affected by the heavy crude processing project include: the crude unit (8H1); the vacuum unit (33H1); the gas oil hydrocracker heater (20H1); the hydrogen reformer feed furnaces (30H1 and 30H2); the asphalt furnace (45H1); the south flare; existing FCCU; CO boiler; the existing sulfur recovery unit; cooling towers; propane pit flare; and tanks 4, 49, 59, 70-72, 139 and 140. The consecutive 24-month period baseline periods that were determined for the proposed project are presented in Table 3-2. The baseline actual emissions for the project-affected sources based on the time period presented in Table 3-2 are presented in Appendix A.

Table 3-2

Baseline Actual 24-Month Period

Pollutant	Consecutive 24-month Period
PM_{10}	January 2005 - December 2006
$PM_{2.5}$	January 2009- December 2010
SO_2	January 2006 – December 2007
NO_x	January 2010 – December 2011
CO	January 2009 – December 2010
VOC	January 2008- December 2009

According to 40 CFR Part 52.21, an emissions increase with respect to any regulated NSR pollutant emitted by a major stationary source, the amount by which the sum of the following exceeds zero:

> (a) The increase in emissions from a particular physical change or change in the method of operation at a stationary source as calculated pursuant to paragraph (a)(2)(iv) of this section; and
>
> (b) Any other increases and decreases in actual emissions at the major stationary source that are contemporaneous with the particular change and are otherwise creditable. Baseline actual emissions for calculating increases and decreases under this paragraph (b)(3)(i)(b) shall be determined as provided in paragraph (b)(48) of this section, except that paragraphs (b)(48)(i)(c) and (b)(48)(ii)(d) of this section shall not apply.

The emissions increase was calculated as the sum of emissions increases from new and modified existing units that are impacted by this project. If the project emissions increase for a regulated pollutant is less than the significant emission rate, NSR is not required for that pollutant. Table 3-3 and Appendix B presents the proposed PTE emissions for new or modified equipment as part of the heavy crude processing project.

Table 3-3

Proposed PTE Emissions from Heavy Crude Processing Project New and Modified Equipment Only

Emission Unit	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	SO_2 (TPY)	NO_x (TPY)	VOC (TPY)	CO (TPY)	Total HAPS (TPY)
24H1 Crude Furnace #3 (new)	1.97	1.97	2.61	10.51	1.42	21.02	0.49
25H1 FCC#2 Feed Heater (new)	1.48	1.48	1.96	7.88	1.06	15.77	0.36
FCCU #2 Wet Scrubber (new)	13.58	13.58	17.70	19.91	--	154.85	--
26H1 Hot Oil Furnace (new)	0.46	0.46	0.61	2.45	0.33	4.91	0.11
27H1 Reactor Charge Heater (new)	3.25	3.25	4.31	8.67	2.34	34.69	0.80
20H3 Reactor Charge Heater (new)	1.38	1.38	1.83	7.38	1.00	14.75	0.34
Boiler #11 (new)	3.91	3.91	3.88	7.82	1.56	14.47	0.72
Sour Water Stripper	--	--	--	--	--	--	--
Cooling Tower #10 (new)	0.09	0.001	--	--	1.56	--	2.07
Cooling Tower #11 (modified)	0.09	0.001	--	--	1.56	--	2.07
33H1 Vacuum Furnace Heater (new)	4.27	4.27	5.65	11.39	3.07	45.6	1.05
540 HP Diesel Generator (new)	0.01	0.001	0.03	0.20	0.03	0.25	0.0004
Stab-in Asphalt Tank Heaters (new)	0.16	0.16	0.21	2.06	0.11	1.68	0.04
Tanks (See Table 2-1)	--	--	--	--	1.46	--	0.02
Fugitives from leaks (new)	--	--	--	--	14.6	--	0.85
South Flare (modified)	--	--	-2.3	5.8	-2.8	29.5	0.40
12 Additional Truck Bays for Black Wax Crude	--	--	--	--	--	--	--
Project Total	30.6	30.5	36.5	84.1	27.3	337.5	9.3
NSR/Significant Emissions Rate	15	10	40	40	40	100	NA
Significant	Yes	Yes[1]	No	Yes	No[1]	Yes	--

[1] Davis County is non-attainment for $PM_{2.5}$ and maintenance for ozone; thus, $PM_{2.5}$ and VOC emissions are subject to NNSR permitting requirements provisions.

From Table 3-3, the emission projections from the heavy crude processing project only indicate that emissions for PM_{10}, NO_2, and CO are significant under PSD. However, if the emissions increase is greater than the NSR/PSD significant emission rate, then a source has several options which include:

1. Accept limits on new or existing units impacted by the project to obtain an project emissions increase less the significant emission rate;
2. Conduct a netting analysis of contemporaneous creditable increases and decreases to determine if the net emission emissions increase is less than the NSR significant emissions rate;
3. Use a combination of 1 and 2 to maintain the net emissions increase to a level less than the significant emission rate, or
4. Undergo NSR review for the project.

3.1.2 PSD Netting Analysis

A netting analysis was performed by Holly since the heavy crude processing project emissions increase of PM_{10}, NO_2 and CO exceeded the PSD significant emission rates. The netting analysis was performed following the steps listed below:

Step 1 – Determine the emissions increases from the proposed project

The emission increases expected to results from the proposed project were examined. This included emissions from the new and modified emissions units and any other plant-wide emissions increases that will occur as a result of the proposed project.

Step 2 – Determine the Beginning and Ending Dates of the Contemporaneous Period as it Relates to the Proposed Modification

The contemporaneous period starts five years from the date of the NOI until the AO is signed, that is May 25, 2007.

Step 3 – Determine which emissions Units at the Source have experienced an Increase or Decrease in Emissions during the Contemporaneous Period

Credible emission increases are associated with a physical change or change in the method of operation at a source which did not require a PSD permit. Decreases are credible reductions in actual emissions from an emissions unit that are, or can be made, federally-enforceable. A physical change or change in the method of operation is also associated with the types of decreases that are credible.

Step 4 – Determine which Emissions Changes are Credible

There are several rules that apply when determining if the emission changes are credible. The applicable ones for this project are:

1. An increase or decrease in emissions is credible if the reviewing authority had not relied upon it in previously issuing a PSD permit and the permit is in effect when the increase from the proposed modification occurs.
2. A decrease is credible only to the extent that it is "federally enforceable" from the moment that the actual construction begins on the proposed modification to the source. The proposed decrease must occur before the proposed emissions increase occurs. An increase occurs when the emissions units on which construction occurred becomes operational and begins to emit a particular pollutant.
3. A decrease is credible only to the extent that it has the same health and welfare significance as the proposed increase from the source.
4. A source cannot take credit for a decrease that it has to make or will have to make in order to bring an emissions unit into compliance.
5. A source cannot take credit for an emissions reduction from potential emissions from an emission unit which was permitted but never was built or operated.

Step 5 – Determine, on a Pollutant-by-Pollutant Basis, the Amount of each Contemporaneous and Creditable Emissions Increase and Decrease

An emissions increase is the amount by which the new level of "actual emissions" at the emissions unit exceeds the old level or level prior to the physical or operational change. An emissions decrease is the amount by which the old level of actual emissions or the old level of allowable emissions, whichever is lower, exceeds the new level of "actual" emissions. Both emissions increases and decreases are calculated, in most cases, from a two-year period that directly preceded the physical change. A contemporaneous emissions increase is calculated as the positive difference between an emissions unit's potential to emit just after a physical or operation change and the unit's actual emissions just prior to the change. A decrease is the amount by which the old level of actual emissions exceeds the new level of "actual" emissions.

Step 6 – Sum all Contemporaneous and Credible Increases and Decreases

The proposed project will be subject to PSD review for each regulated pollutant for which the sum of all creditable emission increases and decreases results in a significant net emissions increase.

1. The emissions increase from the proposed project only was determined. (See Table 3-3).
2. The contemporaneous period was defined. Under federal PSD regulations, an emissions change is contemporaneous to a given project if it occurred within the five years preceding the start of construction of the project or if it will occur between the time construction commences and operation begins. The contemporaneous period for this project begins on May 25, 2007.
3. Sum the emission change to determine the net emissions increase. Compare the net emissions increase to the PSD significant emission rate. All creditable contemporaneous actual emission increases and decreases that were a result of physical changes in the method of operation at the plant site were summed together.

For the emissions change to be credible, it must not have been relied upon in the issuance of a PSD permit, the new level of actual emissions exceeds the old. An emissions decrease is credible if it: (1) the old level of actual or allowable emissions, whichever is lower, exceeds the new level of actual emissions; (2) is federally enforceable; and (3) it has approximately the same qualitative significance for public health and welfare as that attributed to the increase from a particular change.

On June 8, 2007, Holly received an approval order for a modernization project. With the modernization project, changes in equipment and operations were proposed to handle heavier crude (Canadian crude) with higher sulfur content. The portions of the refinery that were to handle the heavier fractions needed to be expanded. In addition, several measures were proposed to significantly reduce emissions of criteria pollutants including the replacement of existing equipment and addition of new control equipment. The net emission changes from the 2007 modernization project were determined to be:

- NO_x – reduction of 79.8 TPY;
- SO_2 – reduction of 81.9 TPY
- PM_{10} – reduction of 83.9 TPY
- CO – increase of 172.8 TPY
- VOC – increase of 16.8 TPY.

The contemporaneous period starts five years from the date of the NOI until the AO is signed, that is May 25, 2007. However, the contemporaneous period will likely slide by several months since the review of the NOI has not been completed as of this date and an approval order would not likely be granted until late Fall 2012 at the earliest. Holly is unable to begin construction until an approval order is granted.

Although several of the changes proposed in the modernization project have been implemented, primarily those associated with reducing refinery air emissions through additional pollution controls, due to market forces, Holly is now seeking to modify implementation of certain previously permitted changes. These modifications are summarized in Section 1.0 of the NOI. Central to these changes is a revision in the planned nature of the crude oil feed to the refinery.

The 2007 modernization project included a significant increase in processing of heavier crude oil with higher sulfur content. Now Holly is proposing to replace that heavier crude with local eastern Utah crude, which is a highly-paraffinic crude oil with lower sulfur content.

Thus, Holly feels that since an approval order for the current proposed project will not be issued until Fall of 2012 at the earliest and that the AO for the modernization project was dated June 8, 2007, the emissions from the modernization project fall outside the five years before construction can commence and are not considered contemporaneous.

The approval order issued on November 3, 2009 was to incorporate CD requirements including new permit limits on heaters 8H1 and 12H1 based on performance tests conducted in October 2008 and the inclusion of a small portable electric generator for use an as emergency power supply with an associated hours of operation limitation. The results of the performance testing results indicated higher NO_x emissions of approximately 39.3 tons using the EPA mandated NGULNB or equivalent burners. Thus, since the use of NGULNB or equivalent burners was a mandate of the CD, credit was not taken for these emissions in part of the netting analysis.

Table 3-4 presents a summary of the contemporaneous project emission estimates that were obtained from a review of projects undertaken or proposed at Holly Refinery since May 25, 2007. Emissions presented for the equipment identified in approval orders or NOI's are based on PTE emission estimates.

Table 3-5 presents additional proposed changes at the Refinery. These changes are considered "side projects" and not necessarily associated with the heavy crude processing project. As can be seen in Table 3-5, several sources will not be constructed; thus no emissions are presented for these sources. 10H2, 30H1 and 30H2 hydrogen reformer furnaces will be built and additional NO_x control will be added through the use of SCR's. Since these sources have not been built, credit for reducing NO_x emissions was not taken. Boiler #8 emissions are based on the difference between an emissions unit's potential to emit just after a physical or operation change and the unit's actual emissions (average of 2010/2011) just prior to the change.

In Section VI.143.a of the Holly Refinery Consent Decree, EPA indicates that the prohibition of Holly Refinery to be able to generate emission reductions that result from the consent decree was not intended to prohibit Holly Refinery from *"utilizing or generate netting reduction or emissions offset credits from refinery units that are covered by this Consent Decree to the extent that the proposed netting reductions or emission offset credits represent the difference between the emissions limitations set forth in this Consent Decree for these refinery units and the more stringent emissons limitations that Holly may elect to accept for these refinery units in a permitting process*". As it applies to Boiler 6, this is interpreted that the removal of the boiler would be a more stringent emission limitation.

In Section V.A.14 of the Consent Decree, Holly Refinery is required to minimize NOx emissions to the maximum extent practicable without interfering with interfering with conversion or process rates beginning by no later than April 1, 2009. The Consent Decree includes Boiler 6 in this requirement if it is in operation at that time. This boiler was in operation at that time and is still in operation until such time an Approval Order removes it from service. In accordance with 40 CFR Per 40 CFR 52.21(b)(48)(ii)(c), in determining baseline actual emissions for NO_x for the CO Boiler, the average rate can be adjusted downward to exclude any emissions that would have exceeded an emission limitation with which the major stationary source must currently comply, had the major stationary source been required to comply with such limitations during the consecutive 24-month period.

The DAQ determined that the April 1, 2009 is the baseline for the required NO_x reduction for Boiler 6. A contemporaneous time period that began after March 31, 2009 (January 1, 2010 through December 31, 2011) was chosen for the CO boiler. Actual NO_x emissions from the CO boiler for 2010 and 2011 were 72.08 tons and 58.05 tons, respectively, for an average of 65.07 tons per the 24-month period.

Table 3-4

Contemporaneous Project Emissions and NSR Applicability (TPY)

Project	Emissions Change					Source
	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	NO_2 (TPY)	CO TPY	VOC TPY	
Install 250 gpm charge pump	--	--	--	--	0.03	DAQE-AN101230040-11
Install 3 dedicated ethanol unload areas	--	--	--	--	0.05	DAQE-101230039-11
Incorporation of FCCU NO_x and SO_2 Limits from CD	--	--	--	--	--	DAQE-AN101230038-10
Install Benzene Sat Unit #23 and boiler #5 NOx limit	0.69	0.69	3.7	7.57	0.50	NOI Dated April 29, 2010
Incorporate NSPS Subpart A & J for CO Emissions to FCCU	--	--	--	--	--	DAQE-AN101230032-10
Addition of Boilers #9 and #10	7.82	7.82	15.65	28.94	3.13	NOI dated Oct. 14, 2009
Incorporate CD Requirements & Add 135 KW diesel generator	0.02	0.02	0.66[1]	0.12	0.01	DAQE-AN101230027-09
Total Changes	8.5	8.5	20.0	36.6	3.7	

CD - July 2008 Consent Decree

[1] The NO_2 emissions do not include the increase of 39.3 tons of NO_2 emissions listed in DAQE-AN101230027-09 abstract for heaters 8H1 and 12H1. This emission increase was based on October 8, 2009 performance test results. These tests were conducted in compliance with the CD after the replacement of the original heater burners with NGULNB or equivalent.

Table 3-5

Additional Proposed Refinery Changes and Corresponding Emissions

Project	Emissions Change				Comment
	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	NO_2 (TPY)	CO TPY	
10H2 Hot Oil Furnace (existing)	--	--	--	--	SCR will be added once constructed
8H2 35 MMBtu/hr Crude Feed Heater	--	--	--	--	Unit will not be constructed
33H1 15 MMBtu/hr Vacuum Furnace Heater	--	--	--	--	Unit will not be constructed
Unit 32 Amine Unit #2	--	--	--	--	Unit will not be constructed
Unit 35 Amine Unit #3	--	--	--	--	Unit will not be constructed
Unit 31 SRU with TGTU	--	--	--	--	Unit will not be constructed
Unit 35 SRU with TGTU	--	--	--	--	Unit will not be constructed
Power Boiler #8	--	--	-7.61	--	SCR will be added for NOx control
Emergency Equipment (modified)	0.06	0.06	0.84	0.18	Additional operating hours
CO Boiler (existing)	-55.75	-36.55	-65.07	-18.98	Unit will be removed
45H1 15.3 MMBtu/hr asphalt mix heater	--	--	--	--	Unit will be removed
30H1 & 30H2 Hydrogen Reformer Feed Furnaces (existing)	--	--	--	--	SCR's will be added for NO_x control once furnaces are constructed
Propane Pit Flare (existing)	-0.86	-2.6	-23.76	-129.28	Flare will be removed
Total	-40.90	-38.23	-95.60	-158.61	

Projected greenhouse gas emissions (GHG) in metric tons per year for the new sources only (MTPY) are presented in Table 3-6 and Appendix B.

Table 3-6

PTE Greenhouse Gas Emission Estimates for Proposed Heavy Crude Processing Project at Holly Refining & Marketing Company Woods Cross Refinery

Equipment	CO_2 (MTPY)	CH_4 (MTPY)	N_2O (MTPY)
20H3 Reactor Charge Heater	17,660.6	0.35	0.03
24H1 Crude Furnace #3	25,169.6	0.49	0.05
25H1 FCC#2 Feed Heater	18,877.2	0.37	0.04
FCC	53,846.7	1.58	0.32
26H1 Hot Oil Furnace	5,872.9	0.12	0.01
27H1 Reactor Charge Heater	41,529.8	0.82	0.08
33 H1 Vacuum Furnace Heater	54,534.0	1.07	0.11
#11 Boiler	37,460.7	0.74	0.07
Process Flare (South)	10,070.0	30.40	0.101
Asphalt Heaters (6 total)	2,013.5	0.06	0.004
Tanks	NA	1.00	NA
Fugitives (Leaks)	NA	9.60	NA
Product Combustion	5,102,318.7	NA	NA
Total	5,369,353.7	46.6	0.815
Total CO_2e			**5,370,584**

3.2 PSD Applicability Determination

Table 3-7 and Appendix B presents a summary of net emissions expected from the proposed heavy crude refinery project, contemporaneous emission estimates, and additional proposed refinery changes and the applicability of PSD. As seen from Table 3-7, the only pollutants with a significant emissions increase are CO and GHG.

Table 3-7

PSD Applicability Results

Equipment	PM_{10} (TPY)	NO_x (TPY)	CO (TPY)	GHG (MTPY)
Heavy Crude Proc. Project	30.6	84.1	337.5	5,370,584[1]
Contemporaneous Emissions	8.5	20.0	36.6	--
Additional Proposed Changes	-40.9	-95.6	-158.6	--
Net Emissions	-1.8	8.5	215.5	
Significant Emissions Rate	15	40	100	
Significant	No	No	Yes	Yes

[1] As CO_2e

3.3 Non-Attainment Area New Source Review

As mentioned previously, Holly's Woods Cross refinery is located in Davis County which is in non-attainment for $PM_{2.5}$ and ozone. Proposed VOC and $PM_{2.5}$ emissions are presented in Table 3-8. Both $PM_{2.5}$ and ozone (VOC) emissions are less than significant (i.e. 40 tons). Based on Table 3-8, emission offsets are not required.

Table 3-8

Net Emission Change for $PM_{2.5}$ and VOC Emissions

Equipment	$PM_{2.5}$ (TPY)	VOC (TPY)
Heavy Crude Proc. Project	30.5	27.3
Contemporaneous Emissions	8.5	3.7
Additional Proposed Changes	-38.2	-50.4
Net Emissions	0.77	-19.4
Significant Emissions Rate	10	40
Offsets Required	No	No

Overall net emissions from new and project-affected sources are presented in Table 3-8. As seen from Table 3-9, overall emissions of PM_{10}, $PM_{2.5}$, SO_2, and VOC of will be reduced. Appendix C contains the PTE emissions from entire refinery operations (existing and proposed).

Table 3-9

Net Emissions from New and Project-Affected Sources

Emission Unit	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	SO_2 (TPY)	NO_x (TPY)	VOC (TPY)	CO (TPY)	Total HAPS (TPY)
24H1 Crude Furnace #3 (new)	2.0	2.0	2.6	10.5	1.4	21.0	0.49
25H1 FCC#2 Feed Heater (new)	1.5	1.5	2.0	7.9	1.1	15.8	0.36
FCCU #2 Wet Scrubber (new)	13.6	13.6	17.7	19.9	--	154.9	--
26H1 Hot Oil Furnace (new)	0.5	0.5	0.6	2.5	0.3	4.9	0.11
27H1 Reactor Charge Heater (new)	3.3	3.3	4.3	8.7	2.3	34.7	0.80
20H3 Reactor Charge Heater (new)	1.4	1.4	1.8	7.4	1.0	14.8	0.34
Boiler #8 (existing)				-7.6			
Boiler #11 (new)	3.9	3.9	3.9	7.8	1.6	14.5	0.72
Cooling Tower #10 (new)	0.1	0.001	--	--	1.6	--	2.07
Cooling Tower #11 (modified)	0.1	0.001	--	--	1.6	--	2.07
Cooling Tower 4-8 (existing)	--	--	--	--	-48.1	--	--
33H1 Vacuum Furnace Heater (new)	4.3	4.3	5.7	11.4	3.1	45.6	1.1
540 HP Diesel Generator (new)	0.01	0.001	0.03	0.20	0.03	0.25	0.0004
Emergency Equipment (existing)	0.06	0.06	0.06	0.84	0.07	0.18	0.0005
Stab-in Asphalt Tank Heaters (new)	0.16	0.16	0.21	2.1	0.11	1.7	0.04
Tanks (new and modified)	--	--	--	--	1.5	--	0.02
Fugitives from leaks (new)	--	--	--	--	14.6	--	0.85
South Flare (modified)	--	--	-2.3	5.8	-2.8	29.5	0.40
CO Boiler (existing)	-55.8	-36.6	-297.9	-65.0	-0.8	-19.0	-0.31
Propane Pit Flare (existing)	-0.9	-2.6	0.0	-23.8	-1.6	-130.0	--
SRU Incinerator (existing)	--	--	-138.3	--	--	--	--
Net Emissions	-25.8	-8.5	-399.6	-11.3	-23.0	188.8	9.1

3.4 Emission Calculation Methodologies

Emission estimates were derived for the proposed new and modified equipment and are based on manufacturer data, facility testing data, fuel type, anticipated operating hours, and published emission factors and emission calculation guidance presented in publications such as EPA's *Compilation of Air Pollution Emission Factors (AP-42), Volume I: Stationary Point and Area Sources*. The calculation methodologies for each proposed source type are presented in the following sections.

3.4.1 Process Heaters, Furnaces, and Steam Boiler

With the proposed heavy crude processing project, six process heaters and furnaces (reactor charge heater, crude furnace #3, FCC #2 feed heater, hot oil furnace, 27H1 reactor charge furnace, vacuum furnace heater), six asphalt tank heaters, and one steam boiler (boiler #11) will be added. Natural gas/plant gas is one of the major combustion fuels used throughout industry. It is mainly used to generate industrial process steam and heat. Refinery plant gas/natural gas to be used to fire the above mentioned equipment consists of a high percentage of methane and varying amounts of ethane, propane, butane, and inerts. The emissions from refinery plant gas/natural gas-fired boilers and furnaces include nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOCs), sulfur dioxide (SO_2), particulate matter of sizes 10 and 2.5 microns (PM_{10}, $PM_{2.5}$), and hazardous air pollutants (HAPs).

The emission factors for criteria and hazardous air pollutants from the process heaters/furnaces and steam boiler are based on AP-42, Tables 1.4-1, 1.4-2, and 1.4-3 with the exception of NO_x and SO_2. NO_x emission factors are based on assumed performance using ultra low-NO_x burners with the exception of the vacuum furnace heater (33H1), hot oil furnace (10H2), hydroisom charge heater (27H1), hydrogen reformer feed furnaces (30H1 and 30H2), and boilers #8 and #11. This later equipment will utilize low NO_x burners and NO_x emissions will be controlled by SCR. NO_x emissions from the FCC flue gas will be controlled by a wet gas scrubber. SO_2 emissions are based on a 60 ppm average of H_2S in plant gas.

An example PTE calculation methodology for the process heaters and furnaces is presented in Equation 1 and the assumptions below:

$$\boxed{NO_x = Burner_{\max} \div GHV \times EF_{NOxC} \times 8760 \div 2000}$$

(Eq. 1)

Where:
NO_x= Annual potential NO_x emissions from combustion of natural gas/plant gas (tons/year).
$Burner_{max}$ = Maximum burner rating for the combustion unit (MMBtu/hr).
GHV = Gross heating value of natural gas/plant gas (Btu/scf). An average gross heating value of 1020 BTU/scf for natural gas was used.
EF_{NOxC} = Emission factor for NO_x from controlled burners (lb/mmscf). The current Holly Woods Cross Refinery operating permit emission factor for ULNB and NGULNB NO_x from is 41 lb/mmscf or 0.04 lb/MMbtu.
EF_{NOxC} = Emission factor for NO_x from LNB with SCR is 0.02 lb/MMbtu.
8760 = Conversion factor from hours to years based on 24 hours per day, 7 days per week, 52 weeks per year.
2000 = Conversion factor from pounds to tons.

3.4.2 Emergency Equipment

As part of the heavy crude processing project, Holly is proposing the addition of a 540 HP diesel emergency generator to be used for emergency power supply. The proposed emergency generator will meet EPA Tier 3 emission limitations as found in 40 CFR Part 60 Subpart IIII for NO_x, non-methane hydrocarbons, CO, and PM. Hours of operation for this generator will be limited to 50 hours annually for testing and maintenance purposes only.

For other criteria and HAPS, emission factors found in EPA's AP-42 Section 3.3, Gasoline and Diesel Engines were utilized. Per AP-42, all PM emissions are expected to be ≤ 1 μ in size. An example PTE calculation methodology for the emergency generator is presented in Equation 2 and the assumptions below:

$$\boxed{VOC = HP_{\max} \times EF_{VOC} \times Operation_{Permitted} \div 2000}$$

(Eq. 2)

Where:
VOC = Annual potential VOC emissions from combustion of diesel fuel (tons/year).

HP_{max} = Maximum horsepower rating for the unit (HP) and based on the highest rated emergency engine.
EF_{VOC} = Emission factor for VOCs from engines in lb/HP-hr. Reference: AP-42, Section 3.3 Gasoline and Diesel Engines, Table 3.3-1, uncontrolled diesel industrial engines.
$Operation_{Permitted}$ = Permitted hours for non-emergency use (50 hours).
2000 = Conversion factor from pounds to tons.

3.4.3 Cooling Towers

Cooling towers are heat exchangers that are used to dissipate large heat loads to the atmosphere. In the cooling tower, warm cooling water returning from refinery processes is contacted with air by cascading through packing. Cooling tower emissions include "drift" crystallized solid particles that are considered PM_{10} emissions.

VOCs from cooling towers will be monitored and controlled via the Modified El Paso Method for Determination of Volatile Organic Compound Emissions from Water Sources. The methods requires a continuous stream of cooling water, process water, or wastewater to be supplied via a hard pipe or direct interface to an air stripping column apparatus for analysis. Air flowing countercurrent to the water strips volatile organic compounds from the water for analysis. Concentrations of air stripped compounds in the air exhaust, along with the air and water flow rates, are used to determine concentrations of strippable volatile compounds in the water. A FID analyzer will be used to determine the valve of "combined" or "total" strippable volatile organic compounds. The method is presented in Appendix P -Texas Commission on Environmental Quality – Air Stripping Method (Modified El Paso Method) for Determination of Volatile Organic Compound Emissions from Water Sources.

Since the Modified El Paso method was going to be implemented, it was felt to be appropriate to use the "controlled" emission factor of 0.7 lb/10^6 gallons cooling water as found in AP-42, Section 5.1 for VOC's from cooling towers. Previously, VOC emissions were calculated using the "uncontrolled" emission factor of 6 lb/10^6 gal cooling water which is also found in AP-42, Section 5.1. Thus, the use of the controlled emission factor accounts for the estimated VOC reductions.

Air emissions from the cooling tower also consist of fugitive VOCs and gases stripped from the cooling water as the air and water come into contact. These contaminants enter the cooling water system from leaking heat exchangers and condensers. VOC and PM emissions from the proposed cooling tower 10 and additional cell for cooling tower 11 were based on the following equations and assumptions below:

$$\boxed{VOC = Feed \times 42 \times EF_{Water} \div 10^6 \times EF_{VOC} \div 2000}$$

(Eq. 4)

Where:
VOC = Annual potential VOC emissions from cooling towers (tons/year).
Feed = Annual refinery crude feed (bbls) based on 3-year average (2008-2010) +3 standard deviations.
42 = Conversion factor from barrels to gallons.
EF_{Water} = Emission factor for cooling water used per crude feed (40 gallons cooling water to 1 gallon crude feed). Reference: AP-42, Section 5.1.
10^6 = Conversion from gallons to million gallons (gal/10^6 gal).
EF_{VOC} = Controlled emission factor for VOCs from cooling towers (0.7 lb/10^6 gal). Reference: AP-42, Table 5.1-2.
2000 = Conversion factor from pounds to tons.

The PM PTE calculation methodology is presented in Equation 5. PM emissions were estimated based on the methodology and particle size distributions presented by Joel Reisman and Gordon Frisbie's paper titled, Calculating Realistic PM_{10} Emissions from Cooling Towers.

$$\boxed{PM = Circulation\_Rate \times \frac{TDS}{10^6} \times \frac{Drift\_Rate}{100} \times \rho \times 60 \times 8760 \div 2000}$$

(Eq. 5)

Where:
PM = Annual potential PM emissions from cooling towers (tons/year).
Circulation Rate = Water circulation rate of the cooling tower (gal/min).
TDS = Based on average of total dissolved solids (TDS) measurements collected from existing cooling tower water.
10^6 = Conversion factor from ppm.
Drift Rate = Drift loss of circulating water (%).
ρ = density of water (lbs/gal).
60 = Conversion factor from minutes to hours.
8760 = Conversion factor from hours to years based on 24 hours per day, 7 days per week, 52 weeks per year.
2000 = Conversion factor from pounds to tons.

In the above mentioned paper, a linear relationship, based on research data between solid particle diameter size and Electric Power Research Institute (EPRI) % mass, at a constant TDS is established. Therefore, percentages of PM_{10} and $PM_{2.5}$ can be calculated using the interpolation equation below in Equation 6. Equations 7 and 8 present the PM_{10} and $PM_{2.5}$ PTE methodologies, respectively.

$$y_2 = y_0 + \left(\frac{y_1 - y_0}{x_1 - x_0}\right) \times (x_2 - x_0)$$

(Eq. 6)

$$PM_{10} = PM \times \frac{EPRI\%_{10}}{100}$$

(Eq. 7)

$$PM_{2.5} = PM \times \frac{EPRI\%_{2.5}}{100}$$

(Eq. 8)

Where:
PM_{10}/ $PM_{2.5}$ = Annual potential PM_{10}/$PM_{2.5}$ emissions from cooling towers (tons/year).
PM = Annual potential PM emissions from cooling towers (tons/year).
$EPRI\%_{10}$ = EPRI% Mass % at solid particle diameter 10 or 2.5 microns.

HAP emissions were also calculated for the cooling towers based on Equation 9 and the assumptions below:

$$HAPs = \frac{VOC_{CoolingTowers}}{VOC_{Fugitives}} \times HAPs_{StorageTanks}$$

(Eq. 9)

Where:
HAPs = Annual potential organic HAPs emissions from cooling towers (tons/year).
$VOC_{CoolingTowers}$ = Annual potential VOC emissions from cooling towers (tons/year).
$VOC_{Fugitives}$ = Annual potential VOC fugitive emissions from valves and fittings (lbs/year).
$HAPs_{Storage\ Tanks}$ = Annual HAPs emissions from storage tanks (lbs/year). Storage tank HAPs emissions determined using the TANKS software, averaging the last 8 years, and multiplying by 2 standard deviations.

3.4.4 Flare

Flaring is a high-temperature oxidation process used to burn combustible components, mostly hydrocarbons, of waste gases from industrial operations. Natural gas, propane, ethylene, propylene, butadiene and butane constitute over 95 percent of the waste gases flared.

Emissions from flaring include unburned hydrocarbons, CO, and other partially burned and altered hydrocarbons. Also emitted are NO_x and, if sulfur-containing material such as hydrogen sulfide or mercaptans is flared, SO_2. The quantities of hydrocarbon emissions generated relate to the degree of combustion. The degree of combustion depends largely on the rate and extent of fuel-air mixing and on the flame temperatures achieved and maintained.

The average non-upset throughput to the south flare is estimated to be 17,000 standard cubic feet per hour (scf/h) and was based on 2011 flow monitoring data. The efficiency of the flare was estimated to be 98% and the average methane concentration of the flare is 55%. The higher heating value of the flare gas was assumed to be 1150 BTU/scf. Flare HAP emissions were based on California Air Resource Board (CARB) species profiles which were applied to the EPAs' TOC emission factor, as found in AP-42 for flares. Criteria pollutant emission factors used were based on AP-42 Section 13.5 Industrial Flares and Wyoming Department of Environmental Quality suggested emission factors. PM_{10} and $PM_{2.5}$ emissions for the Woods Cross refinery flares were assumed to be zero. An example flare calculation is presented in Equation 3 below:

$$\boxed{NO_x = Flare_{Average} \times HHV \times EF_{NOx} \times 10^{-6} \times 8760 \div 2000}$$

(Eq. 3)

Where:
NO_x = Annual potential NO_x emissions from normal flaring (tons/year).
$Flare_{Average}$ = Average non-upset flare throughput (scf/hr) which is based on 2011 monitored flow to flare.
HHV = Average higher heating value of flared gas (Btu/scf) which is based on 2011 monitored flow to flare.

EF_{NOx} = Emission factor for NO_x from industrial flares in lb/mmBtu. Reference: AP-42 Section 13.5 Industrial Flares, Table 13.5-1. The VOC emission factor utilized was from Wyoming Department of Environmental Quality and HAPS emission factors from CARB.
10^{-6} = Conversion factor from Btu to MMBtu.
8760 = Conversion factor from hours to years based on 24 hours per day, 7 days per week, 52 weeks per year.
2000 = Conversion factor from pounds to tons.

3.4.5 Storage Tanks

Storage tanks are used in the oil and gas industry to store raw materials, intermediates, blend stocks, and finished products. Emissions from storage tanks generally depend on several factors; tank size (capacity), dimensions (diameter and height), type (fixed roof, internal floating roof, external floating roof), vapor pressure of substance stored, and tank turnovers. Storage tanks that store chemicals that are not hydrocarbon based are assumed to have no emissions. The emissions from storage tanks include VOCs and HAPs.

All PTE VOC and HAPs emissions for the proposed or modified storage tanks at the Woods Cross Refinery were calculated using the average emissions for the last five years generated by the TANKS program, Version 4.09D, plus two standard deviations. Copies of the TANKS program output are included in Appendix B. HAPs emissions were developed based on published or assay data for the crude and other products, if available.

3.4.6 Fluid Catalytic Cracking Unit

Emissions from the new FCCU will be controlled by a wet gas scrubber. NO_x and SO_2 emissions were based on Holly Consent Decree limits for the existing FCCU (with a wet gas scrubber) of 40 ppm and 25 ppm, respectively based on 0% O_2 and a 365 day averaging period. PM_{10} emissions were based on Consent Decree PM limit of 0.5 lb/1000 lb coke. All PM_{10} was assumed to be $PM_{2.5}$. CO emissions were based on engineering calculations of 23 mmscf/day and the existing FCCU limit of 500 ppm based on a one-hour average and 0% O_2. VOC emissions were assumed to be negligible. Annual emissions were based on 8760 operating hours.

3.4.7 Fugitives

Fugitive emission sources include leaks of hydrocarbon vapors from process equipment and evaporation of hydrocarbons from open areas, rather than through a stack or vent. Fugitive emission sources include valves of all types, flanges, pump and compressor seals, process drains, cooling towers, and oil/water separators.

Fugitive emissions are attributable to the evaporation of leaked or spilled petroleum liquids and gases. Normally, control of fugitive emissions involves minimizing leaks and spills through equipment changes, procedure changes, and improved monitoring, housekeeping, and maintenance practices.

The following assumptions were made for the fugitive sources:

- only relief valves that vent to atmosphere are counted;
- same number of heavy liquid components as light liquid components;
- twice as many connectors as valves;
- leak rate is greater than 10,000 ppm;
- 2% of all components leaking; and
- year-long continuous leak.

The VOC calculation methodology to estimate fugitive emissions from leaks is presented in Equation 10.

$$\boxed{VOC = \#Components \times EF_{source} \times 0.02 \times 24 \times 2.205 \times 365 \div 2000}$$

(Eq. 10)

Where:
VOC = Potential VOC emissions from fugitive sources (tons/year).
#Components = Number of components in a source group (gas valves, light liquid valves, heavy liquid valves, light liquid pump seals, heavy liquid pump seals, compressor seals, pressure relief valves, connectors, open-ended lines, sampling connections).
EF_{source} = Emission factor for source group (kg/hr/source). Reference: Protocol for Equipment Leak Emission Estimates, Table 2-2.
0.02 = 2% assumed leak rate of all components in a source group.

24 = Conversion factor from hours to days.
2.205 = Conversion from kilograms to pounds.
365 = Conversion factor from days to year.
2000 = Conversion factor from pounds to tons.

3.4.8 Product Loading/Unloading

Although a reconfiguration of loading spots is anticipated from the heavy crude processing project, no additional air emissions are expected. Air emissions from the converted or new propane loading spots will be controlled through a small electric-driven compressor which will recover displaced relief gas from loading propane into rail cars. Since emissions from fuel oil and asphalt rail loading are negligible due to the heavy nature of these products, no vapor controls are proposed.

The black wax unloading bays will be constructed with a heated closed sump. Black wax product collected in the sump will be piped to one of the proposed black wax crude storage tanks. Emissions from the black wax unloading bays will be negligible due to the crude being a solid at average ambient conditions.

3.4.9 Wastewater Treatment

As mentioned in Section 2, based on the preliminary results of the water conservation and wastewater reduction study that Holly undertook, it is anticipated that installation and operation of the proposed new process units will not increase the overall throughput of the existing wastewater treatment plant. Thus, no increased air emissions are expected from wastewater treatment.

3.4.10 Greenhouse Gases

Emissions of greenhouse gases (GHG) for the stationary fuel combustion sources were determined based on the calculation methodologies found in 40 CFR Part 98. Stationary fuel combustion sources are devices that combust solid, liquid, or gaseous fuel, generally for the purposes of producing electricity, generating steam, or providing useful heat or energy for industrial, commercial, or institutional use, or reducing the volume of waste by removing combustible matter.

3.4.10.1 Stationary Fuel Combustion Sources

Stationary fuel combustion sources at Holly include boilers and process heaters. Emergency generators and emergency equipment are not included per §98.30(b)(2). The calculation methodologies for GHG are the same for plant fuel gas and/or natural gas fired combustion units.

For calculating CO_2 emissions from the stationary fuel combustion sources, the equation as found in 40 CFR 98.33(a)(3)(iii), and presented as Equation 11 below was used.

$$\boxed{CO_2 = \frac{44}{12} \times Fuel \times CC \times \frac{MW}{MVC} \times 0.001}$$

(Eq. 11)

Where:
CO_2= Annual CO_2 mass emissions from combustion of plant fuel gas or natural gas (metric tons).
Fuel = Annual volume of the gaseous fuel combusted (scf). This was based on a gas heating value of 1020 Btu/scf and maximum heater duty.
CC = Annual average carbon content of the gaseous fuel (kg C per kg of fuel or 0.7135 based on average value from Holly's 2011 GHG annual inventory calculation.
MW = Annual average molecular weight of the gaseous fuel (kg/kg-mole) or 15.9 based on average value from Holly's 2011 GHG annual inventory calculation.
MVC = Molar volume conversion factor at standard conditions, as defined in §98.6, or 849.5 scf per kg mole at 68 °F and 836.6 scf per kg mole at 60 °F standard temperature.
44/12 = Ratio of molecular weights, CO_2 to carbon.
0.001 = Conversion factor from kg to metric tons.

For the calculation of CH_4 and N_2O emissions, the following equation (Equation 12) as presented in 40 CFR 98.33(c)(1) was used.

$$CH_4 \text{ or } N_2O = 0.001 \times Fuel \times HHV \times EF$$

(Eq. 12)

Where:
CH_4 or N_2O = Annual CH_4 or N_2O emissions from the combustion of a particular type of fuel (metric tons).
Fuel = Annual volume of the gaseous fuel combusted (scf). This was based on a gas heating value of 1020 Btu/scf and maximum heater duty.
HHV = Default high heat value of the fuel from 40 CFR Part 98, Table C–1.
EF = Fuel-specific default emission factor for CH_4or N_2O from 40 CFR Part 98, Table C–2.
1×10^{-3}= Conversion factor from kilograms to metric tons.

The equation for HHV as found in 40 CFR 98.33(a)(2)(ii) is as follows.

$$(HHV)_{annual} = \frac{\sum_{i=1}^{n} (HHV)_i \times (Fuel)_i}{\sum_{i=1}^{n} (Fuel)_i}$$

(Eq. 13)

Where:
$(HHV)_{annual}$= Weighted annual average high heat value of the fuel (mmBtu per mass or volume).
$(HHV)_I$= Based on average value from Holly's 2011 GHG annual inventory calculation.
$(Fuel)_I$= Annual volume of the gaseous fuel combusted (scf) determined by month. This was based on a gas heating value of 1020 Btu/scf and maximum heater duty.
n = Number of months in the year that the fuel is burned in the unit.

3.4.10.2 Flare

40 CFR 98.253(b)(1)(iii)(C) presents the calculation (Equation 14) that was used to determine CO_2 emissions from normal operations for the south flare. Startup, shutdown, malfunction events were considered to be zero.

$$CO_2 = 0.98 \times 0.001 \times \left(Flare_{Norm} \times HHV \times EmF + \sum_{p=1}^{n} \left[\frac{44}{12} \times (Flare_{SSM})_p \times \frac{(MW)_p}{MVC} \times (CC)_p \right] \right)$$

(Eq. 14)

CO_2= Annual CO_2 emissions for a specific fuel type (metric tons/year).
0.98 = Assumed combustion efficiency of a flare.
0.001 = Unit conversion factor (metric tons per kilogram, mt/kg).
$Flare_{Norm}$= Annual volume of flare gas combusted during normal operations based on 17,000 scfh.
HHV = Higher heating value for fuel gas or 1150 Btu/scf.
EmF = Default CO_2 emission factor for flare gas of 60 kilograms CO_2/MMBtu (HHV basis).
n = Number of start-up, shutdown, and malfunction events which was assumed to be zero.
p = Start-up, shutdown, and malfunction event index which was assumed to be zero.
44 = Molecular weight of CO_2(kg/kg-mole).
12 = Atomic weight of C (kg/kg-mole).

For calculation of CH_4, the equation found in 40 CFR 98.253(b)(2) and presented as Equation 16 below was used:

$$CH_4 = \left(CO_2 \times \frac{EmF_{CH4}}{EmF} \right) + CO_2 \times \frac{0.02}{0.98} \times \frac{16}{44} \times f_{CH4}$$

(Eq. 16)

Where:
CH_4= Annual methane emissions from flared gas (metric tons CH_4/year).
CO_2= Emission rate of CO_2 from flared gas (metric tons/year).
EmF_{CH4}= Default CH_4emission factor for "Petroleum Products", 40 CFR Part 98 Table C–2.
EmF = Default CO_2emission factor for flare gas or 60 kg CO_2/MMBtu (HHV basis).
0.02/0.98 = Correction factor for flare combustion efficiency.
16/44 = Correction factor ratio of the molecular weight of CH_4 to CO_2.
f_{CH4}= Weight fraction of carbon in the flare gas prior to combustion. Default of 0.4 was used.

For calculation of N_2O, the following equation was used:

$$N_2O = \left(CO_2 \times \frac{EmF_{N2O}}{EmF} \right)$$

(Eq. 17)

Where:
N_2O = Annual nitrous oxide emissions from flared gas (metric tons N_2O/year).
CO_2= Emission rate of CO_2 from flared gas (metric tons/year).
EmF_{N2O}= Default N_2O emission factor for "Petroleum Products", 40 CFR Part 98 Table C–2.
EmF = Default CO_2 emission factor for flare gas or 60 kg CO_2/MMBtu (HHV basis).

3.4.10.3 Fluid Catalytic Cracking Unit

The GHG emissions for the proposed FCCU are presented below. For calculation of CO_2 emissions, the equation as found in 40 CFR 98.253(c)(2)(i) (Equation 18) was used.

$$CO_2 = \sum_{p-1}^{n}\left[(Q_r)_p \times \frac{(\%CO_2 + \%CO)_p}{100\%} \times \frac{44}{MVC} \times 0.001\right]$$

(Eq. 18)

Where:
CO_2= Annual CO_2mass emissions (metric tons/year).
Q_r= Volumetric flow rate of exhaust gas from the FCCU regenerator estimated to be 766681.72 dscf/hr.
$\%CO_2$= Hourly average percent CO_2 concentration in the exhaust gas stream from FCCU regenerator estimated to be 16.2 based on November 2011data.
%CO = Hourly average percent CO concentration in the exhaust gas stream FCCU regenerator estimated to be 0.015 based on November 2011 data.
44 = Molecular weight of CO_2 (kg/kg-mole).
MVC = Molar volume conversion factor (849.5 scf/kg-mole at 68 °F and 14.7 psia at 60 °F)
0.001 = Conversion factor (metric ton/kg).
n = Number of hours in calendar year.

Per 40 CFR 98.253(c)(2)(ii) and 40 CFR 98.253(c)(4), the following equation (19) was used to calculate CH_4 emissions:

$$CH_4 = \left(CO_2 \times \frac{EmF_2}{EmF_1}\right)$$

(Eq. 19)

Where:
CH_4= Annual methane emissions from coke burn-off (metric tons CH_4/year).
CO_2= Emission rate of CO_2 (Equation 18).
EmF_1= Default CO_2emission factor for "Petroleum Coke" of 102.41 kg CO_2/MMBtu from 40 CFR Part 98, Table C–1.
EmF_2= Default CH_4emission factor for "Petroleum Products" of 0.003 kg CH_4/MMBtu from 40 CFR Part 98, Table C–1.

N_2O was calculated using the following equation (Eq. 20) as found in 40 CFR 98.253(c)(5).

$$N_2O = \left(CO_2 \times \frac{EmF_3}{EmF_1} \right)$$

(Eq. 20)

Where:
N_2O = Annual nitrous oxide emissions from coke burn-off (mt N_2O/year).
CO_2= Emission rate of CO_2 (Equation 18).
EmF_1= Default CO_2emission factor for "Petroleum Coke" of 102.41 kg CO_2/MMBtu from 40 CFR Part 98, Table C–1.
EmF3 =Default N_2O emission factor for "Petroleum Products" 0.0006 kg N_2O/MMBtu from 40 CFR Part 98, Table C–1.

3.4.10.4 Fugitive Sources including Equipment Leaks

For the determination of GHG from equipment leaks, the equation as found in 40 CFR 98.253(l)(2) was used.

$$CH_4 = (0.4 \times N_{CD} + 0.2 \times N_{PU1} + 0.1 \times N_{PU2} + 4.3 \times N_{H2} + 6 \times N_{FGS})$$

(Eq. 21)

Where:
CH_4= Annual methane emissions from equipment leaks (metric tons/year).
N_{CD}= Number of atmospheric crude oil distillation columns at the facility.
N_{PU1}= Cumulative number of catalytic cracking units, coking units (delayed or fluid), hydrocracking, and full-range distillation columns (including depropanizer and debutanizer distillation columns) at the facility.
N_{PU2}= Cumulative number of hydrotreating/hydrorefining units, catalytic reforming units, and visbreaking units at the facility.
N_{H2}= Total number of hydrogen plants at the facility.
N_{FGS}= Total number of fuel gas systems at the facility.

3.4.10.5 Storage Tanks

Per 40 CFR 98.253(m)(1), CH_4 was calculated for storage tanks in accordance with Equation 22 as follows:

$$\boxed{CH_4 = \left(0.1 \times Q_{\mathrm{Ref}}\right)}$$

(Eq. 22)

Where:
CH_4= Annual methane emissions from storage tanks (metric tons/year).
0.1 = Default emission factor for storage tanks (metric ton CH_4/MMbbl).
Q_{Ref}= Quantity of crude oil plus the quantity of intermediate products received from off site that are processed at the facility (MMbbl/year).

3.4.10.6 Suppliers of Petroleum Products

A petroleum refinery for the purpose of 40 CFR Part 98 Subpart MM is any facility engaged in producing petroleum products through the distillation of crude oil. For calculation of CO_2 emissions from products produced, imported, or exported, the following equation, as found in in 40 CFR 98.393(a)(1) was used.

$$\boxed{CO_{2i} = \left(\mathrm{Pr}\,oduct_i \times EF_i\right)}$$

(Eq. 23)

Where:
CO_{2i}= Annual CO_2emissions that would result from the complete combustion or oxidation of each petroleum product or natural gas liquid "i" (metric tons).
$Product_i$= Annual volume of product "i" produced, imported, or exported by the reporting party (barrels).
EF_i= Product-specific CO_2emission factor (metric tons CO_2per barrel).

For calculation of CO_2 emissions from non-crude feedstock products that enter the refinery, per 40 CFR 98.393(b)(1), Equation 24 below was utilized.

$$\boxed{CO_{2j} = \left(\mathrm{Pr}\,oduct_j \times EF_j\right)}$$

(Eq. 24)

Where:
CO_{2j}= Annual CO_2emissions that would result from the complete combustion or oxidation of each non-crude feedstock "j" (metric tons).
$Feedstock_j$= Annual volume of a petroleum product or natural gas liquid "j" that enters the refinery to be further refined or otherwise used on site (barrels). For natural gas liquids, volumes shall reflect the individual components of the product as listed in table MM–1 of this subpart.
EF_j= Feedstock-specific CO_2emission factor (metric tons CO_2per barrel).

For the calculation of CO_2 emissions from non-crude feedstock products that enter the refinery, Equation 25, as found in 40 CFR 98.393(c)(1) was used.

$$\boxed{CO_{2m} = \left(Biomass_m \times EF_m\right)}$$

(Eq. 25)

Where:
CO_{2m}= Annual CO_2emissions that would result from the complete combustion or oxidation of each type of biomass "m" (metric tons).
$Biomass_m$= Annual volume of a specific type of biomass that enters the refinery and is co-processed with petroleum feedstocks to produce a petroleum product reported under paragraph (a) of this section (barrels).
EF_m= Biomass-specific CO_2emission factor (metric tons CO_2per barrel).

To summarize CO_2 for refinery products, the following calculation as found in 40 CFR 98.393(d) was used.

$$\boxed{CO_r = \sum\left(CO_{2i}\right) - \sum\left(CO_{2j}\right) - \sum\left(CO_{2m}\right)}$$

(Eq. 26)

Where:
CO_{2r}= Annual CO_2 emissions that would result from the complete combustion or oxidation of all petroleum products and natural gas liquids minus non-crude feedstocks and any biomass to be co-processed with petroleum feedstocks.
CO_{2i}= Annual CO_2 emissions that would result from the complete combustion or oxidation of each petroleum product or natural gas liquid "i" (metric tons).
CO_{2j}= Annual CO_2 emissions that would result from the complete combustion or oxidation of each non-crude feedstock "j" (metric tons).
CO_{2m}= Annual CO_2 emissions that would result from the complete combustion or oxidation of each type of biomass "m" (metric tons).

3.5 Startup and Shutdown Emissions

The average number of startups (SU) and shutdowns (SD) for the new process units are presented in Table 3-10 and are based on the average shutdowns per year for the existing units at Holly from 2007 through 2011. Potential-to-emit startup and shutdown emissions, per startup event and on an annual basis are presented in Tables 3-11 and 3-12, respectively, for the proposed new equipment. Annual SU/SD emissions, presented in Table 3-13 and in Appendix B, are based on the projected number of SU and SD as presented in Table 3-10.

"Torch oil" is a term which is usually applied to gas oil that is burned in FCC regenerators, to supply necessary heat requirements during startup and shutdown. Torch oil and refinery plant gas will be used for the new FCCU.

At Holly, it will be the standard operating procedure that the wet gas scrubber will be online prior to the start up or shutdown of the FCCU. It was also assumed that the wet gas scrubber will be online during any malfunction or maintenance event of the FCCU. There is no change in emission due to start up, shut down, or malfunction. It should be noted that the startup, shutdown and malfunction estimates provided in this section are overly conservative and have assumed that the wet gas scrubber was not in operation.

Table 3-10

Average Startup/Shutdowns Per Year

Process	Number of SU/SD
New Crude Unit	3.4
New FCC Unit	2.6
New Poly Gas Unit	2.6
New Hydrocracker/Hydroisom Unit	4.2

Table 3-11

PTE Startup Emissions per Event

Pollutant	New Crude (lbs)	New FCC (lbs)	Poly Gas (lbs)	Hydrocracker/Hydroisom Unit (lbs)
NO_x	28.2	182.2	8.0	32.1
CO	153.7	991.6	43.3	174.4
SO_x	1.0	6.5	0.3	1.1
PM_{10}	2.9	18.5	0.8	3.3
$PM_{2.5}$	2.9	18.5	0.8	3.3
VOC	2.1	13.4	0.6	2.4

Table 3-12

PTE Shutdown Emissions per Event

Pollutant	New Crude (lbs)	New FCC (lbs)	Poly Gas (lbs)	Hydrocracker/Hydroisom Unit (lbs)
NO_x	62.3	170.5	256.2	429.1
CO	338.8	927.7	1394.1	2334.9
SO_x	1.5	4.1	6.2	10.4
PM_{10}	4.2	11.7	17.4	29.4
$PM_{2.5}$	4.2	11.7	17.4	29.4
VOC	3.1	8.5	12.6	21.3

Table 3-13

Total Startup/Shutdown Emissions in Tons Per Year

Pollutant	New Crude (TPY)	New FCC (TPY)	Poly Gas (TPY)	Hydrocracker/Hydroisom Unit (TPY)
NO_x	0.15	0.46	0.34	0.97
CO	0.84	2.50	1.87	5.27
SO_x	0.00	0.01	0.01	0.02
PM_{10}	0.01	0.04	0.02	0.07
$PM_{2.5}$	0.01	0.04	0.02	0.07
VOC	0.01	0.03	0.02	0.05

3.6 Flaring Emissions Due to Upsets

Flaring emissions from upset conditions were calculated based on the average emissions calculated for flaring events from 2005 through 2008 from the existing north and south flares. Three standards deviations were applied to the average emission estimates so that a conservative emissions estimate could be obtained. Proposed flare emissions from upsets for the north and south flare are as follows:

- SO_2 – 120 TPY per flare
- NO_x – 4 TPY per flare
- VOC – 8 TPY per flare
- CO – 21 TPY per flare

3.7 Potential to Emit Emissions for Entire Refinery

Based on the above calculation methodologies, PTE emissions for the entire refinery which includes existing operations and proposed changes were determined. These PTE emissions are presented in Table 3-14.

Table 3-14
Potential to Emit Emissions for
Holly Refining & Marketing Company Woods Cross Refinery

Equipment	PM_{10} (TPY)	$PM_{2.5}$ (TPY)	SO_2 (TPY)	NO_x (TPY)	VOC (TPY)	CO (TPY)
All combustion sources (SIP sources)	84.4	84.4	109.5	364.9	42.7	912.2
All other sources (Non-SIP sources)	101.7	1.9	4.5	12.9	207.9	67.1
All Sources	186.1	86.3	114.1[1]	377.7	2621.7[2]	979.3

[1] Value does not include flaring upset emissions.
[2] Total includes fugitives including emissions from tank cleaning.

4.0 REGULATORY REVIEW

The following sections contain an assessment of federal and State of Utah air regulations that are potentially applicable for the proposed heavy crude processing project at Holly's Woods Cross refinery.

4.1 Federal Regulations

For the purposes of this permit application the following federal regulations have been reviewed for potential applicability to the Project:

- New Source Performance Standards (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
- National Ambient Air Quality Standards (NAAQS)
- Prevention of Significant Deterioration (PSD)
- Good Engineering Stack Height Analysis
- Operating Permit (Title V)
- Mandatory Greenhouse Gas Reporting

A review of each specific federal requirement is presented below.

4.1.1 New Source Performance Standards (NSPS)

The United States Environmental Protection Agency (EPA) has promulgated standards of performance for specific sources of air pollution. These standards have been codified in 40 CFR Part 60, Subparts A through KKKK. NSPS apply to certain categories of new, modified, or reconstructed sources after a given applicability date as specified in the applicable standard. The following Subparts are applicable to the proposed project:

- Subpart A - General Provisions

- Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units
- Subpart Ja - Standards of Performance for Petroleum Refineries
- Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced After July 23, 1984
- Subpart GGGa – Equipment Leaks of VOC in petroleum Refineries for which Construction, Reconstruction, or Modification Commenced After November 7, 2006
- Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

4.1.1.1 40 CFR Part 60 Subpart A

Certain provisions of 40 CFR Part 60 Subpart A applies to the owner or operator of any stationary source subject to a NSPS. Subpart A contains general requirements for notifications, monitoring, performance testing, reporting, recordkeeping, and operation and maintenance provisions.

4.1.1.2 40 CFR Part 60 Subpart Dc

40 CFR 60 Subpart Dc applies to each steam generating unit that commences construction, modification, or reconstruction after June 9, 1989 and that has a maximum design heat input capacity of 29 megawatts (MW) (100 million British thermal units per hour (MMBtu/hr)) or less, but greater than or equal to 2.9 MW (10 MMBtu/hr). The requirements of Subpart Dc apply to the proposed 89.3 MMBtu/hr boiler #11.

4.1.1.3 40 CFR Part 60 Subpart Ja

The provisions of this subpart apply to the new FCCU and fuel gas combustion devices, including flares and process heaters. Holly will comply with the following emission limitations:

- 0.5 gram per kilogram (g/kg) coke burn-off (0.5 lb PM/1,000 lb coke burn-off) or, if a PM CEMS is used, 0.020 gr/dscf corrected to 0 percent excess air for the newly constructed FCCU.
- NO_x in excess of 80 parts per million by volume (ppmv), dry basis corrected to 0 percent excess air, on a 7-day rolling average basis for the FCCU.
- SO_2 in excess of 50 ppmv dry basis corrected to 0 percent excess air, on a 7-day rolling average basis and 25 ppmv, dry basis corrected to 0 percent excess air, on a 365-day rolling average basis for the FCCU.
- CO in excess of 500 ppmv, dry basis corrected to 0 percent excess air, on an hourly average basis.
- The wet scrubber's three-hour rolling average pressure drop must not fall below the level established during the most recent performance test.
- The wet scrubber's three-hour rolling average liquid-to-gas ratio must not fall below the level established during the most recent performance test.

For each new fuel gas combustion device, Holly will comply with either the emission limits or fuel gas concentration limit as presented below:

- Holly shall not burn in any new fuel gas combustion device any fuel gas that contains H_2S in excess of 162 ppmv determined hourly on a three-hour rolling average basis and H_2S in excess of 60 ppmv determined daily on a 365 successive calendar day rolling average basis.

- For each new process heater with a rated capacity of greater than 40 million British thermal units per hour (MMBtu/hr), Holly shall not discharge to the atmosphere any emissions of NO_x in excess of 40 ppmv (dry basis, corrected to 0 percent excess air) on a 24-hour rolling average basis.

4.1.1.4 40 CFR Part 60 Subpart Kb

Storage tanks to be added or modified as part of the heavy crude processing project, with a capacity greater than or equal to 75 cubic meters (m^3) and that will be used to store volatile organic liquids for which construction commenced after July 23, 1984 are subject to the requirements of 40 CFR Part Kb. This subpart does not apply to storage vessels with a capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa. The new tanks, as well as any existing tanks that are "reconstructed," will meet NSPS Subpart Kb technology standards (e.g., roof requirements, vent requirements, inspection schedules, etc.).

4.1.1.5 40 CFR Part 60 Subpart GGGa

40 CFR 60 Subpart GGGa applies to the Holly Refining affected process units (valves, pumps, pressure relief devices, sampling connections, etc.) constructed after November 7, 2006. Subpart GGGa requires minimum performance specifications, routine inspection and repair of all such fugitive components consistent with §60.482-1 through 60.482-10 under NSPS Subpart VV (NSPS LDAR program).

4.1.1.6 40 CFR Part 60 Subpart IIII

40 CFR Part 60 Subpart IIII applies to stationary, compression ignition, internal combustion engines. The diesel engine in the proposed emergency generator falls under this rule. Holly will purchase an engine that is certified to the emission standards (Tier III) specified in the rule and will install a non-resettable hour meter on the engine prior to startup. In addition, SO_2 emissions are required to be minimized by burning only ultra-low sulfur diesel fuel with a maximum sulfur content of 15 ppmw.

Holly is proposing limiting the non-emergency operation of the new generator to 50 hours per year for maintenance and testing. In addition, Holly is proposing an increase to the existing operating hours for the remaining emergency equipment from an average of 30 to 50 hours per year for maintenance and testing purposes, or a total for all emergency equipment of 500 hours per year. This would be offset by a reduction in the permitted use of the ETF portable diesel generator by 200 hours to 1100 hours per year.

4.1.2 National Emission Standards for Hazardous Air Pollutants (NESHAP)

The Clean Air Act requires the US EPA to regulate emission of hazardous air pollutants under regulations know as Maximum Achievable Control Technologies (MACTs). These MACTs are embodied in National Emission Standards for Hazardous Air Pollutants (NESHAP) as found in 40 CFR Part 61 and for source categories as found in 40 CFR Part 63. The following Subparts are determined to be applicable to the proposed project.

- 40 CFR Part 63 Subpart A - General Provisions
- 40 CFR Part 61 Subpart FF - National Emission Standard for Benzene Waste Operations

- 40 CFR 63 Subpart UUU: National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units
- 40 CFR Part 63 Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Boilers and Process Heaters
- 40 CFR Part 63 Subpart CC - National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries

The provisions of 40 CFR Part 63 Subpart A apply to certain proposed facility operations and contain general requirements for notifications, monitoring, performance testing, reporting, recordkeeping, and operation and maintenance provisions.

Part 61, Subpart FF applies to all petroleum refineries, regardless of the quantity of benzene processed. Refinery operators must determine the Total Annual Benzene (TAB) generated, as prescribed under §61.342(a). Refineries with a TAB greater than 10 Megagrams/year (Mg/yr) must comply with Subpart FF control requirements. Facilities with a TAB less than 10 Mg/yr, but greater than 1 Mg/yr must update their TAB calculations annually, and report these values to the US EPA. Facilities with a TAB less than 1 Mg/yr are required to submit to EPA an initial report, and are only required to submit future reports if there are changes in the waste-generating processes that could cause the TAB to increase to 1 Mg/yr or more.

40 CFR Part 63 Subpart UUU establishes national emission standards for HAPs emitted from petroleum refineries. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and work practice standards.

40 CFR 63 Subpart DDDDD governs process heaters and boilers with a heat input of greater than 10 MMBtu/hr. The work practice standards and compliance requirements established in DDDDD may be applicable for the proposed process heaters or furnaces. Holly will comply with this standard following the final resolution of this proposed rule.

The applicable requirements of 40 CFR 63 Subpart CC relates to all heat exchange systems such as the proposed new cooling tower associated with petroleum refining process units. Samples from the cooling tower return line will be collected and analyzed to determine the total strippable VOC concentration (as methane) from the air stripping testing system using "Air Stripping Method (Modified El Paso Method) for Determination of Volatile Organic Compound Emissions from Water Sources" Revision Number One, dated January 2003, Sampling Procedures Manual, Appendix P: Cooling Tower Monitoring, prepared by Texas Commission on Environmental Quality, January 31, 2003.

4.1.3 National Ambient Air Quality Standards (NAAQS)

The 1970 Clean Air Act (CAA) gave EPA authority to establish the minimum level of air quality that all states would be required to achieve. These minimum standards were developed to protect the public health and welfare. Thus, National Ambient Air Quality Standards (NAAQS) have been established for several pollutants (referred to as criteria pollutants) and are presented in Table 4-1.

As part of this permit application, Holly is required to demonstrate that its facility and associated processes will not cause or contribute to a violation of the NAAQS.

Table 4-1

National Ambient Air Quality Standards [1]

Pollutant	Averaging Period	Primary Standard ($\mu g/m^3$)	Secondary Standard ($\mu g/m^3$)
SO_2	1-hour	197[1]	NA[2]
	3-hour	NA[2]	1,300
	24-hour	365[3]	NA[2]
	annual	80	NA[2]
PM_{10}	24-hour	150[4]	Same as primary
$PM_{2.5}$	24-hour	35[5]	Same as primary
	Annual	15[6]	Same as primary
CO	1-hour	40,000[3]	NA[2]
	8-hour	10,000[3]	NA[2]
NO_2	1-hour	188[9]	None
	Annual	100	Same as primary
O_3	8-hour (2008 standard)	0.075[7]	Same as primary
	8-hour (1997 standard)	0.08[8]	Same as primary
Lead	3-Month	1.5	NA[2]

1) To attain this standard, the 3-year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 75 ppb.
2) No ambient standard for this pollutant and/or averaging time.
3) Not to be exceeded more than once per year.
4) Not to be exceeded more than once per year on average over three years.
5) To attain this standard, the three-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceeds 35 $\mu g/m^3$.
6) To attain this standard, the three-year average of the weighted annual mean $PM_{2.5}$concentrations from single or multiple community-oriented monitors must not exceed 15 $\mu g/m^3$.
7) To attain this standard, the three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm.
8) To attain this standard, the three-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.
9) To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 100 ppb.

[1] http://www.epa.gov/air/criteria.html

The 1990 CAA amendments called for a review of the ambient air quality of all regions of the United States. States were required to file with EPA designations of all areas as attainment, non-attainment, and unclassifiable. An area that is in attainment indicates that air quality concentrations are less than the NAAQS; non-attainment areas are areas where monitoring data has indicated air quality concentrations that are greater than the standards. Unclassifiable areas are areas where there is insufficient monitoring data to prove that the area has attained the federal standards; however, these areas are treated as attainment areas.

The current air quality classification for Davis is non-attainment area for $PM_{2.5}$, maintenance for ozone (O_3) and PM_{10}, and attainment for SO_2, NO_2, VOC, and CO. New major sources or major modifications to existing major sources in attainment areas are required to obtain a PSD permit prior to initiation of construction.

4.1.4 Prevention of Significant Deterioration

Major new sources located in attainment areas are required to obtain a PSD permit prior to construction. A "major" stationary source, as defined by 40 CFR 52.21(b)(1)(i)(a) is any stationary source with the potential to emit 250 tons per year of a regulated air pollutant or any stationary source defined as one of the 28 source categories listed in 40 CFR 52.21(b)(1)(i)(a) with the potential to emit 100 tons per year of any regulated pollutant. Holly, as a petroleum refinery, would fall under one of the named 28 listed source categories and, as such, the applicable PSD threshold is 100 tons per year.

A major modification is defined as "any physical change in or change in the method of operation of a major stationary source that would result in: (1) a significant emissions increase of a regulated NSR pollutant; and (2) a significant net emissions increase of that pollutant from the major stationary source." EPA rules specify what amount of emissions increase is "significant" for listed regulated NSR pollutants and these significant emission rates are presented in Table 4-2.

Table 4-2

PSD Significant Emission Rates

Pollutant	Significant Emission Rate (TPY)
CO	100
NO_x	40
SO_2	40
PM_{10}	15
$PM_{2.5}$	10
O_3	40 (VOCs)
Lead	0.6
Fluorides	3
Sulfuric acid mist (H_2SO_4)	7
Total reduced sulfur (including H_2S)	10
Reduced sulfur compounds (including H_2S)	10
H_2S	10

For proposed modifications at existing major sources, PSD applies to each regulated NSR pollutant for which the proposed emissions increase resulting from the modification both is significant and results in a significant net emissions increase. This is true even if the increased pollutant is different than the pollutant for which the source is major. Thus, the regulations quoted above require a two-step applicability process for modifications. Step 1 involves determining if the modification by itself results in a significant increase. No emissions decreases are considered in Step 1.

If there is a significant increase in Step 1, then Step 2 applies, which involves determining if the modification results in a significant net emissions increase. The Step 2 calculation includes creditable emissions increases and decreases from the modification by itself and also includes creditable emissions increases and decreases at the existing source over a “contemporaneous period.”

A contemporaneous period is defined in the federal regulations as the period that extends back 5 years prior to the date that construction commences on the modification and forward to the date that the increase from the modification occurs.

To determine PSD applicability of an existing stationary source, one of two tests may be used to determine the emissions increase from an existing emissions unit: the actual-to-projected-actual" emissions test or the "actual-to-potential" emissions test. If the emissions unit at an existing source is new, the owner or operator must use the "actual-to potential" emissions test to calculate emissions increases. Also, the "baseline actual emissions" for existing emissions units are generally the actual emissions in TPY from the unit for any consecutive 24-month period (selected by the applicant) in the prior 10 years.

For Holly, CO emissions will be significant and as such are subject to PSD. PSD permitting requirements also cover new construction projects that emit GHG emissions of at least 75,000 tons per year CO_2e (carbon dioxide equivalent). Holly will also be significant for GHG.

The PSD application for this project includes the following analyses for each pollutant subject to PSD:

- Best Available Control Technology (BACT) analysis,
- Air Quality Monitoring Requirements,
- Air Quality Impact Analysis,
- Additional Impact analyses, and
- PSD Class I analysis.

4.1.4.1 Best Available Control Technology Analysis

A PSD source must conduct an analysis to ensure the application of the Best Available Control Technology (BACT) to emissions of pollutants subject to PSD review. To determine BACT, the "Top Down" methodology is recommended by EPA. A detailed explanation of the "Top Down" BACT analysis is presented in Section 5.0 of this permit application.

4.1.4.2 Air Quality Monitoring Requirements

In accordance with 40 CFR 52.21(m), a PSD permit application must contain an analysis of the existing ambient air quality data in the area which could be affected by the proposed project if the project would result in a net significant emissions increase. To define the existing air quality, a pre-construction monitoring program that is specifically designed to collected data in the area of the proposed source can be initiated or else data collected from either a state or privately-operated monitoring program may be used. The condition for monitoring can be waived if the proposed project would cause an impact less than EPA-specified de minimis monitoring levels as established by the EPA. PSD de minimis monitoring concentration levels are presented in Table 4-3.

Table 4-3

PSD De Minimis Monitoring Concentrations

Pollutant	Averaging Period	Threshold Concentration ($\mu g/m^3$)
CO	8-hour	575
NO_2	annual	14
SO_2	24-hour	13
PM_{10}	24-hour	10
$PM_{2.5}$	24-hour	4
O_3	NA	Exempt if VOC emissions are less than 100 TPY
Lead	3-month	0.1
Fluorides	24-hour	0.25
Total reduced sulfur	1-hour	10
H_2S	1-hour	0.2
Reduced sulfur compounds	1-hour	10

4.1.4.3 Air Quality Impact Analysis

An air quality impact analysis must be performed for the proposed modification subject to PSD review for each pollutant for which the increase in emissions exceeds the significant emission rate to demonstrate that the project will not cause or contribute to a exceedance of any applicable NAAQS or PSD increment. Usually, the analysis will involve: (1) the assessment of existing air quality which may include ambient monitoring data and air quality dispersion modeling results; and (2) using dispersion modeling, the prediction of ambient concentrations that will result from the applicants proposed project and future growth associated with the project. To determine the air quality impact, atmospheric dispersion modeling is performed in accordance with EPA's Guideline on Air Quality Models[2] and Utah modeling requirements[3].

[2] 40 CFR Part 51, Appendix W
[3] Utah Division of Air Quality Emissions Impact Assessment Guidelines

Federal PSD increments have been established for SO_2, NO_2, PM_{10} and $PM_{2.5}$ for the Class I and Class II areas. Class I areas are those federally protected areas in which the least amount of incremental impact can occur such as National Parks and Wilderness areas. Nearly all other areas are defined as Class II where higher increments are specified. As part of the PSD regulations, an ambient air quality analysis is required to demonstrate that the PSD increment consumed does not exceed or contribute to a concentration that exceeds allowable PSD increments.

As part of the air quality impact analysis, a preliminary dispersion modeling analysis was performed for those pollutants which were expected to be emitted in significant amounts. Per a request from the UDAQ, modeling was performed for existing and proposed Holly sources of NO_2, SO2, PM_{10}, $PM_{2.5}$, and CO.

An impact analysis may be limited to Holly sources only if modeled impacts are below the significant impact levels (SILs). The preliminary modeling indicated that SO_2 and NO_2 were the only two pollutants above the PSD Class II SILs which required a full impact analysis to be performed for these pollutants. The allowable PSD increments and SILs are presented in Table 4-4. SIL's for the one-hour NO_2 and SO_2 standards have not been established.

Table 4-4

PSD Increments and Significant Impact Levels in Micrograms per Cubic Meter

Pollutant	Averaging Time	PSD Increments		SILs	
		Class 1	Class II	Class 1	Class II
NO_2	Annual	2.5	25	0.1	1
SO_2	3-hour	25	512	1	25
	24-hour	5	91	0.2	5
	annual	2	20	0.1	1
CO	1-hour	---	---	---	2000
	8-hour	---	---	---	500
PM_{10}	24-hour	8	30	0.3	5
	annual	4	17	0.2	1
$PM_{2.5}$	24-hour	1	4	0.07	1.2
	annual	2	9	0.06	0.3

All air quality impact analyses were performed in accordance with an UDAQ approved modeling protocol which was designed specifically for the proposed project. A copy of the modeling protocol approval letter is presented in Appendix D.

4.1.4.4 Additional Impact Analyses

Per 40 CFR 52.21, a PSD permit application must contain an additional impacts analysis. These analyses provide an analysis of the impairment to visibility, acid deposition, soils and vegetation that would occur as a result of the source and general commercial, residential, industrial, and other growth associated with the source. The applicant need not provide an analysis of the impact on vegetation having no significant commercial or recreational value.

4.1.5 Good Engineering Stack Height Analysis

The CAA requires that the degree of emission limitation required for control of any pollutant not by affected by a stack which exceeds good engineering practice (GEP) height. GEP stack height is defined as the highest of:

- 65 meters,
- A height established by applying the formula: HGEP = H + 1.5 L where H is the height of the structure or nearby structure and L is the lesser dimension (height or projected width) of the nearby structure, and
- A height demonstrated by fluid modeling or field study.

A structure is considered nearby a stack if it is within a distance of five times the structures height or maximum projected width. Only the smaller value of the height or projected width is used and the distance to the structure cannot be greater than 0.8 kilometers. Although GEP stack height regulations require that the stack height used in modeling not exceed GEP stack height, the actual stack height may be greater.

The regulations (40 CFR Part 51) also increase stack height beyond that resulting from the formula in cases where plume impaction occurs. Plume impaction occurs when a plume of exhaust gases emitted from a stack hits a higher hill or mountain (elevated terrain) downwind of the stack. Elevated terrain is terrain that exceeds the height calculated by the GEP stack height formula.

Per 40 CFR Part 51 and the results of BPIP-PRIME show there is no significant terrain that would induce downwash with ½ kilometer at least a 10% height relative to the distance from the source. Thus, plume impaction was not considered.

All stacks for the proposed Holly heavy crude processing project will be less than 65 meters and will be modeled at their actual stack elevation. The modeling complies with GEP regulations.

4.1.6 40 CFR Part 70 Operating Permit Program (Title V)

In accordance with the CAA of 1990, the proposed Holly project sources will be subject to the requirements of 40 CFR Part 70.

4.1.7 40 CFR Part 98 - Mandatory Greenhouse Gas Reporting

On September 22, 2009, EPA finalized the mandatory reporting of greenhouse gases rule. This rule establishes the first federal requirement to report and monitor GHG emissions. The reporting threshold is 25,000 metric tons CO_2e/year based on actual emissions or capacity-based thresholds depending on sector type. The final rule requires reporting of annual emissions of carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, perfluorocarbons, and other fluorinated greenhouse gases, as applicable, to the reporting facility. Monitoring, reporting, and recordkeeping activities will be required for Holly Refining.

4.2 Utah Administrative Codes

The air quality regulations, codified in Title R307 of the Utah Administrative Code, which are potentially applicable to this project, are as follows:

- R301-101. General Requirements
- R301-102. General Requirements: Broadly Applicable Requirements
- R307-107. General Requirements: Unavoidable Breakdown
- R307-150. Emission Inventories
- R307-165. Emission Testing
- R307-170. Continuous Emission Monitoring Program
- R307-210. Stationary Sources
- R307-214. National Emission Standards for Hazardous Air Pollutants
- R307-305. Nonattainment and Maintenance Areas for PM_{10}: Emission Standards
- R307-326. Ozone Nonattainment and Maintenance Areas: Control of Hydrocarbon Emissions in Petroleum Refineries
- R307-401. Permits: New and Modified Sources
- R307-403. Permits: New and Modified Sources in Nonattainment Areas and Maintenance Areas
- R307-405. Permits: Major Sources in Attainment or Unclassified Areas (PSD)
- R307-406. Permits: Visibility
- R307-410. Permits: Emissions Impact Analysis
- R307-414. Permits: Fees for Approval Orders
- R307-415. Permits: Operating Permit Requirements

4.2.1 R307-102 General Requirements: Broadly Applicable Requirements

The definitions and general requirements found in E307-102 will apply to Holly Refining and Marketing Company including penalties for violations of state statutes and providing periodic reports and other information as necessary to determine compliance with state and federal standards.

4.2.2 R307-107 General Requirements: Unavoidable Breakdown

The unavoidable breakdown provisions of R307-107 will apply to the Holly Heavy Crude Processing Project. A breakdown for any period longer than 2 hours will be reported to the Executive Secretary within 3 hours of the beginning of the breakdown if reasonable, but in no case longer than 18 hours after the beginning of the breakdown.

During times other than normal office hours, breakdowns for any period longer than 2 hours shall be initially reported to the Environmental Health Emergency Response Coordinator.

Within 7 calendar days of the beginning of any breakdown of longer than 2 hours, a written report will be submitted to the Executive Secretary which shall include the cause and nature of the event, estimated quantity of pollutant (total and excess), time of emissions and steps taken to control the emissions and to prevent recurrence.

The submittal of such information shall be used by the Executive Secretary in determining whether a violation has occurred and/or the need of further enforcement action.

Breakdowns that are caused entirely or in part by poor maintenance, careless operation, or any other preventable upset condition or preventable equipment breakdown will not be considered unavoidable and are not covered by R307-107.

4.2.3 R307-150 Emission Inventories

The emission inventory provision of R307-150 will apply to Holly since it is anticipated that the proposed project will be considered a major modification. Holly shall submit an inventory annually for all emissions units including fugitive emissions. The inventory shall include PM_{10}, $PM_{2.5}$, oxides of sulfur, oxides of nitrogen, CO, VOC, ammonia, other chargeable pollutants, and non-exempted HAPS.

For each pollutant, the emissions inventory data shall include the rate and period of emissions, startup and shut down emissions, the specific emissions unit which is the source of the air pollution, composition of air contaminant, type and efficiency of the air pollution control equipment, and other information necessary to quantify operation and emissions and to evaluate pollution control. The emissions of a pollutant shall be calculated using the source's actual operating hours, production rates, and types of materials processed, stored, or combusted during the inventoried time period.

4.2.4 R307-165 Emission Testing

Holly will be subject to the emission testing requirements that are listed in R307-165. Emission testing will be required of the Holly project sources within six months of start-up and at least once every five years or more frequently as determined by the Executive Secretary.

4.2.5 R307-170 Continuous Emission Monitoring Program

The proposed Holly project will be required to operate a continuous monitoring system that is subject to the requirements of 40 CFR 60.13 (d) through (j). Performance specification tests and audits, record keeping, and electronic data reports are also required as part of this regulation.

4.2.6 R307-210 Stationary Sources

The provisions of 40 Code of Federal Regulations (CFR) Part 60, effective on July 1, 2006, except for Subparts Cb, Cc, Cd, Ce, BBBB, DDDD,and HHHH, are incorporated by reference into these rules with the exception that references in 40 CFR to "Administrator" shall mean "executive secretary" unless by federal law the authority referenced is specific to the Administrator and cannot be delegated. With the proposed heavy crude processing project, several of the proposed sources will be subject to New Source Performance Standards as found in 40 CFR Part 60, specifically, Subparts A, Dc, Ja, Kb, GGGa, and IIII.

4.2.7 R307-214 National Emission Standards for Hazardous Air Pollutants (NESHAPS)

The provisions of 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Source Categories, effective as of July 1, 2010, are incorporated into the air rules by reference. With the proposed modification, sources at the refinery will be subject to the requirements of the NESHAPs, including notification, monitoring, performance testing, reporting, recordkeeping, operation and maintenance provisions, as well as the applicable requirements of Subpart UUU.

4.2.8 R307-305 Nonattainment and Maintenance Areas for PM_{10}: Emission Standards

Since Holly is located in a PM_{10} maintenance area, Holly will be subject to the emission limitations and operating parameters as specified in Section IX, Part H, of the Utah state implementation.

4.2.9 R307-326 Ozone Nonattainment and Maintenance Areas: Control of Hydrocarbon Emissions in Petroleum Refineries

This rule requires that Reasonably Available Control Technology (RACT) be applied to control hydrocarbon emissions from Holly's refinery since it is located in ozone maintenance area. This rule would include the application of RACT to control emissions from the new FCCU as well as the monitoring of leaks from refinery equipment.

4.2.10 R307-401 Permit: New and Modified Sources

This rule, which applies to the proposed Holly heavy crude processing project, establishes the application and permitting requirements for new installations and modifications to existing installations throughout the State of Utah. According to R307-401 any person intending to construct a new installation which will or might reasonably be expected to become a source or an indirect source of air pollution shall submit to the executive secretary a NOI and receive an approval order prior to initiation of construction. The NOI shall include the information described in R307-401-5 to determine whether the proposed construction will be in accord with applicable requirements of these rules. Within 30 days after receipt of a NOI, or any additional information necessary to the review, the executive secretary shall advise the applicant of any deficiency in the NOI or the information submitted.

4.2.11 R307-405 Permits: Major Sources in Attainment or Unclassified Areas (PSD)

R307-405 implements the federal PSD permitting program for major sources and major modifications in attainment areas and maintenance areas as required by 40 CFR 51.166. This rule does not include the routine maintenance, repair and replacement provisions that were vacated by the DC Circuit Court of Appeals on March 17, 2006.

The proposed CO emissions from Holly's heavy crude processing project meets the definition of a "major modification" as found in R307-405 and will be subject to PSD requirements. A major modification is a physical change or change in the method of operation at an existing major source that causes a significant "net emissions increase" at that source of any pollutant regulated under the Clean Air Act.

Every new major source must be reviewed by the Executive Secretary to determine the air quality impact of the source to include a determination whether the source will cause or contribute to a violation of the maximum allowable increases or the NAAQS in any area. The determination of air quality impact will be made as of the source's projected start-up date.

Such determination shall take into account all allowable emissions of approved sources and, to the extent practicable, the cumulative effect on air quality of all sources and growth in the affected area.

4.2.12 R307-406 Permits: Visibility

R307-406 establishes the requirements for evaluating the impact of emissions on visibility in any mandatory Class I area from any new major source or major modification proposed in either an attainment area or area of nonattainment area. In determining visibility impact by a major new source or major modification, the Executive Secretary shall use, the procedures identified in the EPA publication "Workbook For Estimating Visibility Impacts" (EPA 450-4- 80-031) November 1980, or equivalent. Federal land managers will be notified as appropriate.

4.2.13 R307-410 Permits: Emissions Impact Analysis

R307-410 establishes the procedures and requirements for evaluating the emissions impact of new or modified sources that require an approval order under R307-401 to ensure that the source will not interfere with the attainment or maintenance of any NAAQS. The rule also establishes the procedures and requirements for evaluating the emissions impact of hazardous air pollutants. The rule also establishes the procedures for establishing an emission rate based on the good engineering practice stack height as required by 40 CFR 51.118.

Prior to receiving an approval order under R307- 401, a modification to an existing source located in an attainment area which increases the total controlled emission rate per pollutant of the source in an amount greater than or equal to those specified in Table 1 of R307-410, shall conduct air quality modeling, as identified in R307-410-3, to estimate the impact of the new or modified source on air quality unless previously performed air quality modeling for the source indicates that the addition of the proposed emissions increase would not violate a National Ambient Air Quality Standard, as determined by the Executive Secretary.

4.2.14 R307-414 Permits: Fees for Approval Orders

The owner and operator of each new major source or major modification is required to pay a fee to the Department sufficient to cover the reasonable costs of reviewing and acting upon the notice of intent required pursuant to R307-401 for each new major source or major modification and implementing and enforcing requirements placed on such source by any approval order issued pursuant to such notice (not including any court costs associated with any enforcement action). R307-414 will apply to Holly since a NOI will be submitted prior to construction.

4.2.15 R307-415 Permits: Operating Permit Requirements

Title V of the CAA requires States to develop and implement a comprehensive air quality permitting program. Title V does not impose new substantive requirements. Title V does require that sources subject to R307-415 pay a fee and obtain a renewable operating permit that clarifies, in a single document, which requirements apply to a source and assures the source's compliance with those requirements.

R307-415 establishes the procedures and elements of the Title V program. Since the Holly project is a major modification and a Part 70 source, Holly will be subject to R307-415.

5.0 BEST AVAILABLE CONTROL TECHNOLOGY DEMONSTRATION

As presented in Utah Air Quality Rule R307-401-2 (d), "Best available control technology (BACT)" means an emissions limitation (including a visible emissions standard) based on the maximum degree of reduction for each air contaminant which would be emitted from any proposed stationary source or modification which the executive secretary, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. The BACT analysis was conducted in accordance with EPA's recommended "top-down" methodology which is:

- Step 1 – Identify All Control Technologies
- Step 2 – Eliminate Technically Infeasible Options
- Step 3 – Rank Remaining Control Technologies by Control Effectiveness
- Step 4 – Evaluate Most Effective Controls
- Step 5 – Select BACT.

In Step 1 in a "top down" analysis, all available control options for the emission unit in question are identified. Identifying all potential available control options consists of those air pollution control technologies or control techniques with a practical potential for application to the emission unit and the regulated pollutant being evaluated.

In Step 2, the technical feasibility of the control options identified in Step 1 are evaluated and the control options that are determined to be technically infeasible are eliminated. Technically infeasible is defined where a control option, based on physical, chemical, and engineering principles, would preclude the successful use of the control option on the emissions unit under review due to technical difficulties. Technically infeasible control options are then eliminated from further consideration in the BACT analysis.

The third step of the "top-down" analysis is to rank all the remaining control options not eliminated in Step 2, based on control effectiveness for the pollutant under review. If the BACT analysis proposes the top control alternative, there would be no need to provide cost and other detailed information.

Once the control effectiveness is established in Step 3 for all feasible control technologies identified in Step 2, additional evaluations of each technology, based on energy, environmental, and economic impacts, are considered to make a BACT determination in Step 4. The energy impact of each evaluated control technology is the energy benefit or penalty resulting from the operation of the control technology at the source. The costs of the energy impacts either in additional fuel costs or the cost of lost power generation impacts the cost-effectiveness of the control technology.

The second evaluation to be reviewed for each control technology remaining in Step 4 is the environmental evaluation. Non-air quality environmental impacts are evaluated to determine the cost to mitigate the environmental impacts caused by the operation of a control technology.

The third evaluation addresses the economic evaluation of the remaining control technologies. The cost to purchase and to operate the control technology is analyzed. The capitol and annual operating costs are estimated based on established design parameters or documented assumptions in the absence of established designed parameters. The cost-effectiveness describes the potential to achieve the required emissions reduction in the most economical way. It also compares the potential technologies on an economic basis.

In Step 5, BACT is selected for the pollutant and emission unit under review. BACT is the highest ranked control technology not eliminated in Step 4.

In the preparation of the BACT analyses, several sources of information were examined including EPA's RBLC RACT/BACT/LAER Clearinghouse, state agency databases, vendor data, and published literature.

Beginning in July 2011, UDAQ rules regulate GHG emissions where physical changes at an existing stationary source will result in an emissions increase of 75,000 tons per year CO_2e or more (see UAC R307-405-3(9)9d)). The required BACT reviews for GHG emissions are found in Section 5.10 through 5.14 of this NOI.

5.1 BACT for Process Heaters

The proposed process heaters at the Holly Refining & Marketing facility include:

- 60 MMBtu/hr Crude Heater:
- 42.1 MMBtu/hr Reactor Charge Heater;
- 45 MMBtu/hr FCCU #2 Feed Heater;
- 14 MMBtu/hr Hot Oil Furnace;
- 99 MMBtu/hr Reactor Charge Furnace;
- 0.8 MMBtu/hr Asphalt Heaters (6 heaters); and
- 130 MMBtu/hr Vacuum Furnace Heater.

These process heaters will be fired on either natural gas or refinery fuel gas.

5.1.1 BACT for CO

The EPA's top-down process was used to determine the best available control technology for control of CO emissions from the proposed process heaters. Carbon monoxide is a product of the chemical reaction between carbonaceous fuels and oxygen. CO occurs as the product of combustion in fuel-rich mixtures. In fuel-lean mixtures, CO can result due to poor mixing of fuel and air or because of very high temperatures in the combustion zone.

5.1.1.1 Step 1 – Identify All Available Control Technologies

A search of the EPA's RACT/BACT/LAER (RBLC) Clearinghouse[4] and California Air Resources Board (CARB) BACT Clearinghouses[7] as well as other data sources found combustion controls, catalytic oxidation, and thermal oxidation as technically feasible for reducing CO emissions from refinery process heaters/boilers. EM_x™ was identified as a control alternative.

The first control technology identified to reduce CO emissions is through good engineering design of the equipment utilizing good combustion practices. Good combustion practices for CO include adequate fuel residence times, proper fuel-air mixing, and temperature control. For the proposed process heaters, there will be adequate turbulence in the flue gas which will ensure good mixing, a high temperature zone (greater than 1800°F) that will ensure complete burnout along with a sufficient residence time (one to two seconds) at high temperature which will lead to minimized CO emissions. Higher combustion zone temperatures favor the complete oxidation of carbon-containing compounds to carbon dioxide (CO_2) and water. Therefore, emissions of carbon monoxide would be expected to decrease at higher temperatures.

4 California Air Resources Board BACT Clearinghouse at http:/www.arb.ca.gov/bact/bact.htm

A second control technology identified for controlling CO emission from process heaters is catalytic oxidation. Catalytic oxidation allows complete oxidation to take place at a faster rate and a lower temperature than is possible with thermal oxidation. In a typical catalytic oxidizer, the gas stream is passed through a flame area and then through a catalyst bed at a velocity in the range of 10 to 30 feet per second (fps). Catalytic oxidizers typically operate at a narrow temperature range of approximately 600 to 1100 °F. At lower temperatures, the CO conversion efficiency falls off rapidly.

Catalytic oxidizers are similar to a Selective Catalytic Reduction (SCR) system in that a catalyst bed facilitates the conversion of a CO to CO_2. Unlike SCR, catalytic oxidizers do not use additional chemicals such as ammonia to facilitate the conversion.

The third control technology identified is thermal oxidizers or thermal incineration. Thermal oxidizers combine temperature, time, and turbulence to achieve complete combustion. Thermal oxidizers are equivalent to adding another combustion chamber where more oxygen is supplied to complete the oxidation of CO. The waste gas is passed through burners, where the gas is heated above its ignition temperature. Additional fuel is required to reach this higher temperature. The hot gases then pass through one or more residence chambers to ensure complete combustion.

Thermal oxidizers require operating temperatures in the 1200 to 2000°F range to ensure conversion of CO to CO_2. The combustion process occurs in two separate stages: (1) the combustion of fuels, and (2) the combustion of pollutants. The combustion process in the first stage is extremely rapid and is an irreversible chemical reaction. The oxygen supplied by the primary air may be in excess or obtained directly from the process gas stream. In the second stage, the heated gases from the burners pass through residence chambers where the CO is oxidized. Residence time, heating value of the gas stream, and operating temperatures determine the efficiency of the process.

A control alternative, supplied by Emera Chem is EM_x^{TM}. EM_x^{TM} is a developing add-on technology with the potential to reduce NO_x and CO emissions from combustion sources. EM_x^{TM} utilizes a catalytic technique that simultaneously oxidizes NO to NO_2 and CO to CO_2, then absorbs the NO_2 onto the surface of a catalyst through the use of a potassium carbonate coating. The CO_2 is passes through the catalyst unchanged.

5.1.1.2 Step 2 - Eliminate Technically Infeasible Control Options

Oxidation catalyst is not a technically feasible option for control of CO emissions from process heaters. The Holly Refinery plant gas contains sulfur.

In flue gas containing more than trace levels of SO_2, poisoning and deactivation of the catalyst by sulfur-containing compounds occurs as well. In addition, SO_2 would be converted to SO_3 which will form sulfuric acid increasing the emissions of this acid gas and will increase both condensable particulate emissions and flue gas system corrosion rates.

A typical oxidation catalyst for CO is platinum or rhodium on an alumina support material. Acceptable catalyst operating temperatures range from 400 to 1,250°F with an optimal operating range of 850 to 1,100°F. In process heaters, the catalyst would have to be installed upstream of any air preheat or waste heat recovery equipment to achieve this temperature range.

The EPA's RBLC and recent issued permits were reviewed and catalytic oxidation was not identified as a CO technically feasible control option for natural gas or refinery-fuel gas-fired boilers and heaters.

EM_x was also identified as not a technically feasible option. EM_x™ is a multi-pollutant catalyst that does not require ammonia. EM_x™ technology is available for gas turbine, reciprocating engines, and industrial/utility boilers[5] firing pipeline quality natural gas; however, there is no practical experience with operating on flue gas streams from refinery gas-fired equipment. At this time, EM_x™ is not being used in any commercial refinery situation with equipment using a sulfur-bearing fuel gas stream such as refinery fuel gas because SO_x will contaminate the catalyst and reduce efficiency over time.

Because of the lack of commercial refinery experience and the catalyst's sensitivity to sulfur compounds, EM_x™ is deemed to be technically infeasible for the refinery process heaters and is rejected for further consideration.

5.1.1.3 Step 3 - Rank Remaining Control Options

The following lists the ranking of the remaining control options:

1) Thermal oxidation – 90% reduction
2) Good combustion practice

5.1.1.4 Step 4 - Evaluate Remaining Control Options

The remaining control options were reviewed in consideration with energy, environmental, and economic impacts.

Thermal oxidation is considered a technically feasible add-on control option. Flue gases from the combustion equipment could be routed through a thermal oxidizer where gases could be heated to an operating range of 1200 - 2000°F. At this temperature, CO will be burned to CO_2. Raising the exit gas to the appropriate temperature range will require a significant amount of energy and generate increased combustion emissions.

5 http://murcal.com/11.emerachem/11.emerachem.catalysts.html

Heaters and boilers can be considered as thermal oxidizers themselves and adding another thermal oxidizer downstream of a heater or boiler to control CO is impractical. Thermal oxidation did not result as BACT and was eliminated from consideration.

CO emissions can be controlled using proper equipment design and operation, good combustion practices, and gaseous fuels, which are usually less efficient than the oxidation technologies, but have minimal environmental and economic impacts.

5.1.1.5 Step 5 - Select BACT

Based on the information presented in EPA's RBLC, combustion controls, based on modern boiler and burner designs to optimize residence time, fuel/air mixing, and combustion temperature are the industry standards for CO reduction from refinery process heaters. Table 5-1 presents a summary of previous BACT determinations for CO. This table is not exhaustive, rather lists the lowest emission rates identified in approximately the past six years from select plants.

Table 5-1

Summary of BACT Determinations for CO for Process Heaters

Facility	Permit Date	Size (MMBtu/hr)	Primary Fuel	Limit (lb/MMBtu)	Technology
Total Refining – Port Arthur	11/06/2009	68 and 90	Refinery Gas	0.08 (one-hour average)	Proper equipment design and operation, good combustion practices, use of gaseous fuels.
St. Charles Refinery Valero Refining	11/17/2009	15-95	Refinery Gas	0.08 (one-hour average)	Proper equipment design and operation, good combustion practices, use of gaseous fuels.
Marathon Petroleum CO LLC Garyville Refinery	7/16/2008	73.8 - 85.1	Refinery gas	0.04 (3-run average)	Proper design, operation, and good engineering practices
St. Charles Refinery Valero Refining	02/08/2007	15-95	Refinery Gas	0.08	Proper equipment design and operation, good combustion practices, use of gaseous fuels.
Marathon Petroleum CO LLC Garyville Refinery	12/27/2006	73.8 - 85.1	Refinery gas	0.04	Proper design, operation, and good engineering practices
Arizona Clean Fuels Yuma LLC	04/14/2005	23.2 - 346	Refinery gas	0.04	Proper design, operation, and good engineering practices

The lowest CO emission factor for process heaters and boilers firing refinery fuel gas found in the database searches ranged from 0.08 based on a one-hour average and to 0.04 lb/MMBtu based on three-hour average. The proposed CO BACT emission limit for proposed Holly process heaters is based on the heat input utilizing proper equipment design and operation, good combustion practices, and the use of gaseous fuels. A BACT CO emission limit of 0.08 lb/MMBtu is proposed for the crude heater, reactor charge heater, FCCU #2 feed heater, hot oil furnace, reactor charge heater, stab-in heaters, and vacuum heater.

5.1.2 BACT for PM_{10} and $PM_{2.5}$

PM_{10} is particulate matter (PM) less than 10 microns in diameter produced by combustion. PM_{10} consists of two parts, filterable and condensable. Filterable PM_{10} is the material that is captured on the filter used in the EPA Reference Method 5 test; Condensable PM_{10} is particulate that passes through the filter as a gas and is measured using EPA Reference Method 202. According to AP-42, filterable PM emissions from gaseous fuels such as refinery fuel gas are typically lower than emissions from solid fuels. Particulate matter from refinery gas or natural gas combustion is usually composed of larger molecular weight hydrocarbons that have not been fully combusted.

$PM_{2.5}$ is particulate matter 2.5 microns or smaller. According to John Zink, emissions from the process heaters are in the PM_{10} range. In addition, this is collaborated by the publication, *$PM_{2.5}$ Speciation Profiles and Emission Factors from Petroleum Industry Gas-Fired Sources*[6] which indicates that "measured emissions of primary fine particulate from the gas-fired boiler, process heater, and steam generator were extremely low". Thus the BACT analysis for the process heaters will focus on PM_{10}.

[6] http://www.epa.gov/ttn/chief/conference/ei10/poster/wien.pdf

5.1.2.1 Step 1 - Identify All Available Control Technologies

The following is a list of control technologies which were identified for controlling PM_{10} emissions:

- good combustion practice;
- use of low sulfur gaseous fuels;
- proper design and operation;
- wet gas scrubber;
- electrostatic precipitator (ESP);
- cyclone; and
- baghouse/fabric filters.

By maintaining the heaters in good working order per manufacturer specifications with low sulfur gaseous fuels, emissions of PM_{10} are reduced.

A wet gas scrubber is an air pollution control device that removes PM and acid gases from waste streams from stationary point sources. PM and acid gases are primarily removed through the impaction, diffusion, interception and/or absorption of the pollutant onto droplets of liquid. Wet scrubbers have some advantages over ESPs and baghouses in that they are particularly useful in removing PM with the following characteristics:

- Sticky and/or hygroscopic materials;
- Combustible, corrosive or explosive materials;
- Particles that are difficult to remove in dry form;
- PM in the presence of soluble gases; and
- PM in gas stream with high moisture content.

An ESP is a particle control device that uses electrical forces to move the particles out of the gas stream onto collector plates. This process is accomplished by the charging of particles in the gas stream using positively or negatively charged electrodes. The particles are then collected as they are attracted to oppositely opposed electrodes. Once the particles are collected on the plates, they are removed by knocking them loose from the plates, allowing the collected layer of particles to fall down into a hopper. Some precipitators remove the particles by washing with water. ESP's are used to capture coarse particles at high concentrations. Small particles at low concentrations are not effectively collected by an ESP.

A cyclone operates on the principle of centrifugal separation. The exhaust enters the top and spirals around towards the bottom. As the particles proceed downward, the heavier material hits the outside wall and drops to the bottom where it is collected. The cleaned gas escapes through an inner tube. Cyclones are generally used to reduce dust loading and collect large particles.

A fabric filter unit (or baghouse) consists of one or more compartments containing rows of fabric bags. Particle-laden gases pass along the surface of the bags then through the fabric. Particles are retained on the upstream face of the bags and the cleaned gas stream is vented to the atmosphere. Fabric filters collect particles with sizes ranging from submicron to several hundred microns in diameter. Fabric filters are used for medium and low gas flow streams with high particulate concentrations.

5.1.2.2 Step 2 - Eliminate Technically Infeasible Control Options

None of the add-on control devices were identified as being suitable for the process heaters burning gaseous fuels due to both the extremely low concentration of small particulates expected in gas streams from this type of equipment. PM/PM_{10} concentrations in the refinery fuel and natural gas-fired boilers and heaters are even less than the concentrations guaranteed by the cyclones, EPS's, fabric filters, and wet scrubbers.

Therefore, wet scrubbers, EPS's, cyclones, and fabric filtration (baghouses) were rejected as BACT for PM/PM_{10} emissions from heaters and boilers.

5.1.2.3 Step 3 - Rank Remaining Control Options

The remaining control option is the utilization of good combustion practices.

5.1.2.4 Step 4 - Evaluate Remaining Control Options

The concept of applying combustion controls and appropriate furnace design or "proper combustion" to minimize PM_{10} emissions include adequate fuel residence time, proper fuel-air mixing, and temperature control to ensure the maximum amount of fuel is combusted. Optimization of these factors for PM_{10} control can result in an increase in the NO_x emissions. Heater and boiler designers strive to balance the factors under their control to achieve the lowest possible emissions of all pollutants. Thus, the only control technology identified in the RBLC database for the refinery fuel or natural gas-fired process heaters is a work practice requirement to adhere to good combustion practices and use of low sulfur gaseous fuel. This control strategy is technically feasible and will not cause any adverse energy, environmental, or economic impacts.

5.1.2.5 Step 5 - Select BACT

A review of the RBLC as well as other databases indicated that the most stringent control technologies for PM_{10} are good combustion practices and use of gaseous fuel. The proposed PM_{10} BACT emission limit for the proposed new process heaters is based on manufacturer data at 0.0075 lb/MMBtu utilizing proper equipment design and operation, good combustion practices, and gaseous fuels. Table 5-2 presents a summary of previous BACT determinations for PM_{10}. This table is not exhaustive, rather lists the lowest emission rates identified in the past several years from select plants.

Table 5-2

Summary of BACT Determinations for PM_{10} for Process Heaters

Facility	Permit Date	Size (MMBtu/hr)	Primary Fuel	Limit (lb/MMBtu)	Technology
St. Charles Refinery Valero Refining	11/17/2009	15-95	Refinery Gas	0.0074 (Annual avg.)	Proper equipment design and operation, good combustion practices, gaseous fuels
Hunt Refinery Co.	09/28/2009	34.7-254	Refinery gas	0.0075	None listed.
Marathon Petroleum CO LLC Garyville Refinery	12/27/2006	63.7-183.3	Refinery gas	0.0075 (3-hr avg.)	Proper design, operations and good engineering practices
Arizona Clean Fuels Yuma LLC	04/14/2005	23.2 - 346	Refinery gas	0.0075	None listed.
ExxonMobil Refining & Supply Baton Rouge Refinery	02/18/2004	22-82	Gaseous fuels	0.0080	Good engineering design and proper combustion practices

5.1.3 BACT for SO_2

Sulfur dioxide (SO_2) emissions come from the sulfur in the fuel gas. Both refinery gas and natural gas contain sulfur, mostly in the form of hydrogen sulfide (H_2S). In general, refinery fuel has higher sulfur content than natural gas supplied by a pipeline. When burned in a boiler or heater, essentially all the sulfur in the fuel is oxidized to SO_2.

5.1.3.1 Step 1 - Identify All Available Control Technologies

The following is a list of control technologies which were identified for controlling SO_2 emissions:

- fuel specification - low sulfur fuels;
- wet flue gas desulfurization (wet FGD);
- advanced flue gas desulfurization (AFGD); and
- dry absorption (dry FGD).

Nearly all of the sulfur combusted in the fuel will be converted to SO_2. By limiting the sulfur content of the fuel, emissions of SO_2 will be reduced.

The simplest method for flue gas desulfurization is with the use of a wet scrubber. In a wet caustic scrubbing system, the flue gas and a caustic solution flow counter-current to each other. The sulfur reacts with the caustic solution and is stripped out of the flue gas.

The AFGD process accomplishes SO_2 removal by utilizing a single absorber which performs three functions which are prequenching the flue gas, adsorption of SO_2, and oxidation of the resulting calcium sulfite to wallboard-grade gypsum. Incoming flue gas is cooled and humidified with process water sprays before passing to the absorber.

In the absorber, two tiers of fountain-like sprays distribute reagent slurry over polymer grid packing that provides a large surface area for gas/liquid contact. The gas then enters a large gas/liquid disengagement zone above the slurry reservoir in the bottom of the absorber and exits through a horizontal mist eliminator. As the flue gas contacts the slurry, the SO_2 is absorbed, neutralized, and partially oxidized to form calcium sulfite and calcium sulfate.

Dry FGD systems spray lime slurry into an absorption tower where the SO_2 is absorbed by the slurry forming calcium sulfite and calcium sulfate. The liquid-to-gas ration is such that the water evaporates before the droplets reach the bottom of the tower. The dry solids are carried out with the gas and collected with a fabric filter or an ESP.

5.1.3.2 Step 2 - Eliminate Technically Infeasible Control Options

All listed control options are technically feasible.

5.1.3.3 Step 3- Rank Remaining Control Options

The following lists the ranking of the control options:

1) AFGD – 95 – 99.5% reduction;
2) Wet FGD – 90 - 99% reduction;
3) Dry FGD – 90-95% reduction; and
4) Low sulfur fuels – base case.

The NSPS fuel specification for low sulfur fuels is limited to 162 ppmv or less.

5.1.3.4 Step 4 - Evaluate Remaining Control Options

A review of the recent literature, recent permits, and the RBLC database did not result in AFGD, wet FGD or dry FGD as BACT. Limestone slurry scrubbing systems are usually applied to power plants for flue gas desulfurization. With wet caustic scrubbing, water contamination issues arise with the disposal of large volumes of sodium sulfite and sodium sulfate solution. In addition, based on available literature which included cost information, these control options were not cost effective in terms of dollars per ton removal. Hence, these three options were eliminated from consideration.

The only control strategy identified for the fuel gas-fired process heaters is adherence to fuel specifications - low sulfur fuel. This control strategy is technically feasible and will not cause adverse energy, environmental, or economic impacts.

5.1.3.5 Step 5 - Select BACT

BACT limits for SO_2 can be expressed as the total sulfur or H_2S content of the fuel or as emissions limit that specify the type of fuel.

Holly has a fuel gas sulfur content of 162 or less ppmv which is the proposed BACT emission limit from refinery fuel gas-fired process heaters. In addition to the fuel gas sulfur content limit, equipment design and work practice requirements will be implemented to minimize, to the greatest extent possible, emissions that would occur due to upsets.

5.1.4 BACT for NO_x

Nitrogen oxides (NO_x) are formed during the combustion of fuels by oxidation of chemically-bound nitrogen in the fuel and by thermal fixation of nitrogen in the combustion air. There are three different formation mechanisms: thermal, fuel, and prompt NO_x. Thermal NO_x is primarily temperature dependent (above 2000°F); fuel NO_x is primarily dependent on the presence of fuel-bound nitrogen and the local oxygen concentration. Prompt NO_x is formed in relatively small amounts from the reaction of molecular nitrogen in the combustion air with hydrocarbon radicals in the flame front.

5.1.4.1 Step 1 - Identify All Available Control Technologies

There are a variety of options available for control of NO_x emissions from combustion sources. These include modifications that reduce NO_x formation, add-on control devices, or combinations of both. The control technologies and techniques for NO_x emissions that were identified include:

- low NO_x burners (LNB),
- next or current generation ultra-low NO_x burners (ULNB)
- flue gas recirculation (FGR),
- selective non-catalytic reduction (SNCR),
- selective catalytic reduction (SCR),
- low NO_x burners and flue gas recirculation (LNB +FGR),
- next or current generation ultra-low NO_x burners and flue gas recirculation (ULNB + FGR)
- low NO_x burners and selective non-catalytic reduction (LNB + SNCR),
- next or current generation ultra-low NO_x burners and selective non-catalytic reduction (ULNB + SNCR),
- low NO_x burners and selective catalytic reduction (LNB + SCR),
- next or current generation ultra-low NO_x burners and selective catalytic reduction (ULNB + SCR),

- EM_x™ (formerly $SCONO_x$),
- low NO_x burners and EM_x™, and
- next or current generation ultra-low NO_x burners and EM_x™.

5.1.4.2 Step 2 - Eliminate Technically Infeasible Control Options

All of the individual controls or combinations of controls were determined to be technically feasible. All controls except the combination of SNCR and LNB or ULNB have been demonstrated on process heaters.

5.1.4.3 Step 3 - Rank Remaining Control Options

Table 5-3 lists a range of control efficiencies for the NO_x control devices.

Table 5-3

Control Efficiencies for NO_x Control Devices [7]

Technology	Range of Control (%)
ULNB + SCR	85-99
LNB + SCR	80-99
EM_x™	90-95
ULNB + SNCR	75-95
SCR	80-95
ULNB (including FGR)	75-90
LNB + SNCR	50-89
LNB+FGR (with or without FGR)	50-72
SNCR	30-75
LNB	50-72
FGR	30
No control	---

7 Petroleum Refinery Tier 2 BACT Analysis Report, Draft, US EPA, March 14, 2000.

5.1.4.4 Step 4 - Evaluate Remaining Control Options

The top-ranked control option for the process heaters involves the use next generation ULNB or current ULNB with SCR as the post-combustion control device. Next generation ULNB can reduce NO_x emissions at refineries by 90%. SCR is a process that involves the post-combustion removal of NO_x from flue gas with a catalytic reactor.

In the SCR process, ammonia injected into the exhaust gas reacts with nitrogen oxides and oxygen to form nitrogen and water. The reactions take place on the surface of the catalyst. The function of the catalyst is to effectively lower the activation energy of the NO_x decomposition reaction. Technical factors related to this technology include the catalyst reactor design, optimum operating temperature, sulfur content of the fuel, catalyst de-activation due to aging, and the ammonia slip emissions.

The applicability of SCR is limited to heaters that have both a flue gas temperature appropriate for the catalytic reaction and space for a catalyst bed large enough to provide sufficient residence time for the reaction to occur. Optimum NO_x reduction occurs at catalyst bed temperatures of 600°F to 750°F for vanadium or titanium based catalysts and 470°F to 510°F for platinum catalysts[8].

Sulfur content of the fuel can be of concern for systems that employ SCR. Catalyst systems promote partial oxidation of sulfur dioxide to sulfur trioxide which combined with water to form sulfuric acid. Sulfur trioxide and sulfuric acid react with excess ammonia to form ammonia salts. These salts may condense as the flue gas is cooled leading to increased particulate emissions.

8 Midwest Regional Planning Organization, Petroleum Refinery Best Available Retrofit Technology (BART) Engineering Analysis, March 30, 2005.

The SCR process also causes the catalyst to deactivate over time. Catalyst deactivation occurs through physical deactivation and chemical poisoning. To achieve high NO_x reduction rates, SCR vendors suggest a higher ammonia injection rate than stoichiometrically required which results in ammonia slip. This slip leads to emissions trade-off between NO_x and ammonia.

There are also safety issues associated with the transportation, handling, and storage of aqueous ammonia. The storage of ammonia is regulated under Occupational Safety and Health Act (OSHA) regulations and Section 112(2), Risk Management Planning provisions of the Clean Air Act. Aqueous ammonia is made at Holly which will be used in the SCR system.

EM_x™, formerly $SCONO_x$, is a post combustion control system produced by EmeraChem LLC. The EM_x™ system uses a coated oxidation catalyst in the flue gas to remove both NO_x and other pollutants with a reagent such as ammonia. The emissions of NO_x are oxidized to NO_2 and then absorbed onto the catalyst. A dilute hydrogen gas is passed through the catalyst periodically to regenerate the catalyst. This gas absorbs the NO_2 from the catalyst and reduces N_2 before it exits the stack.

EM_x™ operates in a temperature range between 300°F to 700°F. The catalyst uses a potassium carbonate coating that reacts to form potassium nitrites and nitrates on the surface of the catalyst. When all the potassium carbonate coating on the surface of the catalyst has reacted to form nitrogen compounds, NO_x can no longer be absorbed and the catalyst must be regenerated.

The EM_x™ system catalyst is subject to reduced performance and deactivation due to exposure to sulfur oxides. The EM_x™ system is typically used to control emissions from natural gas-fired combustion turbines, reciprocating engines, and industrial boilers in which the sulfur concentration in the exhaust stream is low. The higher concentration of sulfur in the refinery gas will poison the EM_x™ catalyst.

EM_x^{TM} has not been demonstrated for refinery fuel gas-fired process heaters. This technology has not been demonstrated to function efficiently on combustion sources burning fuels other than natural gas. In addition, there are significant technical differences between the proposed refinery's combustion sources and those few sources where EM_x^{TM} has been demonstrated in practice. These significant technical differences preclude a determination that EMx^{TM} has been demonstrated to function efficiently on sources that are similar or identical to the proposed process heaters. Thus, EM_x^{TM} has been eliminated as BACT for process heaters.

Selective non-catalytic reduction (SNCR) is a post-combustion NO_x control technology based on the reactions of ammonia and NO_x. SNCR involves injecting urea/ammonia into the combustion gas to reduce the NO_x to nitrogen and water. The optimum exhaust gas temperature range for implementation of SNCR is 1600°F to 2100°F[9]. Operating temperatures below this range results in ammonia slip which form additional NO_x. In addition, the ammonia/urea must have sufficient residence time, approximately 3 to 5 seconds, at the optimum operating temperatures for efficient NO_x reduction.

There are two advantages of an SNCR system over a SCR system. These include lower capital costs and there are no liquid or solid wastes generated with a SNCR system.

The exhaust temperatures of the proposed process heaters are estimated to be 900° F or less. Therefore, SNCR was eliminated as BACT for use as a post-combustion control for NO_x emissions from the proposed process heaters.

Next and current generation ultra-low NO_x burners may incorporate a variety of techniques including staged fuel injection, internal flue gas recirculation, lean flame technology, steam injection, or a combination of techniques.

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9 Midwest Regional Planning Organization, Petroleum Refinery Best Available Retrofit Technology (BART) Engineering Analysis, March 30, 2005.

Several next generation ULNB have been developed over the past few years. Callidus has developed ULNB that use reduced oxygen concentrations in the flame which enables the flame to burn at a lower temperature without compromising burner efficient. Hamworthy has developed a series of advanced low-NO_x burners which operates in a low excess air environment incorporating air-staging techniques. The John Zink Company has developed several new ULNB which use staged fuel injection combined with internal furnace gas recirculation and lean flame technology or a lean premix primary flame with staged combustion.

Many current ULNB combine the benefits of flue gas recirculation and low-NO_x burner control technologies. The ULNB is designed to recirculate hot, oxygen depleted flue gas from the flame or firebox back into the combustion zone. By doing this, the average oxygen concentration is reduced in the flame without reducing the flame temperatures below that which is necessary for optimal combustion efficiency. Reducing oxygen concentrations in the flame impacts the amount of fuel NO_x generated. ULNB designs have a control efficiency of up to 85% and coupling them with SCR, the control efficiency can range from 85-97 percent.

Low-NO_x burner technology uses advanced burner design to reduce NO_x formation through the restriction of oxygen, flame temperature, and/or residence time. There are two general types of LNB: staged fuel and staged air burners. In a staged fuel LNB, the combustion zone is separated into two regions. The first region is a lean combustion region where a fraction of the fuel is supplied with the total quantity of combustion air. Combustion in this zone takes place at substantially lower temperatures than a standard burner. In the second combustion region, the remaining fuel is injected and combusted with left over oxygen from the first region. This technique reduces the formation of thermal NO_x.

Staged fuel LNB's are well suited for process heaters and boilers burning process or natural gas which generate higher thermal NO_x. By increasing residence times, staged-air LNBs provide reducing conditions which has a greater impact on fuel NO_x than staged fuel burners.

Flue gas recirculation is another combustion control used to reduce NOx. FGR involves the recycling of fuel gas into the air-fuel mixture at the burner to help cool the burner flame. Internal FGR, used primarily in ULNB, involves recirculation of the hot O_2-depleted flue gas from the heater into the combustion zone using burner design features. External FGR, usually used with LNB, requires the use of hot-side fans and ductwork to route a portion of the flue gas in the stack back to the burner windbox.

Flue gas recirculation has not been demonstrated to function efficiently on process heaters that are subject to highly variable loads and that burn fuels with variable heat value. There are significant technical differences between the proposed process heaters and those combustion sources where flue gas recirculation has been demonstrated in practice. Thus, FGR has been eliminated as BACT for NO_x reduction for the process heaters proposed by Holly.

In summary, based on the above discussion, SNCR, SCR, ULNB+SCR, LNB+SCR, ULNB+SNCR, LNB + SNCR, FGR, LNB + FGR, and EM_x™ were eliminated due to technical, economic, energy and environmental impacts.

5.1.4.5 Step 5 - Select BACT

SCR's do have significant environmental and energy impacts when compared to next or current generation ULNB and LNB. For the proposed process heaters, ULNB and LNB's and good combustion control will not cause any adverse energy, environmental, or economic impacts. The highest-ranked control option (ULNB + SCR) when considered in comparison to the use of ULNB and LNB's, will cause energy and economic impacts and will yield both beneficial and adverse environmental impacts.

Table 5-4 presents a summary of previous BACT determinations for NO_x for process heaters. This table is not exhaustive, rather lists the lowest emission rates identified in the past several years from select plants. As can be seen from Table 5-4, the use of LNB and ULNB is BACT for the industry with NO_x emission limits ranging from 0.03 to 0.05 lb/MMBtu.

Thus, for Holly's new process heaters with the exception of the reactor charge furnace (27H1) and the vacuum furnace heater (33H1), ULNB's will be utilized with a proposed emission rate of 0.04 lb/MMBtu based on a three-hour average. For the reactor charge furnace (27H1) and the vacuum furnace heater (33H1), LNB with SCR will be utilized with a proposed emission rate of 0.02 lb/MMBtu.

Table 5-4

Summary of BACT Determinations for NO_x for Process Heaters

Facility	Permit Date	Size (MMBtu/hr)	Primary Fuel	Limit (lb/MMBtu)	Technology
Valero Refining – New Orleans LLC St. Charles Refinery	11/17/2009	CPF Heater H-39-03 & H-39-02 (94-28 & 94-30)	Refinery gas	0.05 (3 - one-hr test avg.)	Low NO_x burners
Valero Refining – New Orleans LLC St. Charles Refinery	11/17/2009	Heaters/ reboilers	Refinery gas	0.04 (3 - one-hr test avg.)	Ultra low NO_x burners
Chevron Products Company, Pascagoula Refinery	4/14/2009	73.25, 73.95, 54.53	Refinery gas	0.03 (30-day rolling avg.)	Ultra low NO_x burners
Navajo Refining Company, Artesia Refinery	12/14/2007	9.6, 35	Refinery gas	0.03 (3-hour rolling avg.)	Ultra low NO_x burners
Arizona Clean Fuels Yuma LLC	04/14/2005	25, 23.2, 99.5	Refinery gas	0.04 (3-hour average)	Low NO_x burners

5.1.5 BACT for VOC

Emissions of volatile organic compounds (VOCs) results from the incomplete combustion of carbon and organic compounds and are a function of oxygen availability, temperature, residence time, and turbulence.

5.1.5.1 Step 1 - Identify All Available Control Technologies

Two control technologies were identified for controlling VOC emissions. These control technologies are good combustion practice and catalytic oxidation.

Good combustion practice includes operational and design elements to control the amount and distribution of excess air in the flue gas. This ensures that there is enough oxygen present for complete combustion. If sufficient combustion air supply, temperature, residence time, and mixing are incorporated in the combustion design and operation, VOC emissions are minimized.

The formation of VOC in combustion units depends on the efficiency of combustion. Catalytic oxidation decreases VOC emissions by allowing the complete oxidation to take place at a faster rate and a lower temperature than is possible with thermal oxidation. In a typical catalytic oxidizer, the gas stream is passed through a flame area and then through a catalyst bed at a velocity in the range of 10 to 30 feet per second. The optimal range for oxidation catalysts is approximately 850 to 1,100 °F.

5.1.5.2 Step 2 - Eliminate Technically Infeasible Control Options

With the use of oxidation catalysts, emissions of acid gases increase as does the need for additional heat input and power. Sulfur and other compounds in the exhaust can lead to fouling of the catalyst, leading to decreased activity. Furthermore, a review of the RBLC and other state databases did not indicate that this technology has been used as a VOC control for process heaters. Therefore, the use of oxidation catalysts for control of VOC emissions from process heaters at the Holly refinery is not technically feasible.

Based on the review of the available literature, RBLC and state databases, good combustion practices were identified as BACT for reducing VOC emissions.

5.1.5.3 Steps 3 - 5

The only control strategy identified for the refinery fuel gas-fired process heaters is adherence to good combustion practices. This control strategy is technically feasible and will not cause adverse energy, environmental, or economic impacts.

Good combustion practice includes operational and design elements to control the amount and distribution of excess air in the flue gas. This ensures that there is enough oxygen present for complete combustion. If sufficient combustion air supply, temperature, residence time, and mixing are incorporated in the combustion design and operation, VOC emissions are minimized.

Good combustion practice and proper equipment design is the industry standard for control of VOC emissions from refinery process heaters. VOC emissions are controlled by maintaining various operational combustion parameters. Table 5-5 presents a summary of previous BACT determinations for VOC for process heaters. This table is not exhaustive, rather lists the lowest emission rates identified in the past several years from select plants.

Table 5-5

Summary of BACT Determinations for VOC for Process Heaters

Facility	Permit Date	Size (MMBtu/hr)	Primary Fuel	Limit (lb/MMBtu)	Technology
Valero Refining – New Orleans LLC St. Charles Refinery	11/17/2009	Heaters/ reboilers	Refinery gas	0.0054 (annual average)	Proper design operation, and good engineering practices and use of gaseous fuels
Navajo Refining Company, Artesia Refinery	12/14/2007	9.6, 35	Refinery gas	0.0050 (1-hour avg.)	Gaseous fuels
Marathon Petroleum CO LLC. Garyville Refinery	12/27/2006	Sources: 5-08, 9-08, 11-08 & 12-08, 1-08 & 2-08, 15-08	Refinery gas	0.015(3-hr average)	Proper design operation, and good engineering practices

The proposed BACT emission limit for the Holly process heaters is based on utilizing good combustion practices, proper equipment design, and gaseous fuels. The estimated VOC emission rate from these heaters is 0.0054 lb/MMBtu which represents BACT.

5.2 BACT for Power Boiler

Holly Refining is proposing the addition Boiler #11, an 89.3 MMBtu/hr refinery- or natural gas-fired boiler.

5.2.1 BACT for CO and VOC

EPA's top-down process was used to determine the best available control technology for control of CO and VOC emissions from the proposed boiler. As mentioned previously, CO and VOC's are products of the chemical reaction between carbonaceous fuels and oxygen. The primary factors influencing generation of CO and VOC are temperature and residence time in the combustion zone. Higher combustion zone temperatures and residence times lead to more complete combustion and lower CO emissions.

5.2.1.1 Step 1 - Identify All Control Technologies

Two control options, good combustion practice and catalytic oxidation, were identified for the control of CO and VOC emissions from the proposed boiler.

The first control technology identified to reduce CO and VOC emissions is through good engineering design of the equipment utilizing good combustion practice. Good combustion practices for CO and VOC include adequate fuel residence times, proper fuel-air mixing, and temperature control. For the proposed boiler, there will be adequate turbulence in the flue gas which will ensure good mixing, a high temperature zone (greater than 1800°F) that will ensure complete burnout along with a sufficient residence time (one to two seconds) at high temperature which will lead to minimized CO and VOC emissions. Higher combustion zone temperatures favor the complete oxidation of carbon-containing compounds to CO_2 and water. Therefore, emissions of CO and VOC would be expected to decrease at higher temperatures.

Catalytic oxidation allows complete oxidation to take place at a faster rate and a lower temperature than is possible with thermal oxidation. In a typical catalytic oxidizer, the gas stream is passed through a flame area and then through a catalyst bed at a velocity in the range of 10 to 30 feet per second (fps). Catalytic oxidizers typically operate at a narrow temperature range of approximately 600ºF to 1100ºF. At lower temperatures, the CO conversion efficiency decreases rapidly.

Catalytic oxidizers are similar to a SCR system in that a catalyst bed facilitates the conversion of a CO to CO_2. Unlike SCR, catalytic oxidizers do not use additional chemicals such as ammonia to facilitate the conversion.

5.2.1.2 Step 2 – Eliminate Technically Infeasible Options

Oxidation catalyst is not a technically feasible option for control of CO and VOC emissions from the proposed boiler. The Holly Refinery plant gas contains sulfur. In flue gas containing more than trace levels of SO_2, poisoning and deactivation of the catalyst by sulfur-containing compounds occurs as well. In addition, SO_2 would be converted to SO_3 which will form sulfuric acid increasing the emissions of this acid gas and will increase both condensable particulate emissions and flue gas system corrosion rates.

The EPA's RBLC and recent issued permits were reviewed and catalytic oxidation was not identified as a CO and VOC technically feasible control option for refinery-fuel gas-fired boilers.

5.2.1.3 Steps 3- 5

CO and VOC emissions can be controlled by using good combustion practice, including providing adequate fuel residence time, excess oxygen and high temperature combustion zone to ensure complete combustion. Thus, the only identified control technology, good combustion practice, is considered technically feasible for refinery or natural gas fired boilers. With the use of GCP, no adverse economic, energy, or collateral environmental impacts are identified that preclude the use of this control option.

Table 5-6 presents a summary of previous BACT determinations for power boilers that are similar sized to the proposed Holly boiler. This table is not exhaustive, rather lists the lowest emission rates identified in the past several years from select plants.

Table 5-6

Summary of BACT Determinations for CO for Power Boilers <100 MMBtu/hr

Facility	Permit Date	Boiler Name	Size MMbtu/hr	Primary Fuel	Limit lb/MMBtu	Technology
St. Charles Refinery Valero Refining	12/31/2010	EQT0323-Boiler 401F	99	Refinery Gas	8.15 lb/hr	Good combustion practices, proper equipment design and operation, use of gaseous fuels
Conoco Phillips Ponca City Refinery	2/09/2009	Leased boiler #1 and TB-1, TB-2, TB-3	95	Natural gas	0.04	Ultra low NOx burners and good combustion practices
Williams Refining and Marketing LLC.	4/3/2002	Boiler 9	95	Natural gas	0.09	None given in database

Holly Refining & Marketing will utilize good combustion practices to reduce CO emissions from the proposed boiler. Holly has obtained performance guarantee of 50 ppm or approximately 0.037 lb/MMBtu for CO and 10 ppm for VOC or approximately 0.004 lb/MMBtu. The use of good combustion practices and estimated emissions of 50 ppm for CO and 10 ppm for VOC represents BACT.

5.2.2 BACT for PM_{10} and $PM_{2.5}$

Particulate matter from refinery gas or natural gas combustion is usually composed of larger molecular weight hydrocarbons that have not been fully combusted.

5.2.2.1 Step 1 - Identify All Available Control Technologies

The list of control technologies that were identified for controlling PM_{10} and $PM_{2.5}$ emissions from the power boiler are as follows:

- good combustion practice;
- wet gas scrubber;
- electrostatic precipitator (ESP);
- cyclone; and
- baghouse/fabric filters.

Like the process heaters, information obtained from vendors indicated that particulate emissions are in the PM_{10} range. Thus, the BACT analysis focused on PM_{10}.

5.2.2.2 Step 2 - Eliminate Technically Infeasible Control Options

None of the add-on control devices were identified as the proposed boiler burning gaseous fuels due to the extremely low concentration of small particulates expected in gas streams from this type of equipment. PM/PM_{10} concentrations in the refinery fuel and natural gas-fired boilers are even less than the concentrations guaranteed by the cyclones, ESP's, fabric filters, and wet gas scrubbers. Therefore, wet gas scrubbers, ESP's, cyclones, and fabric filtration (baghouses) were rejected as BACT for PM/PM_{10} emissions from the proposed boiler.

5.2.2.3 Steps 3 -5

The remaining control option is the utilization of good combustion practices. The proposed PM_{10} and $PM_{2.5}$ emission limit for the proposed Holly boiler is based on manufacturer specifications and 0.010 lb/MMBtu utilizing proper equipment design and operation, good combustion practices, and the use of gaseous fuels. This represents BACT for PM_{10} and $PM_{2.5}$.

Table 5-7 presents a summary of previous BACT determinations for PM_{10}. This table is not exhaustive, rather lists the lowest emission rates identified in the past four years from select plants.

Table 5-7

Summary of BACT Determinations for PM_{10} for Power Boilers <100 MMBtu/hr

Facility	Permit Date	Boiler Name	Size MMBtu/hr	Primary Fuel	Limit lb/MMBtu	Technology
St. Charles Refinery Valero Refining	12/31/2010	EQT0323-Boiler 401F	99	Refinery Gas	0.74 lb/hr	Good combustion practices, proper equipment design and operation, use of gaseous fuels
Williams Refining and Marketing LLC.	4/3/2002	Boiler 9	95	Natural gas	0.0075	None given in database

5.2.3 BACT for SO_2

The quantity of SO_2 emissions from the proposed boiler depends on the sulfur content of the fuels combusted. In general, refinery fuel has a higher sulfur content that natural gas supplied by a pipeline. When burned in a boiler, essentially all the sulfur in the fuel is oxidized to SO_2.

5.2.3.1 Step 1 - Identify All Available Control Technologies

The following is a list of control technologies which were identified for controlling SO_2 emissions:

- fuel specification - low sulfur fuels;
- wet flue gas desulfurization (wet FGD);
- advanced flue gas desulfurization; and
- dry absorption (dry FGD).

5.2.3.2 Step 2 - Eliminate Technically Infeasible Control Options

All listed control options are technically feasible.

5.2.3.3 Step 3- Rank Remaining Control Options

The following lists the ranking of the control options:

1) AFGD – 95 – 99.5% reduction;
2) Wet FGD – 90 - 99% reduction;
3) Dry FGD – 90-95% reduction; and
4) Low sulfur fuels – base case.

5.2.3.4 Step 4 - Evaluate Remaining Control Options

A review of the recent literature, recent permits, and the RBLC database did not result in AFGD, wet FGD, or dry FGD as BACT for large boilers. These three options were eliminated from further consideration.

The only control strategy identified for the fuel gas-fired boiler is adherence to fuel specifications. This control strategy is technically feasible and will not cause adverse energy, environmental, or economic impacts.

5.2.3.5 Step 5 - Select BACT

Holly has a fuel gas sulfur content limit of 162 ppmv or less which is proposed as the BACT emission limit for the boiler. In addition to the fuel gas sulfur content limit, equipment design and work practice requirements will be implemented to minimize, to the greatest extent possible, emissions that would occur due to upsets.

5.2.4 BACT for NO_x

Oxides of nitrogen are formed during the combustion of fuels by oxidation of chemically-bound nitrogen in the fuel and by thermal fixation of nitrogen in the combustion air.

5.2.4.1 Step 1 - Identify All Available Control Technologies

There are a variety of options available for control of NO_x emissions from combustion sources. These include modifications that reduce NO_x formation, add-on control devices, or combinations of both. The same control technologies and techniques for NO_x emissions that were identified for the process heaters are applicable to the boiler. They include:

- low NO_x burners (LNB),
- ultra-low NO_x burners (ULNB)
- flue gas recirculation (FGR),
- selective non-catalytic reduction (SNCR),
- selective catalytic reduction (SCR),
- low NO_x burners and flue gas recirculation (LNB +FGR),
- ultra-low NO_x burners and flue gas recirculation (ULNB + FGR)
- low NO_x burners and selective non-catalytic reduction (LNB + SNCR),
- ultra-low NO_x burners and selective non-catalytic reduction (ULNB + SNCR),
- low NO_x burners and selective catalytic reduction (LNB + SCR),
- ultra-low NO_x burners and selective catalytic reduction (ULNB + SCR),

- EM_x™ (formerly $SCONO_x$),
- low NO_x burners and EM_x™,
- ultra-low NO_x burners and EM_x™, and
- good combustion practices.

5.2.4.2 Step 2 - Eliminate Technically Infeasible Control Options

All of the individual controls or combinations of controls were determined to be technically feasible.

5.2.4.3 Step 3 - Rank Remaining Control Options

The range of control efficiencies for the NO_x control devices is presented in Table 5-3 above.

5.2.4.4 Step 4 - Evaluate Remaining Control Options

With SCR, ammonia is injected as the flue gas passes through a catalyst bed (see Section 5.1.4.4 for a comprehensive discussion).

SNCR consists of injecting ammonia or urea into the combustion unit flue gases in a specific temperature zone between 1600ºF to 2100ºF. The exhaust temperature of the proposed boiler is estimated to be 900º F or less. This would require additional energy input and therefore, additional exhaust emissions to raise the temperature of the power boiler exhaust to the operating temperature of the SNCR. Therefore, SNCR was eliminated as BACT for use as a post-combustion control for NO_x emissions from the proposed boiler. SNCR+LNB and SNCR+ULNB were also eliminated.

Ultra-low NO_x and low NO_x are burner designs that reduce NO_x formation. The ULNB is designed to recirculate hot, oxygen depleted flue gas from the flame or firebox back into the combustion zone. By doing this, the average oxygen concentration is reduced in the flame without reducing the flame temperatures below that which is necessary for optimal combustion efficiency. Low-NO_x burner technology uses advanced burner design to reduce NO_x formation through the restriction of oxygen, flame temperature, and/or residence time.

Flue gas recirculation is another combustion control used to reduce NO_x. FGR involves the recycling of fuel gas into the air-fuel mixture at the burner to help cool the burner flame.

Internal FGR, used primarily in ULNB, involves recirculation of the hot O_2-depleted flue gas from the heater into the combustion zone using burner design features. External FGR, usually used with LNB, requires the use of hot-side fans and ductwork to route a portion of the flue gas in the stack back to the burner windbox.

EM_x is an add-on technology that utilizes a catalyst to absorb the SO_2 in the flue gas. The catalyst is periodically regenerated using hydrogen. This technology has only been used on a small number of natural gas combustion turbines for NO_x control and not on power boilers. Thus, it was eliminated from further BACT consideration.

In summary, based on the above discussion, SNCR, ULNB+SNCR, LNB + SNCR, EM_x™, EM_{Xx}™ +LNB and EM_x™+ULNB were eliminated due to technical, economic, energy and environmental impacts.

ULNB, LNB, and ULNB or LNB with SCR are all viable options to control NO_x emissions.

With the use of an SCR, adverse energy impacts occur. The adverse energy impact is due to the electrical requirements of the SCR system operation and to the reduction in energy efficiency attributable to the pressure drop across the catalyst.

The adverse environmental impacts attributable to the use of an SCR system includes the use of ammonia reagent, the handling and disposal of a spend catalyst as a solid waste stream, and ammonia emissions. The ammonia needed for the SCR will be available from other on-site operations and will not be trucked to the facility. Industry experience with SCR systems indicates that the removal and disposal of the spent catalyst can be conducted safely with insignificant risk to the environment.

With the use of addition energy and the SCR system, additional costs are incurred. The average cost effectiveness of this control option was justified by the air quality benefit gained through the use of an SCR system. Thus, although the use of an SCR has adverse energy, environmental and economic impacts, the beneficial environmental impacts outweigh the adverse impacts.

5.2.4.5 Step 5 - Select BACT

Table 5-8 presents a summary of previous BACT determinations for NO_x for similar sized boilers as proposed by Holly for refineries. This table is not exhaustive, rather lists the lowest emission rates identified in the past four years from select plants.

Table 5-8

Summary of BACT Determinations for NO_x for Power Boilers <100 MMBtu/hr

Facility	Permit Date	Boiler Name	Size MMBtu/hr	Primary Fuel	Limit lb/MMBtu	Technology
Valero Energy Corp. Valero Delaware City Refinery	02/26/2010	Four package boilers	99.9	Refinery Gas	0.015	SCR and LNB
St. Charles Refinery Valero Refining	12/31/2010	EQT032 3-Boiler 401F	99	Refinery Gas	0.040	Ultra low NO_x burners and good combustion practices
Conoco Phillips Ponca City Refinery	2/09/2009	Leased boiler #1 and TB-1, TB-2, TB-3	95	Natural gas	0.036	Ultra low NO_x burners
Williams Refining and Marketing LLC.	4/3/2002	Boiler 9	95	Natural gas	0.084	None given in database

Hence, with the combination of LNB and a SCR with combustion control for controlling NO_x emissions, this option is the highest ranking control option and has been chosen for the proposed boiler #11 at Holly and is considered BACT. The proposed NO_x emission rate is 0.02 lb/MMBtu based on a three-hour average.

5.3 BACT for Cooling Tower

The cooling system proposed for the Holly Refining heavy crude processing project consists of the addition of cooling tower #10 and the addition of a cell to existing cooling tower #11.

Cooling towers are heat exchangers that are used to dissipate large heat loads to the atmosphere. $PM_{10}/PM_{2.5}$ and VOC emissions are expected from the cooling towers.

Particulate matter is emitted from wet cooling towers due to the presence of dissolved or suspended solids in water droplets from cooling tower drift. As the drifted droplet evaporates, the dissolved solids present in the droplet collected into a single particle. The size of the resulting particle depends on the size of the droplet, the mass of the dissolved solids present, and the density of the resultant particle.

VOC emissions are due the evaporation of VOC's that may be present in the cooling water due to equipment or heat exchanger leaks. Small amounts of hydrocarbons may be present in the cooling water.

5.3.1 BACT for $PM_{10}/PM_{2.5}$

Particulate matter is emitted from the cooling towers due to the presence of dissolved and suspended solids in the water droplets from the drift from the cooling tower.

5.3.1.1 Step 1- Identify All Available Control Technologies

Four control technologies were identified to limit $PM_{10}/PM_{2.5}$ drift from cooling towers. These include:

- Use of dry cooling heat exchanger units;
- High-efficiency drift eliminators;
- Limitation on total dissolved solid (TDS) concentrations in the circulating water; and
- Combination of drift eliminator efficiency rating and TDS limit.

5.3.1.2 Step 2 - Eliminate Technically Infeasible Control Options

Dry cooling or non-evaporative cooling towers have been adopted for heat rejection at combined-cycle power plants in arid or low precipitation climates. This type of cooling tower circulates the process water through a large bank of radiator coils. These coils are cooled by forced flow of ambient air on the outer finned surfaces of the radiator. Ambient airflow is driven by very large axial propeller fans, typically located below the radiator bank, so that the air is blown upward through the radiator and the warmer air exits the top of the tower. Because there is no contact between the water and the ambient air, and thus no opportunity for drift, a dry cooling tower would not be a source of particulate matter emissions.

Dry cooling has been employed at primary combined-cycle power plants as a means to reduce water consumption rather than as BACT for reducing PM_{10} emissions. There is a very substantial capital cost penalty as well as significant process changes that would be required in utilizing this control technology. Because of the high capital cost and process design changes involved in using dry cooling, and that dry cooling has not been identified as being utilized at a refinery, this option was determined to be technically infeasible and was eliminated from further consideration.

5.3.1.3 Step 3 - Rank Remaining Control Options

The remaining control options were ranked in order from most to less stringent:

1. Combinations of high-efficiency drift eliminators and TDS limit;
2. High-efficiency drift eliminators to control drift as low as 0.0005% of circulating water;
3. Limitation of TDS concentrations in the circulating water.

5.3.1.4 Step 4 - Evaluate Remaining Control Options

All modern cooling towers are equipped with drift eliminators. The drift eliminator forces the exhaust air to make sharp turns before exiting. The momentum of entrained droplets carries the droplets to the drift eliminators surfaces where they coalesce and drip back into the tower. Typically, for cross-flow designs the drift rate will be less than 0.005% because of the use of higher efficiency eliminators; counterflow and forced-draft counterflow designs routinely achieve 0.001%.

The only identified, technically feasible control option is the use of high-efficiency drift eliminators in conjunction with the proposed wet cooling tower and additional cell. In using the drift eliminators, no significant energy, environmental, or economic impacts are expected.

5.3.1.5 Step 5 - Select BACT

The cooling towers will be equipped with drift eliminators with a vendor-guaranteed maximum total liquid drift of 0.0005 percent of the circulating water flow rate. This is equivalent to the most stringent identified equipment specification for wet cooling tower and represents BACT.

5.3.2 BACT for VOC

Emissions of VOC can also occur due to evaporation of volatile organic compounds that may be present in the cooling water due to leaks from heat exchangers.

5.3.2.1 Step 1- Identify All Available Control Technologies

Only one control technology was identified for controlling VOC emissions from cooling towers and this is the implementation of a heat exchanger leak detection and repair program.

5.3.2.2 Step 2 - Eliminate Technically Infeasible Control Options

The implementation of a heat exchanger leak detection and repair program was determined to be technically feasible.

5.3.2.3 Steps 3 - 5

The only identified, technically feasible control option is to implement a heat exchanger leak detection and repair program for the proposed wet and expanded cooling towers. In using this option, no significant energy, environmental, or economic impacts are expected. This program involves monitoring cooling water for the presence of hydrocarbons, and finding and repairing leaks when hydrocarbons are found.

Therefore, to satisfy BACT, Holly will install and maintain an in-line hydrocarbon monitor in the return water steam entering the cooling tower to detect unusual levels of hydrocarbons. This determination is expressed as a work practice requirement rather than an emission limitation.

5.4 BACT for Fluid Catalytic Cracking Unit

This BACT review was based on data summarized by EPA in the RACT-BACT-LAER Clearinghouse, review of state databases and review of recent consent decrees. While the emission limits imposed by the consent decrees do not necessarily represent BACT or LAER, they do represent the most stringent emissions limitations placed upon FCCU's.

Emissions from the burning of coke off the catalyst in the FCCU regenerator vessel are released out the regenerator stack. The emissions include: NO_x, CO, PM, and SO_2.

5.4.1 BACT for CO

CO will be present in the FCCU regenerator flue gas. The FCCU will be run in "full burn" operation. In full burn, the FCCU regenerator, when properly designed and operated, will convert nearly all of the coke to CO_2, thereby limiting CO emissions.

5.4.1.1 Step 1 – Identify All Available Control Technologies

Three control technologies were identified as potentially able to control CO emissions from a full burn FCCU regenerator. These technologies are: catalytic oxidation, CO combustion promoters, and good combustion practices.

5.4.1.2 Step 2 - Eliminate Technically Infeasible Control Options

Catalytic oxidizers, a post-emission control technology, are designed so that the waste gases pass through a flame area and then through a catalyst bed where CO is oxidized to CO_2 at temperatures of 650 to 1100°F. The regenerator flue gas will exit the wet gas scrubber at approximately 150°F. The process of reheating the flue gas would result in increased CO. In addition, catalytic oxidation cannot be used on waste gas streams that contain particulate due to the potential for fouling the catalyst which prohibits oxidation. Thus, catalytic oxidizers are technically infeasible and are eliminated from further consideration.

CO combustion promoters and good combustion practices are technically feasible and will be considered further.

5.4.1.3 Steps 3 - 5

One remaining CO control technology is CO combustion promoters. CO combustion promoters are an additive to the coke combustion process in the regenerator that hampers the formation of NO_x while enhancing the combustion of coke on the catalyst. The CO combustion promoters are readily fluidized, mixing with the catalyst. They are added to the circulating fluid bed (CFB) regenerator unit to improve the efficiency of CO burning, reduce emissions of CO and improve the efficiency of the unit. The CO combustion promoter accumulates in, or just above, in the fast fluidized bed combustion zone of the regenerator. There are several CO promoters that are available for use including Engelhard Corporations OxyClean™, Intercat, and Grace Davison's XNO_x all of which are effective in reducing CO emissions while controlling NO_x emissions.

A second control technology for reducing CO emissions is good combustion practices. Full burn regenerators operate with excess oxygen in the flue gas, typically 1-3 volume percent on a dry basis. The minimum excess oxygen required to promote complete CO oxidation is a function of bed temperature, gas residence time in the bed, and how efficiently the regenerator design utilizes the available oxygen. If the full burn unit is properly designed and operated, with sufficient oxygen present, the oxidation of CO to CO_2 should be complete. Therefore, good combustion design and operation will effectively control CO emissions present in the FCCU regenerator exhaust gas.

Good combustion practices and a CO promoter will be used by Holly to minimize CO emissions from the new FCCU. Using these control options, there are no anticipated additional environmental or energy impacts associated with this unit. Thus, the FCCU in full burn, the use of CO promoters and good combustion practices are considered BACT for CO. CO emissions will be limited to 500 ppmvd based on a one-hour average at 0% O_2.

5.4.2 BACT for PM_{10} and $PM_{2.5}$

The main source of PM_{10} and $PM_{2.5}$ is catalyst fines and products of incomplete combustion that are released in the regenerator exhaust stack.

5.4.2.1 Step 1 - Identify All Available Control Technologies

The following is a list of control technologies which were identified for controlling PM_{10} and $PM_{2.5}$ emissions from the FCCU regenerator stack:

- Wet Gas Scrubber;
- Electrostatic Precipitator (ESP); and
- Third Stage Separator (TSS)/Cyclone.

Descriptions of the ESP and the wet gas scrubber are presented in Section 5.1.2.1. A third stage separator (TSS) is a specially designed cyclone or set of cyclones, for the flue gas from an FCCU regenerator. The TSS is in a separate vessel, outside the regenerator, that houses a number of small diameters, high efficiency cyclones arranged in parallel in the vessel. There is a flow distributor at the inlet to evenly distribute the regenerator flue gas to each small cyclone to create better efficiencies in particulate removal. The TSS is able to remove a significant amount of particulate that would normally go out the regenerator stack.

5.4.2.2 Step 2 - Eliminate Technically Infeasible Control Options.

Each of the technologies is technically feasible.

5.4.2.3 Step 3 - Rank Remaining Control Options

The following lists the ranking of the remaining control options:

- Electrostatic Precipitators – Up to 95% reduction
- Wet Gas Scrubber – 85 to 95 % reduction

- Third Stage Separator – No efficiency percentages were found but the literature suggests that the TSS is able to reduce the amount of particulate to approximately 0.6 lbs per 1000 lbs of coke burned.

5.4.2.4 Step 4 - Evaluate Remaining Control Options

ESP is a proven technology. The collected particulate is disposed of as a dry solid. The discharge doesn't have a vapor plume. There is a small pressure drop across the ESP. The particle collection process begins when the particle absorbs a charge sufficient amount to be attracted to the collection plates. However, the particle charging and collection process can be affected by several factors including particle size, particle resistivity, electric field and the temperature and composition of the flue gas stream.

There are reliability issues with electrostatic precipitators, so in many cases, multiple units are installed for redundancy which adds cost. Temperature and humidity affect the resistivity of PM. An EPS has a limited ability to handle high temperature excursions or FCCU upsets. In addition, any VOCs that might be in the stream because of an upset are dangerous to the unit. ESPs are also susceptible to changes in catalysts.

Wet gas scrubbers are also a proven technology. They have been demonstrated on a long-term basis to remove particles to very low levels. They have an excellent reliability so there is no need for multiple units. Wet scrubbers have a much broader operating range and are more able to handle upsets from the FCCU. A wet gas scrubber also has a lower operating temperature than an ESP which provides for improved removal of condensable PM. The waste from a wet gas scrubber can be disposed of as a wet solid.

The TSS removes a significant amount of catalyst fines from the flue gas stream. However, a TSS by itself will not reduce particulate to meet the NSPS standard of 0.5lb/1000lb coke burned.

5.4.2.5 Step 5 - Select BACT

According to the RBLC, wet scrubbers are used extensively as one method to reduce particulate from FCCUs and a wet gas scrubber is proposed by Holly to reduce PM emissions from the new FCCU. Thus, a wet gas scrubber is considered BACT for reduction of particulate from the FCCU regenerator stack. The emissions of PM_{10} and $PM_{2.5}$ will be well controlled below the 0.5 lbs/1000 lbs of coke burn-off limit.

5.4.3 BACT for SO_2

Depending on the feed sulfur content and FCCU design, sulfur emissions in the form of SO_2 and SO_3 from the regenerator can vary significantly. Black wax crude is inherently low in sulfur. In the FCCU reactor, 70 to 95 percent of the incoming feed sulfur is transferred to the acid gas and product side in the form of H_2S. The remaining of the incoming feed sulfur is attached to the coke where it is oxidized into sulfur oxides and emitted in the FCCU regenerator flue gas.

5.4.3.1 Step 1 - Identify All Available Control Technologies

The following is a list of control technologies which were identified for controlling SO_2 emissions from the FCCU:

- Control of sulfur in the FCCU feed
- Feed hydrotreatment
- Wet Gas Scrubbers
- Wellman-Lord Flue Gas Desulfurization Process
- $DeSO_x$ Additives

As mentioned previously, black and yellow wax crudes are inherently low in sulfur.

In the feedstock hydrotreatment process, the FCCU feedstock is treated over a metal catalyst in a hydrogen environment before the cracking process. Depending on initial sulfur levels, flue gas emissions of SO_2 can be reduced by up to 90 percent with the additional benefit of reductions in nitrogen compound and trace metal emissions.

Wet gas scrubbers are principally defined in Section 5.1.2.1. The water used in a wet gas scrubber is mixed with an alkaline reagent to react with the SO_2 to form sulfate and sulfite salts. These compounds are captured as a wet solid in the filtering section of the wet gas scrubber. The SO_2 removal efficiencies typically range from 95 to 99.9%.

In the Wellmann-Lord flue gas desulfurization process, flue gas enters the absorber and gas is scrubber using an aqueous sodium sulfate solution. The scrubbed flue gas exits the absorber, passes through a set of demisters and is discharged to the atmosphere. The SO_2 removal efficiency using this process is between 85 to 98%.

$DeSO_x$ additives are typically metal oxide catalysts that are added to the regenerator to convert SO_2 to SO_3. The metal oxide catalyst is introduced to the feed in the riser with the regenerated catalyst. The SO_3 is adsorbed to a sulfate and then recycled back to the reactor with the FCCU catalyst where it is reduced in the riser/reactor to H_2S which is controlled by a refineries sulfur plant.

5.4.3.2 Step 2 - Eliminate Technically Infeasible Control Options

All options are technically feasible with the exception of feedstock hydrotreatment.

The feedstock hydrotreatment requires a large number of process units to take the sulfur out of the feed to the FCCU. This equipment includes a hydrogen plant, a high pressure hydrotreater, approximately three additional heaters, a fractionation tower, and a gas plant. This sulfur removal technique is larger than the FCCU process itself. The three additional process heaters would operate full time and each heater would have additional emissions. In addition, there are additional environmental concerns with catalyst removal and disposal from the hydrotreater.

The catalyst beds in the hydrotreater are layers of catalyst inside high pressure vessels. The feedstock flows through these beds where the reactions take place. The Black Wax crude has a heavy residual bottoms fraction. This fraction is too heavy for the catalyst beds to efficiently crack into lighter fractions. It would plug up the catalyst beds in the hydrotreater. This issue makes it technically infeasible to hydrotreat the Black Wax feedstock to the FCCU without removing the bottoms fraction first. Thus, this option has been determined to be technically infeasible.

5.4.3.3 Step 3 - Rank Remaining Control Options

The following lists the ranking of the remaining control options:

- Wet Gas Scrubbers - 95-99.9%
- Wellman-Lord Flue Gas Desulfurization Process - 85-98%
- $DeSO_x$ additives – 30%

5.4.3.4 Step 4 - Evaluate Remaining Control Options

According to EPA's RBLC, wet scrubbers have been successfully applied to several refinery FCCUs to control emissions of SO_2 and PM. Recent consent decrees will require several refineries to install wet gas scrubbers to reduce SO_2 emissions. Several designs of wet scrubbers are available (plate or tray towers, spray chambers, and venturi) and emission control levels for SO_2 between 95-99.9% have been achieved.

The Wellman-Lord Flue Gas Desulfurization process has been used successfully in Japan, Germany, and the United States but no new units were identified that have been built in recent years.

$DeSO_x$ additives are added to a regenerator to reduce the SO_x from the flue gas of the regenerator. This catalyst converts SO_2 in the regenerator to SO_3 and stabilizes it as a metal sulfate. This metal sulfate is then introduced to the feed in the riser with the regenerated catalyst. The riser has a reducing atmosphere as opposed to the oxidizing atmosphere in the regenerator. The metal sulfate is converted to H_2S in the riser/reactor and released with the products to the fractionator.

Although more than 70 refiners have successfully used $DeSO_x$ additives worldwide, there are a number of operating variables that have been identified as having significant effects on the performance of SO_x reduction additives. Some of these include the presence of combustion promoters, the ratio of catalyst circulation rate to unit catalyst inventory, temperature, availability of oxygen in the regenerator, feed sulfur content, and SO_x concentration. Various scientific studies have shown that the fraction of sulfur in the feed has a direct impact on the coke sulfur content deposited on spent catalyst and, thus, on SO_x emissions. Since the sulfur content of the proposed feed is extremely low and the amount of SO_2 control that can be achieved by using $DeSO_x$ additives is significantly less than the top ranking option, $DeSO_x$ additives are eliminated from further consideration.

5.4.3.5 Step 5 - Select BACT

The top control option, a wet gas scrubber with a control efficiency of up to 99% will be utilized by Holly Refining to reduce SO_2 emissions from the proposed FCCU. The use of a wet gas scrubber represents BACT. SO_2 emissions from the wet gas scrubber are estimated to be 25 ppmvd at 0% O_2 based on a 365-day average.

5.4.4 BACT for NO_x

The FCCU regenerator is proposed as a full-burn unit which is recognized by EPA as an inherently low NO_x design. The predominant NO_x species inside an FCCU regenerator is NO that is further oxidized to NO_2 upon release to the atmosphere. NO_x in the regenerator can be formed by two mechanisms, thermal NO_x produced from the reaction of molecular nitrogen with oxygen and fuel NO_x which is produced from the oxidation of nitrogen-containing coke specie deposited on the catalyst inside the reactor.

5.4.4.1 Step 1 - Identify All Available Control Technologies

The following is a list of control technologies which were identified for controlling NO_X emissions from a FCCU:

- Selective Non-Catalytic Reduction (SNCR);
- Selective Catalytic Reduction (SCR);
- LoTOx; and
- Catalyst additives and low NO_x combustion promoters.

5.4.4.2 Step 2 - Eliminate Technically Infeasible Control Options

All the options are technically feasible.

5.4.4.3 Step 3 - Rank Remaining Control Options

The remaining control options were ranked in order of reduction:

- Selective Non Catalytic Reduction (SNCR) – 60 to 80% reduction
- Selective Catalytic Reduction (SCR) - > 90% reduction
- LoTox - >90% reduction with SCR
- Catalyst additives and low NO_x combustion promoters – 45-95% reduction.

The SNCR system is a post-combustion control technology that reacts with urea or ammonia with flue gas without the presence of a catalyst to produce N_2 and H_2O. The typical operating temperature range for an SNCR is 1,600ºF to 2,000ºF. The SNCR temperature range is sensitive as the reagents can produce additional NO_x if the temperature is too high or removes too little NO_x if the reaction proceeds slowly if the temperature is too low. The NH_3 slip in SNCR applications can range from 10 to 100 ppmv. SNCR has been used successfully with CO boilers but are typically not used with full burn units due to low NO_x removal at temperatures below 1,400ºF. In full burn units, such is proposed by Holly, the flue gas must be heated to 1,600 to 1,800ºF to achieve NO_x removal rates of 50% and greater.

Selective Catalytic Reduction is a post combustion control technology that injects ammonia in flue gas in the presence of a catalyst (typically vanadium or tungsten oxides) to produce N_2 and H_2O. An SCR is similar to SNCR with the exception that a catalyst is used to accelerate the reactions at lower temperatures. The ideal temperature range for an SCR is 600ºF to 750ºF with guaranteed NO_x removal rates of 90+%. Design considerations include targeted NO_x removal level, service life, pressure drop limitation, ammonia slip, space limitation, flue gas temperature, composition and SO_2 oxidation limit. SCR suppliers typically guarantee the performance of the unit for NO_x removal, service life, pressure drop, ammonia slip and SO_2 oxidation. Ammonia slip, referring to the amount of ammonia which passes through the process unreacted, is typically guaranteed to 10 ppmv.

The Belco $LoTO_x$™ technology is a selective, low temperature technology that uses ozone to oxidize NO_x to water soluble nitric pentoxide (N_2O_5). These higher oxides of nitrogen are highly soluble. Inside a wet gas scrubber, the N_2O_5 forms nitric acid that is subsequently scrubbed by the scrubber nozzles and neutralized by the scrubber's alkali reagent. Since the process is applied at a controlled temperature zone in the wet gas scrubber, it can be used at any flue gas temperature. The controlled temperature zone in the wet gas scrubber is below 300°F. Since the $LoTO_x$™ technology does not use a fixed catalyst bed, it can handle unit upsets without impacting overall reliability and mechanical availability.

The $LoTO_x$™ technology generates ozone on demand based on the amount of NO_x in the flue gas. There is no storage of ozone required. Emission reductions using this process have been estimated to range from 80 to 95%.

Several vendors offer NO_x reducing catalyst additives and combustion promoters. Current NO_x additives affect the availability of nitrogen species to be oxidized and reduced and the performance of the additives is dependent on the application. Grace Davison's XNOx is a combustion promoter additive that can reduce NO_x emission from 50-75% in the regenerator. Grace Davison's DENOX promoter can reduce NO_x emissions up to 60%. Engelhards CLEANNOx and OxyClean reduce NO_x emissions by 45%. INTERCAT's COP-NP can reduce emissions from approximately 40-65%. The NO_x combustion promoters (catalysts and additives) are added directly into the FCCU reactor and regenerator. These additives can withstand the harsh environment of the regenerator but do not have the same life as catalyst.

A benefit associated with the use of additives is flexibility. Additives can easily be added and removed from the operation depending on the refiner's needs but are more expensive than FCC catalysts with an average cost approaching $20 per pound. The additional cost associated with the recommended usage rate of these additives may triple the current catalyst cost resulting in negative process unit economics. Higher removal rates may require more additive and that can impact yields, product quality and unit throughput.

5.4.4.4 Step 4 – Evaluate Remaining Control Options

SNCR is not feasible in this application because of the need to heat the flue gas to reach the optimum operating levels of the SNCR. The amount of NO_x reduction is also lower. Most EPA consent decree applications have achieved a 5 to 30% reduction with others in the industry achieving up to 70% depending on process conditions.[10] A drawback of using SNCR technology is the potential formation of ammonium sulfate salts and resultant fouling. These salts will exist as small particulates.

10 Advances in Fluid Catalytic Cracking, Chapter 17, FCC NOX Emissions and Controls, Jeffrey A. Sexton, 2010.

SCRs operate in the temperature range of the regenerator flue gas coming out of the FCC. This control technology has a high NO_x reduction rate when compared to other NO_x control technologies. Although SCR offers high NO_x reduction rates, catalyst deactivation can occur from salt formation on the catalyst surface, cracks of the catalyst from the substrate material can occur from thermal stresses, and thermal degradation of the catalyst can occur at temperatures greater than 800°F. Other items that can lead to catalyst deactivation include erosion of the catalyst due to excessive catalyst fines loading and plugging of the catalyst system due to catalyst fines.

At the plants where SCR's have been installed, the majority of them have third stage separators or ESP's located before the SCR catalyst bed to protect against upsets in the FCC regenerator. Holly is not proposing either a third stage separator or ESP as part of the heavy crude processing project.

$LoTO_x$™ in conjunction with wet scrubbing systems has been demonstrated to effectively reduce high levels of NO_x from a FCCU. The efficiency obtained from the combination of LoTOx™ and wet gas scrubbing systems is comparable to an SCR.

Combustion promoters will not reduce the NO_x emissions alone to meet NO_x BACT levels.

5.4.4.5 Step 5 – Select BACT

A review of the literature and the EPA's RBLC indicate that SCRs, and $LoTO_x$™ in conjunction with wet scrubbing systems are used for the reduction of NO_x in a number of FCCUs. However, Holly is concerned about potential SCR problems such as fouling, plugging, poisoning and/or thermal degradation of the catalyst which could result in potential downtime for the SCR and possible the process. Addition concerns with the use of a SCR include conversion of SO_2 to SO_3 and formation of ammonium sulfate/sulfite particles that could deposit in the catalyst or ductwork.

Thus, Holly Refining has chosen a LoTOx™ system in conjunction with a wet gas scrubber to reduce NO_x emissions in the regenerator flue gas. This is considered to represent BACT. NO_x emissions from the FCCU regenerator will not exceed 110 ppm per 365-day rolling average and 180 ppm per 7-day rolling average. BELCO, a subsidiary of DuPont, has provided a list of locations where the LoTOx ™ technology has been installed or is projected to be installed in FCCU regenerator applications. Table 5-9 presents a list of a few of these facilities.

Table 5-9

LoTOx™ NO_x Reduction Technology Installations

Application	Location	Capacity	Start-up
Refinery FCCU (New EDV scrubber with LoTOx technology)	Valero, Houston,	58,000 bpsd	April 2007
Refinery FCCU (Retrofitted LoTOx Technology to existing EDV® wet scrubber)	Marathon, Texas City, Texas	72,000 bpsd	February 2007
Refinery FCCU (New EDV scrubber with LoTOx technology)	BP, Texas City,	130,000 bpsd	June 2007
Refinery FCCU (Retrofitted LoTOx addition to existing EXXON scrubber)	Flint Hills, Corpus Christi, TX	45,000 bpsd	2009
Refinery FCCU (New EDV Scrubber with LoTOx technology)	Petrobras, REFAP	7,000 m^3/day	2009
Refinery FCCU (Retrofitted LoTOx Technology to existing EDV scrubber)	Valero, St. Charles, LA	100,000 bpsd	2010
Refinery FCCU (Retrofitted LoTOx addition to existing CANSOLV unit)	Valero, Delaware City, DE	75,000 bpsd	2010
Refinery FCCU (New EDV Scrubber with LoTOx technology	Holly Refining, Woods Cross, NJ	Confidential	2013
Refinery FCCU (New EDV Scrubber with LoTOx technology)	Petrochina, Sichuan	Confidential	2010
Refinery FCCU (New EDV Scrubber with LoTOx technology)	West Pacific, Dalian	Confidential	2010

5.5 BACT for Storage Tanks

Due to the processing of heavy crude at the refinery, several new tanks will be added or existing tanks modified to store the black and yellow wax crude or resultant products. Fugitive VOC emissions result from vapor expansion and contraction due to diurnal temperature and pressure variations, vapor losses at roof tank seals, and vapor losses due to filling and emptying tanks. The amount of VOC loss is dependent on the tanks roof design and vapor pressure of the stored liquid.

Internal floating roof (IFR) tanks are used to store high vapor pressure volatile organic liquid products at a refiner. Internal floating roof tanks use a fixed cone roof covering over the top of the tank along with an internal floating roof having at least a single seal system between the tank wall and floating roof cover.

5.5.1 BACT for VOC

Under NSPS regulations, control equipment is required when storing volatile organic liquids with maximum vapor pressure of 0.75 psia. Otherwise, control requirements generally are triggered at 1.5 psia. Tanks storing volatile organic liquids below the vapor pressure threshold are required to keep records of types of products stored and their vapor pressures, periods of storage and tank design specifications.

Because high vapor pressure volatile organic liquids must be stored in “controlled tanks”, the regulations define how these tanks are constructed and monitored. Tanks constructed after July 23, 1984 are required to operate in accordance with 40 CFR Part 60 Subpart Kb and are exempt from refinery MACT requirements (63.640(n)). Tanks constructed before that date and storing volatile organic liquids containing HAPS are required to meet the applicable Refinery MACT requirements of NESHAP 40 CFR 63 Subpart CC which refers to the control standards of 40 CFR Part 63 Subpart G.

Compliance options for VOC emission controls on tanks includes using a fixed roof with an internal floating roof, an external floating roof meeting certain design specifications, and using a closed-vent system and control device that meet the requirements of 40 CFR Part 60 Subpart Kb.

5.5.1.1 Step 1 - Identify All Available Control Technologies

The available control technologies for tanks storing organic liquids include control equipment designed to minimize leakage from tanks, air pollution control equipment, less polluting processes, and combinations of each. The nominal requirements relating to control of VOC emissions from storage tanks are outlined in the above mentioned regulations. The control options that were identified include:

1) Operating the tank under pressure such that it operates with no emissions;
2) Routing the vapors to a process or a fuel gas system via piping such that the tank has no emissions;
3) Fixed roof in combination with an internal roof and with a vapor collection system in a closed vent system routed to a control device;
4) Fixed roof in combination with an internal floating roof;
5) An external floating roof; and
6) A fixed roof with vapor collection by a closed vent system routed to a control device.

5.5.1.2 Step 2 - Eliminate Technically Infeasible Control Options

The two most effective control options, operating the tank with no emissions by operating the tank under pressure or by routing the sweep gases to a process or fuel gas system, are only feasible for tanks storing certain petroleum products. Butane and propane are materials that are stored in tanks under pressure and for the proposed changes, no new pressurized tanks are proposed. Thus, this option is eliminated from further discussion and is technically infeasible.

The second option, routing the vapors to a process or a fuel gas system via piping such that the tank has no emissions, is feasible for tanks storing petroleum products that are compatible with the process or fuel gas system into which the gases would be routed. For the proposed heavy crude processing project, none of the proposed tanks fall under this option. Thus, this option is eliminated from further discussion and is technically infeasible. The remaining options are technically feasible.

5.5.1.3 Step 3 - Rank Remaining Control Options

The control options for the storage tanks are listed in decreasing order of control effectiveness.

The highest ranking control option for reducing emissions from storage tanks is a fixed roof in combination with an internal floating roof with a vapor collection in a closed vent system routed to a control device. This design incorporates a roof structure that floats on the surface of the stored liquid with dual, flexible seals along the edge of the roof which eliminates working losses. The headspace between the floating roof and the top of the tank is filled with sweep gas that is vented under a slight vacuum. The breathing losses that escape through the tank are carried with the sweep gas to add on control device such as a thermal oxidizer or carbon adsorption unit.

The second effective option includes an internal floating roof and dual rim seals. This option does not include sweep gas routed to a control device.

The third option used to control VOC emissions from storage tanks includes the use of an external floating roof with dual rim seals. This type of tank is similar to the internal floating roof configuration without the enclosed headspace. The floating roof and seals act to reduce VOC losses. This control option has overall effectiveness equivalent to a tank which is equipped with an internal floating roof and dual rim seals. The external floating roof design is commonly accepted control technology for tanks storing liquids with relatively low volatility.

The fourth option includes a fixed roof with vapor collection by a closed vent system routed to a control device. This design omits any control equipment such as a floating roof and relies on an end-of-pipe air pollution control device. Holly is not proposing any tanks with this configuration as part of the heavy crude processing project.

5.5.1.4 Step 4 - Evaluate Remaining Control Options

Vapor losses from fixed roof vertical tanks are primarily due to changes in the atmospheric temperature and pressure as well as liquid level changes inside the tank. Due to the low volatility of the products to be stored, black wax and gas oil, Holly is proposing fixed roof tanks with no vapor recovery.

The cost of a vapor control system is a function of the vapor flow rate to the system. The flow rate is controlled by the rate at which liquids are pumped into the tank. The total annualized costs of installing a vapor control system by incineration is approximately $425,000 (based on EPA estimates adjusted to 2011 dollars). If carbon adsorption were used for vapor control, the projected annualized costs would be approximately $595,000. The volume of VOC vapors, expected to be approximately 6,242 pounds for the proposed tanks is insufficient to justify the installation of a vapor recovery system.

Because of the low volatility off the products being stored, the installation of internal floating roofs and seals or an external floating roof is also not warranted. The capitol cost to install internal floating roof and controlled deck fittings is approximately $30,000 per tank. For an external floating roof, the estimated capitol cost would be over $210,000.

In addition, if a vapor recovery system were utilized, energy usage will increase. If an incineration device is used, increased emissions would be expected from flaring. If activated carbon were used, a solid waste could also be generated.

5.5.1.5 Step 5 - Select BACT

Holly is proposing fixed roof tanks as a means of controlling VOC emissions for Tanks 89-97, 99, and 139 and 140. Tank turnovers will be minimized as much as reasonable. Tank 98 will be equipped with an internal floating roof with primary and secondary seals. The maximum true vapor pressure of the liquids stored in 1.5 psia. Tank emissions were estimated to be 3.1 TPY. Tanks 158 and 168 will store wastewater and sour water, respectively. These tanks will be equipped with an external floating roof which is BACT for tanks storing liquids with relatively low volatility.

5.6 BACT for Product Loading Racks

With the proposed heavy crude processing project, one existing LPG rail loading spot on the west track will be converted to load propane and one additional rail spot for loading propane will be constructed on the west track. The crude truck unloading facilities will be expanded to accommodate six (6) more truck bays.

5.6.1 BACT for VOC

The product loading racks will be a source of VOC emissions.

5.6.1.1 Step 1 - Identify All Available Control Technologies

Three control technologies were identified to reduce VOC emissions from product loading racks. These technologies include: carbon adsorption, condensation, and incineration.

5.6.1.2 Step 2 - Eliminate Technically Infeasible Control Options

Due to the makeup of the black wax crude, these options are not technically feasible. Black wax crude becomes a solid with insignificant VOC emissions at ambient temperatures.

5.6.1.3 Steps 3 – 5

The new truck unloading bays for the black wax crude will utilize a sump that can be pumped out. The sump will be heated and appropriately sized to accommodate a spill. Transfer piping from the new unloading bays to Tank 126 will be installed. A small electric-driven compressor will be added to control loading emissions by recovering displaced relief gas from loading propane into rail cars.

5.7 BACT for Emergency Generator

The emergency diesel generator will be operated only during interruptions in normal electrical power supply or for maintenance, testing, and operator training. The emergency generator will be limited to 50 hours of operation per year for maintenance and testing.

Diesel engines are classified as compression ignition (CI) internal combustion engines. In diesel engines, air is drawn into a cylinder as the piston creates space for it by moving away from the intake valve. The piston's subsequent upward swing then compresses the air, heating it at the same time. Next, fuel is injected under high pressure as the piston approaches the top of its compression stroke, igniting spontaneously as it contacts the heated air. The hot combustion gases expand, driving the piston downward. During its return swing, the piston pushes spent gases from the cylinder, and the cycle begins again with an intake of fresh air. The primary pollutants in the exhaust gases include NO_x, CO, VOC, and particulate matter.

5.7.1 BACT for NO_x

The predominant mechanism for NO_x formation from internal combustion engines is thermal NO_x which arises from the thermal dissociation and subsequent reaction of nitrogen and oxygen molecules in the combustion air.

5.7.1.1 Step 1 - Identify All Available Control Technologies

The following control options were evaluated for controlling NO_x emissions from the emergency generator. They are categorized as combustion modifications and post-combustion controls. Combustion modifications include: ignition timing retard, air-to-fuel ratio, and derating. Post combustion controls include SCR, NSCR catalyst, and NO_x absorption systems.

As described above, the injection of diesel fuel into the cylinder of a CI engine initiates the combustion process. With ignition timing retard, this combustion modification lowers NO_x emissions by moving the ignition event to later in the power stroke when the piston is in the downward motion and combustion chamber volume is increasing. Because the combustion chamber volume is not at its minimum, the peak flame temperature is reduced which reduces the formation of thermal NO_x.

Diesel engines are inherently lean-burn engines. The air-to-fuel ration can be adjusted by controlling the amount of fuel that enters each cylinder. By reducing the air-to-fuel ratio to near stoichiometric, combustion will occur under conditions of less excess oxygen and reduced combustion temperatures. Lower oxygen levels and combustion temperature reduce NO_x formation.

Derating involves restricting engine operation to lower than normal levels of power production. Derating reduces cylinder pressure and temperatures which reduces NO_x formation.

Selective catalytic reduction systems introduce a liquid reducing agent such as ammonia or urea into the flue gas stream before the catalyst. The catalyst reduces the temperature needed to initiate the reaction between the reducing agent and NO_x to form nitrogen and water.

For SCR systems to function effectively, exhaust temperatures must be high enough (200ºC to 500ºC) to enable catalyst activation. For this reason, SCR control efficiencies are expected to be relatively low during the first 20 to 30 minutes after engine start up, especially during maintenance and testing. There are also complications controlling the excess ammonia (ammonia slip) from SCR use.

A non-selective catalytic reduction system (NSCR) is used to reduce emissions from rich-burn engines that are operated stoichiometrically or fuel-rich stoichiometric. In the engine exhaust, NSCR catalysts convert NO_x to nitrogen and oxygen. NSCR catalytic reactions require that O_2 levels be kept low and that the engine be operated at fuel-rich air-to fuel-ratios. Lean-burn engines are characterized by an oxygen-rich exhaust which minimizes the potential for NO_x reduction.

NO_x absorber development is a new catalyst advance for removing NO_x in a lean (i.e., oxygen rich) exhaust environment for both diesel and gasoline lean-burn direct-injection engines. With this developing technology, NO is catalytically oxidized to NO_2 and stored in an adjacent chemical trapping site as a nitrate. The stored NO_x is removed in a two-step reduction step by temporarily inducing a rich exhaust condition. NO_x adsorbers (sometimes referred to as lean NO_x traps) employ precious metal catalyst sites to carry out the first NO to NO_2 conversion step. The NO_2 then is adsorbed by an adjacent alkaline earth oxide site where it chemically reacts and is stored as a nitrate. When this storage media nears capacity it must be regenerated. This is accomplished in by creating a rich atmosphere with injection of a small amount of diesel fuel. The released NO_x is quickly reduced to N_2 by reaction with CO on a rhodium catalyst site or another precious metal that is also incorporated into this unique single catalyst layer.

5.7.1.2 Step 2 - Eliminate Technically Infeasible Control Options

Combustion modifications and SCR have been demonstrated and are technically feasible technologies that will be further considered for BACT. NSCR catalysts are effective to reduce NO_x emission when applied to rich-burn engines fired on natural gas, propane or gasoline. The proposed diesel engine is inherently a lean-burn engine; thus, NSCR is eliminated from further consideration.

In addition, NO_x absorbers were eliminated from further consideration since NO_x adsorbers are experimental technology and no commercial applications of NO_x absorbers were identified in state or EPA's RBLC RACT/BACT/LAER Clearinghouse databases as being employed on stationary emergency generators. Also, the literature indicates that testing of these NO_x absorbers has raised issues about sustained performance of the catalyst. Current lean NO_x catalysts are prone to poisoning by both lube oil and fuel sulfur[11].

5.7.1.3 Step 3- Rank Remaining Control Options

The remaining control options, combustion modification and the post-combustion control, SCR will be examined further. Combustion controls have been demonstrated to reduce NO_x emissions from CI engines by approximately 50%; the use of a SCR can reduce emissions in the range from 70 to 90%.

5.7.1.4 Step 4 - Evaluate Remaining Control Options

The top control option, SCR, uses a reducing-agent like ammonia or urea (which is usually preferred) with a special catalyst to reduce NO_x in diesel exhaust to N_2. The SCR catalyst sits in the exhaust stream and the reducing agent is injected into the exhaust ahead of the catalyst. Once injected the urea becomes ammonia and the chemical reduction reaction between the ammonia and NO takes place across the SCR catalyst.

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11 http://www.poweronsite.org/AppGuide/Chapters/Chap4/4-1_Recip_Engines.htm

There are several downsides with using an SCR. First, an improperly functioning SCR system can create excess ammonia emissions. SCR systems also add significant equipment to the engine system which increases the possibility of failures and increasing on-going maintenance costs. In addition, cost evaluations were performed to determine the cost of control per ton of NO_x removed from an SCR for the emergency generator. Per EPA's cost effectiveness evaluation[12], cost per ton of NO_x removed is $396,886 for the emergency generator.

Thus, based on the economic impact prepared by EPA, the post-combustion NO_x control utilizing SCR is not cost effective for the emergency generator and has been eliminated from further consideration.

Thus, the only control technology for the emergency generator is a work practice requirement to adhere to GCP. This control strategy is technically feasible and will not cause any adverse energy, environmental, or economic impacts.

5.7.1.5 Step 5 - Select BACT

Holly is proposing a generator that incorporates in its design injection timing retard, turbocharging and aftercooling. The generator will be operated and maintained in accordance with GCP. The hours of operation will be restricted to 50 hours per year for maintenance and testing. The combustion controls, ultra-low sulfur diesel fuel and limited annual hours of operation as BACT for the emergency diesel generator. The emergency generator will be Tier III compliant. The use of good combustion controls including ignition timing retard, air-to-fuel ratio, and derating will be based on manufacturer recommendations.

12 Memorandum from Tanya Parise, Alpha-Gamma Technologies to Sims Roy, EPA OAQPS ESD Combustion Group, June 9, 2005.

5.7.2 BACT for CO and VOC

Carbon monoxide and VOC emissions are primarily the result of incomplete combustion of the diesel fuel. These emissions occur when there is a lack of available oxygen, the combustion temperature is too low, or if the residence time in the cylinder is too short.

5.7.2.1 Step 1 - Identify All Available Control Technologies

The following control options were evaluated for controlling CO and VOC emissions from the CI combustion engines. They include: good combustion practices and the post-combustion control technologies of diesel oxidation catalysts and non-selective catalytic reduction (NSCR) catalysts.

Good combustion practices refer to the operation of engines at high combustion efficiency which reduces the products of incomplete combustion. The proposed emergency generator engine is designed to achieve maximum combustion efficiency. The manufacturers will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency.

A diesel oxidation catalyst is a flow-through metal or ceramic substrate coated with platinum or other precious metals. The diesel oxidation catalyst sits in the exhaust stream and all exhaust from the engine passes through it. The catalyst promotes the oxidation of unburned CO and HC (as VOC) in the exhaust producing CO_2 and water. Diesel oxidation catalysts are commercially available and reliable for controlling CO and HC emissions from diesel engines.

NSCR technology uses three-way catalysts to promote the reduction of NO_x to nitrogen and water. CO and hydrocarbons are simultaneously oxidized to carbon dioxide and water. NSCR is applicable only to rich burn engines. NSCR catalytic reactions require that O_2 levels be kept low and that the engine be operated at fuel-rich air-to fuel-ratios. The proposed emergency generator is a lean-burn engine which is characterized by an oxygen-rich exhaust which minimizes the potential for CO reduction.

5.7.2.2 Step 2 - Eliminate Technically Infeasible Control Options

Good combustion practices and diesel oxidation catalysts have been demonstrated and are technically feasible technologies that will be further considered for BACT. NSCR catalysts are effective to reduce CO and VOC emissions when applied to rich-burn engine that are fired on natural gas, propane or gasoline. The proposed diesel engines are inherently lean-burn engines; thus, NSCR is eliminated from further consideration.

5.7.2.3 Step 3- Rank Remaining Control Options

The remaining control options, good combustion practices and the post-combustion control using a diesel oxidation catalyst will be examined further. Combustion controls have been demonstrated to reduce CO emissions from CI engines by approximately 50%; the use of a diesel oxidation catalyst can reduce CO emissions in the range of 60 to 85% and 35 to 50% for VOC emissions.

5.7.2.4 Step 4 - Evaluate Remaining Control Options

Diesel oxidation catalysts can significantly reduce CO and VOC emissions. However, due to the limited hours of proposed operation for the emergency generator, this add-on control is not practical. The cost effectiveness of installing and operating standard diesel oxidation catalysts on each of the proposed engines was evaluated.

The cost effectiveness of a standard diesel oxidation catalyst on the emergency generator was estimated to be in excess of the $500,000 per ton for both CO and VOC removed[13]. Thus, based on the economic impact, the post-combustion CO and VOC control utilizing diesel oxidation catalysts is not cost effective for the emergency generator and has been eliminated from further consideration.

5.7.2.5 Step 5 - Select BACT

Holly is proposing combustion controls, ultra-low sulfur diesel fuel and limited annual hours of operation as BACT for the emergency diesel generator. The emergency generator will be Tier III compliant and will meet a CO emission standard of 3.5 g/kW-hr. The emergency generator hours of operation will be restricted to 50 hours per year for maintenance and testing. The use of good combustion controls will be based on manufacturer recommendations.

5.7.3 BACT for $PM_{10}/PM_{2.5}$

Diesel particulate emissions are composed of a variety of liquid phase hydrocarbons and solid phase soot (carbon). The literature suggests that the majority of particulate emissions from diesel combustion are in the $PM_{2.5}$ size or smaller range.

5.7.3.1 Step 1 - Identify All Available Control Technologies

The following control options were evaluated for controlling $PM_{10}/PM_{2.5}$ emissions from the CI combustion engines. They include: GCP, use of low sulfur fuels, diesel particulate filters, and diesel oxidation catalysts.

Good combustion practices refer to the operation of engines at high combustion efficiency which reduces the products of incomplete combustion.

The proposed emergency generator engine is designed to achieve maximum combustion efficiency. The manufacturers will provide operation and maintenance manuals that detail the required methods to achieve the highest levels of combustion efficiency.

Limiting the sulfur content of diesel fuel is a pollution prevention method to reduce the sulfate fraction (25-25%) of diesel particulate matter. The literature suggests that the use of low sulfur fuels, such as ultra-low sulfur diesel, can reduce particulate emissions by 10-20%.

Diesel particulate filters are add-on devices that filter out particulate matter. Diesel particulate filters are add-on devices that include both passive and active diesel particulate filters, depending on the method used to clean the filters. Some filters are single-use, while others are designed to burn off the accumulated particulate, either through the use of a catalyst (passive), or through an active technology, such as a fuel burner which heats the filter to soot combustion temperatures, through engine modifications. The use of diesel particulate filters has been demonstrated to reduce particulate emissions by up to 85%.

A diesel oxidation catalyst utilizes metal catalysts to oxidize particulate matter in the diesel exhaust. Diesel oxidation catalysts are commercially available and are reliable for reducing particulate matter emissions up to 30% from diesel engines.

5.7.3.2 Step 2 - Eliminate Technically Infeasible Control Options

All proposed control options are technically feasible and will be reviewed further.

5.7.3.3 Step 3- Rank Remaining Control Options

The proposed control options are ranked in descending order based on control efficiency:

- Diesel particulate filters – 85%
- Diesel oxidation catalysts – 30%
- Low sulfur fuels – 10-20%

- Good combustion practices - baseline

5.7.3.4 Step 4 - Evaluate Remaining Control Options

The top ranked control options, diesel particulate filters and diesel oxidation catalysts can significantly reduce $PM_{10}/PM_{2.5}$ emissions. However, due to the limited hours of proposed operation for the emergency generator, these add-on controls are not practical. Per EPA's cost effectiveness evaluation, the cost per ton of PM removed from an emergency generator with a catalyzed diesel particulate filter was $348,278. EPA also determined the cost effectiveness utilizing an oxidation catalyst to reduce particulate matter emissions. Per EPA's cost effectiveness evaluation, the cost per ton of PM removed from an emergency generator was $163,458[12]. Thus, based on the economic impact prepared by EPA, the post-combustion add-on devices are not cost effective for the emergency generator and have been eliminated from further consideration.

5.7.3.5 Step 5 - Select BACT

Holly is proposing good combustion practices, ultra-low sulfur diesel fuel, and limited annual hours of operation as BACT for the emergency diesel generator. The emergency generator will be Tier III compliant and will meet a PM emission standard of 0.2 g/kW-hr. The emergency generator hours of operation will be restricted to 50 hours per year for maintenance and testing.

The use of good combustion practices will be based on manufacturer recommendations; ultra-low sulfur diesel fuel (15 ppm sulfur) will also be utilized.

5.7.4 BACT for SO_2

Sulfur dioxide emissions occur from the reaction of various elements in the diesel fuel. Sulfur in diesel fuel oxidizes during combustion to SO_2 and sulfur trioxide (SO_3). In the presence of water vapor, these hydrolyze to H_2SO_4.

5.7.4.1 Step 1 - Identify All Available Control Technologies

Only one control option was found to reduce SO_2 emissions from the proposed CI combustion engine is the use of low-sulfur diesel fuel.

5.7.4.2 Step 2 - Eliminate Technically Infeasible Control Options

All proposed control option is technically feasible and will be reviewed further.

5.7.4.3 Steps 3 – 5

The use of ultra-low sulfur diesel fuel containing no more than 15 parts per million by weight of sulfur is the only feasible SO_2 control technology for the proposed emergency generator. There is no adverse energy, environmental or cost impact associated with the use of these control technologies. Thus, no further analysis is required under EPA's top-down BACT approach.

5.8 BACT for Leaks

With the proposed changes at the refinery, piping, valves, connectors, pumps, compressors and other components will be installed for the movement of gas and liquid raw materials, etc. Leakage from this equipment is a potential source of fugitive VOC emissions.

5.8.1 BACT for VOC

Several leak control programs were reviewed for this analysis. Emissions from leaking equipment are reduced through a combination of repair and equipment modifications and leak detection.

5.8.1.1 Step 1 - Identify All Available Control Technologies

Common strategies for VOC emissions from equipment leaks are based on work practices known as leak detection and repair (LDAR) programs. The requirements for the LDAQ program for the Holly heavy crude processing project is set forth in 40 CFR Part 60 Subpart GGGa. These requirements apply to each valve, pump, pressure relief device, sampling connection system, open-ended valve or line, and flange or other connector in VOC service.

5.8.1.2 Step 2 - Eliminate Technically Infeasible Control Options

The identified control strategy for leak control (the regulation in this case) is technically feasible.

5.8.1.3 Steps 3 – 5

For VOC emissions, compliance with the leak control program will be equivalent to the requirements of 40 CFR Part 60 Subpart GGGa. Each valve, pump, pressure relief device, sampling connection system, open-ended valve or line, and flange or other VOC connector in VOC service will be subject to the requirements which include lower leak definitions for pumps (2000 ppm) and valves (500 ppm). Holly will incorporate these leak control requirements into their existing LDAR.

5.9 BACT for Flare

The flare system at Holly provides for the safe disposal of hydrocarbon gases which are vented automatically from process units through pressure relief valves, control valves or are manually vented. As part of the heavy crude processing project, the south flare at Holly will be reconstructed.

5.9.1 BACT for NO_x, SO_2, CO, and VOC

EPA's top-down process was used to determine the best available control technology for control of flare emissions. Emissions from flaring include carbon particles (soot), unburned hydrocarbons, NO_x, SO_2, CO, and VOC.

5.9.1.1 Step 1 - Identify All Available Control Technologies

Flares operate primarily as air pollution control devices. The only technically feasible control options for emissions of all pollutants from flares are: (1) equipment design specifications and good combustion work practices such as minimization of exit velocity, ensuring adequate heat value of combusted gases, and minimizing the quantity of gases combusted; and (2) flare gas recovery systems.

5.9.1.2 Step 2 - Eliminate Technically Infeasible Control Options

Both control options are technically feasible.

5.9.1.3 Step 3- Rank Remaining Control Options

Where feasible, a flare gas recovery system is the most effective control method. Good combustion practices and design specifications are also effective methods for controlling emissions from a flare.

5.9.1.4 Step 4 - Evaluate Remaining Control Options

A flare gas recovery system typically is installed upstream of the flare. A flare gas recovery system includes a seal system to allow for recovery of process gases vented to the flare. Compressors recover the vapors and the vapors are sent to the fuel gas treatment system for H_2S removal. After conditioning of the recovered vapors, the gases are combined with other plant fuel gas sources and are combusted in other devices that operate using fuel gas.

Normally, the flare gas recovery system recovers all of the vent gas. There are conditions where the flare gas recovery system may not be sufficient to prevent flaring are process unit startup and shutdown events where large volume of process gases will be sent to the flare. Holly makes every effort to eliminate flaring from startups and shutdowns.

For the top control technology, the use of a flare gas recovery system would involve economic and energy impacts. Cost analyses were prepared for NO_x, CO and VOC to determine the economic feasibility of adding a flare gas recovery system. SO_2 emissions are estimated to less 0.1 ton per year; hence, no cost analysis was performed for this pollutant. These analyses are presented in Appendix E. In summary, based on these cost analyses, the cost effectiveness ($ per ton pollutant reduction) was over $365,000 for NO_x, $67,000 for CO, and $390,000 for VOC.

Proper equipment design and work practices include minimizing exit velocity and the quantity of gases combusted and ensuring adequate heat value of combusted gases. Because the flare is located at a petroleum refinery, the flare must comply with the requirements and limitations presented in 40 CFR Part 60 Subpart Ja.

5.9.1.5 Step 5 - Select BACT

Thus, BACT for the Holly proposed flare is proper equipment design and good combustion practices that meet the requirements of the NSPS and recommended industry practices.

5.10 BACT for Process Heaters for Greenhouse Gases

Potential GHG emissions from the stationary combustion sources such as process heaters and furnaces include primarily carbon dioxide (CO_2) with lesser amounts of nitrous oxide (N_2O) and methane (CH_4). The majority of the total GHG emissions, expressed at CO_2e are CO_2 emissions. CO_2 is a product of combustion of fuel containing carbon, such as refinery fuel gas and natural gas. Refinery fuel gas is a mixture of light C1 to C4 hydrocarbons, hydrogen, hydrogen sulfide (H_2S), and other gases.

5.10.1 Step 1 - Identify All Available Control Technologies

Several control technologies were identified for reducing GHG emissions from stationary combustion sources which include energy efficiency programs and systems, good combustion controls, low-carbon fuel, energy efficient design, and carbon capture and subsequent sequestration.

5.10.1.1 Good Combustion Practices

Good combustion practices for process heaters fired on refinery fuel include good air/fuel mixing in the combustion zone, good burner maintenance and operation, sufficient residence time to complete combustion, high temperatures and low oxygen levels in the primary combustion zone, proper fuel gas supply system design and operation, and excess oxygen levels high enough to complete combustion while maximizing thermal efficiency.

Combustion control is an effective means for reducing CH_4 emissions. Combustion efficiency is related to time, temperature, and turbulence and these three items are designed into the process heater so that fuel efficiency is maximized and operating costs are reduced. Thus, combustion control is accomplished through process heater burner design and operation.

Changes in excess air affect the availability of oxygen and combustion efficiency. Extremely high and low levels of excess air will result in high CH_4 levels. Higher CH_4 levels can also affect NO_x formation. If too much excess air is introduced, combustion temperatures will decrease and the efficiency of the process heater will be negatively affected. Low excess air also lowers combustion temperatures which do not allow for sufficient oxygen an efficient combustion.

5.10.1.2 Low-Carbon Fuel

Gaseous fuels such as refinery fuel gas and natural gas reduces the CO_2 emissions during the combustion process relative to burning other solid fuels such as coal or distillate oils. Holly is proposing the use of refinery fuel gas or natural gas in the process heaters.

5.10.1.3 Energy Efficient Design

A highly efficient energy design requires less fuel for the process heaters. Elements of a highly energy-efficient design include combustion air controls by limiting excess air and combustion air preheat. Excessive amounts of combustion air in process heaters reduced the efficiency of process heat burners. This can be eliminated by installing instrumentation for monitoring and control the excess air levels in the combustion process. Air preheat is a method of recovering heat from the hot exhaust gas of a combustion process by heat exchange with the combustion air before it enters the combustion chamber. Preheating the combustion air reduces the amount of fuel required and ultimately lowers GHG emissions since less fuel is being combusted.

5.10.1.4 Carbon Capture and Subsequent Sequestration

The purpose of CO_2 capture is to produce a concentrated stream that can be readily transported to a CO_2 storage site.

CO_2 emissions can be captured through oxy-combustion and post-combustion methods. In oxy-combustion carbon capture, nearly pure oxygen is used for combustion instead of air which results in an exhaust gas that is comprised of mainly H_2O and concentrated CO_2.

The process used an air separation unit to remove the nitrogen component from the air. The oxygen-rich stream is fed to the combustion unit so the resulting exhaust gas contains a concentration of CO_2 of 80% or higher. This technology is still in the research stage (EPA).

Post-combustion capture systems using solvent scrubbing and high temperature sorbents, ionic liquids, biological capture using algae ponds, and membrane technology were also identified as possible CO_2 control technologies. Post combustion capture is an "end of pipe" technology which involves separating CO_2 from flue gas consisting mainly of nitrogen, water, CO_2 and other impurities.

If a carbon capture technology could be utilized, after capture, a compression system to compress the CO_2 is needed to prepare the CO_2 for transport to a permanent geological storage site such as oil and gas reserves and underground saline formations and to inject the captured CO_2 into the storage site.

5.10.2 Step 2 – Eliminate Technically Infeasible Control Options

The identified control options of good combustion practice, low-carbon fuels, and energy efficient design are technically feasible and will be reviewed further.

As mentioned above, the oxy-combustion CO_2 capture method involves substituting pure oxygen for air in the combustion process. Since no refinery was identified that has applied this process to process heaters and the EPA states that this technology is still in the research phase, oxy-combustion CO_2 capture was eliminated from further review.

Through the use of chemical or physical absorption/adsorption processes, there are several sorbents and solvents under development for the separation of CO_2 from combustion flue gases. The most commercial of these processes uses monoethanolamine (MEA). In typical post-combustion capture solvent-based scrubbing, the flue gas is cooled and cleaned of dust and other impurities before contacting with solvent, such as MEA. A CO_2 scrubbing column removes the CO_2 through absorption. Next, the CO_2 rich solvent is passed to a solvent regeneration column where heat transfer with hot steam releases CO_2 from the solvent, which results in solvent regeneration through the desorption process. Since MEA or other alkanolamines are used in certain processes for separation of CO_2, this control technology will be examined further.

The use of high temperature solid sorbents is also a promising technology for removal of CO_2 from flue gas. Extensive research is on-going evaluating the use of solid sorbents as a means of chemical adsorption, physical adsorption, or a combination of the two. However, some of the research has shown that the degradation of the sorbent over repeated cycles, particularly in the presence of sulfur and ash is a potential problem. The use of sorbents for capturing CO_2 at refineries has not been commercially demonstrated; thus, these post combustion control technologies have been eliminated for further review.

Ionic liquids are material with low melting points and high boiling points and are composed entirely of ions. Currently, ionic liquids are prohibitively expensive and their manufacture is very complicated. The use of these liquids has not been commercially demonstrated to capture CO_2 from refinery operations. Thus, this control technology has been eliminated for further review.

The use of biological capture systems using algae to remove CO_2 from industrial flue gas is an area of active research. The general concept involves using the exhausted CO_2 and waste heat from combustion, in the presence of water and sunlight, to cultivate algae populations. The cultivation of algae represents a valuable source of biomass which may be used to produce additional energy, including liquid fuels such as bio-diesel.

However, it should be noted that the re-use of CO_2 as a liquid bio-fuel only displaces the use of fossil fuels and limits the CO_2 mitigation potential. Biological capture processes suffer from inherent scale-up issues because of the limited rate at which algae can grow. Like the other post-combustion technologies identified above, the use of this CO_2 capture technology has not been demonstrated commercially at a refinery. Thus, the use of biological capture systems using algae has been eliminated from further review.

Membranes are manufactured to allow the selective permeation of a gas to flow through them. There are several types of membrane materials (ceramic, polymeric, metallic) that may be used in CO_2 capture systems. Although the use of membrane technology may be available in the future for use to separate or absorb CO_2 in an exhaust stream, this technology is primarily in the research phase and industrial application is at least 10 years away (EPA)[13]. Major challenges need to be overcome including the cost of the membrane materials, the life-time of membrane and membrane reliability. [14] Thus, since this technology has not been demonstrated commercially at a refinery, this technology was eliminated from further consideration.

5.10.3 Step 3 - Rank Remaining Control Options

The use of good combustion practices, low-carbon fuels, and energy-efficient design to reduce GHG emissions from the proposed process heaters at Holly is inherent in the heater's design; this option is considered to be the baseline. Chemical absorption using a solvent such as MEA is assumed to represent the best CO_2 capture option. The use of a geological storage site is assumed to represent the best option for long-term CO_2 storage.

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13 US EPA. Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from the Petroleum Refining Industry.

14 Figueroa JD, Fout T., Plasynski D., et al. Advances in Co2 capture technology – The US Department of Energy's Carbon Sequestration Program International Journal of Greenhouse Gas Control 2 (2008).

5.10.4 Step 4 - Evaluate Remaining Control Options

All commercial post-combustion CO_2 capture plants identified for this NOI use chemical absorption processes generally using MEA-based solvents. MEA was developed over 70 years ago as a general, non-selective solvent to remove acid gases, CO_2, and hydrogen sulfide, from natural gas streams where it is readied for transport and sequestration. MEA scrubbing is considered state-of-the-art for fossil fuel-fired systems such as gas turbines. In a typical process, flue gas contacts MEA solution in an absorber. The MEA selectively absorbs the CO_2 and is then sent to a stripper. In the stripper, the CO_2-rich MEA solution is heated to release almost pure CO_2.

The MEA process requires a significant amount of power to operate pumps and blowers for gas and solvent circulation. Additional issues with the use of MEA are equipment corrosion, solvent degradation caused by the presence of dissolved O_2 and impurities, or reaction with SO_2, SO_3, and NO_x to produce non-regenerable heat-stable salts. The cost of capture in 2008 using MEA solvent absorption was estimated to be over $100 per ton CO_2 avoided for oil refineries.[15] A study presented in the International Journal of Greenhouse Gas Control explored the cost of routing refinery emission sources to a CO_2 capture plant. The study found that a typical refinery, CO_2 point sources are scattered around the site. The study concluded that "many kilometers of additional ducting would be required to collect the CO_2. Both the capitol costs as well as the required blower duty will be of such a magnitude that this does not appear to be a feasible opportunity."[16]

If CO_2 were captured, it would have to be transported for subsequent sequestration. CO_2 can be transported in three states: gas, liquid, and solid. Applicable commercial-scale transport of CO_2 for Holly would consist of tanker trucks and/or pipeline.

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15 Ho.M., Allinson. GW, and Wiley, D. Comparison of MEA capture cost for low CO_2 emissions.
16 Straelena, Jiri Van et al. CO_2 Capture for Refineries, A Practical Approach. International Journal of Greenhouse Gas Control.

Transport by tanker trucks is not practical due to the large number of trucks needed and their associated exhaust emissions which include CO_2. Also, tank truck and rail options cost more than twice as much as a pipeline.[12] Pipelines routinely carry large volumes of natural gas, oil, and water, for example, over large distances. Pipelines would be the best avenue for transport of CO_2 to a sequestration site although safety issues are of concern with a pipeline especially in populated areas. Pipeline leak or rupture would have significant safety, environmental and health impacts.

Currently, the pipeline infrastructure in the area of the Holly plant does not exist for CO_2 transport. The nearest CO_2 pipeline in northeastern Utah is over 125 miles from the Holly refinery. The cost to build a pipeline would be extreme; the labor and steel costs alone are estimated to be $57,500 per mile per inch pipeline diameter.[17]

CO_2 injection and storage into geological formations is a mitigation option. Injecting CO_2 into deep geological formations at carefully selected sites can store it underground for long periods of time. The cost of geological storage of CO_2 is highly site-specific, depending on factors such as the depth of the storage formation and the number of wells needed for injection. Costs for storage, including monitoring, appear to lie in the range of 0.6–8.3 US$/t$CO_2$ stored[18]. However, current and planned CO_2 geological storage locations in the United States are limited. The closest CO_2 storage project is proposed near Teapot Dome, Wyoming. CO_2 injection is also being used to enhance oil recovery in western and central Wyoming.

Since current cost and energy penalties are relatively high, CO_2 capture has not been demonstrated commercially at a refinery at full scale, CO_2 transport infrastructure in the vicinity of Holly refinery is not available, and the experience with large-scale geological CO_2 storage is limited, CO_2 capture, transport, and sequestration is not considered BACT and has been eliminated from further consideration.

17 http://www.powerplantccs.com/ccs/tra/tra_pipe_cost.html

5.10.5 Step 5 - Select BACT

Thus, at this point in time, the only practical way to reduce the amount of CO_2 generated from stationary combustion sources such as process heaters is good combustion practices including good air/fuel mixing in the combustion zone, good burner maintenance and operation, sufficient residence time to complete combustion, high temperatures and low oxygen levels in the primary combustion zone, proper fuel gas supply system design and operation, and excess oxygen levels high enough to complete combustion while maximizing thermal efficiency. Oxygen monitors and intake air flow monitors will be used to optimize the fuel/air mixture and limit excess air. Air preheater packages, consisting of a compact air-to-air heat exchanger installed at grade level through which the hot stack gases from the convection section exchange heat with the incoming combustion air will be installed on the vacuum unit furnace and crude unit furnace #2.

5.11 BACT for Steam Boiler for Greenhouse Gases

Potential GHG emissions from the refinery fuel or natural gas fired boiler include CO_2, N_2O, and CH_4. The majority of the total GHG emissions, expressed at CO_2e are CO_2 emissions. CO_2 is a product of combustion of fuel containing carbon, such as natural gas. Since CO_2 is created as part of the chemical reaction between oxygen and the fuel when burned, there is no way to reduce the amount of CO_2 generated from combustion. Methane emissions result from incomplete combustion. Nitrous oxide emission results primarily from low temperature combustion.

5.11.1 Step 1 - Identify All Control Available Technologies

Three control options identified as potential CO_2, CH_4, and N_2O controls include low carbon fuels, energy efficient processes and technologies including good combustion practices, and carbon capture and sequestration.

5.11.1.1 Energy Efficient Processes and Technologies

EPA has found that low carbon fuels, such as refinery fuel and natural gas produce half the amount of CO_2 when compared to other fossil fuels.

Good combustion practices generally include the following components: (1) Proper air/fuel mixing in the combustion zone; (2) High temperatures and low oxygen levels in the primary combustion zone; (3)Overall excess oxygen levels high enough to complete combustion while maximizing boiler thermal efficiency, and (4) Sufficient residence time to complete combustion. Good combustion practices is accomplished through boiler design as it relates to time, temperature, and turbulence, and boiler operation as it relates to excess oxygen levels.

5.11.1.2 Carbon Capture and Sequestration

Carbon capture and sequestration is considered an add-on technology. Carbon sequestration is an engineering technique where CO_2 is removed from the exhaust gas, injected and stored permanently underground in a geological formation of some type for a long period of time.

5.11.3 Step 2 – Eliminate Technically Infeasible Control Options

The identified control options of low carbon fuels and energy efficient processes and technologies including good combustion practices are technically feasible and will be reviewed further.

Carbon capture and sequestration from the boiler is not technically feasible for the reasons stated in Section 5.10.4 above and have been eliminated from further consideration.

5.11.3 Steps 3 – 5

Refinery fuel and/or natural gas will be utilized by the boiler and has the lowest CO_2 emission rate of all fossil fuels. According to AP-42, natural gas has a CO_2 emission rate of 120 lb/MMBtu compared to distillate oil which has a CO_2 emission rate of 150 lb/MMBtu. Thus, natural gas is a top ranked low carbon containing fuel.

Good combustion practice includes operational and design elements to control the amount and distribution of excess air in the flue gas. This ensures that there is enough oxygen present for complete combustion. If sufficient combustion air supply, temperature, residence time, and mixing are incorporated in the combustion design and operation, CH_4 and N_2O emissions will be minimized. To improve boiler efficiency and reduce GHG emissions by 3 to 13 percent, insulation will be installed on the new boiler (boiler #11) and improved insulation will be added to the existing boilers and distribution pipes. The reuse of steam condensate, which reduces the amount of feed water and the amount of energy needed since the condensate is preheated will be employed at the refinery. The estimated efficiency improvement by the installation of steam condensate return lines is up to 10%.

For proposed boiler #11, Holly is proposing the use of a Nebraska Boiler Model NOS-2A/S-55. Other boiler configurations are available and were examined for this project but due to the larger cabin space, those boilers did not produce steam as efficiently as the proposed make/model for boiler #11. The proposed boiler utilizes high efficiency TODD VARIFLAME burners and a welded-membrane wall design that creates a gas-tight furnace area. The burners are designed to use advanced fuel-staging and to provide the proper-air-to-fuel mixture throughout the full range of firing rates which maximizes combustion efficiency while minimizing the release of emissions. This proposed boiler design allows for higher steam generation and heat utilization with less fuel consumption, thus resulting in lower GHG emissions. The boiler also features a single-source integrated boiler and burner controls for more efficient operator-free handling of the boiler.

Boiler #11 will be equipped with instrumentation and controls that can achieve up to a 4% reduction in CO_2 emissions. Boiler #11 will be equipped with an O_2 analyzer and O_2 concentrations will be monitored and documented each shift. This boiler will also be equipped with a mechanical linkage that can be adjusted by a factory representative. This linkage increases/decreases air flow and fuel gas simultaneously keeping the excess percent O_2 constant.

Tuning of the burners will be performed periodically to insure efficient boiler operation. Through burner tuning, up to a 3% reduction of CO_2 emissions can be obtained.

Routine maintenance will be performed on the boiler to insure it is operating at maximum efficiency. The system will be periodically checked for air leaks since too much excess air leads to energy loss. Indications of air leakage will be present in higher O_2 levels as well as increased fuel consumption. Improved efficiency improvement from reducing air leakage problems can reduce CO_2 emissions ranging from 1 to 4 percent.

Available control technologies for the control of CH_4 and N_2O emissions are the same controls used for CO and VOC emissions (Section 5.2.1). These controls include good combustion practices including the use of LNB and FGR for the boiler. LNB are designed to control the mixing of air and fuel to reduce the peak temperatures of combustion. The use of LNB and FGR for the boiler is expected to achieve a CH_4 emission rate of 0.001 kg/MMBtu and a N_2O emission rate of 0.0001 kg/MMBtu.

With the above-listed controls, no adverse economic, energy, or collateral environmental impacts were identified that would preclude using these technologies.

The use of low carbon containing fuels including natural gas in combination with the use of efficient steam boiler and good combustion practices represents BACT for control of GHG.

5.12 BACT for Equipment Leaks for Greenhouse Gases

With the proposed Holly heavy crude processing project, piping with a large number of connectors, valves, pumps, and similar components will be installed for movement of gas and liquid materials. These components are potential sources of CO_2 and CH_4 emissions due to leakage.

5.12.1 Step 1 - Identify All Available Control Technologies

Like VOC emissions, GHG emissions from equipment leaks will occur and Holly's LDAR program will provide effective control of GHG emissions. The requirements of the LDAR program use CH_4 as the reference compound for performing the required monitoring for leaks. Thus, the LDAR program already established as BACT for VOC emissions relies on a GHG as the basis for the monitoring and control requirements.

5.12.2 Step 2 – Eliminate Technically Infeasible Control Options

The identified control option is technically feasible.

5.12.3 Steps 3 – 5

The most effective control strategy identified for GHG emissions from equipment leaks is a LDAR program. Identified leaks will be repaired as soon as practical. The use of this system will not result in any adverse energy or environmental impacts.

5.13 BACT for Flare for Greenhouse Gases

The south flare will be used at the Holly refinery to manage the disposal of hydrocarbon products from upsets or emergencies via combustion.

5.13.1 Step 1 - Identify All Available Control Technologies

Two control technologies were identified for minimizing GHG emissions from flaring activities. These are: proper flare operation and flare gas recovery systems. Proper flare operation leads to lower methane emissions and lower overall GHG emissions. The installation of a flare gas recovery system can reduce flaring by approximately 95 percent which offers the highest amount of emission reduction potential.

5.13.2 Step 2 – Eliminate Technically Infeasible Control Options

Both identified control technologies are technically feasible.

5.13.3 Step 3 - Rank Remaining Control Options

The use of a flare recovery system is the most effective option followed by proper flare operation.

5.13.4 Step 4 - Evaluate Remaining Control Options

Flaring can be reduced by installation of a commercially available flare gas recovery system. The cost of installing a flare gas recovery system was looked at in reference to CO_2 and CH_4 which have global warming potentials of 1 and 21, respectively. For the top control technology, the use of a flare gas recovery system would involve an economic impact. Appendix F presents the cost analysis for reduction of CO_2 and CH_4 emissions using a flare gas recovery system. As seen in Appendix F, the cost is considerable, in excess of $220 per ton CO_2 and $73,000 per ton of CH_4 emissions controlled. Like the analysis presented in Section 5.9.1.4, the use of a flare gas recovery system is extremely high for control of criteria pollutant as well as for control of GHG emissions.

Since the cost-effectiveness (cost per ton of CO_2 and CH_4 avoided) from flaring operations at a refinery (or any facility) could not be ascertained from available literature, and that it was demonstrated in Section 5.9.1.4 that the cost of criteria pollutant avoidance from flares was considerable, due to these considerations, this control technology has been eliminated from further consideration. Thus, the remaining control technology, proper flare operation is considered the most effective control from flaring at Holly's Woods Cross Utah refinery.

5.13.5 Step 5 – Select BACT

To insure proper flare operation, Holly will install flow meters and gas combustion monitors on the flare gas line which allows for improved flare gas combustion control and minimizes periods of poor flare combustion efficiencies. The combustion efficiency of the flare will be maintained by controlling the heat content of flare gas and steam or air-assist rates.

5.14 BACT for Fluid Catalytic Cracking Unit for Greenhouse Gases

In a refinery, the FCC unit converts heavy, lower-value hydrocarbon feedstock into lighter, more valuable products. FCC units account for 15-20% of refinery energy consumption and can be a significant source of CO_2 emissions.

5.14.1 Step 1 - Identify All Available Control Technologies

Several control technologies were identified for reducing CO_2 emissions from a FCCU. These include power/waste heat recovery, high-efficiency regenerators, post-combustion capture solvent-based scrubbing, and oxy-combustion.

5.14.2 Step 2 – Eliminate Technically Infeasible Control Options

The identified control options are technically feasible and will be reviewed further.

5.14.3 Step 3 - Rank Remaining Control Options

Traditionally at power plants utilizing a post-combustion control technology with a formulated amine solvent such as MEA can achieve CO_2 recovery between 85-95%. Similar percentages of CO_2 recovery are can be achieved utilizing the oxy-combustion control technology. Power/waste heat recovery and high efficient regenerators are inherent in the design and operation of the equipment at Holly and is considered the baseline condition.

5.14.4 Step 4 - Evaluate Remaining Control Options

Post-combustion capture using an amine solvent such as MEA has been demonstrated to reduce CO_2 emissions from coal-, oil-, and natural gas-fired units mainly at electrical generation facilities. MEA is used as a scrubbing agent to absorb CO_2 in the flue gas and then release it in a steam-heated regenerator. The released CO_2 gas is routed to the CO_2 compressor station for export.

A similar CO_2 capture efficiency can be obtained using oxy-combustion. Traditionally in a FCCU, air is used to regenerate the catalyst by burning off coke deposited on the catalyst during the conversion process. In the oxy-combustion mode, air is replaced by pure oxygen which is diluted with recycled CO_2 so that thermal balance and catalyst fluidization is maintained.

Both post-combustion capture using an amine solvent such as MEA and oxy-combustion are promising technologies but are challenging in a FCCU. A techno-economic evaluation was conducted of post-combustion amine absorption and oxy-combustion for CO_2 capture from a FCC regenerator by the CO_2 Capture Project sponsors. They determined that both processes were able to achieve the required recovery levels. The post-combustion option had lower capital costs and the oxy-combustion had lower operational costs leading to lower overall capture costs. However, with both of these control options, several technical issues still need to be resolved.

With post-combustion capture using an amine solvent such as MEA, the operating experience of existing plants shows a fairly high operating cost due to a high steam consumption and high MEA makeup. Because of the CO_2 scrubber, power usage is increased. Additional issues with the process include equipment corrosion, solvent degeneration caused by the presence of dissolved O_2 and other impurities or reaction with SO_2, SO_3 and NO_x to produce non-regenerable, heat-stable salts.

Although oxy-combustion may be preferred in regards to operating costs, a number of issues need to be addressed using this control technology for CO_2 capture. These issues include corrosion of equipment, thermal balance, catalyst attrition, and coke burn rate. Also health and safety issues need to be assessed due to the presence of gaseous oxygen on-site.

Even if these technologies were cost effective and energy efficient for capturing CO_2, the CO_2 would need to be transported and ultimately sequestered. As mentioned above, the transport by tanker trucks is not practical due to the large number of trucks needed and their associated exhaust emissions which include CO_2. Also, tank truck and rail options cost more than twice as much as a pipeline. While pipelines would be the best avenue for transport of CO_2 to a sequestration site although safety issues are of concern with a pipeline especially in populated areas, the nearest CO_2 pipeline in northeastern Utah is over 125 miles from the Holly refinery. The cost to build a pipeline would be extreme.

Thus, while field demonstrations are being conducted on CO_2 capture technologies such as oxy-combustion, at this point in time, these control technologies are not cost effective, have not been demonstrated at full scale, have energy penalties, and pose environmental and safety risks. Due to these reasons, these CO_2 capture control technologies do not represent BACT.

Power/waste heat recovery and high-efficiency regenerators will be employed to reduce fuel consumption and ensure complete combustion thus lowering GHG emissions.

5.14.5 Step 5 – Select BACT

Holly will install or upgrade power recovery or waste heat boilers to recover latent heat from the FCCU regenerator exhaust as a means of reducing GHG emissions. In addition, Holly will install specially designed FCCU regenerators for high efficiency, complete combustion of catalyst coke deposits. Thus, energy recovery and high efficiency regenerators which allow for complete combustion of coke deposits are considered BACT for GHG emissions from the FCCU.

6.0 PSD CLASS II AREA AMBIENT AIR QUALITY ANALYSIS

This section presents the air quality impacts associated with the emissions from Holly Refining & Marketing Companies proposed heavy crude processing project. Consistent with the procedures presented in 40 CFR Part 51 Appendix W *Guideline on Air Quality Models*, the air dispersion model used to demonstrate compliance with the NAAQS and PSD Class II area increments was the EPA approved model AERMOD. A modeling protocol developed for this project was accepted by the UDAQ and forwarded to the FLMs. The near-field modeling and full-impact analysis input and output files are contained on an external hard drive that accompanies this permit application.

6.1 Near-Field Dispersion Modeling Analyses

Analyses of air quality impacts within designated PSD Class II areas were performed in accordance with Utah Titles R307-405 and R307-410. These analyses consisted of dispersion modeling of criteria and hazardous air pollutants.

6.1.1 Regional Description

The Holly' Woods Cross refinery is located approximately 5 kilometers (3.2 miles) east of Farmington Bay. Elevated terrain, the Wasatch Mountains, is located approximately 4 kilometers (2.5 miles) to the east of the facility. Figure 6.1 presents the location of the refinery and surrounding terrain.

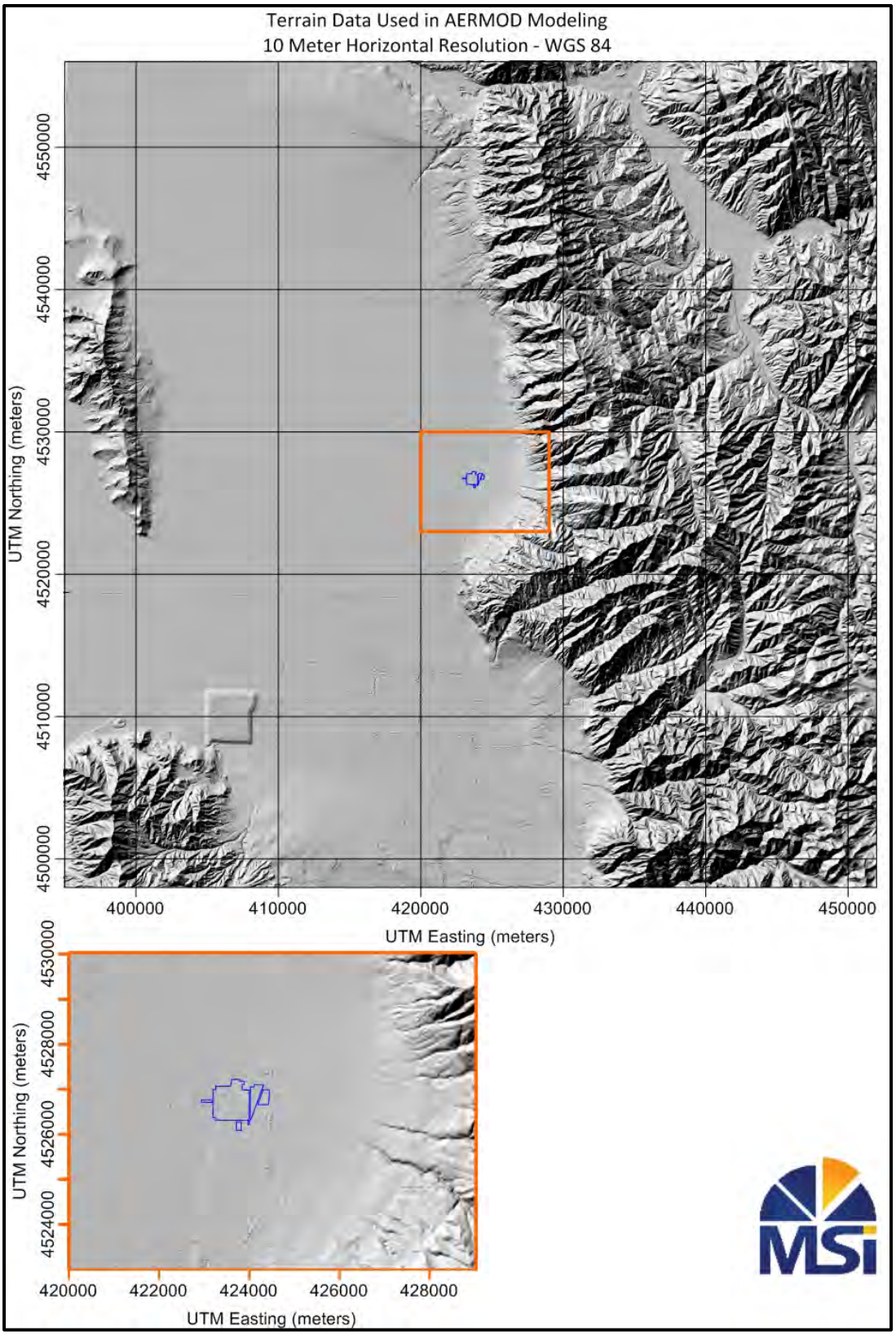

Figure 6.1 Map Showing Location of Holly Refinery and Terrain used in AERMOD

6.2 Background Ambient Air Quality

Background air quality includes pollutant concentrations due to natural sources, nearby sources other than the one(s) currently under consideration, and unidentified sources. Davis County, where the refinery is located, is non-attainment area for $PM_{2.5}$, maintenance for O_3 and PM_{10}, and attainment for SO_2, NO_2, VOC, and CO. The refinery is located within four miles of Salt Lake County, which is in non-attainment for $PM_{2.5}$, PM_{10}, and SO_2, and a maintenance area for O_3.

Background concentrations of NO_2, SO_2, PM_{10}, and CO were derived based on three years of monitoring data obtained from UDAQ's Bountiful ambient air quality monitoring station. The background values used for the SO_2, PM_{10}, CO and NO_2 analyses are presented in Table 6-1. For the one-hour NO_2 full impact analysis, concurrent hourly NO_2 data obtained from the UDAQ Bountiful ambient air quality station for 2006-2009 was formatted for input into AERMOD as temporally varying background concentrations.

Table 6-1

Background Pollutant Concentrations

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)
NO_2	1-hour	89.7[1]
	Annual	35.5
SO_2	1-hour	26.2
PM_{10}	24-hour	56.3
CO	1-hour	4,122
	8-hour	2,484

[1] One hour background concentrations used with Holly sources only.

6.3 Model Selection

To address the near-field impacts from the new and modified sources from Holly's heavy crude processing project and for the entire refinery, the latest version of the AERMOD modeling system (AERMOD 12060, AERMET 11059, AERSURFACE 08009, AERMAP 11103) was utilized.

AERMOD is a steady-state plume dispersion model that is used for assessment of pollutant concentrations from a variety of sources. AERMOD uses Gaussian distributions in the vertical and horizontal for stable conditions, and in the horizontal for convective conditions. The vertical concentration distribution for convective conditions results from an assumed bi-Gaussian probability density function of the vertical velocity. AERMOD accounts for plume downwash based on the PRIME building downwash algorithms. The model uses hourly sequential preprocessed meteorological data to estimate pollutant concentrations for various averaging times.

The AERMOD modeling system consists of two pre-processors and the dispersion model. AERMET is the meteorological pre-processor and AERMAP is the terrain pre-processor that characterizes the terrain and generates receptor elevations. These pre-processors were utilized to generate the required AERMOD files. In addition, in 2008 EPA released AERSURFACE which prepares required land-use information inputs for AERMET.

6.3.1 AERMET

The AERMET preprocessor was used to prepare the meteorological data for AERMOD. AERMET is designed to accept National Weather Service (NWS) one-hour surface observations, NWS twice-daily upper air soundings, and data from an on-site meteorological measurement system. The AERMOD model utilizes a file of boundary layer parameters and a file of profile variables including wind speed, wind direction, and turbulence parameters.

6.3.2 AERMAP

The AERMAP terrain preprocessor was used to extract elevation data from 7.5-minute USGS digital elevation data (DEM). Elevations were based on WGS-84 datum. AERMAP produces receptor heights and related parameters that are input into AERMOD. AERMAP determines the base elevation at each receptor and source. For complex terrain situations, AERMOD captures the essential physics of dispersion in complex terrain and needs elevation data that convey the features of the surrounding terrain. To satisfy this need, AERMAP searches for the terrain height and location that has the greatest influence on dispersion for each individual receptor, within a 10% slope of the facility. This height is then referred to as the hill height scale. Both the base elevation and hill height scale data are produced by AERMAP as a file or files which can be directly accessed by AERMOD.

6.3.3 AERSURFACE

The AERMOD Implementation Guide recommends that the surface characteristics be determined using digital land cover data. The current version of AERSURFACE supports the use of land cover from the United States Geological Survey (USGS) National Land Cover archives. These data were used to determine site characteristics surrounding the meteorological tower. AERSURFACE was used to calculate the surface roughness, albedo and Bowen ratio for 12 sectors around a one-kilometer radius centered at the location of the meteorological tower used in AERMET.

The surface roughness length is related to the height of obstacles to the wind flow. The surface roughness length influences the surface shear stress and is an important in the determination of the magnitude of mechanical turbulence and the stability of the boundary layer. Albedo is the fraction of total incident solar radiation reflected by the surface back to space without absorption. The daytime Bowen ratio, an indicator of surface moisture, is the ratio of sensible heat flux to latent heat flux and was used for determining planetary boundary layer parameters for convective conditions driven by the surface sensible heat flux. Table 6-2 presents the albedo, Bowen ratio, and surface roughness, by month that was used for Holly's near-field dispersion modeling analysis.

Table 6-2

Surface Characteristics used in AERMET for Holly Refining & Marketing Company

Months		Sectors											
		1	2	3	4	5	6	7	8	9	10	11	12
January	Alb.	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
	Bo	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
	Zo	0.056	0.046	0.037	0.05	0.065	0.121	0.086	0.012	0.009	0.02	0.036	0.088
February	Alb.	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
	Bo	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
	Zo	0.056	0.046	0.037	0.05	0.065	0.121	0.086	0.012	0.009	0.02	0.036	0.088
March	Alb.	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
	Bo	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
	Zo	0.084	0.072	0.062	0.079	0.108	0.182	0.086	0.012	0.009	0.02	0.037	0.124
April	Alb.	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
	Bo	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
	Zo	0.084	0.072	0.062	0.079	0.108	0.182	0.086	0.012	0.009	0.02	0.037	0.124
May	Alb.	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
	Bo	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
	Zo	0.084	0.072	0.062	0.079	0.108	0.182	0.086	0.012	0.009	0.02	0.037	0.124
June	Alb.	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
	Bo	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
	Zo	0.084	0.072	0.062	0.079	0.108	0.182	0.086	0.012	0.009	0.02	0.037	0.124
July	Alb.	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
	Bo	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
	Zo	0.173	0.184	0.184	0.159	0.151	0.235	0.086	0.012	0.009	0.02	0.037	0.182
August	Alb.	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
	Bo	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
	Zo	0.173	0.184	0.184	0.159	0.151	0.235	0.086	0.012	0.009	0.02	0.037	0.182

Table 6-2 (Continued)

Surface Characteristics used in AERMET for Holly Refining & Marketing Company

Months		Sectors											
		1	2	3	4	5	6	7	8	9	10	11	12
September	Alb.	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
	Bo	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
	Zo	0.173	0.184	0.184	0.159	0.151	0.235	0.086	0.012	0.009	0.02	0.037	0.182
October	Alb.	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
	Bo	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
	Zo	0.173	0.184	0.184	0.159	0.151	0.235	0.086	0.012	0.009	0.02	0.037	0.182
November	Alb.	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
	Bo	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
	Zo	0.056	0.046	0.037	0.05	0.065	0.121	0.086	0.012	0.009	0.02	0.036	0.088
December	Alb.	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14
	Bo	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
	Zo	0.056	0.046	0.037	0.05	0.065	0.121	0.086	0.012	0.009	0.02	0.036	0.088

6.4 Meteorological Data

The meteorological data input files were prepared using AERMET and were approved by UDAQ for use in this analysis. These files consist of four years (2006 through 2009) of surface meteorological data collected by the UDAQ at Syracuse, Utah . Cloud cover and atmospheric sounding data were obtained from NWS Salt Lake City, Utah observations for the corresponding surface data period (2006-2009).

The AERMET meteorological processor required full upper air soundings (radiosonde data) representing the vertical potential temperature profile near sunrise in order to calculate convective mixing heights. For Holly, the early morning soundings collected at 12Z (or UTC/GMT) by the NWS for the period coinciding with the surface meteorological data were used. Annual wind roses for 2006 through 2009, for Syracuse, Utah are presented in Figures 6.2 through 6.5.

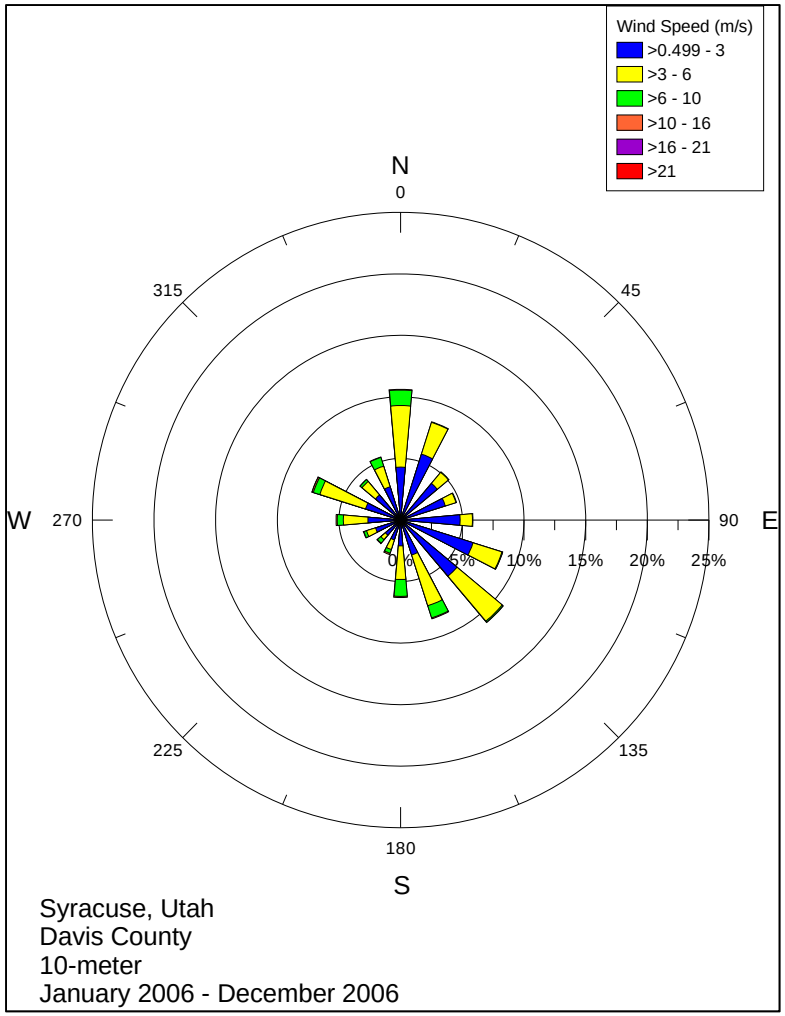

Figure 6.2 2006 Annual Wind Rose (Syracuse, Utah)

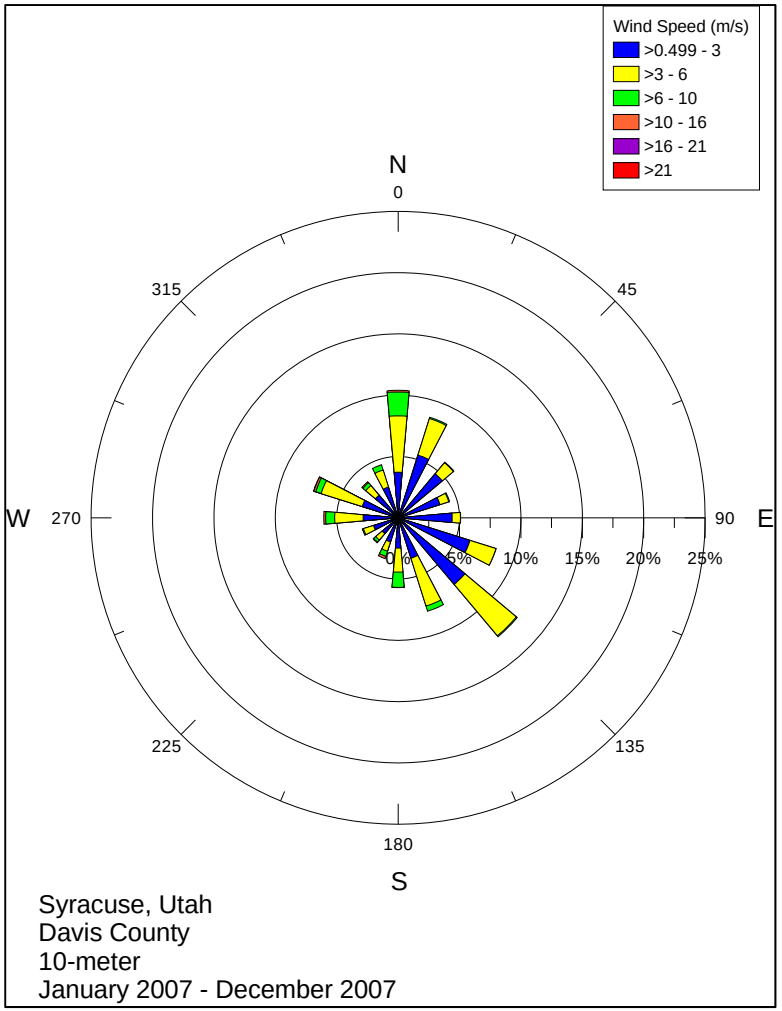

Figure 6.3 2007 Annual Wind Rose (Syracuse, Utah)

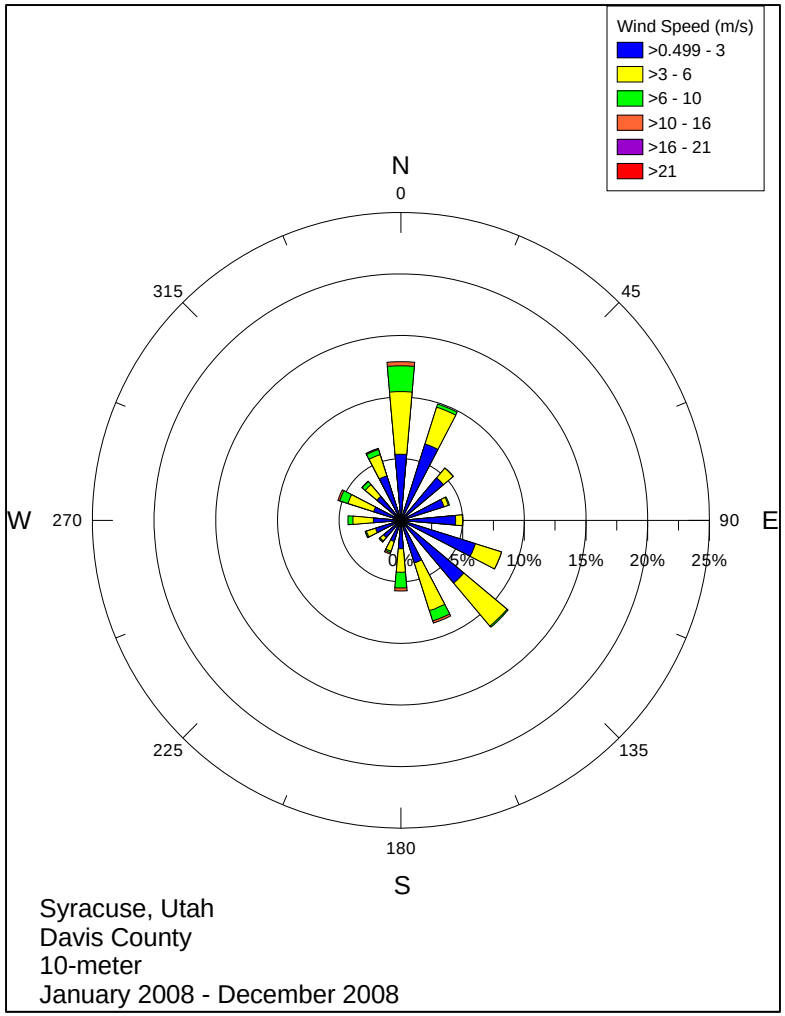

Figure 6.4 2008 Annual Wind Rose (Syracuse, Utah)

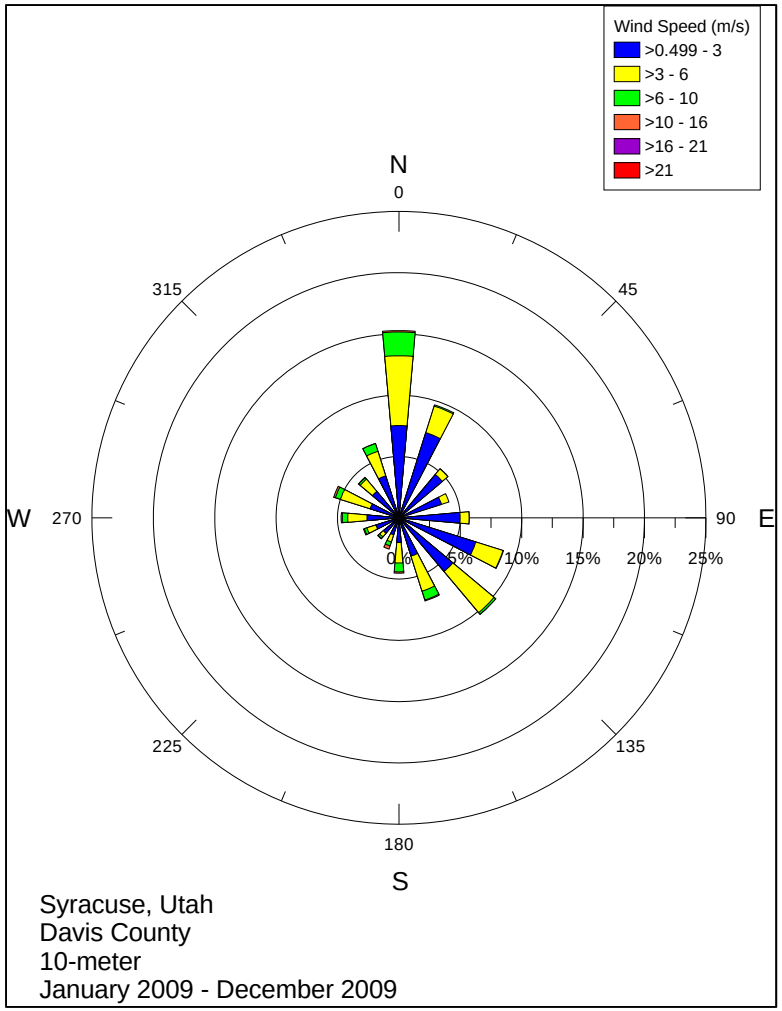

Figure 6.5 2009 Annual Wind Rose (Syracuse, Utah)

6.5 Treatment of Calms or Near-Calms

AERMOD contains algorithms for dealing with low wind speed (near calm) conditions. AERMOD can produce model concentrations for conditions when the wind speed may be less than 1 m/s but still greater than the instrument threshold. The threshold wind speed is typically the threshold of the instrument used to collect the wind information.

6.6 Receptor Grid for Near-Field Modeling

A modeling domain was developed for the near-field analysis that encompassed the location of the maximum modeled concentration from the Holly heavy crude processing project. Discrete receptors based on Universal Transverse Coordinates (UTM) and elevations derived from in-house 10-meter DEM data were used in AERMOD.

The receptor grid was developed to insure that maximum pollutant concentrations were determined by the model. The grid consisted of 10,024 receptors with 25-meter spacing around the fence line, 50-meter spacing for receptors extending out to 500 meters; from 500 meters to 1 kilometer, 100-meter spacing was used. Two hundred-meter spacing was used from 1 to 5 kilometers, and from 5 kilometers out to 10 kilometers 500-meter spacing was used. From 10 kilometers to 25 kilometers, receptor spacing of 1 kilometer (or 1,000 meters) was used. Figure 6.6 presents the receptor grid that was used in the near-field analysis. Receptors were also placed along the Salt Lake County line.

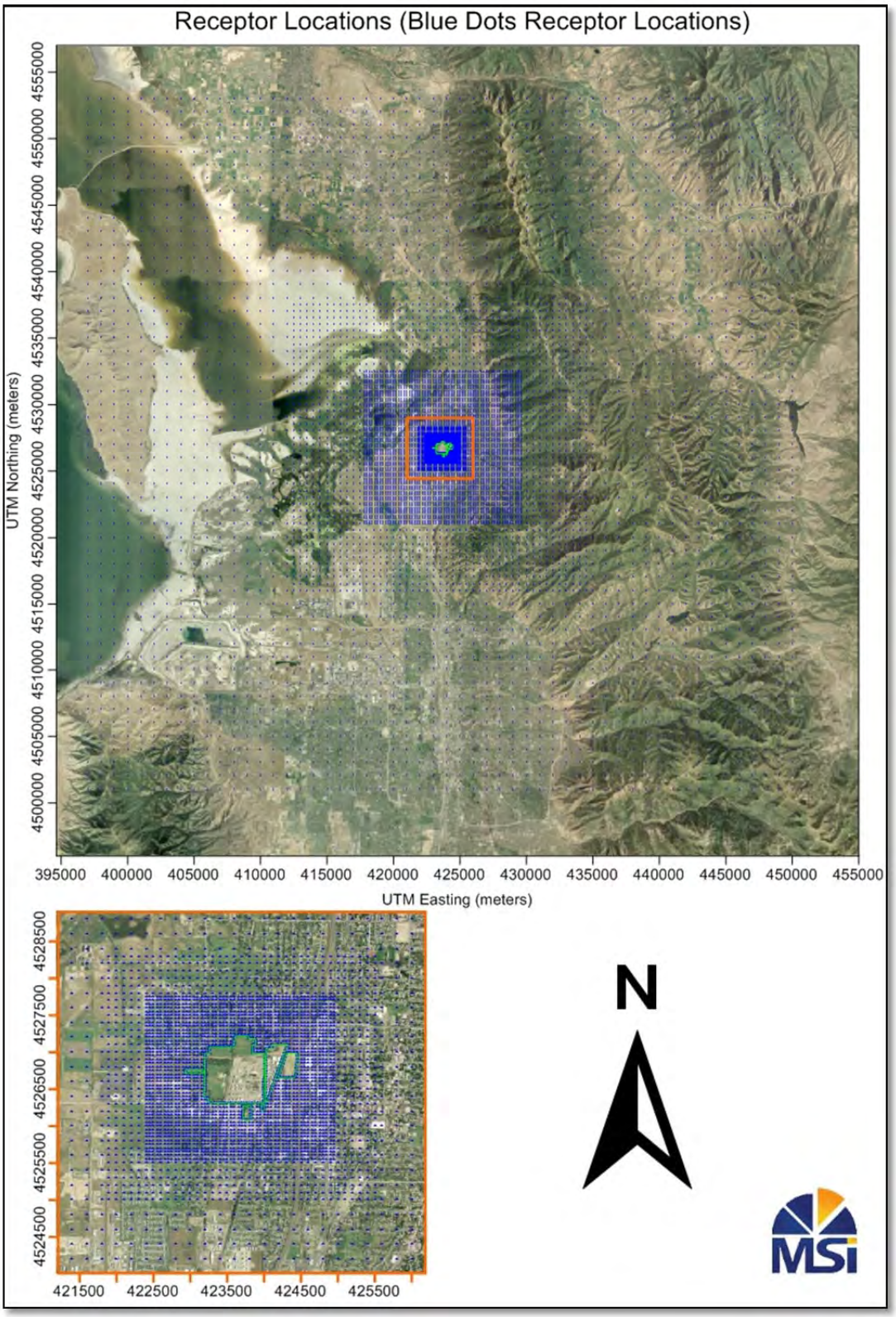

Figure 6.6 AERMOD Discrete Receptor Grid

6.7 Source Parameters and Technical Input Options

The stack parameters and PTE emission rates were used in AERMOD to insure that emissions from Holly' proposed heavy crude processing project and existing operations would meet all applicable air quality standards. The short-term emission estimate rates and source parameters including UTM coordinates, stack base elevations, and source release parameters for each point were modeled are presented in Tables 6-3 and 6-4, respectively. Emissions from the emergency generators were not modeled per the UDAQ.

Long-term (annual) emission rates were also modeled. Tables 6-6 presents the annual emission rates for NO_2 for proposed and existing Holly sources.

Table 6-3

Modeled PTE Emission Rates and Stack Parameters for Proposed Holly Heavy Crude Processing Project Sources – Short Term

Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Stack Exit Temp. (K)	Exit Velocity (m/s)	Stack Diameter (m)	NO_X (g/s)	SO_2 (g/s)	PM_{10} (g/s)	CO (g/s)
20H3 Reactor Charge Heater	423909.2	4526400.9	1305.7	35.1	772.0	4.20	1.55	0.2129	0.0529	0.0391	0.4372
24H1 Crude Furnace #3	423841.1	4526834.6	1300.3	36.6	772.0	7.49	1.65	0.3039	0.0751	0.0563	0.6226
25H1 FCC #2 Feed Heater	423836.8	4526768.1	1301.0	35.5	772.0	6.06	1.58	0.2279	0.0563	0.0422	0.4669
FCC #2 Scrubber	423801.2	4526732.1	1300.8	60.7	338.7	10.26	1.01	0.5727	0.5091	0.3906	4.4545
26H1 Hot Oil Furnace	423802.9	4526783.7	1300.0	24.4	772.0	6.06	0.88	0.0709	0.0175	0.0131	0.1453
27H1 Reactor Charge Furnace	423885.7	4526788.6	1301.0	39.6	772.0	10.01	1.83	0.2446	0.1235	0.0932	1.0269
30H1 Hydrogen Reformer Feed Furnace	423851.5	4526891.3	1301.4	29.9	772.0	7.00	2.44	0.3042	0.1540	0.1156	1.2774
30H2 Hydrogen Reformer Feed Furnace	423851.4	4526886.9	1301.3	29.9	772.0	7.00	2.44	0.3042	0.1540	0.1156	1.2774
33H1 Vacuum Furnace Heater	423911.2	4526432.7	1305.2	39.6	772.0	13.14	1.83	0.3212	0.1627	0.1221	1.3489
#11 Boiler	423780.3	4526634.1	1302.0	15.2	588.7	8.99	1.60	0.2250	0.1118	0.0838	0.9266
SE In-Tank Asphalt Heater	424116.4	4526802.3	1305.2	13.4	616.5	1.03	0.46	0.0099	0.0010	0.0008	0.0083
SW In-Tank Asphalt Heater	424102.4	4526801.9	1305.0	13.4	616.5	1.03	0.46	0.0099	0.0010	0.0008	0.0083
North In-Tank Asphalt Heater	423763.5	4526544.5	1302.0	18.3	616.5	8.72	0.46	0.0099	0.0010	0.0008	0.0083
South In-Tank Asphalt Heater	423751.2	4526533.7	1302.0	18.3	616.5	8.72	0.46	0.0099	0.0010	0.0008	0.0083
North In-Tank Asphalt Heater	423761.9	4526519.5	1301.5	18.3	616.5	8.72	0.46	0.0099	0.0010	0.0008	0.0083
South In-Tank Asphalt Heater	423750.3	4526506.9	1302.0	18.3	616.5	8.72	0.46	0.0099	0.0010	0.0008	0.0083
Cooling Tower # 10	423880.6	4526843.2	1301.0	10.7	310.9	1.83	7.92			0.0027	
Cooling Tower # 11	423788.2	4526478.0	1303.2	10.7	310.9	1.83	7.92			0.0040	

Table 6-4

Modeled PTE Emission Rates and Stack Parameters for Existing or Modified Holly Sources - Short Term

Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Stack Exit Temp. (K)	Exit Velocity (m/s)	Stack Diameter (m)	NO_X (g/s)	SO_2 (g/s)	PM_{10} (g/s)	CO (g/s)
4H1 FCC Furnace	423849.4	4526682.2	1303.0	42.7	799.8	7.70	1.35	0.2021	0.0499	0.0375	0.4140
KVG Compressor (West)	423909.7	4526680.9	1303.0	9.1	727.6	10.24	0.46	0.1790	0.0001	0.0021	0.1178
KVG Compressor (East)	423917.0	4526681.0	1303.0	9.1	727.6	10.24	0.46	0.1790	0.0001	0.0021	0.1178
FCC Scrubber	423858.3	4526654.3	1303.0	60.7	338.7	10.26	1.02	0.5727	0.5091	0.3906	4.4545
6H1 Reformer Reheat Furnace	423927.8	4526591.5	1304.0	18.5	1088.7	13.86	1.37	0.6757	0.0684	0.0514	0.5676
6H3 Reformer Reheater	423926.9	4526577.6	1304.0	38.1	672.0	8.49	1.14	0.4657	0.4716	0.0354	0.3912
6H2 Reformer Reboiler	423914.1	4526562.8	1304.0	18.1	797.0	3.68	1.07	0.1482	0.0150	0.0113	0.1245
SVG Compressor (East)	423846.6	4526590.7	1302.6	10.7	727.6	25.28	0.20	0.2020	0.0001	0.0050	0.0402
SVG Compressor (West)	423839.5	4526591.1	1303.0	10.7	727.6	25.28	0.20	0.2020	0.0001	0.0050	0.0402
7H3 H. F. Alkylation Reboiler	423798.7	4526547.2	1302.9	38.4	672.0	6.59	1.22	0.4114	0.0417	0.0313	0.3455
7H1 Alky Regen Furnace	423802.3	4526569.9	1302.5	10.8	699.8	2.74	0.70	0.0543	0.0055	0.0042	0.0456
8H1 Crude Furnace # 1	423913.8	4526505.6	1304.0	36.9	649.8	5.39	2.29	0.9979	0.1239	0.0930	1.0273
9H1 DHDS Reactor Charge Heater	423919.6	4526529.6	1304.0	22.3	549.8	2.33	0.91	0.1000	0.0101	0.0076	0.0840
9H2 DHDS Stripper Reboiler	423919.5	4526523.9	1304.0	13.3	738.7	5.58	0.49	0.0507	0.0051	0.0039	0.0426
10H1 Asphalt Mix Heater	423826.1	4526508.7	1303.0	25.3	577.6	5.75	0.76	0.1630	0.0165	0.0124	0.1370
10H2 Hot Oil Furnace	423931.3	4526444.2	1305.3	29.9	772.0	6.41	2.29	0.2446	0.1239	0.0930	1.0273
11H1 SRGP Depentanizer Reboiler	423797.8	4526558.0	1302.5	24.4	810.9	7.55	1.07	0.2990	0.0303	0.0227	0.2511
12H1 NHDS Reactor Charge Furnace	423919.7	4526441.1	1305.0	37.9	1088.7	12.72	1.37	0.4428	0.0628	0.0471	0.5209
13H1 Isomerization Reactor Feed Furnace	423926.2	4526442.5	1305.1	17.4	533.2	5.65	0.52	0.0803	0.0081	0.0061	0.0674
19H1 DHT Reactor Charge Heater	423898.8	4526434.1	1305.0	29.9	772.0	6.99	0.94	0.0917	0.0226	0.0170	0.1879
20H1: Reactor Charge Heater	423903.7	4526402.4	1305.4	29.9	772.0	6.02	0.91	0.0755	0.0186	0.0140	0.1546
20H2: Fractionator Charge Heater	423903.2	4526381.6	1305.8	29.9	772.0	6.63	1.55	0.2380	0.0588	0.0441	0.4877
23H1 Reformate Splitter Reboiler Heater	423924.4	4526478.3	1304.6	29.9	772.0	6.24	1.07	0.1063	0.0263	0.0197	0.2178
#4 Boiler	423795.8	4526686.0	1301.3	7.6	810.9	15.12	0.91	0.4397	0.0445	0.0334	0.3694

Table 6-4 Continued

Modeled PTE Emission Rates and Stack Parameters for Existing or Modified Holly Sources - Short Term

Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Stack Exit Temp. (K)	Exit Velocity (m/s)	Stack Diameter (m)	NO_X (g/s)	SO_2 (g/s)	PM_{10} (g/s)	CO (g/s)
#5 Boiler	423788.9	4526685.8	1301.3	15.2	810.9	16.72	1.22	0.1764	0.0876	0.0658	0.7264
#8 Boiler	423807.4	4526650.8	1302.0	15.2	810.9	22.15	1.60	0.2336	0.1159	0.0871	0.9619
#9 Boiler	423801.9	4526653.0	1302.0	15.2	810.9	12.38	1.60	0.2250	0.1118	0.0838	0.9266
#10 Boiler	423789.7	4526634.2	1302.0	15.2	810.9	12.38	1.60	0.2250	0.1118	0.0838	0.9266
North In-Tank Asphalt Heater	424141.2	4526736.4	1307.0	13.4	616.5	1.03	0.46	0.0098	0.0010	0.0008	0.0083
South In-Tank Asphalt Heater	424129.8	4526726.6	1307.0	13.4	616.5	1.03	0.46	0.0098	0.0010	0.0008	0.0083
North In-Tank Asphalt Heater	424102.6	4526818.5	1305.0	13.4	616.5	1.03	0.46	0.0098	0.0010	0.0008	0.0083
South In-Tank Asphalt Heater	424116.1	4526819.3	1305.0	13.4	616.5	1.03	0.46	0.0098	0.0010	0.0008	0.0083
Cooling Tower # 4	423796.7	4526582.7	1302.0	10.7	319.3	1.83	5.67	---	---	0.6294	---
Cooling Tower # 6	423779.3	4526580.9	1302.2	10.7	310.9	1.83	6.10	---	---	0.5700	---
Cooling Tower # 7	423746.0	4526589.1	1301.7	7.6	310.9	1.83	4.88	---	---	0.5374	---
Cooling Tower # 8	423764.9	4526587.8	1301.7	15.2	310.9	1.83	6.71	---	---	1.1458	---
Cooling Tower # 10	423880.6	4526843.2	1301.0	10.7	310.9	1.83	7.92	---	---	0.0027	---
Process Flare (south)	423707.0	4526793.5	1298.9	64.9	1273.0	20.00	0.78	0.1675	0.0030	---	0.9114
Process Flare (north)	423707.0	4526793.5	1298.9	64.9	1273.0	20.00	0.78	0.1675	0.0030	---	0.9115

Table 6-5

Modeled PTE NO_2– Annual Emission Rates and Stack Parameters for Proposed Holly Heavy Crude Processing Project Sources

Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Stack Exit Temp. (K)	Exit Velocity (m/s)	Stack Diameter (m)	NO_X (g/s)
20H3 Reactor Charge Heater	423909.2	4526400.9	1305.7	35.1	772.0	4.20	1.55	0.2129
24H1 Crude Furnace #3	423841.1	4526834.6	1300.3	36.6	772.0	7.49	1.65	0.3039
25H1 FCC #2 Feed Heater	423836.8	4526768.1	1301.0	35.5	772.0	6.06	1.58	0.2279
FCC #2 Scrubber	423801.2	4526732.1	1300.8	60.7	338.7	10.26	1.01	0.5727
26H1 Hot Oil Furnace	423802.9	4526783.7	1300.0	24.4	772.0	6.06	0.88	0.0709
27H1 Reactor Charge Furnace	423885.7	4526788.6	1301.0	39.6	772.0	10.01	1.83	0.2446
30H1 Hydrogen Reformer Feed Furnace	423851.5	4526891.3	1301.4	29.9	772.0	7.00	2.44	0.3042
30H2 Hydrogen Reformer Feed Furnace	423851.4	4526886.9	1301.3	29.9	772.0	7.00	2.44	0.3042
33H1 Vacuum Furnace Heater	423911.2	4526432.7	1305.2	39.6	772.0	13.14	1.83	0.3212
#11 Boiler	423780.3	4526634.1	1302.0	15.2	588.7	8.99	1.60	0.2250
SE In-Tank Asphalt Heater	424116.4	4526802.3	1305.2	13.4	616.5	1.03	0.46	0.0099
SW In-Tank Asphalt Heater	424102.4	4526801.9	1305.0	13.4	616.5	1.03	0.46	0.0099
North In-Tank Asphalt Heater	423763.5	4526544.5	1302.0	18.3	616.5	8.72	0.46	0.0099
South In-Tank Asphalt Heater	423751.2	4526533.7	1302.0	18.3	616.5	8.72	0.46	0.0099
North In-Tank Asphalt Heater	423761.9	4526519.5	1301.5	18.3	616.5	8.72	0.46	0.0099
South In-Tank Asphalt Heater	423750.3	4526506.9	1302.0	18.3	616.5	8.72	0.46	0.0099

Table 6-6

Modeled PTE NO_2– Annual Emission Rates and Stack Parameters for Existing or Modified Holly Sources

Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Stack Exit Temp. (K)	Exit Velocity (m/s)	Stack Diameter (m)	NO_X (g/s)
4H1 FCC Furnace	423849.4	4526682.2	1303.0	42.7	799.8	7.70	1.35	0.2021
KVG Compressor (West)	423909.7	4526680.9	1303.0	9.1	727.6	10.24	0.46	0.1790
KVG Compressor (East)	423917.0	4526681.0	1303.0	9.1	727.6	10.24	0.46	0.1790
FCC Scrubber	423858.3	4526654.3	1303.0	60.7	338.7	10.26	1.02	0.5727
6H1 Reformer Reheat Furnace	423927.8	4526591.5	1304.0	18.5	1088.7	13.86	1.37	0.6757
6H3 Reformer Reheater	423926.9	4526577.6	1304.0	38.1	672.0	8.49	1.14	0.4657
6H2 Reformer Reboiler	423914.1	4526562.8	1304.0	18.1	797.0	3.68	1.07	0.1482
SVG Compressor (East)	423846.6	4526590.7	1302.6	10.7	727.6	25.28	0.20	0.2020
SVG Compressor (West)	423839.5	4526591.1	1303.0	10.7	727.6	25.28	0.20	0.2020
7H3 H. F. Alkylation Reboiler	423798.7	4526547.2	1302.9	38.4	672.0	6.59	1.22	0.4114
7H1 Alky Regen Furnace	423802.3	4526569.9	1302.5	10.8	699.8	2.74	0.70	0.0543
8H1 Crude Furnace # 1	423913.8	4526505.6	1304.0	36.9	649.8	5.39	2.29	0.9979
9H1 DHDS Reactor Charge Heater	423919.6	4526529.6	1304.0	22.3	549.8	2.33	0.91	0.1000
9H2 DHDS Stripper Reboiler	423919.5	4526523.9	1304.0	13.3	738.7	5.58	0.49	0.0507
10H1 Asphalt Mix Heater	423826.1	4526508.7	1303.0	25.3	577.6	5.75	0.76	0.1630
10H2 Hot Oil Furnace	423931.3	4526444.2	1305.3	29.9	772.0	6.41	2.29	0.2446
11H1 SRGP Depentanizer Reboiler	423797.8	4526558.0	1302.5	24.4	810.9	7.55	1.07	0.2990
12H1 NHDS Reactor Charge Furnace	423919.7	4526441.1	1305.0	37.9	1088.7	12.72	1.37	0.4428
13H1 Isomerization Reactor Feed Furnace	423926.2	4526442.5	1305.1	17.4	533.2	5.65	0.52	0.0803
19H1 DHT Reactor Charge Heater	423898.8	4526434.1	1305.0	29.9	772.0	6.99	0.94	0.0917
20H1 Reactor Charge Heater	423903.7	4526402.4	1305.4	29.9	772.0	6.02	0.91	0.0755
20H2 Fractionator Charge Heater	423903.2	4526381.6	1305.8	29.9	772.0	6.63	1.55	0.2380
23H1 Reformate Splitter Reboiler Heater	423924.4	4526478.3	1304.6	29.9	772.0	6.24	1.07	0.1063
#4 Boiler	423795.8	4526686.0	1301.3	7.6	810.9	15.12	0.91	0.4397

Table 6-6 Continued

Modeled PTE NO_2 – Annual Emission Rates and Stack Parameters for Existing or Modified Holly Sources

Source Description	Easting (X) (m)	Northing (Y) (m)	Base Elevation (m)	Stack Height (m)	Stack Exit Temp. (K)	Exit Velocity (m/s)	Stack Diameter (m)	NO_X (g/s)
#5 Boiler	423788.9	4526685.8	1301.3	15.2	810.9	16.72	1.22	0.1764
#8 Boiler	423807.4	4526650.8	1302.0	15.2	810.9	22.15	1.60	0.2336
#9 Boiler	423801.9	4526653.0	1302.0	15.2	810.9	12.38	1.60	0.2250
#10 Boiler	423789.7	4526634.2	1302.0	15.2	810.9	12.38	1.60	0.2250
North In-Tank Asphalt Heater	424141.2	4526736.4	1307.0	13.4	616.5	1.03	0.46	0.0098
South In-Tank Asphalt Heater	424129.8	4526726.6	1307.0	13.4	616.5	1.03	0.46	0.0098
North In-Tank Asphalt Heater	424102.6	4526818.5	1305.0	13.4	616.5	1.03	0.46	0.0098
South In-Tank Asphalt Heater	424116.1	4526819.3	1305.0	13.4	616.5	1.03	0.46	0.0098
Process Flare (south)	423707.0	4526793.5	1298.9	64.9	1273.0	20.00	0.78	0.1675
Process Flare (north)	423707.0	4526793.5	1298.9	64.9	1273.0	20.00	0.78	0.1675

The AERMOD model was run with the regulatory default option which includes the following:

- Stack tip downwash,
- Calms and missing meteorological data routine,
- Direction-specific building downwash,
- Actual receptor elevations,
- Sequential date checking, and
- Complex/intermediate terrain algorithms.

Other selected input variables that were used in AERMOD include:

- 24-hour averaging period for PM_{10},
- One-hour and annual averaging periods for NO_2,
- One-hour averaging for SO_2,
- 1- and 8- hour averaging periods for CO,
- elevated terrain,
- 1- or 24-hour averaging periods for HAPs (as necessary depending on type of HAP),
- Non-default Plume Volume Molar Ratio Method (PVMRM) for NO_2,
- Urban roughness length of 1.0 meter,
- Multiple urban areas for the full impact analysis, and
- concentrations.

6.9 Good Engineering Practice (GEP) Stack Height

The GEP stack height is defined under Section 123 of the CAA as "the height necessary to insure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, or wakes which may be created by the source itself, nearby structures or nearby terrain obstacles." GEP stack height was calculated with the formulas presented in 40 CFR 51.100 (ii). The EPA's refined formula height is defined as H +1.5 L, where L is length.

6.10 Downwash

The BPIP-Prime algorithm in AERMOD was utilized to address downwash effects. The height, width, length, and base elevation of the proposed structures that are in existence or will be constructed at the Holly refinery were utilized. BPIP determines, in each of the 36 wind directions (10 degree sectors) which buildings will produce the greatest downwash effects for a stack. Table 6-7 presents the building dimensions used in AERMOD.

Table 6-7

Building Dimensions used in AERMOD

Building Name	Building Code	E-W Dimension (meters)	N-S Dimension (meters)	Height (meters)
Sulfur Unit (lattice)	SULATT	24.69	19.31	12.00
Boiler House	BH	29.65	17.44	8.00
Heater 4-H-1	HTR4H1	3.03	14.66	15.00
Ammonia Stripping Unit (lattice)	ASULATT	6.90	19.78	20.00
TCC (lattice)	TCC	9.69	11.43	67.00
FCC (lattice)	FCC	10.36	22.77	40.00
Crude Tower	CRUTWR	4.80	5.88	41.00
Crude Unit (lattice)	CRUNIT	6.91	13.88	18.00
Reactor Charge Furnace (lower)	RCFLWR	4.64	4.00	12.00
Reactor Charge Furnace (upper)	RCFUPR	1.60	1.22	26.00
HDS Charge Heater (lower)	HDSLWR	1.43	1.22	7.00
HDS Charge Heater (upper)	HDSUPR	0.84	0.67	17.00
South Office	SOFFICE	33.19	27.09	4.00
North Office/CCR	NOFFICE	18.45	47.84	4.00
Horizontal Tank 122	TANK122	16.50	2.50	2.50
Horizontal Tank 123	TANK123	16.50	2.50	2.50
Horizontal Tank 133	TANK133	25.00	3.75	3.75
Horizontal Tank 134	TANK134	25.00	3.75	3.75
Horizontal Tank 136	TANK136	28.00	2.90	2.90
Horizontal Tank 147	TANK147	21.00	2.65	2.65
Horizontal Tank 148	TANK148	21.00	2.65	2.65
Horizontal Tank 149	TANK149	21.00	2.65	2.65
Horizontal Tank 150	TANK150	21.00	2.65	2.65
Horizontal Tank 151	TANK151	21.00	2.65	2.65
Horizontal Tank 152	TANK152	21.00	2.65	2.65
Horizontal Tank 153	TANK153	21.00	2.65	2.65
Horizontal Tank 324	TANK324	21.00	2.65	2.65
Horizontal Tank 141	TANK141	28.50	3.65	3.65
Horizontal Tank 171	TANK171	4.14	25.88	3.50
Horizontal Tank 172	TANK172	3.49	25.50	3.50
Horizontal Tank 173	TANK173	28.50	3.65	3.65
Horizontal Tank 174	TANK174	28.50	3.65	3.65

6.11 PVMRM

The non-default PVMRM option was utilized in the NO_2 dispersion modeling analysis. PVMRM accounts for NO_2/NO_x chemistry using an in-stack ratio of NO_2 to NO_x and ambient ozone values. In stack ratio used were based on source testing conducted by CCI Environmental Consultants on February 16, 2012. The results of the source testing are presented in Appendix G. Hourly ozone data obtained from the UDAQ Bountiful ambient air quality station for 2006-2009 was formatted for input into AERMOD.

6.12 Urban Roughness

The AERMOD model includes the option to specify if the source is located in an urban area which modifies the dispersion for low-level emission sources to produce more realistic urban dispersion. 40CFR 50 Appendix W provides two procedures to determine if rural or urban dispersion coefficients should be used for a source, land use classification and population density. The first procedure which is based on land use classification requires 50 percent of the area within a three kilometer radius be classified as land use types I1, I2, C1, R2, and R3. Figure 6.7 presents a depiction of 2006 National Land Cover Data (NLCD) data surrounding the Holly Facility. The second procedure requires a population density within the three kilometer radius to be greater than 750 people per square kilometer. Table 6-8 presents the 2010 population density for cities that are within a three-kilometer radius from the refinery. Figure 6.8 presents a population density analysis around Holly's Woods Cross Facility.

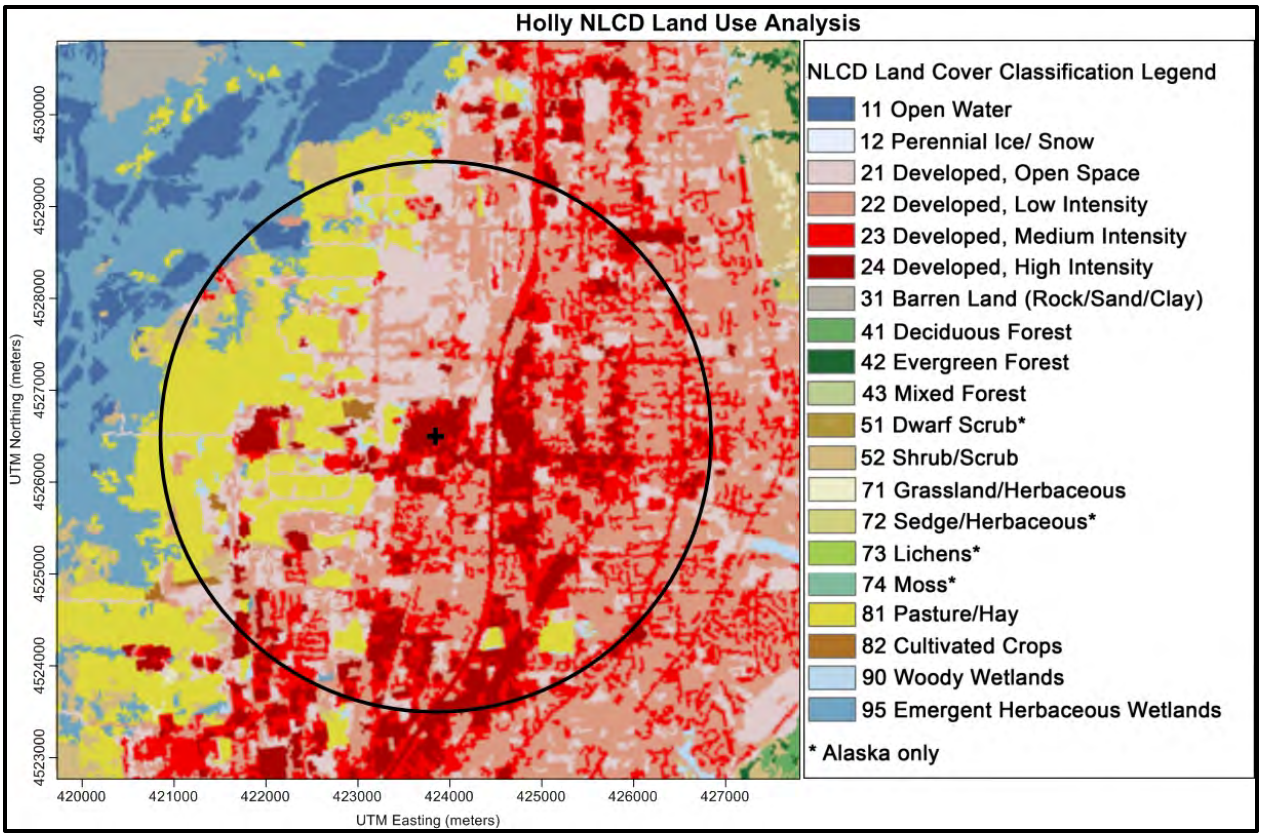

Figure 6.7 Land Use Surrounding Holly Refinery

Table 6-8

Surrounding City Population Densities

Area Name	Area Population	Area Population Density (People/km^2)
Bountiful	42,522	1,221
West Bountiful	5,265	625
Woods Cross	9,761	971
Salt Lake City	186,440	647
Centerville	15,335	990

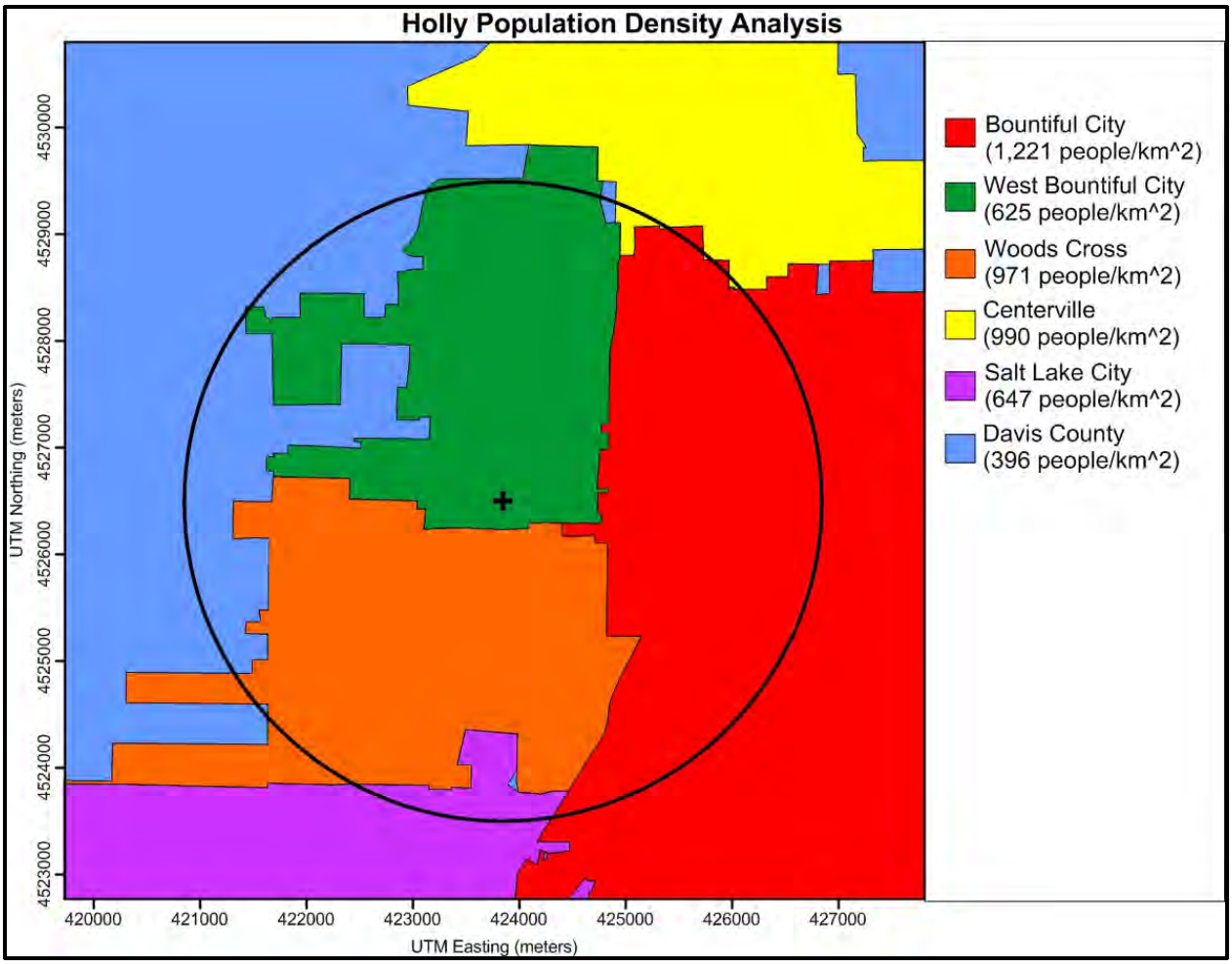

Figure 6.8 Cities/Population Densities Surrounding Holly

6.13 Near-Field Modeling Results

Although CO was the only projected pollutant with emissions above the modeling significance levels, per a request from the UDAQ, near-field modeling was performed for NO_2, CO, SO_2, and PM_{10}. The results of the near-field modeling from proposed new sources only from Holly's heavy crude processing project are presented in Table 6-9 and in Appendix H. AERMOD results for proposed and existing or modified sources at Holly are presented in Table 6-10 and Appendix H. Figures 6.9 through 6.14 present the modeled concentration isopleth plots for the entire Holly facility for NO_2, CO, SO_2, and PM_{10}.

Maximum modeled values are presented for one- and eight-hour CO, and annual NO_2 concentrations. High-second-high (HSH) modeled values are presented for 24-hour PM_{10}. Modeled values for one-hour NO_2 represent the 98th percentile based on a three-year average (2006-2008). Modeled values for one-hour SO_2 represent the 99th percentile based on a three-year average (2006-2008).

Table 6-9

Modeled Maximum and High-Second-High Near-Field Pollutant Concentrations for Proposed Holly Refining & Marketing Company Heavy Crude Processing Project

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)	Location of Model Predicted Concentration	
			UTM East (meters)	UTM North (meters)
NO_2	1-hour[1]	8.7	423887.1	4527160.1
	Annual	0.60	424198.4	4526780.0
SO_2	1-hour[2]	5.4	423840.6	4527010.2
CO	1-hour	70.6	424650.0	4527450.0
	8-hour	32.7	423776.4	4526311.5
PM_{10}	24-hour (high)	1.5	423768.5	4526277.5
	24-hour (HSH)	1.2	423776.4	4526311.5

HSH – High-Second-High
[1] - 98th percentile based on a three-year average (2006-2008)
[2] - 99th percentile based on a three-year average (2006-2008)

Table 6-10

Modeled Maximum and High-Second-High Near-Field Pollutant Concentrations for Proposed and Existing Holly Refining & Marketing Company Sources

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)	Location of Model Predicted Concentration	
			UTM East (meters)	UTM North (meters)
NO_2	1-hour[1]	88.3	423999.6	4526635.1
	Annual	5.4	423999.6	4526635.1
SO_2	1-hour[2]	23.5	424000.4	4526709.7
CO	1-hour	258.9	424000.4	4526709.7
	8-hour	86.9	423950.0	4526200.0
PM_{10}	24-hour (high)	80.6	423776.4	4526311.5
	24-hour (HSH)	55.7	424000.0	4526550.0

HSH – High-Second-High
[1] - 98th percentile based on a three-year average (2006-2008)
[2] - 99th percentile based on a three-year average (2006-2008)

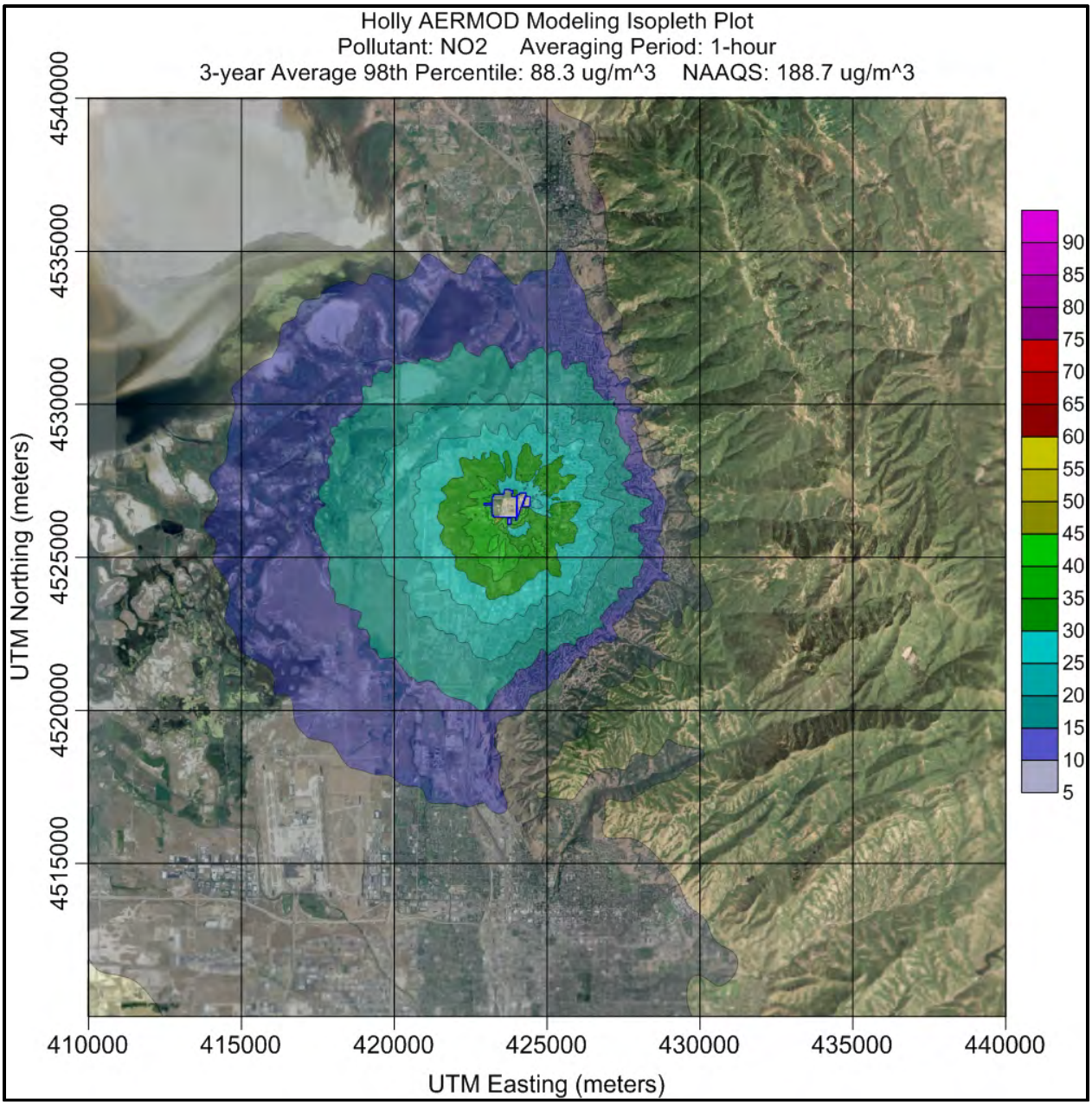

Figure 6.9 Modeled 98th Percentile One-hour NO_2 Concentration Isopleth Plot Based on Three-Year Average

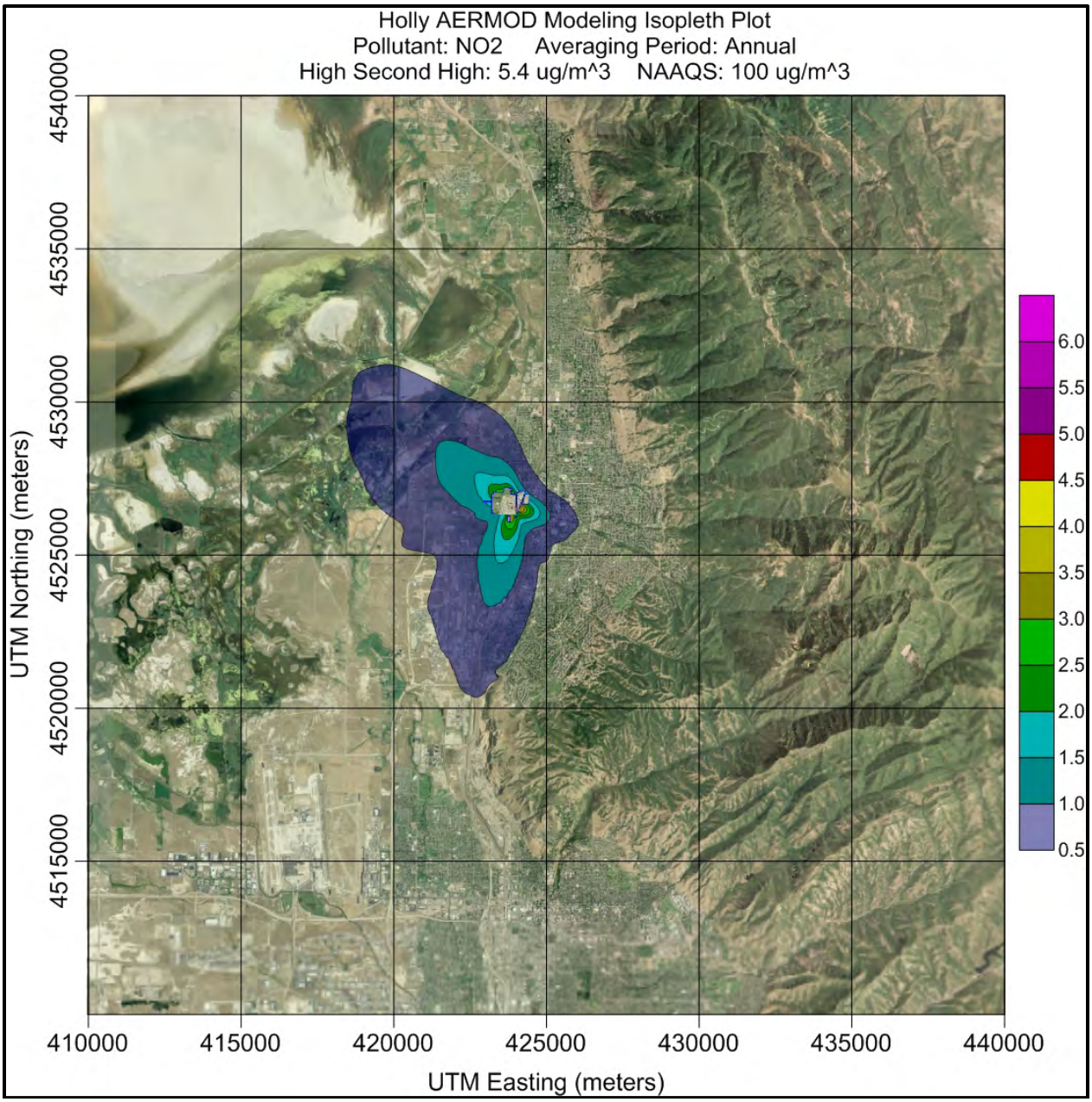

Figure 6.10 Modeled Maximum Annual NO_2 Concentration Isopleth Plot

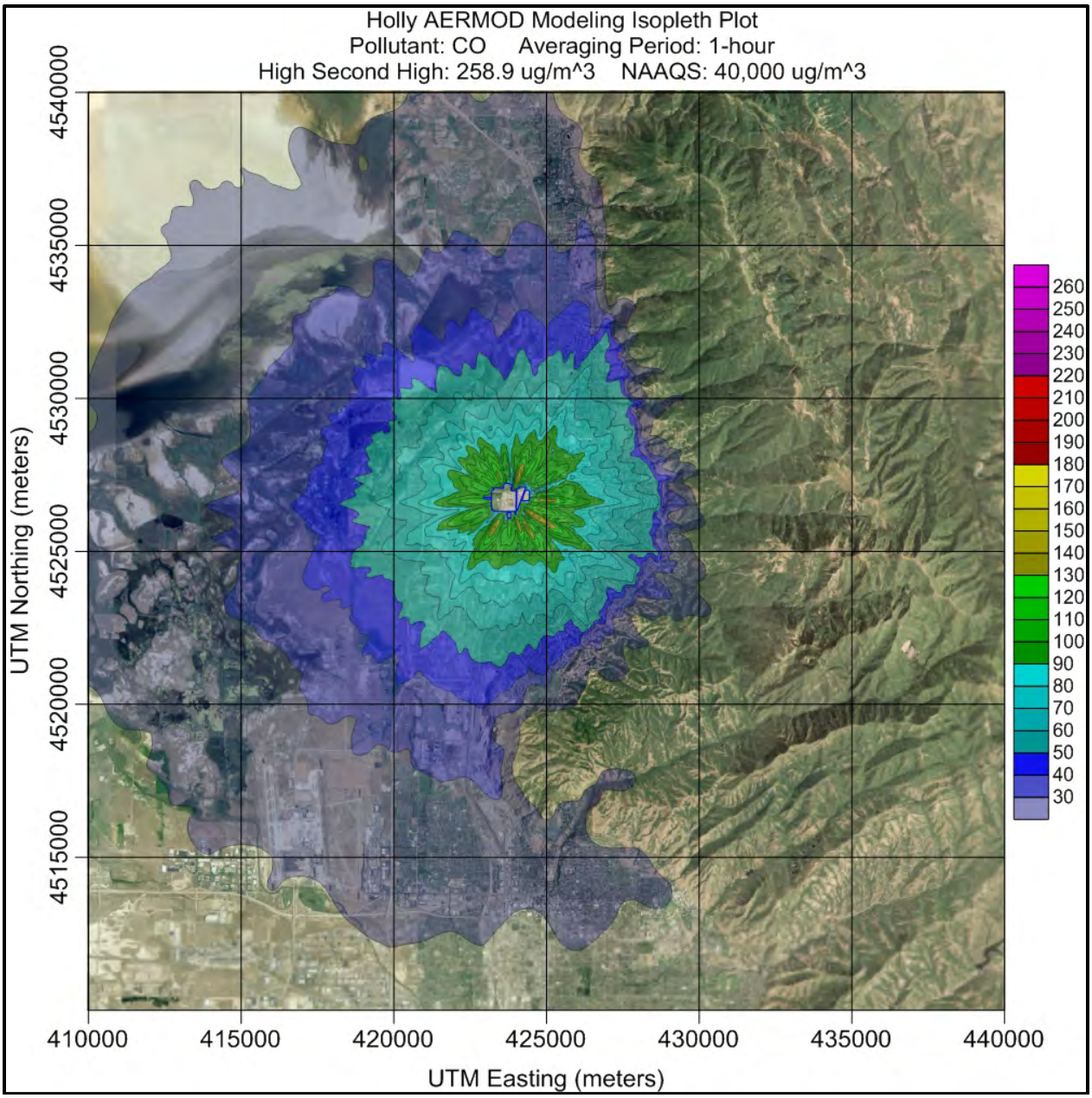

Figure 6.11 Modeled Maximum One-hour CO Concentration Isopleth Plot

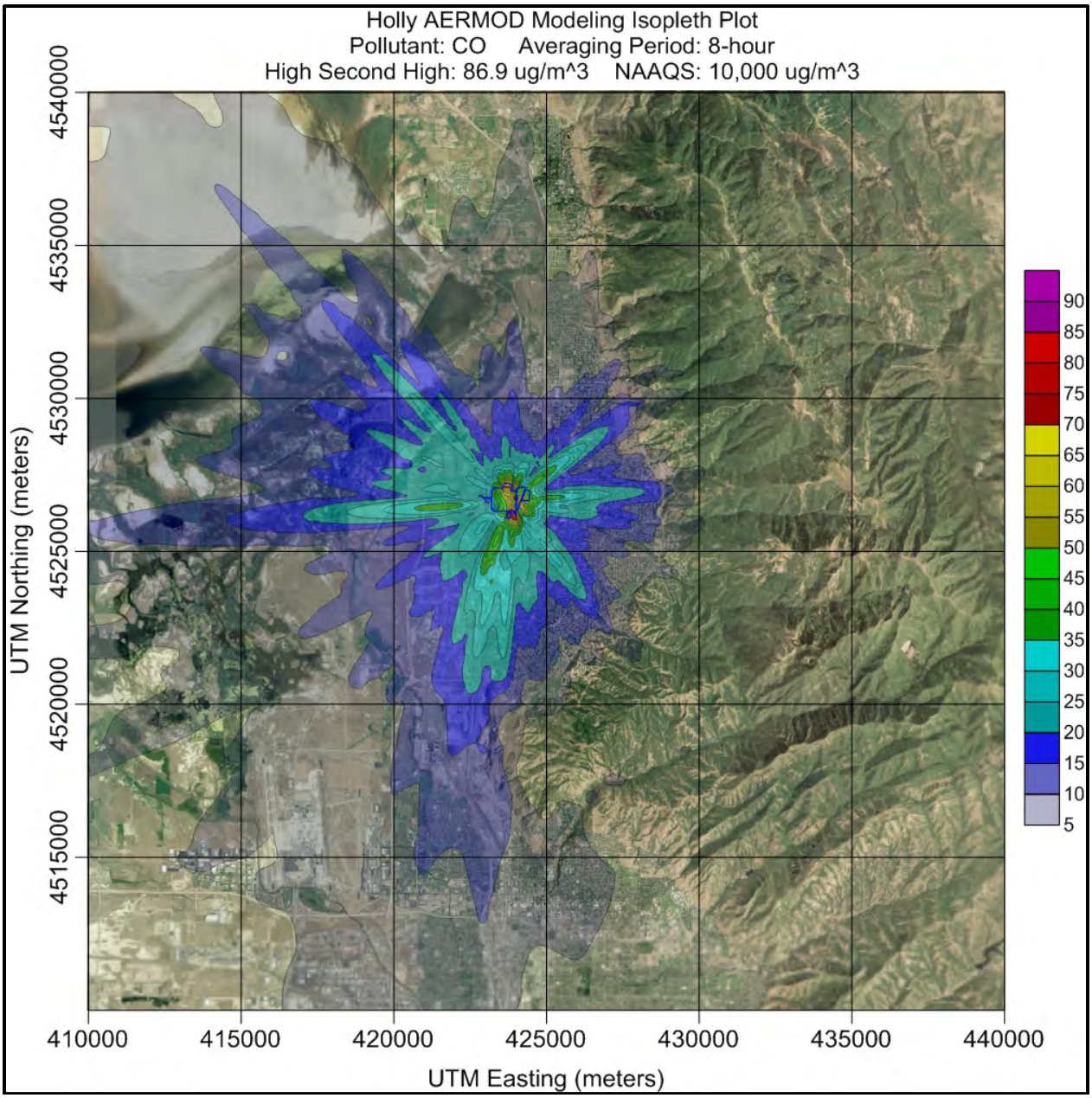

Figure 6.12 Modeled Maximum Eight-hour CO Concentration Isopleth Plot

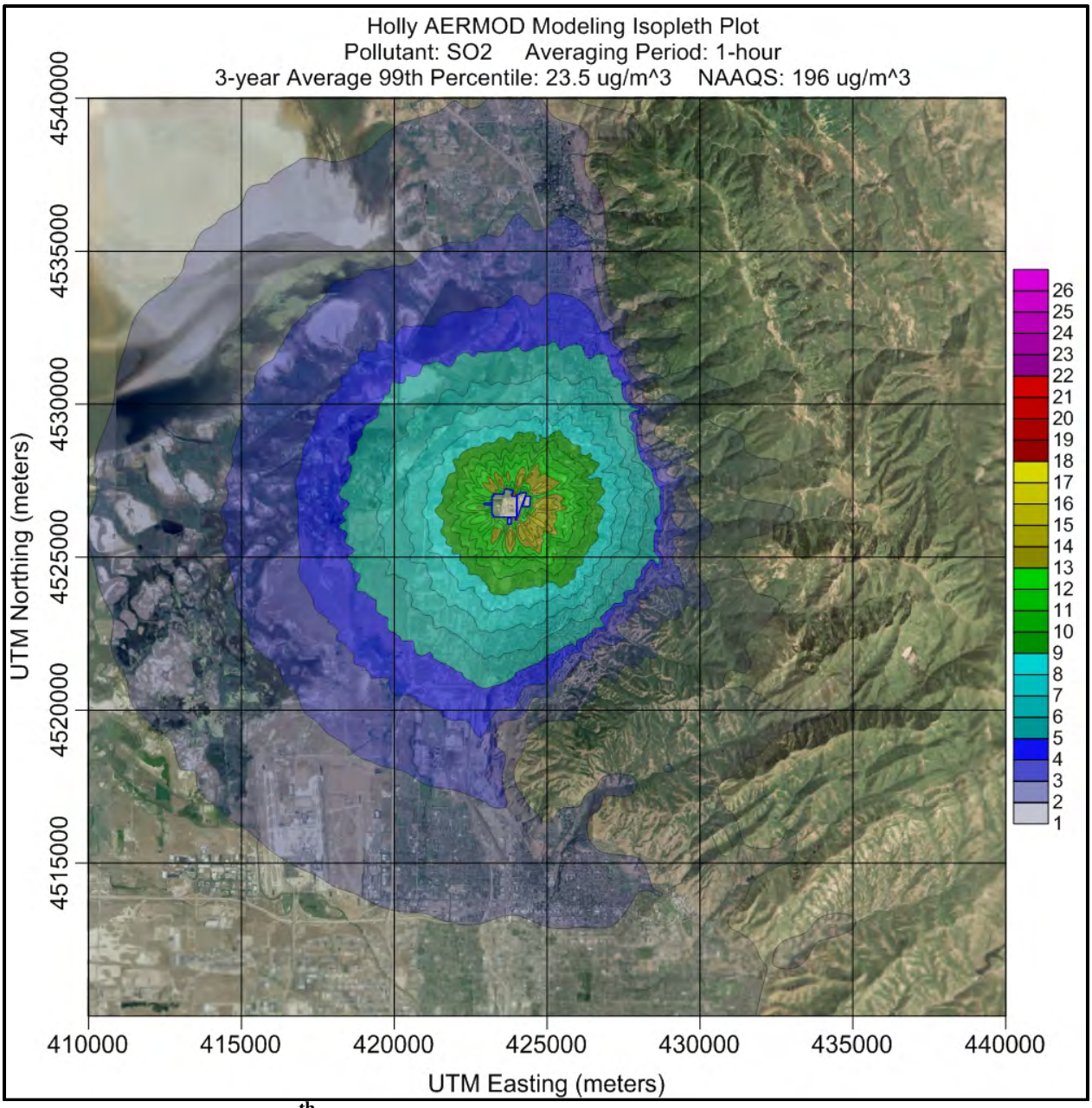

Figure 6.13 Modeled 99th Percentile One-hour SO_2 Concentration Isopleth Plot Based on Three-Year Average

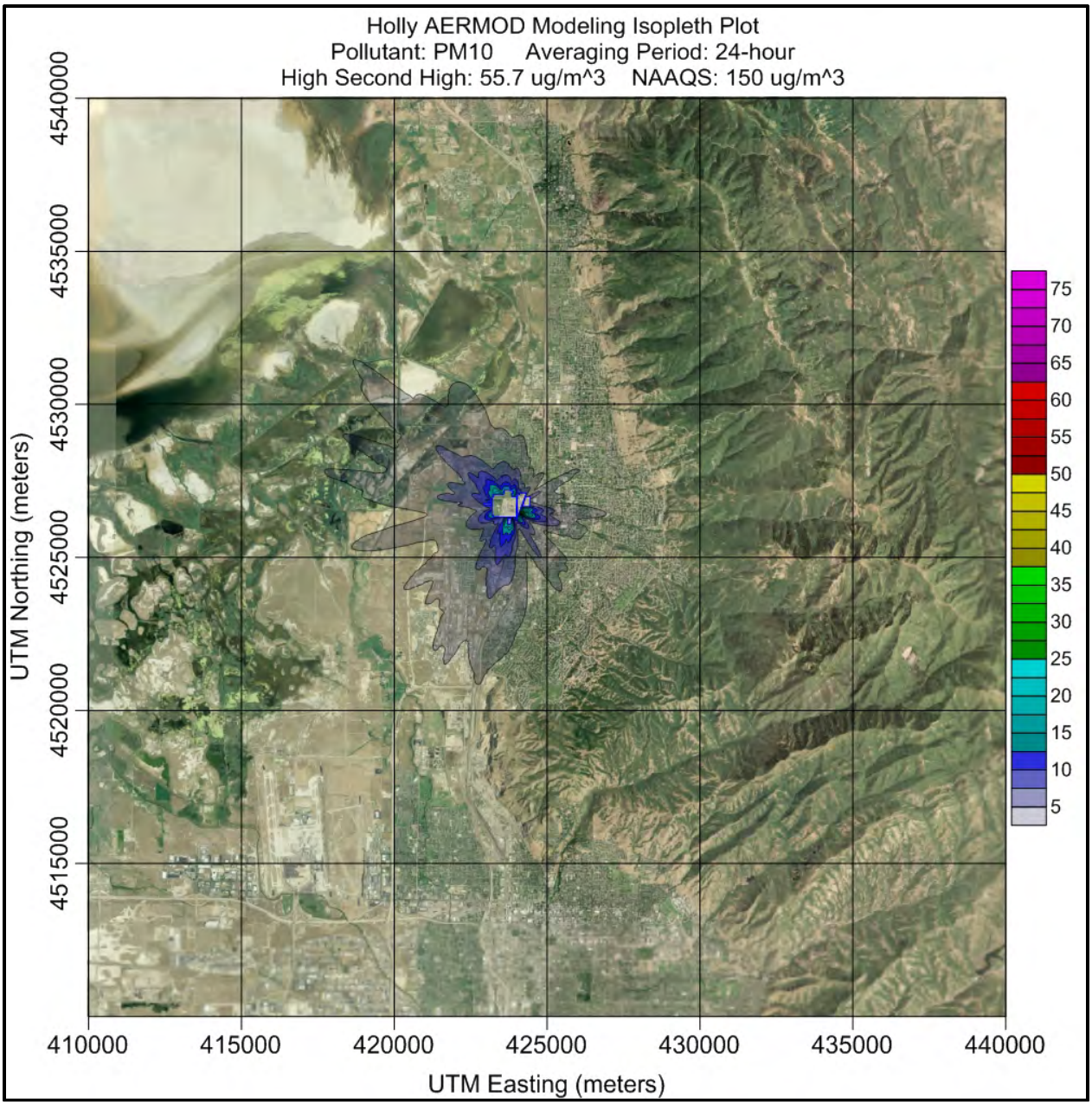

Figure 6.14 Modeled High-Second-High 24-hour PM_{10} Concentration Isopleth Plot

6.14 Significant Impact Levels

The EPA has adopted significant impact levels (SILs) for criteria pollutants. If the highest modeled concentrations for any pollutant and averaging period evaluated are less than the applicable SIL, a full impact or cumulative air quality analysis is not required for that pollutant and averaging period; however, these pollutants may still be subject to further review as part of the PSD additional impact analysis requirements. Table 6-11 presents the PSD Class II area SILs.

Table 6-11

PSD Class II Area Significant Air Quality Impact Levels

Pollutant	Averaging Period	Significant Impact Level ($\mu g/m^3$)
NO_2	1-hour	7.5
	annual	1
SO_2	1-hour	7.8
CO	1-hour	2000
	8-hour	500
PM_{10}	24-hour	5

6.15 Full Impact Analysis

A full impact analysis was performed to determine whether proposed Holly sources would cause a significant off-site impact. In addition to emissions from the proposed processing project, the full impact analysis considers emissions from existing sources as well as the growth associated with the new project. An impact area was established to determine the geographical area for which the required air quality analyses for the NAAQS and PSD increments are carried out. This area includes all locations where the significant increase in the potential emissions of a pollutant from the proposed Holly processing project will cause a significant ambient impact (i.e., equals or exceeds the applicable significant impact levels in Table 6-11). For those pollutants whose impacts were below the modeling significance levels, no further analyses were performed.

Table 6-12 compares modeled maximum concentrations with the significant impact levels. For Holly's heavy crude processing project sources, model predicted impacts of NO_2 were above the modeling significance levels; thus, a full impact analysis was performed to demonstrate compliance with the applicable standards. The impact area is a circular area with a radius extending from the source to the most distant point where AERMOD predicted a significant impact would occur. The maximum distance determined was 3.3 kilometers for one-hour NO_2. A distance of 50 kilometers was added to the maximum distance to define the scope of the full impact analysis.

Table 6-12

Comparison of Modeled Maximum Concentrations for

Holly's Proposed Heavy Crude Processing Project to Significant Impact Levels

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)	SIL ($\mu g/m^3$)	Percent of SIL	Radius of Impact
NO_2	1-hour	12.4	7.5	165%	3.3
	Annual	0.6	1	60%	NA
SO_2	1-hour	7.5	7.8	96%	NA
CO	1-hour	70.6	2,000	3.5%	NA
	8-hour	32.7	500	6.5%	NA
PM_{10}	24-hour	1.5	5	3.0%	NA

6.16 Near-by Source Inventory

UDAQ was contacted to obtain source and emissions information for sources of NO_x that fell within the radius of impact. The UDAQ identified several NO_x sources within the impact area and provided source and emissions information for these sources. A summary of the full impact sources modeled and distance from Holly's refinery are presented in Table 6-13.

Table 6-13

Full Impact Analysis Sources

Source Name	UTM East (meters)	UTM North (meters)	Distance from Holly (kilometers)
Bountiful Power	425416.2	4526557.3	1.6
Gadsby Power Plant	421445.2	4513453.8	13.4
Tesoro Refinery	423603.9	4516183.0	10.4
Chevron Refinery	422232.9	4519660.5	7.1
Big West Oil Refinery	422535.9	4521115.5	5.6
Silver Eagle Refinery	423257.9	4524414.5	2.3

The emissions and source information for PacifiCorp's Gadsby Plant, Chevron, Silver Eagle, Tesoro, and Big West Refineries and Bountiful Power were added to the Holly AERMOD model setup for proposed and existing sources and the model was rerun. Per the UDAQ, permit limits on daily NO_2 emissions were modeled. Stack parameters and emission rates were provided by UDAQ. All sources included in the full impact analysis were modeled as point sources. Full impact source parameters and emission rates are provided in Appendix I. The results of the full impact analysis are presented in Table 6-14 and in Appendix J.

Table 6-14

Full Impact Analysis AERMOD Results

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)	Location of Model Predicted Concentration	
			UTM East (meters)	UTM North (meters)
NO_2	1-hour[1]	167.8[2]	421500.0	4518000.0

[1] - 98th percentile based on a three-year average (2007-2009)
[2] - Includes background concentrations from UDAQ's Bountiful monitor

6.17 National Ambient Air Quality Standard Compliance

For NAAQS compliance, the background pollutant concentrations obtained from the UDAQ were added to the modeled maximum concentrations to evaluate the total impact. The modeled maximum and HSH pollutant concentrations, background concentrations, NAAQS, and percent of NAAQS for Holly heavy crude processing project sources and existing sources are presented in Table 6-15. The maximum, background concentrations, NAAQS, and percent of NAAQS for all sources modeled (Holly plus full impact sources) are presented in Table 6-16.

Table 6-15

NAAQS Compliance Demonstration for Holly's Proposed Heavy Crude Processing Project and Existing Holly Sources Only

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
NO_2	1-hour[1]	88.3[2]	89.7	178.0	188.7	94.3%
	Annual	5.4	35.5	40.9	100	40.9%
CO	1-hour	258.9	4,122	4,380.9	40,000	11.0%
	8-hour	86.9	2,484	2,570.9	10,000	25.7%
SO_2	1-hour[3]	24.2	26.2	50.4	196	25.7%
PM_{10}	24-hour (high)	80.6	56.3	136.9	150	91.3%
	24-hour (HSH)	55.7	56.3	112.0	150	74.7%

HSH – High-Second-High
[1] - 98th percentile based on a three-year average (2006-2008)
[2] – Without corresponding background concentrations from UDAQ's Bountiful monitor
[3] - 99th percentile based on a three-year average (2006-2008)

Table 6-16

NAAQS Compliance Demonstration for Full Impact Analysis Sources

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Total ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
NO_2	1-hour[1]	167.8	included	167.8	188.7	88.9%

[1] - 98th percentile based on a three-year average (2007-2009)

Full impact concentration isopleth plots for the entire modeling domain for the one-hour NO_2 are presented in Figure 6.15.

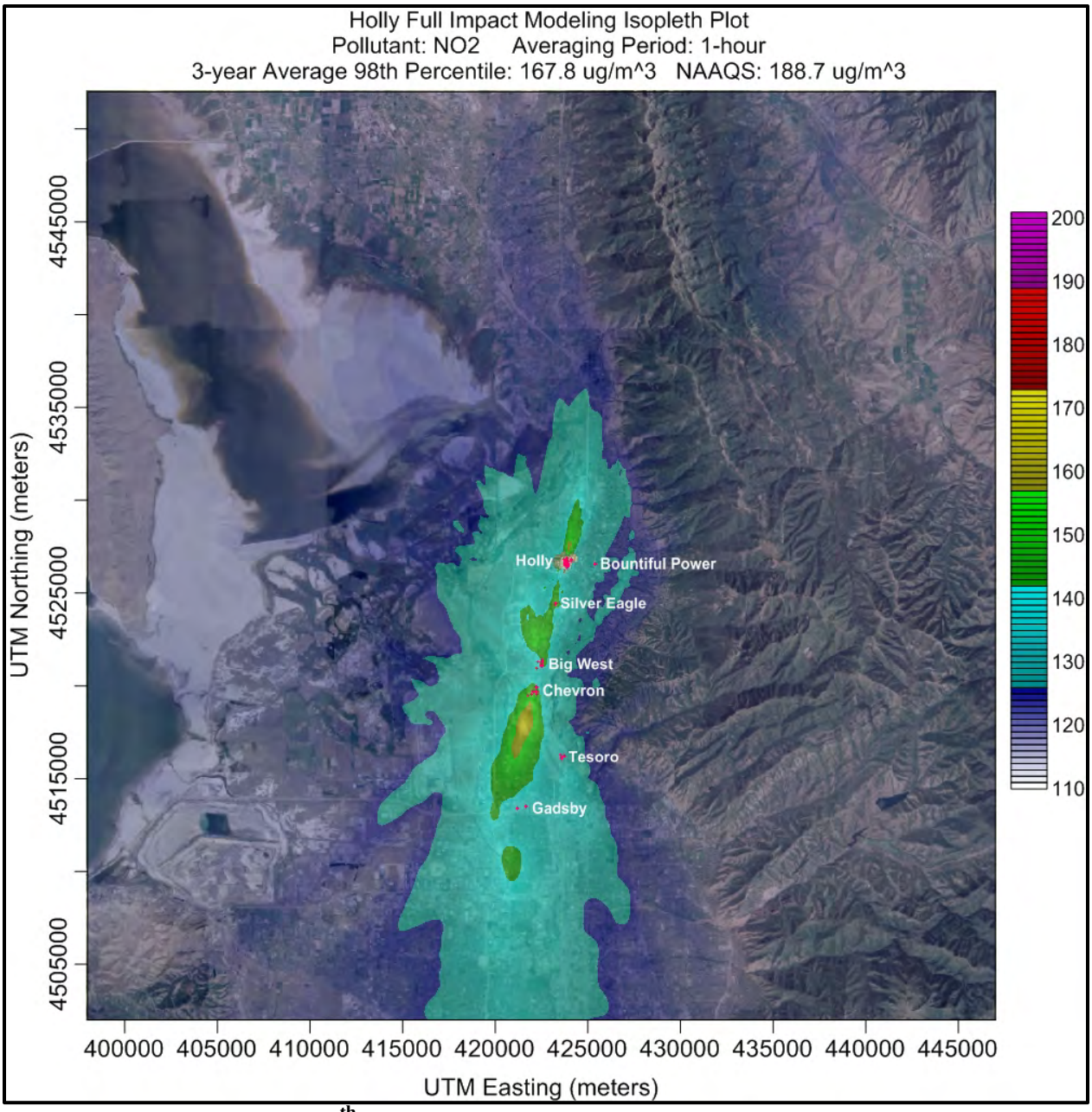

Figure 6.15 Modeled 98th Percentile One-Hour NO_2 Concentration Isopleth Plot – Full Impact Analysis - Entire Modeling Domain Based on Three-Year Average

6.18 PSD Class II Increment Compliance

For the PSD increment analysis, all NO_2 sources were assumed to consume PSD increment. The modeled maximum pollutant concentrations full impact sources for NO_2 were evaluated against the PSD Class II increments. The modeled pollutant concentrations, the PSD Class II increment, and percent of Class II increment consumed by full impact NO_2 sources are presented in Table 6-17.

Table 6-17

PSD Class II Increment Compliance for Full Impact Analysis Sources

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$)	PSD Class II Increment ($\mu g/m^3$)	Percent of Class II Increment
NO_2	Annual[1]	9.3	25	37.2%

[1]Holly and full impact analysis sources

6.19 Hazardous Air Pollutant Air Quality Analyses

Hazardous air pollutant analyses were performed in accordance with Utah Administrative Code R307-410-5. To determine which HAPs required modeling, the UDAQ's 2009 ACGIH Threshold Limit Values (TLVs), Toxic Screening Levels (TSLs) and Emission Threshold Values (ETVs) Microsoft Excel spreadsheet was utilized. The spreadsheet TLVs were updated with data from the ACGIH's 2011 TLV and BEI's Threshold Limit Values for Chemical Substances and Physical Agents & Biological Exposure Indices Handbook.

Based on the spreadsheet results (presented in Appendix K), the emission rates of benzene, formaldehyde, beryllium, cadmium, chromium, and chlorine were above the ETV levels. Thus, dispersion modeling for these HAPs was conducted and the HAP model output is presented in Appendix L. All three HAPs were modeled as a vertically unrestricted release with a distance of greater than 20 meters to the property line.

Formaldehyde was considered to be acute while beryllium and chlorine were considered to be chronic and benzene, cadmium and chromium were considered carcinogenic. Per R307-410-5, the toxic screenings level is calculated by dividing safety factors to the TLV defined in ACGIH. The TLV is divided by 10 for averaging periods of 1-hour or less. For Chronic HAPs, the TLV is divided by 30 for a 24-hour averaging period and for carcinogenic HAPs, the TLV is divided by a safety factor of 90 for a 24-hour averaging period. The results of the HAPS modeling are presented in Table 6-18 and Appendix L.

Table 6-18

Modeled Maximum HAP Concentrations

HAP	Averaging Period	Model Predicted Conc. (ug/m3)	TLV ug/m3	Safety Factor	TSL (ug/m3)	Percent of NAAQS
Benzene	24-HR	0.6	1597.3	90	17.7	3.3%
Formaldehyde	1-HR	0.6	368.5	10	36.8	1.5%
Beryllium	24-HR	0.00E+00	0.1	30	1.67E-03	0.0%
Cadmium	24-HR	1.70E-04	2.0	90	2.22E-02	0.8%
Chromium	24-HR	2.20E-04	10.0	90	1.11E-01	0.2%
Chlorine	24-HR	1.7	1450.1	30	48.3	3.6%

6.20 Preconstruction Monitoring

The results of the SIL modeling were reviewed to determine if the ambient impacts from the proposed heavy crude processing project were below significant monitoring concentrations.

7.0 ADDITIONAL IMPACT ANALYSES

This section contains supplemental information regarding the potential impacts of the project; specifically, the potential for impacts to soils, vegetation, and growth.

7.1 Soils and Vegetation Analysis

The Holly Refinery is located in Davis County, Utah. The United States Department of Agriculture, Natural Resource conservation Service, Web Soil Survey tool was used to inventory the soil and vegetation types found in the area. Soils surrounding the refinery are mostly Draper and Chance loams, Logan silty clay loam, and Woods Cross silty clay loam. The most common vegetation in these soil types includes Kentucky bluegrass, clustered field and Nebraska sedge, and Arctic rush. The soil report and information on rangeland and forest vegetation classifications, productivity, and plant composition is included in Appendix M.

No sensitive aspects of the soil and vegetation in the area surrounding the facility have been identified. Carbon monoxide is generally not phytotoxic. Consequently, the evaluation of the secondary NAAQS, which was established to protect public welfare including the prevention of damage to vegetation, can be used to demonstrate that the increase in CO from the proposed project will not result in harmful effects. A conservative quantitative analysis was conducted by comparing the AERMOD-predicted ambient impacts of CO to the screening criteria for sensitive vegetation species as found in EPA's Screening Procedure for the Impacts of Air Pollution Sources of Plants, Soils, and Animals[19]. The results of the analysis are presented in Table 7-1. For CO, the listed one-week impact is conservatively assumed to be the same as the AERMOD-predicted 8-hour impact from the proposed new sources.

[19] U.S. Environmental Protection Agency, 1980: A Screening Procedure for the Impacts of Air Pollution Sources of Plants, Soils, and Animals. EPA-450/2-81/078.

Table 7-1

Vegetation Impact Analysis

Pollutant	Averaging Period	Modeled Impact[1] ($\mu g/m^3$)	Screening Concentration ($\mu g/m^3$)
CO	1-week	110.8	1,800,000

[1] Model predicted impact is maximum 8-hour concentration from new sources

Thus, as demonstrated in the analysis above, the maximum ground-level concentration associated is well below the EPA's screening concentration. Thus, it can be concluded that the proposed project will not have an adverse impact upon local soils and vegetation.

7.2 Growth Analysis

The work force for the proposed expansion project is expected to range from 50 to 100 jobs during various phases of the construction. It is expected that a regional construction force is already available to build the proposed expansion. Therefore, it is anticipated that no new housing, commercial or industrial construction is necessary to support Holly Refining & Marketing Company during the two-year construction schedule.

With the expansion, approximately 25 permanent positions will be added. It is assumed that individuals that already live in the region will perform these jobs. No new housing requirements are expected for any new personnel moving to the area. In addition, due to the small number of new individuals expected to move into the area to support the expansion project and the existence of commercial activity in the area, new commercial construction would not be necessary to support the permanent work force. Additionally, no significant level of industrial related support will be necessary for Holly's expansion project. Therefore, industrial growth is not expected. Based on the growth expectations discussed above, no new significant emissions from secondary growth during the construction and operation phases of Holly's expansion project are anticipated.

8.0 REFERENCES

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Appendix A
Baseline Emission Estimates

		PM10 Tons	PM2.5 Tons	SOx Tons	NOx Tons	VOC Tons	CO Tons	Lead Tons	Benzene Tons	Formalde. Tons	Hexane Tons	Toluene Tons	Arsenic Tons	Cadmium Tons	Chromium Tons	Cobalt Tons	Mercury Tons	Nickel Tons
2003	2004	57.16	36.25	446.72	66.43	14.56	49.66	0.00007	0.00029	0.01	0.25	0.00047	0.00003	0.00016	0.00020	0.00001	0.00004	0.03802
2004	2005	55.85	35.50	426.16	65.08	14.38	54.68	0.00013	-	-	-	-	-	-	-	-	-	-
2005	2006	57.73	36.77	442.36	68.95	14.11	69.37	0.00007	0.00042	0.01	0.36	0.00069	0.00004	0.00022	0.00028	0.00002	0.00005	0.03406
2006	2007	50.83	25.26	470.83	80.62	15.47	118.11	0.00007	0.00071	0.02	0.61	0.00115	0.00007	0.00038	0.00047	0.00003	0.00009	0.06799
2007	2008	41.64	25.54	461.99	84.10	12.79	137.13	0.00014	0.00065	0.02	0.55	0.00105	0.00006	0.00034	0.00043	0.00003	0.00008	0.05244
2008	2009	42.45	39.72	443.62	85.15	12.09	139.54	0.00007	0.00083	0.03	0.71	0.00135	0.00008	0.00044	0.00055	0.00004	0.00010	0.03867
2009	2010	42.96	40.23	329.43	96.65	15.56	162.27	-	0.00093	0.03	0.80	0.00151	0.00009	0.00049	0.00062	0.00004	0.00011	0.03476

SRU Incinerator - Unit 17
Holly Refining & Marketing

	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	Benzene	Formalde.	Hexane	Toluene	Arsenic	Cadmium	Chromium	Cobalt	Mercury	Nickel
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
2001	0.07	0.07	139.45	0.88	0.05	0.74	0.00E+00	2.00E-05	6.80E-04	1.63E-02	3.00E-05	0.00E+00	1.00E-05	1.50E-05	0.00E+00	0.00E+00	2.00E-05
2002	0.06		147.73	0.78	0.04	0.65	0.00E+00	1.50E-05	5.90E-04	1.41E-02	2.50E-05	0.00E+00	1.00E-05	1.00E-05	0.00E+00	0.00E+00	1.50E-05
2003	0.07	0.07	159.08	0.86	0.05	0.72	0.00E+00	1.50E-05	5.90E-04	1.41E-02	2.50E-05	0.00E+00	1.00E-05	1.00E-05	0.00E+00	0.00E+00	1.50E-05
2004	0.06	0.06	149.37	0.85	0.05	0.71	4.24E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2005	0.06	0.06	149.37	0.85	0.05	0.71	4.24E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2006	0.06	0.06	170.78	0.74	0.04	0.62	0.00E+00	1.50E-05	6.10E-04	1.46E-02	3.00E-05	0.00E+00	1.00E-05	1.00E-05	0.00E+00	0.00E+00	1.50E-05
2007	0.06	0.06	170.78	0.80	0.04	0.68	4.02E-06	1.50E-05	6.10E-04	1.46E-02	3.00E-05	0.00E+00	1.00E-05	1.00E-05	0.00E+00	0.00E+00	1.50E-05
2008	0.07	0.07	125.39	0.90	0.05	0.75	4.02E-06	2.00E-05	6.70E-04	1.61E-02	3.00E-05	0.00E+00	1.00E-05	1.00E-05	0.00E+00	0.00E+00	2.00E-05
2009	0.07	0.07	119.62	0.89	0.05	0.75	0.00E+00	2.00E-05	6.70E-04	1.61E-02	3.00E-05	0.00E+00	1.00E-05	1.00E-05	0.00E+00	0.00E+00	2.00E-05
2010	0.07	0.07	182.94	0.90	0.05	0.76	0.00E+00	2.00E-05	6.65E-04	1.60E-02	3.00E-05	0.00E+00	1.00E-05	1.00E-05	0.00E+00	0.00E+00	2.00E-05
2011	0.07	0.07	122.45	0.90	0.05	0.76											
2003	0.0672	0.0672	154.2250	0.8541	0.0483	0.7162	0.0000	0.0000	0.0003	0.0071	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2004	0.0645	0.0645	149.3700	0.8481	0.0466	0.7124	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2005	0.0622	0.0622	160.0750	0.7941	0.0433	0.6662	0.0000	0.0000	0.0003	0.0073	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2006	0.0605	0.0605	170.7800	0.7719	0.0421	0.6476	0.0000	0.0000	0.0006	0.0146	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2007	0.0655	0.0655	148.0850	0.8519	0.0471	0.7126	0.0000	0.0000	0.0006	0.0153	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2008	0.0700	0.0700	122.5050	0.8950	0.0500	0.7500	0.0000	0.0000	0.0007	0.0161	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2009	0.0700	0.0700	151.2800	0.8950	0.0500	0.7550	0.0000	0.0000	0.0007	0.0160	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2010	0.0700	0.0700	152.6950	0.9000	0.0500	0.7600	0.0000	0.0000	0.0007	0.0160	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0700	0.0700	170.7800	0.8950	0.0500	0.7550	0.0000	0.0000	0.0007	0.0161	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

South Flare - 66-1
Holly Refining & Marketing

	PM10 Tons	PM2.5 Tons	SOx Tons	NOx Tons	VOC Tons	CO Tons	Lead Tons	Benzene Tons	Formalde. Tons	Hexane Tons	Toluene Tons	Arsenic Tons	Cadmium Tons	Chromium Tons	Cobalt Tons	Mercury Tons	Nickel Tons
2001	0.04	0.04	0.05	0.36	0.03	1.94	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2002	0.01		0.00	0.13	0.01	0.70	0.00E+00	7.00E-05	2.59E-03	6.21E-02	1.15E-04	5.00E-06	4.00E-05	5.00E-05	5.00E-06	1.00E-05	7.00E-05
2003	0.11	0.11	23.68	2.09	2.34	11.37	0.00E+00	2.50E-05	9.75E-04	2.34E-02	4.50E-05	5.00E-06	1.50E-05	2.00E-05		5.00E-06	2.50E-05
2004	0.10	0.10	6.29	1.37	0.91	7.03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2005	0.10	0.10	6.29	1.37	0.91	7.03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2006	0.00	0.00	2.55	0.54	1.08	2.97	0.00E+00	1.35E-04	4.85E-03	1.16E-01	2.20E-04	1.50E-05	7.00E-05	9.00E-05	5.00E-06	1.50E-05	1.35E-04
2007	0.00	0.00	1.27	1.32	3.80	4.76	0.00E+00	0.00E+00	0.00E+00	5.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2008	0.00	0.00	4.44	2.32	4.78	12.62	0.00E+00	0.00E+00	0.00E+00	2.50E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2009	0.00	0.00	2.38	0.80	1.65	4.35	0.00E+00	0.00E+00	0.00E+00	5.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2010	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Assumptions:
South Flare rebuilt

2003	0.1035	0.1035	14.9859	1.7279	1.6251	9.2002	0.0000	0.0000	0.0005	0.0117	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2004	0.0971	0.0971	6.2918	1.3659	0.9102	7.0303	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2005	0.0485	0.0485	4.4209	0.9529	0.9951	5.0002	0.0000	0.0001	0.0024	0.0581	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
2006	0.0000	0.0000	1.9100	0.9300	2.4400	3.8650	0.0000	0.0001	0.0024	0.0581	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
2007	0.0000	0.0000	2.8550	1.8200	4.2900	8.6900	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2008	0.0000	0.0000	3.4100	1.5600	3.2150	8.4850	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2009	0.0000	0.0000	1.1900	0.4000	0.8250	2.1750	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.1035	0.1035	14.9859	1.8200	4.2900	9.2002	0.0000	0.0001	0.0024	0.0581	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001

FCCU-4H1
Holly Refining & Marketing

	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	Benzene	Formalde.	Hexane	Toluene	Arsenic	Cadmium	Chromium	Cobalt	Mercury	Nickel
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
2001	1.09	1.09	1.48	7.15	0.79	12.01	7.50E-05	3.10E-04	1.11E-02	2.67E-01	5.05E-04	3.00E-05	1.65E-04	2.10E-04	1.00E-05	4.00E-05	3.10E-04
2002	1.00		0.26	6.55	0.72	11.01	0.00E+00	2.75E-04	9.90E-03	2.38E-01	4.50E-04	2.50E-05	1.45E-04	1.85E-04	1.00E-05	3.50E-05	2.75E-04
2003	0.98	0.98	0.59	6.42	0.71	10.78	0.00E+00	2.45E-04	8.81E-03	2.11E-01	4.00E-04	2.50E-05	1.30E-04	1.65E-04	1.00E-05	3.00E-05	2.45E-04
2004	1.08	1.08	1.58	7.12	0.78	11.96	7.12E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2005	1.08	1.08	1.58	4.56	0.78	11.96	7.12E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2006	0.94	0.94	0.2	6.16	0.68	10.35	0.00E+00	2.85E-04	1.01E-02	2.43E-01	4.60E-04	2.50E-05	1.50E-04	1.90E-04	1.00E-05	3.50E-05	2.85E-04
2007	1.00	1.00	0.21	6.57	0.72	11.04	6.57E-05	2.85E-04	1.02E-02	2.45E-01	4.65E-04	2.50E-05	1.50E-04	1.90E-04	1.00E-05	3.50E-05	2.85E-04
2008	0.90	0.90	0.25	5.93	0.65	9.96	6.57E-05	2.45E-04	8.83E-03	2.12E-01	4.00E-04	2.50E-05	1.30E-04	1.65E-04	1.00E-05	3.00E-05	2.45E-04
2009	0.89	0.89	0.37	5.87	0.65	9.86	0.00E+00	2.50E-04	8.85E-03	2.12E-01	4.00E-04	2.50E-05	1.30E-04	1.65E-04	1.00E-05	3.00E-05	2.50E-04
2010	1.11	1.11	0.39	7.32	0.80	12.29	0.00E+00	3.00E-04	1.08E-02	2.59E-01	4.90E-04	3.00E-05	1.60E-04	2.00E-04	1.00E-05	3.50E-05	3.00E-04
2011	0.90	0.90	0.21	5.91	0.65	9.93											

Assumptions:
Emissions will be routed to wet scrubber
CO Boiler Removed

2003	1.0312	1.0312	1.0854	6.7702	0.7466	11.3712	0.0000	0.0001	0.0044	0.1057	0.0002	0.0000	0.0001	0.0001	0.0000	0.0000	0.0001
2004	1.0823	1.0823	1.5807	5.8388	0.7832	11.9623	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2005	1.0112	1.0112	0.8904	5.3585	0.7316	11.1562	0.0000	0.0001	0.0051	0.1213	0.0002	0.0000	0.0001	0.0001	0.0000	0.0000	0.0001
2006	0.9696	0.9696	0.2029	6.3666	0.7015	10.6964	0.0000	0.0003	0.0102	0.2440	0.0005	0.0000	0.0002	0.0002	0.0000	0.0000	0.0003
2007	0.9496	0.9496	0.2279	6.2516	0.6865	10.5014	0.0001	0.0003	0.0095	0.2286	0.0004	0.0000	0.0001	0.0002	0.0000	0.0000	0.0003
2008	0.8950	0.8950	0.3100	5.9000	0.6500	9.9100	0.0000	0.0002	0.0088	0.2121	0.0004	0.0000	0.0001	0.0002	0.0000	0.0000	0.0002
2009	1.0000	1.0000	0.3800	6.5950	0.7250	11.0750	0.0000	0.0003	0.0098	0.2357	0.0004	0.0000	0.0001	0.0002	0.0000	0.0000	0.0003
2010	1.0050	1.0050	0.3000	6.6150	0.7250	11.1100	0.0000	0.0003	0.0108	0.2590	0.0005	0.0000	0.0002	0.0002	0.0000	0.0000	0.0003
	1.0823	1.0823	1.5807	6.7702	0.7832	11.9623	0.0001	0.0003	0.0102	0.2440	0.0005	0.0000	0.0002	0.0002	0.0000	0.0000	0.0003

Asphalt Furnace - 45H1
Holly Refining & Marketing

	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	Benzene	Formalde.	Hexane	Toluene	Arsenic	Cadmium	Chromium	Cobalt	Mercury	Nickel
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2006	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2010	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2011	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Assumptions:
This unit is being removed.

2003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2010	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

CO Boiler - 51-6
Holly Refining & Marketing

	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	Benzene	Formalde.	Hexane	Toluene	Arsenic	Cadmium	Chromium	Cobalt	Mercury	Nickel
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
2001	113.99	0.92	422.55	76.18	0.66	10.15	6.50E-05	2.65E-04	9.40E-03	2.26E-01	4.25E-04	2.50E-05	1.40E-04	1.75E-04	1.00E-05	3.50E-05	1.90E-01
2002	56.27		279.50	54.51	0.65	9.92	0.00E+00	2.50E-04	8.92E-03	2.14E-01	4.05E-04	2.50E-05	1.30E-04	1.65E-04	1.00E-05	3.00E-05	9.42E-02
2003	57.12	35.64	283.73	55.33	0.78	11.90	0.00E+00	2.70E-04	9.72E-03	2.33E-01	4.40E-04	2.50E-05	1.45E-04	1.80E-04	1.00E-05	3.50E-05	7.57E-02
2004	54.10	33.75	269.11	52.41	0.64	9.85	5.86E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2005	54.10	33.75	268.72	52.41	0.64	9.85	5.86E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2006	57.41	35.82	285.22	55.61	0.65	9.95	0.00E+00	2.70E-04	9.73E-03	2.33E-01	4.40E-04	2.50E-05	1.45E-04	1.80E-04	1.00E-05	3.50E-05	6.76E-02
2007	38.46	8.93	310.66	55.57	0.74	11.23	6.69E-05	2.70E-04	9.73E-03	2.33E-01	4.40E-04	2.50E-05	1.45E-04	1.80E-04	1.00E-05	3.50E-05	6.76E-02
2008	38.50	35.83	310.98	55.63	0.67	10.19	6.69E-05	2.55E-04	9.04E-03	2.17E-01	4.10E-04	2.50E-05	1.35E-04	1.70E-04	1.00E-05	3.00E-05	3.66E-02
2009	40.09	37.30	323.80	57.92	0.83	12.73	0.00E+00	3.20E-04	1.14E-02	2.74E-01	5.20E-04	3.00E-05	1.70E-04	2.15E-04	1.50E-05	4.00E-05	3.97E-02
2010	38.48	35.81	29.35	72.08	0.82	25.24	0.00E+00	3.05E-04	1.09E-02	2.62E-01	4.95E-04	3.00E-05	1.60E-04	2.05E-04	1.00E-05	4.00E-05	2.86E-02
2011	38.23	35.57	28.44	58.05	0.72	33.79											

Assumptions:
CO Boiler will be removed

2003	55.6092	34.6974	276.4188	53.8683	0.7124	10.8737	0.0000	0.0001	0.0049	0.1166	0.0002	0.0000	0.0001	0.0001	0.0000	0.0000	0.0379
2004	54.0984	33.7548	268.9127	52.4066	0.6448	9.8473	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2005	55.7542	34.7874	276.9688	54.0083	0.6474	9.8987	0.0000	0.0001	0.0049	0.1167	0.0002	0.0000	0.0001	0.0001	0.0000	0.0000	0.0338
2006	47.9353	22.3730	297.9403	55.5894	0.6928	10.5924	0.0000	0.0003	0.0097	0.2334	0.0004	0.0000	0.0001	0.0002	0.0000	0.0000	0.0676
2007	38.4803	22.3780	310.8203	55.5994	0.7028	10.7124	0.0001	0.0003	0.0094	0.2251	0.0004	0.0000	0.0001	0.0002	0.0000	0.0000	0.0521
2008	39.2950	36.5650	317.3900	56.7750	0.7500	11.4600	0.0000	0.0003	0.0102	0.2456	0.0005	0.0000	0.0002	0.0002	0.0000	0.0000	0.0381
2009	39.2850	36.5550	176.5750	65.0000	0.8250	18.9850	0.0000	0.0003	0.0112	0.2683	0.0005	0.0000	0.0002	0.0002	0.0000	0.0000	0.0341
2010	38.3550	35.6900	28.8950	65.0650	0.7700	29.5150	0.0000	0.0003	0.0109	0.2622	0.0005	0.0000	0.0002	0.0002	0.0000	0.0000	0.0286
	55.7542	36.5650	317.3900	65.0000	0.8250	18.9850	0.0001	0.0003	0.0112	0.2683	0.0005	0.0000	0.0002	0.0002	0.0000	0.0000	0.0676

Cooling Towers ALL - 5 towers including #11
Holly Refining & Marketing

	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	Benzene	Formalde.	Hexane	Toluene	Arsenic	Cadmium	Chromium	Cobalt	Mercury	Nickel
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
2001	0	0	0	0	45.44	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	43.35	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	42.07	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	45.84	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	45.84	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	43.49	0	0	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	43.49	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	44.81	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	46.14	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	47.59	0	0	0	0	0	0	0	0	0	0	0	0

Assumptions:
Implementation of monthly cooling tower hydrocarbon monitoring.

2003	0.0000	0.0000	0.0000	0.0000	43.9535	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2004	0.0000	0.0000	0.0000	0.0000	45.8370	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2005	0.0000	0.0000	0.0000	0.0000	44.6635	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2006	0.0000	0.0000	0.0000	0.0000	43.4900	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2007	0.0000	0.0000	0.0000	0.0000	44.1500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2008	0.0000	0.0000	0.0000	0.0000	45.4750	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2009	0.0000	0.0000	0.0000	0.0000	46.8650	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	46.8650	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Cooling Tower #11 - CT11
Holly Refining & Marketing

	PM10 Tons	PM2.5 Tons	SOx Tons	NOx Tons	VOC Tons	CO Tons	Lead Tons	Benzene Tons	Formalde. Tons	Hexane Tons	Toluene Tons	Arsenic Tons	Cadmium Tons	Chromium Tons	Cobalt Tons	Mercury Tons	Nickel Tons
2001	0	0	0	0	9.09	0	0	0	0	0	0	0	0	0	0	0	0
2002	0	0	0	0	8.67	0	0	0	0	0	0	0	0	0	0	0	0
2003	0	0	0	0	8.41	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	9.17	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	9.17	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	8.70	0	0	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	8.70	0	0	0	0	0	0	0	0	0	0	0	0
2008	0	0	0	0	0.00	0	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	0	0	9.23	0	0	0	0	0	0	0	0	0	0	0	0
2010	0	0	0	0	9.52	0	0	0	0	0	0	0	0	0	0	0	0

New cell added to cooling tower 11

2003	0.0000	0.0000	0.0000	0.0000	8.7907	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2004	0.0000	0.0000	0.0000	0.0000	9.1674	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2005	0.0000	0.0000	0.0000	0.0000	8.9327	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2006	0.0000	0.0000	0.0000	0.0000	8.6990	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2007	0.0000	0.0000	0.0000	0.0000	4.3500	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2008	0.0000	0.0000	0.0000	0.0000	4.6140	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2009	0.0000	0.0000	0.0000	0.0000	9.3730	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	9.3730	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Propane Pit Flare 68-1
Holly Refining & Marketing

	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	Benzene	Formalde.	Hexane	Toluene	Arsenic	Cadmium	Chromium	Cobalt	Mercury	Nickel	Naphthalene
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
2001																		
2002																		
2003	0.2	0.2	0.0	1.81	0.14	9.87	0	2.00E-05	7.95E-04	1.91E-02	3.50E-05	0.00E+00	1.00E-05	1.50E-05	0.00E+00	5.00E-06	2.00E-05	0.000005
2004	0.51	0.51	0.0	4.62	0.37	25.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2005	0.51	0.51	0.0	4.62	0.37	25.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2006	1.21	1.21	0.0	11.06	0.88	60.17	0	1.35E-04	6.75E-08	1.16E-01	2.20E-04	1.50E-05	7.00E-05	9.00E-05	5.00E-06	1.50E-05	1.35E-04	0.00004
2007	2.51	2.51	0.0	22.87	1.81	124.45	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2008	1.78	1.78	0.0	16.28	1.29	88.58	0	2.00E-04	7.13E-03	1.71E-01	3.25E-04	2.00E-05	1.05E-04	1.35E-04	1.00E-05	2.50E-05	2.00E-04	0.00006
2009	2.6	2.6	0.0	23.76	1.88	129.28	0	3.55E-04	1.27E-02	3.05E-01	5.75E-04	3.50E-05	1.85E-04	2.35E-04	1.50E-05	4.50E-05	3.55E-04	0.000105
2010	2.6	2.6	0.0	23.76	1.88	129.27	0	2.90E-04	1.04E-02	2.50E-01	4.70E-04	3.00E-05	1.55E-04	1.95E-04	1.00E-05	3.50E-05	0.00029	0.000085
2011	2.6	2.6	0.0	23.76	1.88	129.27												

Assumptions:
Flare will be removed

2003	0.3530	0.3530	0.0000	3.2138	0.2531	17.4975	0.0000	0.0000	0.0004	0.0095	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2004	0.5060	0.5060	0.0000	4.6176	0.3662	25.1249	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2005	0.8580	0.8580	0.0000	7.8388	0.6231	42.6475	0.0000	0.0001	0.0000	0.0581	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
2006	1.8600	1.8600	0.0000	16.9650	1.3450	92.3100	0.0000	0.0001	0.0000	0.0581	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
2007	2.1450	2.1450	0.0000	19.5750	1.5500	106.5150	0.0000	0.0001	0.0036	0.0856	0.0002	0.0000	0.0001	0.0001	0.0000	0.0000	0.0001
2008	2.1900	2.1900	0.0000	20.0200	1.5850	108.9300	0.0000	0.0003	0.0099	0.2381	0.0005	0.0000	0.0001	0.0002	0.0000	0.0000	0.0003
2009	2.6000	2.6000	0.0000	23.7600	1.8800	129.2750	0.0000	0.0003	0.0116	0.2774	0.0005	0.0000	0.0002	0.0002	0.0000	0.0000	0.0003
2010	2.6000	2.6000	0.0000	23.7600	1.8800	129.2700	0.0000	0.0003	0.0104	0.2498	0.0005	0.0000	0.0002	0.0002	0.0000	0.0000	0.0003
	2.6000	2.6000	0.0000	23.7600	1.8800	129.2750	0.0000	0.0003	0.0116	0.2774	0.0005	0.0000	0.0002	0.0002	0.0000	0.0000	0.0003

Tank 49
Holly Refining & Marketing

	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	Benzene	Formalde.	Hexane	Toluene	Arsenic	Cadmium	Chromium	Cobalt	Mercury	Nickel
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
2001	0	0	0	0	0.06	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2002	0	0	0	0	0.05	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2003	0	0	0	0	0.05	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2004	0	0	0	0	0	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2005	0	0	0	0	0.00	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2006	0	0	0	0	0.00	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2007	0	0	0	0	0.00	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2008	0	0	0	0	0.00	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2009	0	0	0	0	0.00	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2010	0	0	0	0	0.00	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

2003	0.0000	0.0000	0.0000	0.0000	0.0250	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0250	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Tank 59
Holly Refining & Marketing

	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	Benzene	Formalde.	Hexane	Toluene	Arsenic	Cadmium	Chromium	Cobalt	Mercury	Nickel
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
2001	0	0	0	0	0.030	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2002	0	0	0	0	0.030	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2003	0	0	0	0	0.030	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2004	0	0	0	0	0.031	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2005	0	0	0	0	0.031	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2006	0	0	0	0	0.000	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2007	0	0	0	0	0.000	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2008	0	0	0	0	0.000	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2009	0	0	0	0	0.000	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2010	0	0	0	0	0.000	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

2003	0.0000	0.0000	0.0000	0.0000	0.0305	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2004	0.0000	0.0000	0.0000	0.0000	0.0310	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2005	0.0000	0.0000	0.0000	0.0000	0.0155	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2006	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2007	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2008	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2009	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0310	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Tank 71
Holly Refining & Marketing

	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	Benzene	Formalde.	Hexane	Toluene	Arsenic	Cadmium	Chromium	Cobalt	Mercury	Nickel
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
2001	0	0	0	0	0.010	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2002	0	0	0	0	0.550	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2003	0	0	0	0	0.780	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2004	0	0	0	0	0.921	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2005	0	0	0	0	0.921	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2006	0	0	0	0	0.010	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2007	0	0	0	0	0.250	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2008	0	0	0	0	0.692	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2009	0	0	0	0	0.896	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2010	0	0	0	0	0.569	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

2003	0.0000	0.0000	0.0000	0.0000	0.8503	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2004	0.0000	0.0000	0.0000	0.0000	0.9205	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2005	0.0000	0.0000	0.0000	0.0000	0.4653	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2006	0.0000	0.0000	0.0000	0.0000	0.1302	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2007	0.0000	0.0000	0.0000	0.0000	0.4711	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2008	0.0000	0.0000	0.0000	0.0000	0.7939	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2009	0.0000	0.0000	0.0000	0.0000	0.7324	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.9205	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Tank 72
Holly Refining & Marketing

	PM10	PM2.5	SOx	NOx	VOC	CO	Lead	Benzene	Formalde.	Hexane	Toluene	Arsenic	Cadmium	Chromium	Cobalt	Mercury	Nickel
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
2001	0	0	0	0	0.01	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2002	0	0	0	0	1.62	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2003	0	0	0	0	1.45	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2004	0	0	0	0	1.51	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2005	0	0	0	0	1.51	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2006	0	0	0	0	1.80	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2007	0	0	0	0	1.03	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2008	0	0	0	0	0.35	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2009	0	0	0	0	0.50	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2010	0	0	0	0	1.79	0	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

2003	0.0000	0.0000	0.0000	0.0000	1.4815	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2004	0.0000	0.0000	0.0000	0.0000	1.5131	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2005	0.0000	0.0000	0.0000	0.0000	1.6565	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2006	0.0000	0.0000	0.0000	0.0000	1.4149	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2007	0.0000	0.0000	0.0000	0.0000	0.6908	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2008	0.0000	0.0000	0.0000	0.0000	0.4274	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2009	0.0000	0.0000	0.0000	0.0000	1.1471	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	1.6565	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Appendix B
PTE Emission Estimates for Heavy Crude Expansion Project

HAPS Summary - New Sources Only
Holly Marketing & Refining Company

	24H1 Crude Furnace #3 (lb/hr)	25H1 FCC #2 Heater (lb/hr)	26H1 Hot Oil Furnace (lb/hr)	27H1 Reactor Charge Htr (lb/hr)	20H3 Reactor Charge Htr (lb/hr)	Boiler #11 (lb/hr)	Cooling Tower #10 (lb/hr)	Cooling Tower #11 (lb/hr)	33H1 Vacuum Heater (lb/hr)	Emer. Gen. (lb/hr)	Other Emer. Eq. (lb/hr)	Tank Heaters (lb/hr)	Flare (lb/hr)	Tanks (lb/hr)	Fugitives (lb/hr)	Total (lb/hr)
Benzene	1.24E-04	9.26E-05	2.88E-05	2.04E-04	8.67E-05	1.84E-04	5.78E-02	8.83E-02	2.68E-04	1.28E-03	3.55E-03	9.88E-06	2.70E-03	9.51E-04	4.32E-02	0.19881
Formaldehyde	4.41E-03	3.31E-03	1.03E-03	7.28E-03	3.10E-03	6.57E-03			9.56E-03	1.62E-03	4.49E-03	3.53E-04	1.99E-02			0.06158
Hexane	1.06E-01	7.94E-02	2.47E-02	1.75E-01	7.43E-02	1.58E-01	7.05E-02	1.08E-01	2.29E-01			8.47E-03	4.93E-04	2.00E-03	5.28E-02	1.08806
Naphthalene	3.59E-05	2.69E-05	8.37E-06	5.92E-05	2.52E-05	5.34E-05	9.59E-05	1.46E-04	7.77E-05	1.16E-04	3.23E-04	2.87E-06	1.87E-04		7.09E-05	0.00123
Toluene	2.00E-04	1.50E-04	4.67E-05	3.30E-04	1.40E-04	2.98E-04	4.77E-02	7.30E-02	4.33E-04	5.60E-04	1.56E-03	1.60E-05	9.86E-04	1.37E-03	3.57E-02	0.16251
Arsenic	1.18E-05	8.82E-06	2.75E-06	1.94E-05	8.25E-06	1.75E-05			2.55E-05			9.41E-07				0.00009
Beryllium	7.06E-07	5.29E-07	1.65E-07	1.16E-06	4.95E-07	1.05E-06			1.53E-06			5.65E-08				0.00001
Cadmium	6.47E-05	4.85E-05	1.51E-05	1.07E-04	4.54E-05	9.63E-05			1.40E-04			5.18E-06				0.00052
Chromium	8.24E-05	6.18E-05	1.92E-05	1.36E-04	5.78E-05	1.23E-04			1.78E-04			6.59E-06				0.00066
Cobalt	4.94E-06	3.71E-06	1.15E-06	8.15E-06	3.47E-06	7.35E-06			1.07E-05			3.95E-07				0.00004
Manganese	2.24E-05	1.68E-05	5.22E-06	3.69E-05	1.57E-05	3.33E-05			4.84E-05			1.79E-06				0.00018
Mercury	1.53E-05	1.15E-05	3.57E-06	2.52E-05	1.07E-05	2.28E-05			3.31E-05			1.22E-06				0.00012
Nickel	1.24E-04	9.26E-05	2.88E-05	2.04E-04	8.67E-05	1.84E-04			2.68E-04			9.88E-06				0.00100
Selenium	1.41E-06	1.06E-06	3.29E-07	2.33E-06	9.91E-07	2.10E-06			3.06E-06			1.13E-07				0.00001
Xylenes							3.18E-02	4.86E-02		3.90E-04	1.08E-03		4.93E-04	6.30E-04	2.38E-02	0.10681
Ethylbenzene							2.10E-03	3.21E-03					2.45E-02	8.56E-05	1.57E-03	0.03146
2,2,4- Trimethylpentane							4.86E-02	7.44E-02							3.64E-02	0.15936
Chlorine							2.15E-01	3.29E-01								0.54435
Acetaldehyde										1.05E-02	2.92E-02		7.31E-04			0.04043
Acrolein										1.27E-04	3.52E-04		1.70E-04			0.00065
Propylene													4.15E-02			0.04148

Heavy Crude Processing Project
Holly Marketing & Refining Company

Pollutant	10H2 Hot Oil Furnace (tn/yr)	24H1 Crude Furnace #3 (tn/yr)	25 H1 FCC #2 Feed Heater (tn/yr)	FCCU #2 Scrubber (tn/yr)	26H1 Hot Oil Furnace (tn/yr)	27H1 Reactor Charge Heater (tn/yr)	20H3 Reactor Charge Heater (tn/yr)	Boiler #11 (tn/yr)	Boiler #8 (tn/yr)	Cooling Tower #10 (tn/yr)	Cooling Tower #11 (tn/yr)	Cooling Towers 4-8 (tn/yr)	Vacuum Furnace Heater 33H1 (tn/yr)	Emer. Gen (tn/yr)	Other Equip. (tn/yr)	Stab-in Heaters (tn/yr)	Leak/Valve Fugitives (tn/yr)	South Flare (tn/yr)	Tanks (tn/yr)	CO Boiler (tn/yr)	Hydrogen Reformer Feed (tn/yr)	Propane Pit Flare (tn/yr)	SRU (tn/yr)	Totals
NOx	-8.50	10.51	7.88	19.91	2.45	8.67	7.38	7.82	-8.12				11.39	0.20	0.84	2.06		5.42		-65.0	-22.3	-23.8		-43.17
SO2		2.61	1.96	17.70	0.61	4.31	1.83	3.88					5.65	0.03	0.06	0.21		-2.34		-297.9		0.0	-138.3	-399.71
VOC		1.42	1.06		0.33	2.34	1.00	1.56		1.56	2.39	-48.08	3.07	0.03	0.07	0.11	14.62	-2.80	1.970	-0.8		-1.6		-21.67
PM_{10}		1.97	1.48	13.58	0.46	3.23	1.38	3.91		0.095	0.138		4.27	0.01	0.06	0.16				-55.8		-0.9		-25.87
$PM_{2.5}$		1.97	1.48	13.58	0.46	3.23	1.38	3.91		0.001	0.001		4.27	0.00	0.06	0.16				-36.6		-2.6		-8.65
CO		21.02	15.77	154.85	4.91	34.69	14.75	14.47					45.55	0.25	0.18	1.68		29.51		-19.0		-129.3		189.37
lead		1.29E-04	9.66E-05		3.01E-05	2.13E-04	9.04E-05	1.92E-04					2.79E-04			1.03E-05								0.0010
benzene		5.41E-04	4.06E-04		1.26E-04	8.93E-04	3.80E-04	8.05E-04		0.250	0.387		1.17E-03	3.20E-05	4.60E-05	4.33E-05		0.012	0.004	-3.13E-04				0.6571
formaldehyde		1.93E-02	1.45E-02		4.51E-03	3.19E-02	1.36E-02	2.88E-02					4.19E-02	4.04E-05	5.81E-05	1.55E-03		0.087		-1.12E-02				0.2319
hexane		4.64E-01	3.48E-01		1.08E-01	7.65E-01	3.25E-01	6.90E-01		0.309	0.472		1.00E+00			3.71E-02		0.002	0.009	-2.68E-01				4.2663
naphthalene		1.57E-04	1.18E-04		3.67E-05	2.59E-04	1.10E-04	2.34E-04		0.000	0.001		3.41E-04	2.90E-06	4.18E-06	1.26E-05		0.001		0.00E+00				0.0031
toluene		8.76E-04	6.57E-04		2.04E-04	1.45E-03	6.15E-04	1.30E-03		0.209	0.320		1.90E-03	1.40E-05	2.01E-05	7.01E-05		0.004	0.006	-5.08E-04				0.5456
arsenic		5.15E-05	3.86E-05		1.20E-05	8.50E-05	3.62E-05	7.67E-05					1.12E-04			4.12E-06				-3.00E-05				0.0004
beryllium		3.09E-06	2.32E-06		7.21E-07	5.10E-06	2.17E-06	4.60E-06					6.70E-06			2.47E-07				0.00E+00				0.0000
cadmium		2.83E-04	2.13E-04		6.61E-05	4.68E-04	1.99E-04	4.22E-04					6.14E-04			2.27E-05				-1.65E-04				0.0021
chromium		3.61E-04	2.71E-04		8.42E-05	5.95E-04	2.53E-04	5.37E-04					7.82E-04			2.89E-05				-2.10E-04				0.0027
cobalt		2.16E-05	1.62E-05		5.05E-06	3.57E-05	1.52E-05	3.22E-05					4.69E-05			1.73E-06				-1.25E-05				0.0002
manganese		9.79E-05	7.34E-05		2.28E-05	1.62E-04	6.87E-05	1.46E-04					2.12E-04			7.83E-06				0.00E+00				0.0008
mercury		6.70E-05	5.02E-05		1.56E-05	1.11E-04	4.70E-05	9.97E-05					1.45E-04			5.36E-06				-4.00E-05				0.0005
nickel		5.41E-04	4.06E-04		1.26E-04	8.93E-04	3.80E-04	8.05E-04					1.17E-03			4.33E-05				-3.41E-02				-0.0298
selenium		6.18E-06	4.64E-06		1.44E-06	1.02E-05	4.34E-06	9.20E-06					1.34E-05			4.95E-07				0.00E+00				0.0000
Xylenes										0.139	0.213			9.76E-06	1.40E-05			0.002	0.003					0.3569
Ethylbenzene										0.009	0.014							0.107	0.0004					0.1307
2,2,4 Trimethylpentane										0.213	0.326													0.5386
Chlorine										0.943	1.442													2.3842
Acetaldehyde														2.63E-04	3.78E-04			0.003						0.0038
Acrolein														3.17E-06	4.56E-06			0.001						0.0008
Propylene																		0.182						0.1817
Total HAPS		0.49	0.36	0.00	0.11	0.80	0.34	0.72		2.07	3.17	0.00	1.05	0.00	0.00	0.04	0.00	0.40	0.02	-0.31	0.00	0.00	0.00	9.28

Hot Oil Furnace 10H2 - Existing
Holly Marketing & Refining Company
Reference: AP-42, Section 1.4 Natural Gas Combustion, Small Boilers

Pollutant	Equipment Rating (MMBtu/hr)	Emission Factor (lb/MMscf)	Conversion lb/mmscf to lb/MMBtu	Emissions (lb/hr)	Emissions (lb/yr)	Emissions (tn/yr)	SCR Controlled Emissions (tn/yr)	Net Decrease (tn/yr)
NOx	99	41	1020	3.98	34859.6	17.4	8.502	-8.93

Assumptions:
SCR added to control NOx emission.
Projected emissions based on 20 lb/MMscf

Crude Furnace 8H1
Holly Marketing & Refining Company
Reference: AP-42, Section 1.4 Natural Gas Combustion, Small Boilers

Assumptions:
No increase in emissions based on addition of preflash tower.
Existing crude unit able to accommodate additional throughput.

Crude Furnace #3 (24H1) - New
Holly Marketing & Refining Company
Reference: AP-42, Section 1.4 Natural Gas Combustion, Small Boilers

Pollutant	Equipment Rating (MMBtu/hr)	Emission Factor (lb/mmscf)	Emission Factor (lb/MMBtu)	Conversion lb/mmscf to lb/MMBtu	Emissions (lb/hr)	(lb/yr)	(tn/yr)
NOx	60		0.04	1020	2.400	21024.00	10.51
SO2	60			1020	0.596	5219.30	2.61
VOC	60		0.005	1020	0.324	2838.24	1.42
PM_{10}	60		0.008	1020	0.450	3942.00	1.97
$PM_{2.5}$	60		0.008	1020	0.450	3942.00	1.97
CO	60		0.08	1020	4.800	42048.00	21.02
lead	60	0.0005		1020	2.94E-05	0.26	1.29E-04
benzene	60	2.10E-03		1020	1.24E-04	1.08E+00	5.41E-04
formaldehyde	60	7.50E-02		1020	4.41E-03	3.86E+01	1.93E-02
hexane	60	1.8		1020	1.06E-01	9.28E+02	4.64E-01
naphthalene	60	6.10E-04		1020	3.59E-05	3.14E-01	1.57E-04
toluene	60	3.40E-03		1020	2.00E-04	1.75E+00	8.76E-04
arsenic	60	2.00E-04		1020	1.18E-05	1.03E-01	5.15E-05
beryllium	60	1.20E-05		1020	7.06E-07	6.18E-03	3.09E-06
cadmium	60	1.10E-03		1020	6.47E-05	5.67E-01	2.83E-04
chromium	60	1.40E-03		1020	8.24E-05	7.21E-01	3.61E-04
cobalt	60	8.40E-05		1020	4.94E-06	4.33E-02	2.16E-05
manganese	60	3.80E-04		1020	2.24E-05	1.96E-01	9.79E-05
mercury	60	2.60E-04		1020	1.53E-05	1.34E-01	6.70E-05
nickel	60	2.10E-03		1020	1.24E-04	1.08E+00	5.41E-04
selenium	60	2.40E-05		1020	1.41E-06	1.24E-02	6.18E-06
Total HAPS							0.49

Assumptions:
New heater to be installed on second crude unit
Ultra Low NO_x burners
SO_2 emissions based on H_2S content of 60 ppmv

FCC #2 Feed Heater (25H1) - New
Holly Marketing & Refining Company

Pollutant	Equipment Rating (MMBtu/hr)	Emission Factor (lb/mmscf)	Emission Factor (lb/MMBtu)	Conversion lb/mmscf to lb/MMBtu	Emissions (lb/hr)	(lb/yr)	(tn/yr)
NOx	45		0.04	1020	1.800	15768.00	7.88
SO2	45	10.1281		1020	0.447	3914.47	1.96
VOC	45		0.005	1020	0.243	2128.68	1.06
PM_{10}	45		0.008	1020	0.338	2956.50	1.48
$PM_{2.5}$	45		0.008	1020	0.338	2956.50	1.48
CO	45		0.08	1020	3.600	31536.00	15.77
lead	45	0.0005		1020	2.21E-05	0.19	9.66E-05
benzene	45	2.10E-03		1020	9.26E-05	8.12E-01	4.06E-04
formaldehyde	45	7.50E-02		1020	3.31E-03	2.90E+01	1.45E-02
hexane	45	1.8		1020	7.94E-02	6.96E+02	3.48E-01
naphthalene	45	6.10E-04		1020	2.69E-05	2.36E-01	1.18E-04
toluene	45	3.40E-03		1020	1.50E-04	1.31E+00	6.57E-04
arsenic	45	2.00E-04		1020	8.82E-06	7.73E-02	3.86E-05
beryllium	45	1.20E-05		1020	5.29E-07	4.64E-03	2.32E-06
cadmium	45	1.10E-03		1020	4.85E-05	4.25E-01	2.13E-04
chromium	45	1.40E-03		1020	6.18E-05	5.41E-01	2.71E-04
cobalt	45	8.40E-05		1020	3.71E-06	3.25E-02	1.62E-05
manganese	45	3.80E-04		1020	1.68E-05	1.47E-01	7.34E-05
mercury	45	2.60E-04		1020	1.15E-05	1.00E-01	5.02E-05
nickel	45	2.10E-03		1020	9.26E-05	8.12E-01	4.06E-04
selenium	45	2.40E-05		1020	1.06E-06	9.28E-03	4.64E-06
Total HAPS							0.36

Assumptions

Ultra Low NO_x burners

Emission estimates based on AP-42, Section 1.4 Natural Gas Combustion

SO_2 emissions based on H_2S content of 60 ppmv

FCCU #2 Scrubber - New
Holly Marketing & Refining Company

Equations Used:

$PM_{10}/PM_{2.5}$ = 6200 lb coke burn/hr /1000 * Consent Decree FCCU PM limit*operating hours per year

SO_2 = Maximum daily FCC flue gas flow rate * Consent Decree FCCU SOx limit *(1/379.5 scf*MW SOx)*Operating hours per year

NO_x = Maximum daily FCC flue gas flow rate * Consent Decree FCCU NOx limit *(1/379.5 scf*MW NOx)*Operating hours per year

CO = Maximum daily FCC flue gas flow rate * Consent Decree FCCU CO limit *(1/379.5 scf*MW CO)*Operating hours per year

		Emissions	
Pollutant	**lb/hr**	**(lb/yr)**	**(tn/yr)**
NO_x	4.545	39818.18	19.91
SO2	4.040	35393.94	17.70
VOC	Neg.	Neg.	Neg.
PM_{10}	3.1	27156	13.58
$PM_{2.5}$	3.1	27156	13.58
CO	35.354	309697	154.85

Assumptions:

Emissions controlled through wet gas scrubber

NOx from CD controlled fluid catalytic cracking units:	40	Holly Consent Decree FCCU NOx final limits (ppmvd 0% O2 365 day average)
SO2 from CD controlled fluid catalytic cracking units:	25	Holly Consent Decree FCCU SOx final limits (ppmvd 0% O2 365 day average)
PM10 from CD controlled fluid catalytic cracking units:	0.5	Holly Consent Decree FCCU PM final limits (lb/1000 lb coke burn)
PM2.5 from CD controlled fluid catalytic cracking units:	0.5	All PM10 assumed to be PM2.5 (lb/1000 lb coke burn)
CO Emission Limit for FCCU:	500	ppm (1 hr average 0% O2)
VOC from controlled fluid catalytic cracking units:	Neg	AP-42 Emission Factors from Table 5.1-1 (lb/10^3 bbl fresh feed) [TOC]
Plant Wide Annual Operating Time:	8760	hr
Conversion from scf to lb mol:	379.5	scf -> lb mol
Maximum daily FCC flue gas flow rate:	23	mmscfd (Engineering Calculation)
Maximum hourly FCC regenerator coke burn rate:	6200	lbs coke burn / hr (Engineering Calculation)
Molecular Weight of CO:	28	lb/lb-mol
Molecular Weight of NOx:	45	lb/lb-mol
Molecular Weight of SOx:	64	lb/lb-mol

Hot Oil Furnace (26H1) - New
Holly Marketing & Refining Company

Pollutant	Equipment Rating (MMBtu/hr)	Emission Factor (lb/mmscf)	Emission Factor (lb/MMBtu)	Conversion lb/mmscf to lb/MMBtu	Emissions (lb/hr)	Emissions (lb/yr)	Emissions (tn/yr)
NOx	14		0.04	1020	0.560	4905.60	2.45
SO2	14	10.13		1020	0.139	1217.84	0.61
VOC	14		0.005	1020	0.076	662.26	0.33
PM_{10}	14		0.008	1020	0.105	919.80	0.46
$PM_{2.5}$	14		0.008	1020	0.105	919.80	0.46
CO	14		0.08	1020	1.120	9811.20	4.91
lead	14	0.0005		1020	6.86E-06	0.06	3.01E-05
benzene	14	2.10E-03		1020	2.88E-05	2.52E-01	1.26E-04
formaldehyde	14	7.50E-02		1020	1.03E-03	9.02E+00	4.51E-03
hexane	14	1.8		1020	2.47E-02	2.16E+02	1.08E-01
naphthalene	14	6.10E-04		1020	8.37E-06	7.33E-02	3.67E-05
toluene	14	3.40E-03		1020	4.67E-05	4.09E-01	2.04E-04
arsenic	14	2.00E-04		1020	2.75E-06	2.40E-02	1.20E-05
beryllium	14	1.20E-05		1020	1.65E-07	1.44E-03	7.21E-07
cadmium	14	1.10E-03		1020	1.51E-05	1.32E-01	6.61E-05
chromium	14	1.40E-03		1020	1.92E-05	1.68E-01	8.42E-05
cobalt	14	8.40E-05		1020	1.15E-06	1.01E-02	5.05E-06
manganese	14	3.80E-04		1020	5.22E-06	4.57E-02	2.28E-05
mercury	14	2.60E-04		1020	3.57E-06	3.13E-02	1.56E-05
nickel	14	2.10E-03		1020	2.88E-05	2.52E-01	1.26E-04
selenium	14	2.40E-05		1020	3.29E-07	2.89E-03	1.44E-06
Total HAPS							0.11

Assumptions

Ultra Low NO_x burners

Emission estimates based on AP-42, Section 1.4 Natural Gas Combustion

SO_2 emissions based on H_2S content of 60 ppmv

Reactor Charge Heater (27H1) - New
Holly Marketing & Refining Company

Pollutant	Equipment Rating (MMBtu/hr)	Emission Factor (lb/mmscf)	Emission Factor (lb/MMBtu)	Conversion lb/mmscf to lb/MMBtu	Emissions (lb/hr)	Emissions (lb/yr)	Emissions (tn/yr)
NOx	99		0.02	1020	1.98	17344.80	8.67
SO2	99	10.13		1020	0.98	8611.84	4.31
VOC	99		0.005	1020	0.53	4683.10	2.34
PM_{10}	99		0.008	1020	0.74	6504.30	3.25
$PM_{2.5}$	99		0.008	1020	0.74	6504.30	3.25
CO	99		0.08	1020	7.92	69379.20	34.69
lead	99	0.0005		1020	4.85E-05	0.43	2.13E-04
benzene	99	2.10E-03		1020	2.04E-04	1.79E+00	8.93E-04
formaldehyde	99	7.50E-02		1020	7.28E-03	6.38E+01	3.19E-02
hexane	99	1.8		1020	1.75E-01	1.53E+03	7.65E-01
naphthalene	99	6.10E-04		1020	5.92E-05	5.19E-01	2.59E-04
toluene	99	3.40E-03		1020	3.30E-04	2.89E+00	1.45E-03
arsenic	99	2.00E-04		1020	1.94E-05	1.70E-01	8.50E-05
beryllium	99	1.20E-05		1020	1.16E-06	1.02E-02	5.10E-06
cadmium	99	1.10E-03		1020	1.07E-04	9.35E-01	4.68E-04
chromium	99	1.40E-03		1020	1.36E-04	1.19E+00	5.95E-04
cobalt	99	8.40E-05		1020	8.15E-06	7.14E-02	3.57E-05
manganese	99	3.80E-04		1020	3.69E-05	3.23E-01	1.62E-04
mercury	99	2.60E-04		1020	2.52E-05	2.21E-01	1.11E-04
nickel	99	2.10E-03		1020	2.04E-04	1.79E+00	8.93E-04
selenium	99	2.40E-05		1020	2.33E-06	2.04E-02	1.02E-05
Total HAPS							0.80

Assumptions

Low NO_x burners and Selective Catalytic Reduction

NOx emissions based on 20 lb/mmscf (estimated)

Emission estimates based on AP-42, Section 1.4 Natural Gas Combustion

Reactor Charge Heater (20H3) - New
Holly Marketing & Refining Company

Pollutant	Equipment Rating (MMBtu/hr)	Emission Factor (lb/mmscf)	Emission Factor (lb/MMBtu)	Conversion lb/mmscf to lb/MMBtu	Emissions (lb/hr)	(lb/yr)	(tn/yr)
NOx	42.1		0.04	1020	1.68	14751.84	7.38
SO2	42.1	10.1281		1020	0.42	3662.21	1.83
VOC	42.1		0.005	1020	0.23	1991.50	1.00
PM_{10}	42.1		0.008	1020	0.32	2765.97	1.38
$PM_{2.5}$	42.1		0.008	1020	0.32	2765.97	1.38
CO	42.1		0.08	1020	3.37	29503.68	14.75
lead	42.1	0.0005		1020	2.06E-05	0.18	9.04E-05
benzene	42.1	2.10E-03		1020	8.67E-05	7.59E-01	3.80E-04
formaldehyde	42.1	7.50E-02		1020	3.10E-03	2.71E+01	1.36E-02
hexane	42.1	1.8		1020	7.43E-02	6.51E+02	3.25E-01
naphthalene	42.1	6.10E-04		1020	2.52E-05	2.21E-01	1.10E-04
toluene	42.1	3.40E-03		1020	1.40E-04	1.23E+00	6.15E-04
arsenic	42.1	2.00E-04		1020	8.25E-06	7.23E-02	3.62E-05
beryllium	42.1	1.20E-05		1020	4.95E-07	4.34E-03	2.17E-06
cadmium	42.1	1.10E-03		1020	4.54E-05	3.98E-01	1.99E-04
chromium	42.1	1.40E-03		1020	5.78E-05	5.06E-01	2.53E-04
cobalt	42.1	8.40E-05		1020	3.47E-06	3.04E-02	1.52E-05
manganese	42.1	3.80E-04		1020	1.57E-05	1.37E-01	6.87E-05
mercury	42.1	2.60E-04		1020	1.07E-05	9.40E-02	4.70E-05
nickel	42.1	2.10E-03		1020	8.67E-05	7.59E-01	3.80E-04
selenium	42.1	2.40E-05		1020	9.91E-07	8.68E-03	4.34E-06
Total HAPS							0.34

Assumptions

Ultra Low NO_x burners

Emission estimates based on AP-42, Section 1.4 Natural Gas Combustion

SO_2 emissions based on H_2S content of 60 ppmv

Sour Water Stripper
Holly Marketing & Refining Company

No air emissions expected from this unit.

Assumptions:
Emissions controlled through existing sour water stripper/ammonia stripping unit prior to treatment in existing SRU

Boiler #8
Holly Marketing & Refining Company

Pollutant	Equipment Rating (MMBtu/hr)	Emission Factor (lb/mmscf)	Conversion lb/mmscf to lb/MMBtu	Emissions (lb/hr)	Emissions (lb/yr)	Emissions (tn/yr)	SCR Controlled Emissions (tn/yr)	Net Decrease (tn/yr)
NOx	89.3		0.04	3.572	31290.72	15.65	7.823	-7.82

Assumptions
Selective Catalytic Reduction for NOx emissions control
Controlled emission factor 0.02 lb/MMBtu

Boiler #11 - New
Holly Marketing & Refining Company

Pollutant	Equipment Rating (MMBtu/hr)	Emission Factor (lb/mmscf)	Emission Factor (lb/mmscf)	Conversion lb/mmscf to lb/MMBtu	Emissions (lb/hr)	Emissions (lb/yr)	Emissions (tn/yr)
NOx	89.3		0.02	1020	1.786	15645.36	7.82
SO2	89.3	10.1281		1020	0.886	7768.05	3.88
VOC	89.3		0.004	1020	0.357	3129.07	1.56
PM_{10}	89.3		0.01	1020	0.893	7822.68	3.91
$PM_{2.5}$	89.3		0.01	1020	0.893	7822.68	3.91
CO	89.3		0.037	1020	3.304	28943.92	14.47
lead	89.3	0.0005		1020	4.38E-05	0.38	1.92E-04
benzene	89.3	2.10E-03		1020	1.84E-04	1.61E+00	8.05E-04
formaldehyde	89.3	7.50E-02		1020	6.57E-03	5.75E+01	2.88E-02
hexane	89.3	1.8		1020	1.58E-01	1.38E+03	6.90E-01
naphthalene	89.3	6.10E-04		1020	5.34E-05	4.68E-01	2.34E-04
toluene	89.3	3.40E-03		1020	2.98E-04	2.61E+00	1.30E-03
arsenic	89.3	2.00E-04		1020	1.75E-05	1.53E-01	7.67E-05
beryllium	89.3	1.20E-05		1020	1.05E-06	9.20E-03	4.60E-06
cadmium	89.3	1.10E-03		1020	9.63E-05	8.44E-01	4.22E-04
chromium	89.3	1.40E-03		1020	1.23E-04	1.07E+00	5.37E-04
cobalt	89.3	8.40E-05		1020	7.35E-06	6.44E-02	3.22E-05
manganese	89.3	3.80E-04		1020	3.33E-05	2.91E-01	1.46E-04
mercury	89.3	2.60E-04		1020	2.28E-05	1.99E-01	9.97E-05
nickel	89.3	2.10E-03		1020	1.84E-04	1.61E+00	8.05E-04
selenium	89.3	2.40E-05		1020	2.10E-06	1.84E-02	9.20E-06
Total HAPS							0.72

Assumptions

Selective Catalytic Reduction for emissions control
HAPs Emission estimates based on AP-42, Section 1.4 Natural Gas Combustion
SO_2 emissions based on H_2S content of 60 ppmv
CO emissions based on manufacturer supplied emission rate of 0.037 lb/MMbtu
PM10/PM2.5 emissions based on manufacturer supplied emission rate of 0.01 lb/MMBtu
NOx emissions based on 0.02 lb/MMBtu
VOC emissions based on manufacturer supplied emissions rate of 0.004 lb/MMBtu

Cooling Tower #10 Emissions
Holly Marketing & Refining Company

Reference: South Coast Air Quality Management District, Guidelines for Calculating Emissions from Cooling Towers, June 2006
E = Cooling tower circulating water rate (gal/min) * TDS/10^6 * Drift loss * density of water * 60 * operating hours

$E_{(PM)}$ =	662.83	lb/yr
$E_{(PM)}$ =	0.33	tn/yr
$E_{(PM)}$ =	0.0757	lb/hr
$E_{(PM10)}$ =	190.65	lb/yr
$E_{(PM10)}$ =	0.095	tn/yr
$E_{(PM10)}$ =	0.0218	lb/hr
$E_{(PM2.5)}$ =	1.20	lb/yr
$E_{(PM2.5)}$ =	0.001	tn/yr
$E_{(PM2.5)}$ =	0.0001	lb/hr
$E_{(VOC)}$ =	3127.32	lb/yr
$E_{(VOC)}$ =	1.56	tn/yr
$E_{(VOC)}$ =	0.36	lb/hr

HAPS	Benzene	0.25	tn/yr
	Hexane	0.31	tn/yr
	Naphthalene	0.00	tn/yr
	Toluene	0.21	tn/yr
	Xylenes	0.14	tn/yr
	Ethylbenzene	0.01	tn/yr
	2,2,4 Trimethylpentane	0.21	tn/yr
	Chlorine	0.94	tn/yr

Where:

Water Circulating Rate (gal/min)	8,500
Concentration of Total Dissolved Solids (ppm by weight)	2964.9
Drift Loss of Circulating Water	0.000
Density of Water (lbs/gal)	8.34
Conversion of Minutes to Hours	60
Annual Operating Hours (hr/yr)	8760

Assumptions:

Reference: Calculating Realistic PM_{10} Emissions from Cooling Towers, Joel Reisman and Gordon Frisbie, Abstract No. 216

TDS was based on the average TDS of the existing cooling towers
HAP emissions estimated by Holly based on storage tank HAPs emissions determined using the TANKS software, averaging the last 8 years, and multiplying by 2 standard deviations.
New cooling tower
VOC emission factor from AP-42 Section 5.1-2 controlled

Cooling Tower #11 Emissions
Holly Marketing & Refining Company

Reference: South Coast Air Quality Management District, Guidelines for Calculating Emissions from Cooling Towers, June 2006
E = Cooling tower circulating water rate (gal/min) * TDS/10^6 * Drift loss (%)/100 * density of water * 60 * operating hours

$E_{(PM)}$ =	936.35	lb/yr
$E_{(PM)}$ =	0.47	tn/yr - for two cells
$E_{(PM)}$ =	0.1069	lb/hr
$E_{(PM10)}$ =	275.68	lb/yr
$E_{(PM10)}$ =	0.138	tn/yr - for two cells
$E_{(PM10)}$ =	0.0315	lb/hr
$E_{(PM2.5)}$ =	1.72	lb/yr
$E_{(PM2.5)}$ =	0.001	tn/yr - for two cells
$E_{(PM2.5)}$ =	0.0002	lb/hr
$E_{(VOC)}$ =	4782.96	lb/yr
$E_{(VOC)}$ =	2.39	tn/yr
$E_{(VOC)}$ =	0.55	lb/hr

HAPS	Benzene	0.39	tn/yr
	Hexane	0.47	tn/yr
	Naphthalene	0.00	tn/yr
	Toluene	0.32	tn/yr
	Xylenes	0.21	tn/yr
	Ethylbenzene	0.01	tn/yr
	2,2,4 Trimethylpentane	0.33	tn/yr
	Chlorine	1.44	tn/yr

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Water Circulating Rate (gal/min)	13,000	for two cells
Concentration of Total Dissolved Solids (ppm by weight)	2738.56	
Drift Loss of Circulating Water (%)	0.000	
Density of Water (lbs/gal)	8.34	
Conversion of Minutes to Hours	60	
Annual Operating Hours (hr/yr)	8760	

Assumptions:

Reference: Calculating Realistic PM_{10} Emissions from Cooling Towers, Joel Reisman and Gordon Frisbie, Abstract No. 216

TDS based on average TDS for cooling tower 11
HAP emissions estimated by Holly based on storage tank HAPs emissions determined using the TANKS software, averaging the last 8 years, and multiplying by 2 standard deviations.
Existing cooling tower expanded by adding a cell
VOC emission factor from AP-42 Section 5.1-2 controlled

Average Daily Crude Feed (barrels)

Year	Crude Feed	Average	SD	Average + 3SD	Daily
2009	9600949				
2010	9952070	9890265	263898.5	10681960.57	29265.6454
2011	10117776				

Ratio of HAPS to VOC for Tanks (lbs/ton)

	VOC (tons)	HAPS (lbs)						
	VOC	Benzene	Xylene	Toluene	Ethylbenzene	Napthalene	Hexane	2,2,4- Trimethylpentane
2001	29.14	755.960	389.360	606.790	27.290	1.110	668.310	
	Ratio	25.942	13.362	20.823	0.937	0.038	22.934	
2002	28.7	545.990	359.670	518.540	21.650	1.040	586.020	
	Ratio	19.024	12.532	18.068	0.754	0.036	20.419	
2003	30.76	444.550	187.170	431.350	16.310	0.260	619.660	
	Ratio	14.452	6.085	14.023	0.530	0.008	20.145	
2006	30.76	539.450	181.640	566.960	22.610	0.270	909.150	410.720
	Ratio	17.537	5.905	18.432	0.735	0.009	29.556	13.352
2007	37.12	2710.410	235.580	660.110	26.740	0.380	1029.990	288.830
	Ratio	73.018	6.346	17.783	0.720	0.010	27.748	7.781
2008	38.21	570.660	204.050	578.430	23.210	0.300	922.810	200.340
	Ratio	14.935	5.340	15.138	0.607	0.008	24.151	5.243
2009	38.21	503.300	214.970	588.120	24.920	0.270	942.410	335.110
	Ratio	13.172	5.626	15.392	0.652	0.007	24.664	8.770
2010	38.21	544.720	208.720	623.270	26.170	0.200	1058.060	390.710
	Ratio	14.256	5.462	16.312	0.685	0.005	27.691	10.225
Average Ratios		17.046	7.582	16.996	0.703	0.015	24.663	9.074
Standard Deviation		4.421	3.334	2.198	0.120	0.014	3.470	6.360
Final Average Ratio		25.89	14.25	21.39	0.9421	0.0425	31.60	21.79

note: 2004 and 2005 data not available, 2007 benzene was an extreme outlier so it was left out of the average

Old Fractions of Cooling Tower Feed

4	0.165
6	0.137
7	0.148
8	0.340
11	0.210

New Fractions of Cooling Tower Feed

4	0.125000
6	0.104167
7	0.104167
8	0.218750
10	0.177083
11	0.270833

PM = Water Circulation Rate * Drift Rate * TDS

Year	Circulation Rate Millions Gallons per year
2001	15150
2002	14451
2003	14023
2004	15279
2005	15279
2006	14495
2007	231.94
2008	13550
2009	15379
2010	15864

Design Recirculation Rates	GPM
CT 4	6000
CT 6	5000
CT 7	5000
CT 8	10500
CT 10	8500
CT 11 Before	6500
CT 11 After	13000
Total Before	33000
Total After	48000

Assumptions: Additions to Cooling Tower 11 have no effect on TDS, Cooling Tower 10 will have the same average TDS as the rest of the Cooling Towers

Total PM PTE

Cooling Tower	Drift Rate	TDS	Total PM (lbs/year)	2.5 Mass %	10 Mass %	PM 2.5	PM 10
CT 4	0.002	2860.95	150491.93	0.18	29.08	274.48	43755.75
CT 6	0.002	3233.89	141757.59	0.18	27.96	253.27	39630.23
CT 7	0.002	2962.36	129855.33	0.18	28.77	235.53	37360.56
CT 8	0.002	3028.73	278805.88	0.18	28.57	503.84	79659.85
CT 10	0.000006	2964.90	662.83	0.18	28.76	1.20	190.65
CT 11 Before	0.000006	2738.56	468.18	0.18	29.44	0.86	137.84
CT 11 After	0.000006	2738.56	936.35	0.18	29.44	1.72	275.68

Total for old Equipment	1267.97	200544.22
Total With Expansion	1270.03	200872.72

From the NALCO Handbook, evaporation is considered to be 1% of the recirculation rate
for every 10 degree drop. 3% for 30 degrees
(This analysis assumes that chlorine in water evaporates at the same rate as the water.)
Drift Rate = Used .002 without drift eliminators and .000006 with drift eliminators

Avg. Cl (ppm)	lb H2O/gallon	lb Cl/gallon
1.63	8.331	1.36E-05

For PTE on Chlorine New Equipment

Tower	Evaporation (gpm)	Evaporation (gallons/year)	Drift (gpm)	Drift (gallons/year)
4	180	9.46E+07	12	6.31E+06
6	150	7.88E+07	10	5.26E+06
7	150	7.88E+07	10	5.26E+06
8	315	1.66E+08	21	1.10E+07
10	255	1.34E+08	0.051	2.68E+04

For PTE on Chlorine Old Equipment

Tower	Evaporation (gpm)	Evaporation (gallons/year)	Drift (gpm)	Drift (gallons/year)
4	180	9.46E+07	12	6.31E+06
6	150	7.88E+07	10	5.26E+06
7	150	7.88E+07	10	5.26E+06
8	315	1.66E+08	21	1.10E+07
11	195	1.02E+08	0.039	2.05E+04

11	390	2.05E+08	0.078	4.10E+04
Totals	1440	7.57E+08	53.129	2.79E+07
Cl lost (lb/yr)		10267		379

Totals	990	4.18E+08	53.039	2.79E+07
Cl lost (lb/yr)		5668		378

6046

Interrpolation of PM_{10} and $PM_{2.5}$ Percentages - Cooling Towers

Reference: Calculating Realistic PM_{10} Emissions from Cooling Towers - Joel Reisman and Gordon Frisbie

$y2 = y_o + (y_1 - y_o)/(x_1 - x_o) * (x_2 - x_o)$ - linear interrpolation formula

(TDS = 7700 ppmw)		(TDS = 11000 ppmw)	
Solid Part. Dia.	EPRI % Mass	Solid Part. Dia.	EPRI % Mass
(µm)	Smaller	(µm)	Smaller
1.518	0	1.71	0
2.5	0.127	2.5	0.091
3.037	0.196	3.42	0.196
4.555	0.226	5.13	0.226
6.073	0.514	6.84	0.514
7.591	1.816	8.55	1.816
9.11	5.702	10	5.111
10	14.875	10.26	5.702
10.628	21.348		

For 2010 PM 2.5 and PM 10 DATA

	CT 4	CT 6	CT 7	CT 8	CT 11
Average TDS	2346	2179	2232	2232	2064
Throughput	4978.47	4148.72	4459.88	10268.09	6326.80
Drift Fraction	0.00	0.00	0.00	0.00	0.00
Total PM	102414.22	79257.23	87283.20	200952.59	343.41
2.5 Mass %	0.19	0.19	0.19	0.19	0.19
10 Mass Percer	30.62	31.12	30.96	30.96	31.47
PM 2.5	195.06	146.97	164.68	379.15	0.65
PM 10	31357.82	24665.46	27023.79	62217.13	108.06

Assumptions:
Used Table 2 data from reference

Totals lbs/year
886.52
145372.26

	4 Basin		6 Basin		7 Basin		8 Basin		11 Basin	
Date	Conductivity	TDS	Conductivity	TDS	Conductivity	TDS	Conductivity	TDS	Conductivity	TDS
4/14/2010	3276	2293	3967	2777	3479	2435	3438	2407	2702	1891
4/29/2010	3143	2200	3652	2556	3764	2635	3015	2111	2869	2008
5/4/2010	3073	2151	2968	2078	3048	2134	3371	2360	3011	2108
5/11/2010	3310	2317	3544	2481	2715	1901	3010	2107	2250	1575
5/18/2010	3051	2136	3053	2137	2329	1630	3400	2380	3198	2239
5/26/2010	4234	2964	2274	1592	2816	1971	3008	2106	3281	2297
6/1/2010	3459	2421	4682	3277	3382	2367	3299	2309	3028	2120
6/7/2010	3427	2399	3350	2345	3335	2335	3449	2414	2851	1996
6/25/2010	3432	2402	4345	3042	3410	2387	3139	2197	2056	1439
6/30/2010	2837	1986	3032	2122	2096	1467	2069	1448	2750	1925
7/8/2010	3560	2492	2879	2015	3036	2125	3311	2318	3347	2343
7/16/2010	3270	2289	3615	2531	3376	2363	3421	2395	3355	2349
7/22/2010	3249	2274	2902	2031	3401	2381	3861	2703	3010	2107
7/28/2010	3189	2232	4320	3024	3223	2256	3438	2407	2800	1960
8/5/2010	2917	2042	1980	1386	3336	2335	3013	2109	3195	2237
8/10/2010	3146	2202	2803	1962	3553	2487	3289	2302	3271	2290
8/27/2010	3443	2410	3904	2733	3314	2320	3478	2435	3213	2249
9/2/2010	3656	2559	2626	1838	2699	1889	3144	2201	2927	2049
9/9/2010	3504	2453	3267	2287	3409	2386	2855	1999	2951	2066
9/15/2010	4106	2874	3660	2562	3422	2395	2502	1751	3150	2205
9/23/2010	3384	2369	3528	2470	3906	2734	2845	1992	2241	1569
9/30/2010	3524	2467	3341	2339	3405	2384	2970	2079	2425	1698
10/5/2010	3543	2480	3156	2209	2772	1940	2700	1890	1987	1391
10/11/2010	3488	2442	4144	2901	3730	2611	3733	2613	2790	1953
10/19/2010	3529	2470	2468	1728	3500	2450	3168	2218	3162	2213
10/28/2010	3408	2386	3663	2564	3427	2399	3157	2210	2781	1947
11/4/2010	3485	2440		#VALUE!	3527	2469	2390	1673	3609	2526
11/8/2010	3452	2416		#VALUE!	3095	2167	2204	1543	3932	2752
11/10/2010		0	1392	974	1510	1057		0		0
11/15/2010	3500	2450	2032	1422	2910	2037	3454	2418	3087	2161
11/22/2010	3000	2100	3800	2660	2685	1880	3684	2579	3451	2416
12/2/2010	3431	2402	2635	1845	3002	2101	3750	2625	2394	1676
12/9/2010	2313	1619	3041	2129	3407	2385	3900	2730	3002	2101
12/15/2010	2751	1926	2171	1520	3630	2541	3600	2520	3041	2129
12/21/2010	3683	2578	1642	1149	3903	2732	3190	2233	3024	2117
12/29/2010	3550	2485	2005	1404	3253	2277	3360	2352	3045	2132
1/7/2011	3524	2467	2286	1600	3308	2316	3434	2404	2671	1870
1/12/2011	3576	2503	1822	1275	2949	2064	3127	2189	2401	1681
1/18/2011	1970	1379	2384	1669	2931	2052	4377	3064	3668	2568
1/24/2011	1857	1300	2226	1558	2982	2087	3418	2393	3261	2283
2/1/2011	1870	1309	1545	1082	3279	2295	2971	2080	2948	2064
2/7/2011	1991	1394	1660	1162	3500	2450	2072	1450	3281	2297
2/14/2011	2445	1712	1574	1102	3748	2624	2264	1585	3406	2384
2/23/2011	2942	2059	1607	1125	3500	2450	2360	1652	3425	2398
2/28/2011	2958	2071	1685	1180	3447	2413	2315	1621	3359	2351
3/7/2011	3170	2219	1952	1366	3903	2732	2635	1845	3304	2313
3/15/2011	3363	2354	2392	1674	3202	2241	3180	2226	3352	2346
3/21/2011	3005	2104	2429	1700	3440	2408	3056	2139	3419	2393
3/31/2011	2664	1865	3962	2773	3360	2352	3580	2506	3380	2366
4/4/2011	2947	2063	3514	2460	4582	3207	3432	2402	3534	2474
4/8/2011		0	1345	942	1623	1136		0		0
4/11/2011	3037	2126	2010	1407	1936	1355	2997	2098	3305	2314
4/18/2011	3220	2254	2135	1495	2910	2037	3265	2286	3423	2396
4/27/2011	2733	1913	2750	1925	3535	2475	3471	2430	3155	2209
5/3/2011	2702	1891	4529	3170	3742	2619	3133	2193	3480	2436
5/10/2011	3075	2153	1469	1028	3116	2181	3056	2139	3087	2161
5/17/2011	3000	2100	3400	2380	3115	2181	3275	2293	3369	2358
5/25/2011	3220	2254	3500	2450	3262	2283	3590	2513	3037	2126
6/2/2011	3199	2239	2348	1644	3180	2226	3530	2471	3352	2346
6/8/2011	3393	2375	3060	2142	3223	2256	3687	2581	3075	2153
6/15/2011	3360	2352	3384	2369	3117	2182	3200	2240	3219	2253
6/21/2011	3308	2316	2810	1967	3195	2237	3620	2534	3707	2595
6/28/2011	3215	2251	3729	2610	3328	2330	4242	2969	3353	2347
7/7/2011	3320	2324	3083	2158	3800	2660	4167	2917	3164	2215
7/14/2011	3419	2393	4008	2806	3425	2398	4830	3381	3815	2671
7/19/2011	2850	1995	2781	1947	3495	2447	4015	2811	3345	2342
7/26/2011	3402	2381	3870	2709	2838	1987	3675	2573	3615	2531
8/3/2011	3089	2162	3126	2188	3178	2225	2432	1702	3316	2321
	Average	2218		2017		2254		2270		2179
	Standard Deviation	321.363075		608.2225		354.2127		379.4075		279.9763
Final Average TDS		2860.95191		3233.887		2962.364		3028.735		2738.565

Cooling Tower #4-#8 Emissions
Holly Marketing & Refining Company

Reference: South Coast Air Quality Management District, Guidelines for Calculating Emissions from Cooling Towers, June 2006
E = Cooling tower circulating water rate (gal/min) * TDS/10^6 * Drift loss * density of water * 60 * operating hours

$E_{(VOC)}$ =	9749.88	lb/yr	VOC Baseline 2008-2009 52.95 tons	
$E_{(VOC)}$ =	4.87	tn/yr	-48.08	tons
$E_{(VOC)}$ =	1.11	lb/hr		

Where:

Water Circulating Rate (gal/min)	26,500
Concentration of Total Dissolved Solids (ppm by weight)	2964.9
Drift Loss of Circulating Water	0.000
Density of Water (lbs/gal)	8.34
Conversion of Minutes to Hours	60
Annual Operating Hours (hr/yr)	8760

Assumptions:
TDS was based on the average TDS of the existing cooling towers
HAP emissions estimated by Holly based on storage tank HAPs emissions determined using the TANKS software, averaging the last 8 years, and multiplying by 2 standard deviations.
VOC emission factor from AP-42 Section 5.1-2 controlled
Circulation rate for cooling towers 4-8

Vacuum Furnace Heater (33H1) - New
Holly Marketing & Refining Company

Pollutant	Equipment Rating (MMBtu/hr)	Emission Factor (lb/mmscf)	Emission Factor (lb/MMBtu)	Conversion lb/mmscf to lb/MMBtu	Emissions (lb/hr)	(lb/yr)	(tn/yr)
NOx	130		0.02	1020	2.600	22776.00	11.39
SO2	130	10.13		1020	1.291	11308.48	5.65
VOC	130		0.005	1020	0.702	6149.52	3.07
PM_{10}	130		0.008	1020	0.975	8541.00	4.27
$PM_{2.5}$	130		0.008	1020	0.975	8541.00	4.27
CO	130		0.08	1020	10.400	91104.00	45.55
lead	130	0.0005		1020	6.37E-05	0.56	2.79E-04
benzene	130	2.10E-03		1020	2.68E-04	2.34E+00	0.00117
formaldehyde	130	7.50E-02		1020	9.56E-03	8.37E+01	4.19E-02
hexane	130	1.8		1020	2.29E-01	2.01E+03	1.00E+00
naphthalene	130	6.10E-04		1020	7.77E-05	6.81E-01	3.41E-04
toluene	130	3.40E-03		1020	4.33E-04	3.80E+00	1.90E-03
arsenic	130	2.00E-04		1020	2.55E-05	2.23E-01	1.12E-04
beryllium	130	1.20E-05		1020	1.53E-06	1.34E-02	6.70E-06
cadmium	130	1.10E-03		1020	1.40E-04	1.23E+00	6.14E-04
chromium	130	1.40E-03		1020	1.78E-04	1.56E+00	7.82E-04
cobalt	130	8.40E-05		1020	1.07E-05	9.38E-02	4.69E-05
manganese	130	3.80E-04		1020	4.84E-05	4.24E-01	2.12E-04
mercury	130	2.60E-04		1020	3.31E-05	2.90E-01	1.45E-04
nickel	130	2.10E-03		1020	2.68E-04	2.34E+00	1.17E-03
selenium	130	2.40E-05		1020	3.06E-06	2.68E-02	1.34E-05
Total HAPS							1.05

Assumptions

Selective Catalytic Reduction

Emission estimates based on AP-42, Section 1.4 Natural Gas Combustion

Emissions Calculations for Diesel Emergency Generator
Holly Marketing & Refining Company

EPA Reference: EPA Standards and AP-42, Section 3.3 Gasoline and Diesel Engines

Pollutant	Emission Factor			Rating		Emissions		Operating Hours	Emissions	Emissions
	(g/HP-hr)	(lb/MMBtu)	(lb/HP-hr)	(HP)	(MMBtu/hr)	(g/hr)	(lb/hr)	(hr/yr)	(lb/yr)	(tns/yr)
PM	0.4			540	1.37	216	0.475	50	23.76	0.0119
PM_{10}	0.4			540	1.37	216	0.475	50	23.76	0.0119
$PM_{2.5}$	0.04			540	1.37	21.6	0.048	50	2.38	0.0012
SO_2			2.05E-03	540	1.37		1.107	50	55.35	0.0277
NO_x	6.9			540	1.37	3726	8.197	50	409.86	0.2049
CO	8.5			540	1.37	4590	10.098	50	504.90	0.2525
HC	1			540	1.37	540	1.188	50	59.40	0.0297
Benzene		9.33E-04		540	1.37		1.28E-03	50	0.06	3.20E-05
Toluene		4.09E-04		540	1.37		5.60E-04	50	0.03	1.40E-05
Xylenes		2.85E-04		540	1.37		3.90E-04	50	0.02	9.76E-06
Formaldehyde		1.18E-03		540	1.37		1.62E-03	50	0.08	4.04E-05
Acetaldehyde		7.67E-03		540	1.37		1.05E-02	50	0.53	2.63E-04
Acrolein		9.25E-05		540	1.37		1.27E-04	50	0.01	3.17E-06
Naphthalene		8.48E-05		540	1.37		1.16E-04	50	0.01	2.90E-06
Total HAP										3.65E-04

Assumptions:
540 HP
Sulfur content not to exceed 15 ppm.
HP = 2545.46 BTU/hr; therefore, 540 HP = 1374548.4 BTU/hr or 1.37 mmBTU/hr
HC, NOx, PM emissions from Table 1 40 CFR Part 60 Subpart IIII
10% of PM_{10} emissions assumed to be $PM_{2.5.}$ References: EPA 2001, Procedures Document for National Emissions Inventory, Criteria Pollutants and EPA 2006, Documentation for the Final 2002 Nonpoint Section National Emissions Inventory for Criteria and Hazardous Air Pollutants.

Increased hours for Emergency Equipment
Holly Refining & Marketing Company

EPA Reference: EPA Standards and AP-42, Section 3.3 Gasoline and Diesel Engines

Pollutant	Water Well #3 Rating		Fire Pump No.1 Rating		Fire Pump No.2 Rating		Fire Pump Rating		Diesel Compressors (3) Rating		Cummings Gen. Rating		Control Room Gen. Rating		Emission Factor		Operating Hours	Water Well 3 Emissions	FP NO. 1 Emissions	FP NO. 2 Emissions	FP Emissions	DC (3) Emissions	Cum. Gen Emissions	Con. Room Gen Emissions	Total Emissions
	(HP)	(MMBtu/hr)	(HP)	(MMBtu/hr)	(HP)	(MMBtu/hr)	(HP)	(MMBtu/hr)	(HP)	(MMBtu/hr)	(HP)	(MMBtu/hr)	(HP)	(MMBtu/hr)	(lb/MMBtu)	(lb/HP-hr)	(hr/yr)	(tns/yr)	(tns/yr)	(tns/yr)	(tns/yr)	(tns/yr)	(tns/yr)	(tns/yr)	(tns/yr)
PM_{10}	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10		2.20E-03	20	4.93E-03	0.0086	0.0086	0.0040	0.0145	0.0103	0.0084	0.0594
$PM_{2.5}$	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10		2.20E-03	20	4.93E-03	0.0086	0.0086	0.0040	0.0145	0.0103	0.0084	0.0594
SO_2	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10		2.05E-03	20	4.59E-03	0.0081	0.0081	0.0037	0.0135	0.0096	0.0078	0.0554
NO_x	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10		3.10E-02	20	6.94E-02	0.1218	0.1218	0.0558	0.2046	0.1457	0.1178	0.8370
CO	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10		6.68E-03	20	1.50E-02	0.0263	0.0263	0.0120	0.0441	0.0314	0.0254	0.1804
VOC	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10		2.51E-03	20	5.62E-03	0.0099	0.0099	0.0045	0.0166	0.0118	0.0095	0.0678
Benzene	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10	9.33E-04		20	5.32E-06	9.33E-06	9.33E-06	4.27E-06	1.57E-05	1.12E-06	9.02E-07	4.60E-05
Toluene	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10	4.09E-04		20	2.33E-06	4.09E-06	4.09E-06	1.87E-06	6.87E-06	4.89E-07	3.96E-07	2.01E-05
Xylenes	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10	2.85E-04		20	1.63E-06	2.85E-06	2.85E-06	1.31E-06	4.79E-06	3.41E-07	2.76E-07	1.40E-05
Formaldehyde	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10	1.18E-03		20	6.73E-06	1.18E-05	1.18E-05	5.41E-06	1.98E-05	1.41E-06	1.14E-06	5.81E-05
Acetaldehyde	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10	7.67E-03		20	4.37E-05	7.67E-05	7.67E-05	3.51E-05	1.29E-04	9.18E-06	7.42E-06	3.78E-04
Acrolein	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10	9.25E-05		20	5.27E-07	9.25E-07	9.25E-07	4.24E-07	1.55E-06	1.11E-07	8.95E-08	4.56E-06
Naphthalene	224	0.57	393	1.000	393	1.000	180	0.46	220	0.560	470	0.120	380	0.10	8.48E-05		20	4.84E-07	8.48E-07	8.48E-07	3.89E-07	1.42E-06	1.01E-07	8.20E-08	4.18E-06
Total HAP																	20	6.07E-05	1.07E-04	1.07E-04	4.88E-05	1.79E-04	1.27E-05	1.03E-05	5.25E-04

Assumptions:
Sulfur content not to exceed 15 ppm
HP = 2545.46 BTU/hr
20 additional operating hours requeste

Tank Stab-in Asphalt Tank Heaters - New
Holly Marketing & Refining Company

Pollutant	Equipment Rating (MMBtu/hr)	Emission Factor (lb/mmscf)	Emission Factor (lb/MMBtu)	Conversion lb/mmscf to lb/MMBtu	(lb/hr)	Emissions per Heater (lb/yr)	(tn/yr)	6 heaters (tn/yr)
NOx	0.8	100		1020	0.0784	687.06	0.34	2.06
SO2	0.8	10.13		1020	0.0079	69.59	0.03	0.21
VOC	0.8		0.005	1020	0.0043	37.84	0.02	0.11
PM_{10}	0.8		0.008	1020	0.0060	52.56	0.03	0.16
$PM_{2.5}$	0.8		0.008	1020	0.0060	52.56	0.03	0.16
CO	0.8		0.08	1020	0.0640	560.64	0.28	1.68
lead	0.8	0.0005		1020	3.92E-07	0.00	1.72E-06	0.00
benzene	0.8	2.10E-03		1020	1.65E-06	1.44E-02	7.21E-06	0.00
formaldehyde	0.8	7.50E-02		1020	5.88E-05	5.15E-01	2.58E-04	0.00
hexane	0.8	1.8		1020	1.41E-03	1.24E+01	6.18E-03	0.04
naphthalene	0.8	6.10E-04		1020	4.78E-07	4.19E-03	2.10E-06	0.00
toluene	0.8	3.40E-03		1020	2.67E-06	2.34E-02	1.17E-05	0.00
arsenic	0.8	2.00E-04		1020	1.57E-07	1.37E-03	6.87E-07	0.00
beryllium	0.8	1.20E-05		1020	9.41E-09	8.24E-05	4.12E-08	0.00
cadmium	0.8	1.10E-03		1020	8.63E-07	7.56E-03	3.78E-06	0.00
chromium	0.8	1.40E-03		1020	1.10E-06	9.62E-03	4.81E-06	0.00
cobalt	0.8	8.40E-05		1020	6.59E-08	5.77E-04	2.89E-07	0.00
manganese	0.8	3.80E-04		1020	2.98E-07	2.61E-03	1.31E-06	0.00
mercury	0.8	2.60E-04		1020	2.04E-07	1.79E-03	8.93E-07	0.00
nickel	0.8	2.10E-03		1020	1.65E-06	1.44E-02	7.21E-06	0.00
selenium	0.8	2.40E-05		1020	1.88E-08	1.65E-04	8.24E-08	0.00
Total HAPS							0.01	0.04

Assumptions

Emission estimates based on AP-42, Section 1.4 Natural Gas Combustion

SO_2 emissions based on H_2S content of 60 ppmv

6 stab-in heaters proposed; 4 heaters to be added to Tank 59, two heaters each will be added to Tanks 139 and 140.

Storage Tanks - New and Modified
Holly Refining & Marketing

SERVICE	Tank No.	Product	Heated	Size (BBLS)	Volume (Gallons)	Height (ft)	Diameter (ft)	Type	Net Throughput (gallons/year)	Total VOC Emissions (lb)	Benzene (lb)	Ethylbenzene (lb)	Hexane (lb)	Toluene (lb)	Xylene (lb)	
Black Wax Crude Oil	70	Black wax crude	No	80,306	2,471,782	35	126	Cone	15,427,595	395.69	1.98	0.0	0.0	0.0	0.0	0.197845
Black Wax Crude Oil	71	Black wax crude	No	67,155	3,217,980	36	126	Cone	20,084,980	447.79	2.24	0.0	0.0	0.0	0.0	0.223895
Black Wax Crude Oil	72	Black wax crude	No	106,811	5,188,982	36	160	Cone	32,386,965	722.06	3.61	0.0	0.0	0.0	0.0	0.36103
Poly Gasoline Unit Product	85	Poly Gas	No	19,600	832,200	NA	60	Pontoon	15,811,800	1703.46	0.0	0.0	0.21	0.0	0.0	
Gas Oil Storage	86	Gas Oil	No	109,660	4,286,555	31	160	Cone	26,754,450	518.75	0.0	0.0	0.0	0.0	0.0	
Gas Oil Storage	87	Gas Oil	No	109,660	4,286,555	31	160	Cone	26,754,450	518.75	0.0	0.0	0.0	0.0	0.0	
Hydroisomerization Unit Lube and Feed Products	88	Lubes feed	Yes	26,730	1,137,150	40	70	Cone	10,545,745	62.95	0.0	0.0	0.0	0.0	0.0	0.031475
Hydroisomerization Unit Lube and Feed Products	89	Lubes feed	Yes	26,730	1,137,150	40	70	Cone	10,545,745	62.95	0.0	0.0	0.0	0.0	0.0	0.031475
Hydroisomerization Unit Lube and Feed Products	90	Lubes feed	Yes	13,600	580,180	40	50	Cone	10,545,745	56.44	0.0	0.0	0.0	0.0	0.0	0.02822
Hydroisomerization Unit Lube and Feed Products	91	Lubes feed	Yes	13,600	580,180	40	50	Cone	10,545,745	56.44	0.0	0.0	0.0	0.0	0.0	0.02822
Hydroisomerization Unit Lube and Feed Products	92	Lubes feed	Yes	13,600	580,180	40	50	Cone	10,545,745	56.44	0.0	0.0	0.0	0.0	0.0	
Hydroisomerization Unit Lube and Feed Products	93	Lubes feed	Yes	13,600	580,180	40	50	Cone	10,545,745	56.44	0.0	0.0	0.0	0.0	0.0	
Hydroisomerization Unit Lube and Feed Products	94	Lubes feed	Yes	13,600	580,180	40	50	Cone	10,545,745	56.44	0.0	0.0	0.0	0.0	0.0	
Hydroisomerization Unit Lube and Feed Products	95	Lubes feed	Yes	13,600	580,180	40	50	Cone	10,545,745	56.44	0.0	0.0	0.0	0.0	0.0	
Hydroisomerization Unit Lube and Feed Products	96	Lubes feed	Yes	13,600	580,180	40	50	Cone	10,545,745	56.44	0.0	0.0	0.0	0.0	0.0	
Hydroisomerization Unit Lube and Feed Products	97	Lubes feed	Yes	13,600	580,180	40	50	Cone	10,545,745	56.44	0.0	0.0	0.0	0.0	0.0	
Gasoline	98	Gasoline	No	19,600	845,970		60	IFR	12,689,550	1268.7	0.5	0.8	17.3	12.0	5.5	
ULSD #2	99	ULS Diesel	No	66,000	2,950,235	40	110	Cone	25,054,220	566.33	0.0	0.0	0.0	0.0	0.0	
Storm and waste water storage	158	Waste Water	No	64,315	2,701,230	40	110.0	FR	NA	NA	0.0	0.0	0.0	0.0	0.0	
Sour Water Feed	168	Sour Water	No	30,952	1,299,984	40	80.0	FR	NA	NA	0.0	0.0	0.0	0.0	0.0	
ULSD #2	170	ULS Diesel	No	66,000	2,950,235	40	110	Cone	25,054,220	566.33	0.0	0.0	0.0	0.0	0.0	
Propane	171-174	Propane	No	1,600				Hor. Elliptical		NA						
Totals (tn/yr)										3.64	4.16E-03	3.75E-04	8.76E-03	5.99E-03	2.76E-03	
										1.97						

Assumptions:
VFR - Vertical fixed roof tank
IFR - Internal floating roof tank
EFR - External floating roof tank
No HAP emissions expected from gas oil storage
0.05% benzene in liquid for black wax crude - MSDS Silver Eagle Refining
0.1 K factor

Storage Tanks - Removed
Holly Refining & Marketing

Source	Pollutant	PTE Emissions (lb/yr)	PTE Emissions (tn/yr)	Baseline Emissions (tn/yr)	Net Emissions (tn/yr)	Comment
Tank 71	VOC	447.79	0.224	-0.79	-0.57	Baseline 2008-2009
Tank 72	VOC	722.06	0.361	-1.47	-1.11	Baseline 2008-2009

Fugitives from Leaks - New Equipment
Holly Marketing & Refining Company

New

2% Leak Rate	Total Coun	Emission Factor (kg/hr/source)	2% Leaking	Emissions (lb/day)	Emissions (tons/yr)
Gas valves:	1484.088	0.0268	29.6818	42.10	7.68
Light liquid valves:	2210.809	0.0109	44.2162	25.51	4.65
Heavy liquid valves:	2210.809	0.00023	44.2162	0.54	0.10
Light liquid pump seals:	42.38783	0.114	0.84776	5.11	0.93
Heavy liquid pump seals:	42.38783	0.021	0.84776	0.94	0.17
Compressor seals:	2.909254	0.636	0.05819	1.96	0.36
Pressure relief valves:	5	0.16	0.1	0.85	0.15
Connectors:	11811.41	0.00025	236.228	3.13	0.57
Open-ended lines	0	0.0023	0	0.00	0.00
Sampling connections:	0	0.015	0	0.00	0.00
					14.62

Unit	Component	Count		Count
FCC (4)	Gas valves:	766.5656	- modeled after Unit 4	803
	Light liquid valves:	420.0359		440
	Heavy liquid valves:	420.0359		440
	Light liquid pump seals:	17.18329		18
	Heavy liquid pump seals:	17.18329		18
	Compressor seals:	1.909254		2
	Connectors:	3213.275		3366
	Open-ended lines	0		0
	Sampling connections:	0		0
Crude (8)	Gas valves:	135.7955	- modeled after Unit 8	239
	Light liquid valves:	280.6818		494
	Heavy liquid valves:	280.6818		494
	Light liquid pump seals:	5.113636		9
	Heavy liquid pump seals:	5.113636		9
	Compressor seals:	0		0
	Connectors:	1394.318		2454
	Open-ended lines	0		0
	Sampling connections:	0		0
Poly Gas (7)	Gas valves:	202.7273	- modeled after Unit 7	223
	Light liquid valves:	649.0909		714
	Heavy liquid valves:	649.0909		714
	Light liquid pump seals:	9.090909		10
	Heavy liquid pump seals:	9.090909		10
	Compressor seals:	0		0
	Connectors:	3001.818		3302
	Open-ended lines	0		0
	Sampling connections:	0		0
Hydro Isom (2	Gas valves:	55	- modeled after Unit 9	55
	Light liquid valves:	630		630
	Heavy liquid valves:	630		630
	Light liquid pump seals:	1		1
	Heavy liquid pump seals:	1		1
	Compressor seals:	1		1
	Connectors:	2630		2630

		Open-ended lines	0	0
		Sampling connections:	0	0
	51	Gas valves:	228	- left same, add boiler #11, delete boiler #6
		Light liquid valves:	15	
		Heavy liquid valves:	15	
		Light liquid pump seals:	0	
		Heavy liquid pump seals:	0	
		Compressor seals:	0	
		Connectors:	516	
		Open-ended lines	0	
		Sampling connections:	0	
Flare (66)		Gas valves:	51	-same as north flare
		Light liquid valves:	50	
		Heavy liquid valves:	50	
		Light liquid pump seals:	4	
		Heavy liquid pump seals:	4	
		Compressor seals:	0	
		Connectors:	302	
		Open-ended lines	0	
		Sampling connections:	0	
Unloading (86)		Gas valves:	45	-left same
		Light liquid valves:	166	
		Heavy liquid valves:	166	
		Light liquid pump seals:	6	
		Heavy liquid pump seals:	6	
		Compressor seals:	0	
		Connectors:	754	
		Open-ended lines	0	
		Sampling connections:	0	

HAP Fugitives from Leaks - New Equipment
Holly Marketing & Refining Company

		VOC TPY	TONS per year							
			Benzene	**Xylene**	**Toluene**	**Ethylbenzene**	**Naphthalene**	**Hexane**	**2,2,4-Trimethylpentane**	
Fugitives	Valves and Fittings	12.4	0.161	0.09	0.13	0.01	0.00	0.20	0.14	
Fugitives	Pumps	1.1	0.014	0.01	0.01	0.00	0.00	0.02	0.01	
Fugitives	Compressors	0.4	0.005	0.00	0.00	0.00	0.00	0.01	0.00	
Fugitives	Pressure Relief Valves	0.2	0.002	0.00	0.00	0.00	0.00	0.00	0.00	
Fugitives	Connectors	0.6	0.007	0.00	0.01	0.00	0.00	0.01	0.01	
		Total TPY	0.189	0.104	0.156	0.007	0.000	0.231	0.159	0.848

Calculations found in Cooling Tower PTE
Based off averages from 2001 - 2010

Pounds per Ton VOC emitted						
Benzene	Xylene	Toluene	Ethylbenzene	Napthalene	Hexane	2,2,4- Trimethylpentane
25.89	14.25	21.39	0.9421	0.0425	31.60	21.79

Flare Emissions (South Flare)
Holly Marketing & Refining Company

References: AP-42 Section 13.5 Industrial Flares
California Air Resources Board
EPA's Technology Transfer Network
API Compendium of Greenhouse Gas Emission Methodologies for the Oil and Gas Industry

$E_{(lb/hr)}$ = flare gas vol (scf/hr) * HHV (Btu/scf) * (1 MMBtu/1000000 Btu) * EF (lb/MMBtu)

flare gas vol	17,000.0	scf/hr
HHV	1150	Btu/scf
$EF_{(CO)}$ =	0.37	lb/MMBtu
$EF_{(NOx)}$ =	0.068	lb/MMBtu
$EF_{(VOC)}$ =	5.6	lb/MMcf
$EF_{(benzene)}$ =	0.159	lb/MMcf
$EF_{(formaldehyde)}$ =	1.169	lb/MMcf
$EF_{(naphthalene)}$ =	0.011	lb/MMcf
$EF_{(acetaldehyde)}$ =	0.043	lb/MMcf
$EF_{(acrolein)}$ =	0.01	lb/MMcf
$EF_{(propylene)}$ =	2.44	lb/MMcf
$EF_{(toluene)}$ =	0.058	lb/MMcf
$EF_{(xylenes)}$ =	0.029	lb/MMcf
$EF_{(ethylbenzene)}$ =	1.44	lb/MMcf
$EF_{(hexane)}$ =	0.029	lb/MMcf
$EF_{(SO2)}$ =	0.024	lb/hr

Pollutant	**Emissions (lb/hr)**	**Emissions (TPY)**	**Baseline (TPY)**	**Net Emissions (TPY)**	
CO	7.2335	31.68	-2.18	29.51	Baseline 2009-2010
NOx	1.3294	5.82	0.0	5.82	Baseline 2 2010-2011
VOC	9.52E-02	0.42	-3.215	-2.80	Baseline 2008-2009
Benzene	2.70E-03	1.18E-02			
Formaldehyde	1.99E-02	8.70E-02			
Naphthalene	1.87E-04	8.19E-04			
Acetaldehyde	7.31E-04	3.20E-03			
Acrolein	1.70E-04	7.45E-04			
Propylene	4.15E-02	1.82E-01			
Toluene	9.86E-04	4.32E-03			
Xylene	4.93E-04	2.16E-03			
Ethylbenzene	2.45E-02	1.07E-01			
Hexane	4.93E-04	2.16E-03			
Total HAPS		4.01E-01			
SO_2	0.024	0.1042	-2.44	-2.34	Baseline 2006-2007

Assumptions:
Flare efficiency - 98%
Average methane concentration of total HC is 55% per AP-42
Questar - 1 grain S/100 scf
HAPS speciation from CARB
VOC emission factor from webfire database

Truck Unloading
Holly Refining and Marketing Company

Black and yellow wax becomes a solid at ambient temperatures. No emissions are expected.

Assumptions:
Addition of 6 bays

CO Boiler - To Be Removed
Holly Marketing & Refining Company

Source	Pollutant	Emissions (tn/yr)	Comment
Co Boiler	NOx	-65.065	Baseline 2010-2011
	SO2	-297.94	Baseline 2006-2007
	VOC	-0.75	Baseline 2008-2009
	PM_{10}	-55.75	Baseline 2005-2006
	$PM_{2.5}$	-36.55	Baseline 2009-2010
	CO	-18.98	Baseline 2009-2010
	lead		Baseline 2009-2010
	benzene	-3.13E-04	Baseline 2009-2010
	formaldehyde	-1.12E-02	Baseline 2009-2010
	hexane	-2.68E-01	Baseline 2009-2010
	naphthalene		Baseline 2009-2010
	toluene	-5.08E-04	Baseline 2009-2010
	arsenic	-3.00E-05	Baseline 2009-2010
	beryllium		Baseline 2009-2010
	cadmium	-1.65E-04	Baseline 2009-2010
	chromium	-2.10E-04	Baseline 2009-2010
	cobalt	-1.25E-05	Baseline 2009-2010
	manganese		Baseline 2009-2010
	mercury	-4.00E-05	Baseline 2009-2010
	nickel	-3.41E-02	Baseline 2009-2010
	selenium		Baseline 2009-2010

Hydrogen Reformer Feed Furnaces (30 H1 and 30H2)
Holly Marketing & Refining Company
Reference: AP-42, Section 1.4 Natural Gas Combustion, Small Boilers

Pollutant	Equipment Rating (MMBtu/hr)	Emission Factor (lb/MMscf)	Conversion lb/mmscf to lb/MMBtu	(lb/hr)	Emissions (lb/yr)	(tn/yr)	SCR Controlled Emissions (tn/yr)	Net Decrease Per Furnace (tn/yr)	Net Decrease Two Furnaces (tn/yr)
NOx	130	41	1020	5.23	45775.3	22.9	11.165	-11.72	-23.45

Assumptions:
SCR added to control NOx emission.
Projected emissions based on 20 lb/MMscf
Two (2) 130 MMBtu/hr Hydrogen Reformer Feed Furnaces

Propane Pit Flare - To Be Removed
Holly Marketing & Refining Company

Source	Pollutant	Emissions (tn/yr)	Comment
Propane Pit Flare	NOx	-23.76	Baseline 2010-2011
	SO2	0	Baseline 2006-2007
	VOC	-1.59	Baseline 2008-2009
	PM_{10}	-0.86	Baseline 2005-2006
	$PM_{2.5}$	-2.6	Baseline 2009-2010
	CO	-129.28	Baseline 2009-2010

Existing Sulfur Recovery Unit Incinerator

SO_2 ER (tn/yr) = [20 LTPD * 0.002 (99.8% efficiency)*2240 tons/2000LT * 1.988 lb/SO2/lbS * 365 days/yr]

SO_2 = 32.5 TPY

SO_2 = -170.78 SO2 baseline 2006-2007

SO_2 = -138.3 Net decrease in emissions

Assumptions:

Emissions from existing sulfur recovery incinerator routed to wet scrubber

Total Greenhouse Gas Emissions - Heavy Crude Processing Project
Holly Refining & Marketing Company

ID	Description	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)
CP1	Units fired with Plant Gas	203118	3.99	0.3993
66-1	Process Flare (south)	10070	30.40	0.1007
FCC	Catalytic Cracker	53847	1.58	0.3155
Leaks	Equipment leaks	-	9.60	-
Tanks	Storage Tanks	-	1.00	-
Products	Products	5102319	-	-
	Total	5,369,354	46.57	0.82
	CO_2e	5,369,354	977.87	252.7919

Total CO_2e	5,370,584

Global Warming Potentials	
CO_2	1
CH_4	21
N_2O	310

Greenhouse Gas Emissions - Heavy Crude Processing Project
Holly Refining & Marketing Company

A.O. #	ID	Equipment Name	mmBTU/hr	hr/day	day/yr	mmBTU	mmscf	mscf	scf	CO_2 (metric tons/yr)	CH_4 (metric tons/yr)	N_2O (metric tons/yr)
NEW	20H3	20H3 Reactor Charge Heater	42.1	24	365	368796	361.56	361564.71	361564705.88	17660.64	0.35	0.03
NEW	24H1	Crude Furnace #3	60	24	365	525600	515.29	515294.12	515294117.65	25169.56	0.49	0.05
NEW	25H1	FCC #2 Feed Heater	45	24	365	394200	386.47	386470.59	386470588.24	18877.17	0.37	0.04
NEW	26H1	Hot Oil Furnace	14	24	365	122640	120.24	120235.29	120235294.12	5872.90	0.12	0.01
NEW	27H1	27H1 Reactor Charge Furnace	99	24	365	867240	850.24	850235.29	850235294.12	41529.77	0.82	0.08
NEW	33H1	Vacuum Furnace Heater	130	24	365	1138800	1116.47	1116470.59	1116470588.24	54534.04	1.07	0.11
NEW	Boiler # 11	#11 Boiler	89.3	24	365	782268	766.93	766929.41	766929411.76	37460.69	0.74	0.07
NEW	68H6	SE In-Tank Asphalt Heater	0.8	24	365	7008	6.87	6870.59	6870588.24	335.59	0.01	0.00
NEW	68H7	SW In-Tank Asphalt Heater	0.8	24	365	7008	6.87	6870.59	6870588.24	335.59	0.01	0.00
NEW	68H10	North In-Tank Asphalt Heater	0.8	24	365	7008	6.87	6870.59	6870588.24	335.59	0.01	0.00
NEW	68H11	South In-Tank Asphalt Heater	0.8	24	365	7008	6.87	6870.59	6870588.24	335.59	0.01	0.00
NEW	68H12	North In-Tank Asphalt Heater	0.8	24	365	7008	6.87	6870.59	6870588.24	335.59	0.01	0.00
NEW	68H13	South In-Tank Asphalt Heater	0.8	24	365	7008	6.87	6870.59	6870588.24	335.59	0.01	0.00
								Total	**4,158,423,529**	**203,118**	**3.99**	**0.40**

Assumptions

The units highlighted in grey represents units that are no longer required.
Gas heating values vary. For natural gas and plant gas assume 1020 btu/scf.
Use maximum burner duty.

EF = Fuel-specific default CO_2 emission factor:

53.02 kg CO_2/mmBtu
0.001 kg CH_4/mmBtu
0.0001 kg N_2O/mmBtu

ID	Description	CC (kg C per kg of fuel)	MW (kg/kg-mole)	HHV (mmBtu/scf)	MVC
CP1	Units fired with Plant Gas	0.7135	15.8615	0.000960	849.5

All new equipment use plant gas.
CC, MW & HHV use the average value from the 2011 GHG Annual Inventory Calculation.

Greenhouse Gas Emissions - Heavy Crude Processing Project
40 CFR Part 98 - Subpart C - Stationary Combustion Units
Holly Refining & Marketing Company

ID	Description	Fuel (scf)	CC (kg C per kg of fuel)	MW (kg/kg-mole)	HHV (mmBtu/scf)	CO_2 (metric tons)[2]	CH_4 (metric tons)[3]	N_2O (metric tons)[3]
CP1	Units fired with Plant Gas	4,158,423,529	0.7135	15.9	0.000960173	203,118	3.993	0.399

$$CO_2 = \frac{44}{12} \times Fuel \times CC \times \frac{MW}{MVC} \times 0.001$$

For CP1 Equation C-5

$$CO_2 \text{ or } CH_4 \text{ or } N_2O = 0.001 \times Fuel \times HHV \times EF$$

For CP1 ar Equations C-2a, C-8, and C-9a

where:

CO_2 =	Annual CO_2 emissions for a specific fuel type(metric tons/year).		
CH_4 =	Annual CH_4 emissions for a specific fuel type(metric tons/year).		
N_2O =	Annual N_2O emissions for a specific fuel type(metric tons/year).		
Fuel =	Annual volume of the gaseous fuel combusted (scf).		
CC =	Annual average carbon content of the fuel (kg C per kg of fuel), using a monthly fuel volume-weighted average.		
MW =	Annual average molecular weight of the gaseous fuel (kg/kg-mole), using a monthly fuel volume-weighted average.		
MVC =	Molar volume conversion factor, as	849.5	scf per kg-mole at standard conditions
44/12 =	Ratio of molecular weights, CO2 to carbon.		
0.001 =	Conversion factor from kg to metric tons.		
EF =	Fuel-specific default CO_2 emission f	53.02	kg CO_2/mmBtu
		0.001	kg CH_4/mmBtu
		0.0001	kg N_2O/mmBtu
HHV =			mBtu/scf) as determined below

$$(HHV)_{annual} = \frac{\sum_{i=1}^{n} (HHV)_i \times (Fuel)_i}{\sum_{i=1}^{n} (Fuel)_i}$$

Equation C-2b

$(HHV)_{annual}$ =	Weighted annual average high heat value (mmBtu per mass or volume)
$(HHV)_i$ =	Heat value of the fuel, for month "i" (mmBtu per mass or volume)
$(Fuel)_i$ =	Mass or volume of the fuel combusted during month "i"
n =	Number of months per year that fuel is burned in units

Assumption

All new equipment use plant gas.
CC, MW & HHV use the average value from the 2011 GHG Annual Inventory Calculation.

Greenhouse Gas Emissions - Heavy Crude Processing Project
40 CFR Part 98 - Subpart Y - FCC
Holly Refining & Marketing Company

Description of Type of Un	CO_2 (metric tons)[2]	CH_4 (metric tons)[3]	N_2O (metric tons)[4]
FCC	55846.72	1.5774	0.315477

$$CO_2 = \sum_{p=1}^{n} \left[(Q_r)_p \times \frac{(\%CO_2 + \%CO)_p}{100\%} \times \frac{44}{MVC} \times 0.001 \right]$$

$$Q_r = \left(\frac{(79 * Q_a + (100 - \%O_{2a}) * Q_{2a})}{100 - \%CO_2 - \%CO - \%O_2} \right)$$

Equation Y-6

where:

CO_2 =	Annual CO_2 emissions (metric tons/year)	
Q_r =	Volumetric flow rate of exhaust gas from the FCC regenerator, dscfh)	
$\%CO_2$ =	Daily average percent CO2 concentration in the FCC flue gas	
%CO =	Daily average percent CO concentration in the FCC flue gas	
44 =	Molecular weight of CO2 (kg/kgmole)	
MVC =	Molar volume conversion factor, scf/kg-mole	849.5
0.001 =	Conversion factor (metric ton/kg)	
n =	Number of months in a calendar year	

$$CH_4 = \left(CO_2 \times \frac{EmF_2}{EmF_1} \right)$$

Equat

$$N_2O = \left(CO_2 \times \frac{EmF_3}{EmF_1} \right)$$

CH_4 =	Annual methane emissions from coke burn-off (metric tons CH_4/year)		
CO_2 =	Emission rate of CO_2 from coke burn-off (metric tons/year)		
EmF_1 =	Default CO_2 emission factor for "Petroleum Coke" from C-1 subpart C	102.41	kg CO2/mmBtu
EmF_2 =	Default CH_4 emission factor for "Petroleum Products" from C-2 subpart C	0.003	kg CH4/mmBtu

N_2O =	Annual nitrous oxide emissions from coke burn-off (metric tons N_2O/year)		
CO_2 =	Emission rate of CO_2 from coke burn-off (metric tons/year)		
EmF_1 =	Default CO_2 emission factor for "Petroleum Coke" from C-1 subpart C	102.41	kg CO2/mmBtu
EmF_3 =	Default N_2O emission factor for "Petroleum Products" from C-2 subpart C	0.0006	kg N_2O/mmBtu

Assumption

Average FCC Capacity - Nov 2011	9258	bbls/day
FCC Capacity Limit Based on Equipment Specifications	8500	bbls/day
Ratio	1.089176471	
Average Qr Per Nov 2011 Data	797163	dscfh
Average % CO2 Per Nov 2011 Data	16.2	
Average % CO Per Nov 2011 Data	0.015	
MVC	849.5	scf/kg-mole
Maximum Qr Based on Ratio	731895.1717	dscfh

Greenhouse Gas Emissions - Heavy Crude Processing Project
40 CFR Part 98 - Subpart Y - Equipment Leaks
Holly Refining & Marketing Company

Total CH_4 (metric tons)	Monthly CH_4 (metric tons) calc from below
9.60	0.8

Equation Y-21

$$CH_4 = (0.4 \times N_{CD} + 0.2 \times N_{PU1} + 0.1 \times N_{PU2} + 4.3 \times N_{H2} + 6 \times N_{FGS})$$

where:

CH_4 =	Annual methane emissions from equipment leaks (metric tons/year).	
N_{CD} =	Number of atmospheric crude oil distillation columns at the facility.	
N_{PU1} =	Cumulative number of catalytic cracking units, coking units (delayed or fluid), hydrocracking, and full-range distillation columns (including depropanizer and debutanizer distillation columns) at the facility.	9.6
N_{PU2} =	Cumulative nubmer of hydrotreating/hydrorefining units, catalytic reforming units, and visbreaking units at the facility.	
N_{H2} =	Total number of hydrogen plants at the facility.	
N_{FGS} =	Total number of fuel gas systems at the facility	

Current applicable plant units:	**Units**	
N_{CD} =	1	1 atmospheric crude oil distillation column (New Crude Unit in Project Description 1.2.1)
N_{PU1} = (catalytic cracking unit)	1	1 catalytic cracking unit (New FCC in Project Description 1.2.6)
N_{PU1} = (hydrocracking unit)	1	1 hydrocracking column (New Hydrocracker in Project Description 1.2.8)
N_{PU1} = (distillation unit)	0	
N_{PU2} = (hydrotreating unit)	0	
N_{PU2} = (catalytic reforming unit)	0	
N_{H2} = (hydrogen plant)	0	
N_{FGS} = (fuel gas system)	0	

Assumption

Equipment Leaks Potential to Emit GHG Emissions Remains the Same

Greenhouse Gas Emissions - Heavy Crude Processing Project
40 CFR Part 98 - Subpart Y - Storage Tanks
Holly Refining & Marketing Company

Crude oil and other products received for processing

Q_{Ref} (bbl/yr)	CH_4 (metric tons)
9,992,803	1.00

Equation Y-22 $$CH_4 = (0.1 \times Q_{Ref})$$

CH_4 = Annual methane emissions from storage tanks (metric tons/year).
0.1 = Default emission factor for storage tanks (metric ton CH_4/MMbbl).
Q_{Ref} = Quantity of crude oil plus the quantity of intermediate products received from off site that are processed at the facility (MMbbl/year).

Assumptions

PTE of Volume - Average of storage tanks volume from 2009-2011 + 3 Standard Deviations

Average Storage Tank Volume per year from 2009-2011	9890265	bbls
Standard Deviations	263899	bbls
PTE of Volume	10681962	bbls

Use Ratio of of the proposed increasing crude processing capacity to the existing processing capacity ((60000-31000)/31000)

Ratio	0.9355

Greenhouse Gas Emissions - Heavy Crude Processing Project
40 CFR Part 98 - Subpart MM - Product Combustion
Holly Refining & Marketing Company

Product CO_2	Feedstock CO_2	Biomass CO_2	Summary
5,261,598.2	159,279.5	0.0	5,102,318.7

Assumptions

PTE of Product CO_2 - Average of Product CO_2 from 2009-2011 + 3 Standard Deviations

Average Product CO2 per year from 2009-2011	4121431	metric tons
Standard Deviations	501012	

PTE of Feedstock CO_2 - Average of Product CO_2 from 2009-2011 + 3 Standard Deviations

Average Feedstock CO_2 per year from 2009-2011	46592	metric tons
Standard Deviations	40153	

Use Ratio of of the proposed increasing crude processing capacity to the existing processing capacity ((60000-31000)/31000)

Ratio	0.9355

TANKS 4.0.9d
Emissions Report - Summary Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	New Tank_70
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Crude Oil/Gas Oil/Naphtha

Tank Dimensions

Shell Height (ft):		35.00
Diameter (ft):		126.00
Liquid Height (ft) :		26.50
Avg. Liquid Height (ft):		21.55
Volume (gallons):		2,471,781.30
Turnovers:		6.24
Net Throughput(gal/yr):		15,427,590.83
Is Tank Heated (y/n):	N	

Paint Characteristics

Shell Color/Shade:	Aluminum/Diffuse
Shell Condition	Good
Roof Color/Shade:	Aluminum/Diffuse
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		2.20
Slope (ft/ft) (Cone Roof)		0.03

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Summary Format
Liquid Contents of Storage Tank

New Tank_70 - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	45.73	40.06	51.40	54.56	0.0011	0.0008	0.0014	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	49.93	42.64	57.23	54.56	0.0013	0.0009	0.0018	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	55.12	45.91	64.34	54.56	0.0016	0.0011	0.0024	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	60.50	49.09	71.91	54.56	0.0020	0.0012	0.0033	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	66.20	52.79	79.62	54.56	0.0026	0.0014	0.0045	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	72.03	57.29	86.77	54.56	0.0033	0.0018	0.0060	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	75.88	60.98	90.77	54.56	0.0039	0.0021	0.0070	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	73.61	59.97	87.25	54.56	0.0035	0.0020	0.0061	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	67.07	55.02	79.12	54.56	0.0027	0.0016	0.0044	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	59.50	49.91	69.09	54.56	0.0019	0.0013	0.0029	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	51.69	45.33	58.46	54.56	0.0014	0.0010	0.0019	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	46.15	40.99	51.30	54.56	0.0011	0.0008	0.0014	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Summary Format
Individual Tank Emission Totals

Emissions Report for: Annual

New Tank_70 - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	104.82	290.87	395.69

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	New Tank 71
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Crude Oil/Gas Oil/Naphtha

Tank Dimensions

Shell Height (ft):	36.00
Diameter (ft):	126.00
Liquid Height (ft) :	34.50
Avg. Liquid Height (ft):	21.55
Volume (gallons):	3,217,979.42
Turnovers:	6.24
Net Throughput(gal/yr):	20,084,976.75
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Diffuse
Shell Condition	Good
Roof Color/Shade:	Aluminum/Diffuse
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.20
Slope (ft/ft) (Cone Roof)	0.03

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

New Tank 71 - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	45.73	40.06	51.40	54.56	0.0011	0.0008	0.0014	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	49.93	42.64	57.23	54.56	0.0013	0.0009	0.0018	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	55.12	45.91	64.34	54.56	0.0016	0.0011	0.0024	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	60.50	49.09	71.91	54.56	0.0020	0.0012	0.0033	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	66.20	52.79	79.62	54.56	0.0026	0.0014	0.0045	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	72.03	57.29	86.77	54.56	0.0033	0.0018	0.0060	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	75.88	60.98	90.77	54.56	0.0039	0.0021	0.0070	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	73.61	59.97	87.25	54.56	0.0035	0.0020	0.0061	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	67.07	55.02	79.12	54.56	0.0027	0.0016	0.0044	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	59.50	49.91	69.09	54.56	0.0019	0.0013	0.0029	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	51.89	45.33	58.46	54.56	0.0014	0.0010	0.0019	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	46.15	40.99	51.30	54.56	0.0011	0.0008	0.0014	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

New Tank 71 - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	6.6390	9.1843	15.8707	23.5524	35.7449	47.4535	57.2183	48.1400	32.1260	19.6643	9.5961	6.1417
Vapor Space Volume (cu ft):	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0449	0.0573	0.0717	0.0879	0.1023	0.1112	0.1117	0.1026	0.0917	0.0740	0.0514	0.0408
Vented Vapor Saturation Factor:	0.9992	0.9990	0.9987	0.9984	0.9979	0.9973	0.9969	0.9972	0.9978	0.9984	0.9989	0.9991
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053	189,358.1053
Tank Diameter (ft):	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000
Vapor Space Outage (ft):	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863
Tank Shell Height (ft):	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000
Average Liquid Height (ft):	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470
Roof Outage (ft):	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333
Roof Height (ft):	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000
Roof Slope (ft/ft):	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300
Shell Radius (ft):	63.0000	63.0000	63.0000	63.0000	63.0000	63.0000	63.0000	63.0000	63.0000	63.0000	63.0000	63.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Daily Avg. Liquid Surface Temp. (deg. R):	505.4040	509.6022	514.7934	520.1698	525.8726	531.6989	535.5463	533.2761	526.7402	519.1708	511.5646	505.8195
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325
Tank Paint Solar Absorptance (Shell):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Tank Paint Solar Absorptance (Roof):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0449	0.0573	0.0717	0.0879	0.1023	0.1112	0.1117	0.1026	0.0917	0.0740	0.0514	0.0408
Daily Vapor Temperature Range (deg. R):	22.6791	29.1800	36.8669	45.6307	53.6618	58.9631	59.5899	54.5605	48.2019	38.3535	26.2568	20.6186
Daily Vapor Pressure Range (psia):	0.0006	0.0008	0.0013	0.0021	0.0031	0.0042	0.0049	0.0041	0.0028	0.0017	0.0008	0.0005
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0008	0.0009	0.0011	0.0012	0.0014	0.0018	0.0021	0.0020	0.0016	0.0013	0.0010	0.0008
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0014	0.0018	0.0024	0.0033	0.0045	0.0060	0.0070	0.0061	0.0044	0.0029	0.0019	0.0014
Daily Avg. Liquid Surface Temp. (deg R):	505.4040	509.6022	514.7934	520.1698	525.8726	531.6989	535.5463	533.2761	526.7402	519.1708	511.5646	505.8195
Daily Min. Liquid Surface Temp. (deg R):	499.7342	502.3072	505.5766	508.7622	512.4572	516.9581	520.6488	519.6360	514.6897	509.5824	505.0004	500.6648
Daily Max. Liquid Surface Temp. (deg R):	511.0738	516.8972	524.0101	531.5775	539.2881	546.4397	550.4438	546.9163	538.7907	528.7591	518.1288	510.9741
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9992	0.9990	0.9987	0.9984	0.9979	0.9973	0.9969	0.9972	0.9978	0.9984	0.9989	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Vapor Space Outage (ft):	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863
Working Losses (lb):	5.4468	6.5917	8.3097	10.5110	13.4159	17.1215	20.0551	18.2734	13.9169	10.0656	7.1988	5.5514
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Net Throughput (gal/mo.):	1,673,748.0620	1,673,748.0620	1,673,748.0620	1,673,748.0620	1,673,748.0620	1,673,748.0620	1,673,748.0620	1,673,748.0620	1,673,748.0620	1,673,748.0620	1,673,748.0620	1,673,748.0620
Annual Turnovers:	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	3,217,979.4247	3,217,979.4247	3,217,979.4247	3,217,979.4247	3,217,979.4247	3,217,979.4247	3,217,979.4247	3,217,979.4247	3,217,979.4247	3,217,979.4247	3,217,979.4247	3,217,979.4247
Maximum Liquid Height (ft):	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000
Tank Diameter (ft):	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000	126.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	12.0858	15.7760	24.1804	34.0634	49.1608	64.5750	77.2734	66.4134	46.0428	29.7299	16.7949	11.6930

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

New Tank 71 - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	136.46	311.33	447.79

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	New Tank 72
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Crude Oil/Gas Oil/Naphtha

Tank Dimensions

Shell Height (ft):	36.00
Diameter (ft):	160.00
Liquid Height (ft) :	34.50
Avg. Liquid Height (ft):	21.55
Volume (gallons):	5,188,981.69
Turnovers:	6.24
Net Throughput(gal/yr):	32,386,961.75
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Diffuse
Shell Condition	Good
Roof Color/Shade:	Aluminum/Diffuse
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.20
Slope (ft/ft) (Cone Roof)	0.03

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

New Tank 72 - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	45.73	40.06	51.40	54.56	0.0011	0.0008	0.0014	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	49.93	42.64	57.23	54.56	0.0013	0.0009	0.0018	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	55.12	45.91	64.34	54.56	0.0016	0.0011	0.0024	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	60.50	49.09	71.91	54.56	0.0020	0.0012	0.0033	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	66.20	52.79	79.62	54.56	0.0026	0.0014	0.0045	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	72.03	57.29	86.77	54.56	0.0033	0.0018	0.0060	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	75.88	60.98	90.77	54.56	0.0039	0.0021	0.0070	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	73.61	59.97	87.25	54.56	0.0035	0.0020	0.0061	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	67.07	55.02	79.12	54.56	0.0027	0.0016	0.0044	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	59.50	49.91	69.09	54.56	0.0019	0.0013	0.0029	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	51.89	45.33	58.46	54.56	0.0014	0.0010	0.0019	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	46.15	40.99	51.30	54.56	0.0011	0.0008	0.0014	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

New Tank 72 - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	10.7054	14.8096	25.5915	37.9782	57.6385	76.5186	92.2643	77.6256	51.8030	31.7086	15.4736	9.9034
Vapor Space Volume (cu ft):	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0449	0.0573	0.0717	0.0879	0.1023	0.1112	0.1117	0.1026	0.0917	0.0740	0.0514	0.0408
Vented Vapor Saturation Factor:	0.9992	0.9990	0.9987	0.9984	0.9979	0.9973	0.9969	0.9972	0.9978	0.9984	0.9989	0.9991
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484	305,339.3484
Tank Diameter (ft):	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000
Vapor Space Outage (ft):	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863
Tank Shell Height (ft):	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000	36.0000
Average Liquid Height (ft):	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470
Roof Outage (ft):	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333
Roof Height (ft):	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000
Roof Slope (ft/ft):	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300
Shell Radius (ft):	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Daily Avg. Liquid Surface Temp. (deg. R):	505.4040	509.6022	514.7934	520.1698	525.8726	531.6989	535.5463	533.2761	526.7402	519.1708	511.5646	505.8195
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325
Tank Paint Solar Absorptance (Shell):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Tank Paint Solar Absorptance (Roof):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0449	0.0573	0.0717	0.0879	0.1023	0.1112	0.1117	0.1026	0.0917	0.0740	0.0514	0.0408
Daily Vapor Temperature Range (deg. R):	22.6791	29.1800	36.8669	45.6307	53.6618	58.9631	59.5899	54.5605	48.2019	38.3535	26.2568	20.6186
Daily Vapor Pressure Range (psia):	0.0006	0.0008	0.0013	0.0021	0.0031	0.0042	0.0049	0.0041	0.0028	0.0017	0.0008	0.0005
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0008	0.0009	0.0011	0.0012	0.0014	0.0018	0.0021	0.0020	0.0016	0.0013	0.0010	0.0008
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0014	0.0018	0.0024	0.0033	0.0045	0.0060	0.0070	0.0061	0.0044	0.0029	0.0019	0.0014
Daily Avg. Liquid Surface Temp. (deg R):	505.4040	509.6022	514.7934	520.1698	525.8726	531.6989	535.5463	533.2761	526.7402	519.1708	511.5646	505.8195
Daily Min. Liquid Surface Temp. (deg R):	499.7342	502.3072	505.5766	508.7622	512.4572	516.9581	520.6488	519.6360	514.6897	509.5824	505.0004	500.6648
Daily Max. Liquid Surface Temp. (deg R):	511.0738	516.8972	524.0101	531.5775	539.2881	546.4397	550.4438	546.9163	538.7907	528.7591	518.1288	510.9741
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9992	0.9990	0.9987	0.9984	0.9979	0.9973	0.9969	0.9972	0.9978	0.9984	0.9989	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Vapor Space Outage (ft):	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863	15.1863
Working Losses (lb):	8.7829	10.6291	13.3993	16.9490	21.6331	27.6084	32.3388	29.4658	22.4409	16.2308	11.6081	8.9516
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Net Throughput (gal/mo.):	2,698,913.4780	2,698,913.4780	2,698,913.4780	2,698,913.4780	2,698,913.4780	2,698,913.4780	2,698,913.4780	2,698,913.4780	2,698,913.4780	2,698,913.4780	2,698,913.4780	2,698,913.4780
Annual Turnovers:	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	5,188,981.6876	5,188,981.6876	5,188,981.6876	5,188,981.6876	5,188,981.6876	5,188,981.6876	5,188,981.6876	5,188,981.6876	5,188,981.6876	5,188,981.6876	5,188,981.6876	5,188,981.6876
Maximum Liquid Height (ft):	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000	34.5000
Tank Diameter (ft):	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	19.4883	25.4387	38.9908	54.9272	79.2717	104.1270	124.6031	107.0914	74.2439	47.9394	27.0817	18.8550

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

New Tank 72 - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	220.04	502.02	722.06

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	New Tank 85
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	External Floating Roof Tank
Description:	Poly Gas

Tank Dimensions

Diameter (ft):	70.00
Volume (gallons):	3,214,680.00
Turnovers:	14.11

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good

Roof Characteristics

Type:	Pontoon
Fitting Category	Detail

Tank Construction and Rim-Seal System

Construction:	Welded
Primary Seal:	Mechanical Shoe
Secondary Seal	Rim-mounted

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	8
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	3
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

New Tank 85 - External Floating Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Alkylate (WX Input)	All	53.92	47.99	59.86	51.98	2.1011	N/A	N/A	50.0000			50.00	
2,2,4-Trimethylpentane						0.4987	N/A	N/A	114.2300	0.2823	0.0670	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						0.9843	N/A	N/A	78.1100	0.0280	0.0131	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						1.0252	N/A	N/A	84.1600	0.0110	0.0054	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.0876	N/A	N/A	106.1700	0.0110	0.0005	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.6300	N/A	N/A	86.1700	0.0320	0.0248	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.2725	N/A	N/A	92.1300	0.0950	0.0123	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						2.6462	N/A	N/A	46.6816	0.4707	0.8745	31.64	
Xylene (-m)						0.0728	N/A	N/A	106.1700	0.0700	0.0024	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

New Tank 85 - External Floating Roof Tank
Woods Cross, Utah

Annual Emission Calcaulations	
Rim Seal Losses (lb):	655.2165
Seal Factor A (lb-mole/ft-yr):	0.6000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.4000
Average Wind Speed (mph):	8.8083
Seal-related Wind Speed Exponent:	1.0000
Value of Vapor Pressure Function:	0.0454
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	2.1011
Tank Diameter (ft):	70.0000
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	1.0000
Withdrawal Losses (lb):	159.3443
Annual Net Throughput (gal/yr.):	45,368,884.9244
Shell Clingage Factor (bbl/1000 sqft):	0.0015
Average Organic Liquid Density (lb/gal):	7.3000
Tank Diameter (ft):	70.0000
Roof Fitting Losses (lb):	1,413.3833
Value of Vapor Pressure Function:	0.0454
Vapor Molecular Weight (lb/lb-mole):	50.0000
Product Factor:	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	622.6179
Average Wind Speed (mph):	8.8083
Total Losses (lb):	2,227.9441

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Bolted Cover, Gasketed	1	1.60	0.00	0.00	3.6321
Roof Leg (3-in. Diameter)/Adjustable, Center Area, Gasketed	8	0.53	0.11	0.13	12.1557
Roof Leg (3-in. Diameter)/Adjustable, Pontoon Area, Gasketed	3	1.30	0.08	0.65	10.6305
Slotted Guide-Pole/Sample Well/Gask. Sliding Cover, w. Pole Sleeve	1	11.00	46.00	1.40	1,357.8311
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	29.1339

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

New Tank 85 - External Floating Roof Tank
Woods Cross, Utah

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Alkylate (WX Input)	655.22	159.34	1,413.38	0.00	2,227.94
2,2,4-Trimethylpentane	43.91	44.99	94.72	0.00	183.63
Benzene	8.59	4.46	18.54	0.00	31.60
Cyclohexane	3.52	1.75	7.59	0.00	12.86
Ethylbenzene	0.30	1.75	0.65	0.00	2.70
Hexane (-n)	16.27	5.10	35.09	0.00	56.45
Toluene	8.07	15.14	17.41	0.00	40.62
Xylene (-m)	1.59	11.15	3.43	0.00	16.17
Unidentified Components	572.97	75.00	1,235.96	0.00	1,883.92

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	New Tank 86
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Crude Oil/Gas Oil/Naphtha

Tank Dimensions

Shell Height (ft):	31.00
Diameter (ft):	160.00
Liquid Height (ft) :	28.50
Avg. Liquid Height (ft):	21.55
Volume (gallons):	4,286,550.09
Turnovers:	6.24
Net Throughput(gal/yr):	26,754,446.66
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Diffuse
Shell Condition	Good
Roof Color/Shade:	Aluminum/Diffuse
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.20
Slope (ft/ft) (Cone Roof)	0.03

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

New Tank 86 - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	45.73	40.06	51.40	54.56	0.0011	0.0008	0.0014	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	49.93	42.64	57.23	54.56	0.0013	0.0009	0.0018	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	55.12	45.91	64.34	54.56	0.0016	0.0011	0.0024	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	60.50	49.09	71.91	54.56	0.0020	0.0012	0.0033	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	66.20	52.79	79.62	54.56	0.0026	0.0014	0.0045	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	72.03	57.29	86.77	54.56	0.0033	0.0018	0.0060	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	75.88	60.98	90.77	54.56	0.0039	0.0021	0.0070	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	73.61	59.97	87.25	54.56	0.0035	0.0020	0.0061	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	67.07	55.02	79.12	54.56	0.0027	0.0016	0.0044	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	59.50	49.91	69.09	54.56	0.0019	0.0013	0.0029	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	51.89	45.33	58.46	54.56	0.0014	0.0010	0.0019	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	46.15	40.99	51.30	54.56	0.0011	0.0008	0.0014	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

New Tank 86 - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	7.1827	9.9370	17.1730	25.4878	38.6879	51.3702	61.9503	52.1165	34.7719	21.2797	10.3829	6.6447
Vapor Space Volume (cu ft):	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0449	0.0573	0.0717	0.0879	0.1023	0.1112	0.1117	0.1026	0.0917	0.0740	0.0514	0.0408
Vented Vapor Saturation Factor:	0.9994	0.9993	0.9991	0.9989	0.9986	0.9982	0.9979	0.9981	0.9986	0.9990	0.9993	0.9994
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836
Tank Diameter (ft):	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000
Vapor Space Outage (ft):	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863
Tank Shell Height (ft):	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000
Average Liquid Height (ft):	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470
Roof Outage (ft):	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333
Roof Height (ft):	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000
Roof Slope (ft/ft):	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300
Shell Radius (ft):	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Daily Avg. Liquid Surface Temp. (deg. R):	505.4040	509.6022	514.7934	520.1698	525.8726	531.6989	535.5463	533.2761	526.7402	519.1708	511.5646	505.8195
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325
Tank Paint Solar Absorptance (Shell):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Tank Paint Solar Absorptance (Roof):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0449	0.0573	0.0717	0.0879	0.1023	0.1112	0.1117	0.1026	0.0917	0.0740	0.0514	0.0408
Daily Vapor Temperature Range (deg. R):	22.6791	29.1800	36.8669	45.6307	53.6618	58.9631	59.5899	54.5605	48.2019	38.3535	26.2568	20.6186
Daily Vapor Pressure Range (psia):	0.0006	0.0008	0.0013	0.0021	0.0031	0.0042	0.0049	0.0041	0.0028	0.0017	0.0008	0.0005
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0008	0.0009	0.0011	0.0012	0.0014	0.0018	0.0021	0.0020	0.0016	0.0013	0.0010	0.0008
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0014	0.0018	0.0024	0.0033	0.0045	0.0060	0.0070	0.0061	0.0044	0.0029	0.0019	0.0014
Daily Avg. Liquid Surface Temp. (deg R):	505.4040	509.6022	514.7934	520.1698	525.8726	531.6989	535.5463	533.2761	526.7402	519.1708	511.5646	505.8195
Daily Min. Liquid Surface Temp. (deg R):	499.7342	502.3072	505.5766	508.7622	512.4572	516.9581	520.6488	519.6360	514.6897	509.5824	505.0004	500.6648
Daily Max. Liquid Surface Temp. (deg R):	511.0738	516.8972	524.0101	531.5775	539.2881	546.4397	550.4438	546.9163	538.7907	528.7591	518.1288	510.9741
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9994	0.9993	0.9991	0.9989	0.9986	0.9982	0.9979	0.9981	0.9986	0.9990	0.9993	0.9994
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Vapor Space Outage (ft):	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863
Working Losses (lb):	7.2554	8.7805	11.0690	14.0014	17.8709	22.8070	26.7147	24.3413	18.5381	13.4080	9.5893	7.3948
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Net Throughput (gal/mo.):	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210
Annual Turnovers:	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898
Maximum Liquid Height (ft):	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000
Tank Diameter (ft):	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	14.4382	18.7175	28.2420	39.4891	56.5588	74.1772	88.6649	76.4577	53.3101	34.6877	19.9721	14.0394

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

New Tank 86 - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	181.77	336.98	518.75

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	New Tank 87
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Crude Oil/Gas Oil/Naphtha

Tank Dimensions

Shell Height (ft):	31.00
Diameter (ft):	160.00
Liquid Height (ft) :	28.50
Avg. Liquid Height (ft):	21.55
Volume (gallons):	4,286,550.09
Turnovers:	6.24
Net Throughput(gal/yr):	26,754,446.66
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	Aluminum/Diffuse
Shell Condition	Good
Roof Color/Shade:	Aluminum/Diffuse
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.20
Slope (ft/ft) (Cone Roof)	0.03

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

New Tank 87 - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	45.73	40.06	51.40	54.56	0.0011	0.0008	0.0014	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	49.93	42.64	57.23	54.56	0.0013	0.0009	0.0018	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	55.12	45.91	64.34	54.56	0.0016	0.0011	0.0024	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	60.50	49.09	71.91	54.56	0.0020	0.0012	0.0033	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	66.20	52.79	79.62	54.56	0.0026	0.0014	0.0045	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	72.03	57.29	86.77	54.56	0.0033	0.0018	0.0060	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	75.88	60.98	90.77	54.56	0.0039	0.0021	0.0070	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	73.61	59.97	87.25	54.56	0.0035	0.0020	0.0061	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	67.07	55.02	79.12	54.56	0.0027	0.0016	0.0044	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	59.50	49.91	69.09	54.56	0.0019	0.0013	0.0029	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	51.89	45.33	58.46	54.56	0.0014	0.0010	0.0019	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	46.15	40.99	51.30	54.56	0.0011	0.0008	0.0014	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

New Tank 87 - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	7.1827	9.9370	17.1730	25.4878	38.6879	51.3702	61.9503	52.1165	34.7719	21.2797	10.3829	6.6447
Vapor Space Volume (cu ft):	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0449	0.0573	0.0717	0.0879	0.1023	0.1112	0.1117	0.1026	0.0917	0.0740	0.0514	0.0408
Vented Vapor Saturation Factor:	0.9994	0.9993	0.9991	0.9989	0.9986	0.9982	0.9979	0.9981	0.9986	0.9990	0.9993	0.9994
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836	204,808.3836
Tank Diameter (ft):	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000
Vapor Space Outage (ft):	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863
Tank Shell Height (ft):	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000	31.0000
Average Liquid Height (ft):	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470	21.5470
Roof Outage (ft):	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333	0.7333
Roof Height (ft):	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000	2.2000
Roof Slope (ft/ft):	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300
Shell Radius (ft):	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000	80.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Daily Avg. Liquid Surface Temp. (deg. R):	505.4040	509.6022	514.7934	520.1698	525.8726	531.6989	535.5463	533.2761	526.7402	519.1708	511.5646	505.8195
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325	514.2325
Tank Paint Solar Absorptance (Shell):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Tank Paint Solar Absorptance (Roof):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0449	0.0573	0.0717	0.0879	0.1023	0.1112	0.1117	0.1026	0.0917	0.0740	0.0514	0.0408
Daily Vapor Temperature Range (deg. R):	22.6791	29.1800	36.8669	45.6307	53.6618	58.9631	59.5899	54.5605	48.2019	38.3535	26.2568	20.6186
Daily Vapor Pressure Range (psia):	0.0006	0.0008	0.0013	0.0021	0.0031	0.0042	0.0049	0.0041	0.0028	0.0017	0.0008	0.0005
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0008	0.0009	0.0011	0.0012	0.0014	0.0018	0.0021	0.0020	0.0016	0.0013	0.0010	0.0008
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0014	0.0018	0.0024	0.0033	0.0045	0.0060	0.0070	0.0061	0.0044	0.0029	0.0019	0.0014
Daily Avg. Liquid Surface Temp. (deg R):	505.4040	509.6022	514.7934	520.1698	525.8726	531.6989	535.5463	533.2761	526.7402	519.1708	511.5646	505.8195
Daily Min. Liquid Surface Temp. (deg R):	499.7342	502.3072	505.5766	508.7622	512.4572	516.9581	520.6488	519.6360	514.6897	509.5824	505.0004	500.6648
Daily Max. Liquid Surface Temp. (deg R):	511.0738	516.8972	524.0101	531.5775	539.2881	546.4397	550.4438	546.9163	538.7907	528.7591	518.1288	510.9741
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9994	0.9993	0.9991	0.9989	0.9986	0.9982	0.9979	0.9981	0.9986	0.9990	0.9993	0.9994
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Vapor Space Outage (ft):	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863	10.1863
Working Losses (lb):	7.2554	8.7805	11.0690	14.0014	17.8709	22.8070	26.7147	24.3413	18.5381	13.4080	9.5893	7.3948
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0011	0.0013	0.0016	0.0020	0.0026	0.0033	0.0039	0.0035	0.0027	0.0019	0.0014	0.0011
Net Throughput (gal/mo.):	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210	2,229,537.2210
Annual Turnovers:	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415	6.2415
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898	4,286,550.0898
Maximum Liquid Height (ft):	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000	28.5000
Tank Diameter (ft):	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000	160.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	14.4382	18.7175	28.2420	39.4891	56.5588	74.1772	88.6649	76.4577	53.3101	34.6877	19.9721	14.0394

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

New Tank 87 - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	181.77	336.98	518.75

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 088 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Lube Oil

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	70.00
Liquid Height (ft) :	39.50
Avg. Liquid Height (ft):	29.36
Volume (gallons):	1,137,146.07
Turnovers:	9.27
Net Throughput(gal/yr):	10,545,744.60
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.30
Slope (ft/ft) (Cone Roof)	0.07

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 088 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 088 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	1.1300	1.0206	1.1300	1.0935	1.1300	1.0935	1.1300	1.1300	1.0935	1.1300	1.0935	1.1300
Vapor Space Volume (cu ft):	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977
Tank Diameter (ft):	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Tank Shell Height (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Average Liquid Height (ft):	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Height (ft):	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000
Roof Slope (ft/ft):	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700
Shell Radius (ft):	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Daily Avg. Liquid Surface Temp. (deg. R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Daily Vapor Temperature Range (deg. R):	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650
Daily Vapor Pressure Range (psia):	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Daily Avg. Liquid Surface Temp. (deg R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Min. Liquid Surface Temp. (deg R):	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614
Daily Max. Liquid Surface Temp. (deg R):	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Working Losses (lb):	1.9518	7.5706	4.4822	7.4338	5.5774	1.5245	5.3866	10.6404	0.5766	2.2359	1.0371	1.2320
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Net Throughput (gal/mo.):	414,569.3000	1,608,053.1000	952,055.6000	1,578,976.0000	1,184,672.6000	323,813.4000	1,144,140.8000	2,260,085.6000	122,476.4000	474,926.4000	220,281.3000	261,694.1000
Annual Turnovers:	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662
Maximum Liquid Height (ft):	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000
Tank Diameter (ft):	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	3.0818	8.5913	5.6122	8.5273	6.7074	2.6180	6.5166	11.7704	1.6702	3.3659	2.1306	2.3620

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 088 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	49.65	13.30	62.95

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 089 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Lube Oil

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	70.00
Liquid Height (ft) :	39.50
Avg. Liquid Height (ft):	29.36
Volume (gallons):	1,137,146.07
Turnovers:	9.27
Net Throughput(gal/yr):	10,545,744.60
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.30
Slope (ft/ft) (Cone Roof)	0.07

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 089 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 089 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	1.1300	1.0206	1.1300	1.0935	1.1300	1.0935	1.1300	1.1300	1.0935	1.1300	1.0935	1.1300
Vapor Space Volume (cu ft):	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977	43,897.9977
Tank Diameter (ft):	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Tank Shell Height (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Average Liquid Height (ft):	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Height (ft):	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000
Roof Slope (ft/ft):	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700	0.0700
Shell Radius (ft):	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000	35.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Daily Avg. Liquid Surface Temp. (deg. R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Daily Vapor Temperature Range (deg. R):	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650
Daily Vapor Pressure Range (psia):	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Daily Avg. Liquid Surface Temp. (deg R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Min. Liquid Surface Temp. (deg R):	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614
Daily Max. Liquid Surface Temp. (deg R):	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Working Losses (lb):	1.9518	7.5706	4.4822	7.4338	5.5774	1.5245	5.3866	10.6404	0.5766	2.2359	1.0371	1.2320
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Net Throughput (gal/mo.):	414,569.3000	1,608,053.1000	952,055.6000	1,578,976.0000	1,184,672.6000	323,813.4000	1,144,140.8000	2,260,085.6000	122,476.4000	474,926.4000	220,281.3000	261,694.1000
Annual Turnovers:	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739	9.2739
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662	1,137,146.0662
Maximum Liquid Height (ft):	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000
Tank Diameter (ft):	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000	70.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	3.0818	8.5913	5.6122	8.5273	6.7074	2.6180	6.5166	11.7704	1.6702	3.3659	2.1306	2.3620

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 089 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	49.65	13.30	62.95

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 090 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Lube Oil

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	50.00
Liquid Height (ft) :	39.50
Avg. Liquid Height (ft):	29.36
Volume (gallons):	580,176.56
Turnovers:	18.18
Net Throughput(gal/yr):	10,545,744.60
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.30
Slope (ft/ft) (Cone Roof)	0.09

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 090 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 090 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.5765	0.5207	0.5765	0.5579	0.5765	0.5579	0.5765	0.5765	0.5579	0.5765	0.5579	0.5765
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Tank Shell Height (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Average Liquid Height (ft):	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Height (ft):	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000
Roof Slope (ft/ft):	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
Shell Radius (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Daily Avg. Liquid Surface Temp. (deg. R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Daily Vapor Temperature Range (deg. R):	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650
Daily Vapor Pressure Range (psia):	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Daily Avg. Liquid Surface Temp. (deg R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Min. Liquid Surface Temp. (deg R):	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614
Daily Max. Liquid Surface Temp. (deg R):	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Working Losses (lb):	1.9518	7.5706	4.4822	7.4338	5.5774	1.5245	5.3866	10.6404	0.5766	2.2359	1.0371	1.2320
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Net Throughput (gal/mo.):	414,569.3000	1,608,053.1000	952,055.6000	1,578,976.0000	1,184,672.6000	323,813.4000	1,144,140.8000	2,260,085.6000	122,476.4000	474,926.4000	220,281.3000	261,694.1000
Annual Turnovers:	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644
Maximum Liquid Height (ft):	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	2.5283	8.0914	5.0588	7.9917	6.1539	2.0824	5.9631	11.2169	1.1345	2.8125	1.5950	1.8086

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 090 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	49.65	6.79	56.44

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 091 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Lube Oil

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	50.00
Liquid Height (ft) :	39.50
Avg. Liquid Height (ft):	29.36
Volume (gallons):	580,176.56
Turnovers:	18.18
Net Throughput(gal/yr):	10,545,744.60
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.30
Slope (ft/ft) (Cone Roof)	0.09

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 091 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 091 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.5765	0.5207	0.5765	0.5579	0.5765	0.5579	0.5765	0.5765	0.5579	0.5765	0.5579	0.5765
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Tank Shell Height (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Average Liquid Height (ft):	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Height (ft):	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000
Roof Slope (ft/ft):	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
Shell Radius (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Daily Avg. Liquid Surface Temp. (deg. R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Daily Vapor Temperature Range (deg. R):	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650
Daily Vapor Pressure Range (psia):	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Daily Avg. Liquid Surface Temp. (deg R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Min. Liquid Surface Temp. (deg R):	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614
Daily Max. Liquid Surface Temp. (deg R):	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Working Losses (lb):	1.9518	7.5706	4.4822	7.4338	5.5774	1.5245	5.3866	10.6404	0.5766	2.2359	1.0371	1.2320
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Net Throughput (gal/mo.):	414,569.3000	1,608,053.1000	952,055.6000	1,578,976.0000	1,184,672.6000	323,813.4000	1,144,140.8000	2,260,085.6000	122,476.4000	474,926.4000	220,281.3000	261,694.1000
Annual Turnovers:	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644
Maximum Liquid Height (ft):	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	2.5283	8.0914	5.0588	7.9917	6.1539	2.0824	5.9631	11.2169	1.1345	2.8125	1.5950	1.8086

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 091 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	49.65	6.79	56.44

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 092 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Lube Oil

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	50.00
Liquid Height (ft) :	39.50
Avg. Liquid Height (ft):	29.36
Volume (gallons):	580,176.56
Turnovers:	18.18
Net Throughput(gal/yr):	10,545,744.60
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.30
Slope (ft/ft) (Cone Roof)	0.09

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 092 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 092 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.5765	0.5207	0.5765	0.5579	0.5765	0.5579	0.5765	0.5765	0.5579	0.5765	0.5579	0.5765
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Tank Shell Height (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Average Liquid Height (ft):	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Height (ft):	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000
Roof Slope (ft/ft):	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
Shell Radius (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Daily Avg. Liquid Surface Temp. (deg. R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Daily Vapor Temperature Range (deg. R):	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650
Daily Vapor Pressure Range (psia):	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Daily Avg. Liquid Surface Temp. (deg R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Min. Liquid Surface Temp. (deg R):	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614
Daily Max. Liquid Surface Temp. (deg R):	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Working Losses (lb):	1.9518	7.5706	4.4822	7.4338	5.5774	1.5245	5.3866	10.6404	0.5766	2.2359	1.0371	1.2320
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Net Throughput (gal/mo.):	414,569.3000	1,608,053.1000	952,055.6000	1,578,976.0000	1,184,672.6000	323,813.4000	1,144,140.8000	2,260,085.6000	122,476.4000	474,926.4000	220,281.3000	261,694.1000
Annual Turnovers:	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644
Maximum Liquid Height (ft):	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	2.5283	8.0914	5.0588	7.9917	6.1539	2.0824	5.9631	11.2169	1.1345	2.8125	1.5950	1.8086

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 092 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	49.65	6.79	56.44

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 093 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Lube Oil

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	50.00
Liquid Height (ft) :	39.50
Avg. Liquid Height (ft):	29.36
Volume (gallons):	580,176.56
Turnovers:	18.18
Net Throughput(gal/yr):	10,545,744.60
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.30
Slope (ft/ft) (Cone Roof)	0.09

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 093 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 093 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.5765	0.5207	0.5765	0.5579	0.5765	0.5579	0.5765	0.5765	0.5579	0.5765	0.5579	0.5765
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Tank Shell Height (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Average Liquid Height (ft):	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Height (ft):	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000
Roof Slope (ft/ft):	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
Shell Radius (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Daily Avg. Liquid Surface Temp. (deg. R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Daily Vapor Temperature Range (deg. R):	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650
Daily Vapor Pressure Range (psia):	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Daily Avg. Liquid Surface Temp. (deg R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Min. Liquid Surface Temp. (deg R):	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614
Daily Max. Liquid Surface Temp. (deg R):	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Working Losses (lb):	1.9518	7.5706	4.4822	7.4338	5.5774	1.5245	5.3866	10.6404	0.5766	2.2359	1.0371	1.2320
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Net Throughput (gal/mo.):	414,569.3000	1,608,053.1000	952,055.6000	1,578,976.0000	1,184,672.6000	323,813.4000	1,144,140.8000	2,260,085.6000	122,476.4000	474,926.4000	220,281.3000	261,694.1000
Annual Turnovers:	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644
Maximum Liquid Height (ft):	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	2.5283	8.0914	5.0588	7.9917	6.1539	2.0824	5.9631	11.2169	1.1345	2.8125	1.5950	1.8086

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 093 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	49.65	6.79	56.44

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 094 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Lube Oil

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	50.00
Liquid Height (ft) :	39.50
Avg. Liquid Height (ft):	29.36
Volume (gallons):	580,176.56
Turnovers:	18.18
Net Throughput(gal/yr):	10,545,744.60
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.30
Slope (ft/ft) (Cone Roof)	0.09

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 094 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 094 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.5765	0.5207	0.5765	0.5579	0.5765	0.5579	0.5765	0.5765	0.5579	0.5765	0.5579	0.5765
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Tank Shell Height (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Average Liquid Height (ft):	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Height (ft):	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000
Roof Slope (ft/ft):	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
Shell Radius (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Daily Avg. Liquid Surface Temp. (deg. R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Daily Vapor Temperature Range (deg. R):	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650
Daily Vapor Pressure Range (psia):	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Daily Avg. Liquid Surface Temp. (deg R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Min. Liquid Surface Temp. (deg R):	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614
Daily Max. Liquid Surface Temp. (deg R):	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Working Losses (lb):	1.9518	7.5706	4.4822	7.4338	5.5774	1.5245	5.3866	10.6404	0.5766	2.2359	1.0371	1.2320
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Net Throughput (gal/mo.):	414,569.3000	1,608,053.1000	952,055.6000	1,578,976.0000	1,184,672.6000	323,813.4000	1,144,140.8000	2,260,085.6000	122,476.4000	474,926.4000	220,281.3000	261,694.1000
Annual Turnovers:	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644
Maximum Liquid Height (ft):	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	2.5283	8.0914	5.0588	7.9917	6.1539	2.0824	5.9631	11.2169	1.1345	2.8125	1.5950	1.8086

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 094 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	49.65	6.79	56.44

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 095 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Lube Oil

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	50.00
Liquid Height (ft) :	39.50
Avg. Liquid Height (ft):	29.36
Volume (gallons):	580,176.56
Turnovers:	18.18
Net Throughput(gal/yr):	10,545,744.60
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.30
Slope (ft/ft) (Cone Roof)	0.09

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 095 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 095 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.5765	0.5207	0.5765	0.5579	0.5765	0.5579	0.5765	0.5765	0.5579	0.5765	0.5579	0.5765
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Tank Shell Height (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Average Liquid Height (ft):	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Height (ft):	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000
Roof Slope (ft/ft):	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
Shell Radius (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Daily Avg. Liquid Surface Temp. (deg. R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Daily Vapor Temperature Range (deg. R):	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650
Daily Vapor Pressure Range (psia):	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Daily Avg. Liquid Surface Temp. (deg R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Min. Liquid Surface Temp. (deg R):	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614
Daily Max. Liquid Surface Temp. (deg R):	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Working Losses (lb):	1.9518	7.5706	4.4822	7.4338	5.5774	1.5245	5.3866	10.6404	0.5766	2.2359	1.0371	1.2320
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Net Throughput (gal/mo.):	414,569.3000	1,608,053.1000	952,055.6000	1,578,976.0000	1,184,672.6000	323,813.4000	1,144,140.8000	2,260,085.6000	122,476.4000	474,926.4000	220,281.3000	261,694.1000
Annual Turnovers:	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644
Maximum Liquid Height (ft):	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	2.5283	8.0914	5.0588	7.9917	6.1539	2.0824	5.9631	11.2169	1.1345	2.8125	1.5950	1.8086

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 095 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	49.65	6.79	56.44

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 096 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Lube Oil

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	50.00
Liquid Height (ft) :	39.50
Avg. Liquid Height (ft):	29.36
Volume (gallons):	580,176.56
Turnovers:	18.18
Net Throughput(gal/yr):	10,545,744.60
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.30
Slope (ft/ft) (Cone Roof)	0.09

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 096 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 096 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.5765	0.5207	0.5765	0.5579	0.5765	0.5579	0.5765	0.5765	0.5579	0.5765	0.5579	0.5765
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Tank Shell Height (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Average Liquid Height (ft):	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Height (ft):	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000
Roof Slope (ft/ft):	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
Shell Radius (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Daily Avg. Liquid Surface Temp. (deg. R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Daily Vapor Temperature Range (deg. R):	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650
Daily Vapor Pressure Range (psia):	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Daily Avg. Liquid Surface Temp. (deg R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Min. Liquid Surface Temp. (deg R):	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614
Daily Max. Liquid Surface Temp. (deg R):	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Working Losses (lb):	1.9518	7.5706	4.4822	7.4338	5.5774	1.5245	5.3866	10.6404	0.5766	2.2359	1.0371	1.2320
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Net Throughput (gal/mo.):	414,569.3000	1,608,053.1000	952,055.6000	1,578,976.0000	1,184,672.6000	323,813.4000	1,144,140.8000	2,260,085.6000	122,476.4000	474,926.4000	220,281.3000	261,694.1000
Annual Turnovers:	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644
Maximum Liquid Height (ft):	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	2.5283	8.0914	5.0588	7.9917	6.1539	2.0824	5.9631	11.2169	1.1345	2.8125	1.5950	1.8086

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 096 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	49.65	6.79	56.44

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 097 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	Lube Oil

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	50.00
Liquid Height (ft) :	39.50
Avg. Liquid Height (ft):	29.36
Volume (gallons):	580,176.56
Turnovers:	18.18
Net Throughput(gal/yr):	10,545,744.60
Is Tank Heated (y/n):	Y

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	2.30
Slope (ft/ft) (Cone Roof)	0.09

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 097 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gas Oil	Jan	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Feb	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Mar	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Apr	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	May	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jun	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Jul	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Aug	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Sep	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Oct	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Nov	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1
Gas Oil	Dec	53.92	47.99	59.86	51.98	0.0015	0.0012	0.0020	130.0000			130.00	Option 4: RVP=.01, ASTM Slope=1

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 097 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Standing Losses (lb):	0.5765	0.5207	0.5765	0.5579	0.5765	0.5579	0.5765	0.5765	0.5579	0.5765	0.5579	0.5765
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Tank Vapor Space Volume:												
Vapor Space Volume (cu ft):	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376	22,396.9376
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Tank Shell Height (ft):	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000	40.0000
Average Liquid Height (ft):	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600	29.3600
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Outage (Cone Roof)												
Roof Outage (ft):	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667	0.7667
Roof Height (ft):	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000	2.3000
Roof Slope (ft/ft):	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900	0.0900
Shell Radius (ft):	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000	25.0000
Vapor Density												
Vapor Density (lb/cu ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Daily Avg. Liquid Surface Temp. (deg. R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Average Ambient Temp. (deg. F):	27.8500	34.1000	41.8000	49.6000	58.7500	69.1000	77.9500	75.6000	65.1000	53.1500	40.8500	29.7000
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731	10.731
Liquid Bulk Temperature (deg. R):	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	617.0902	922.6212	1,303.0279	1,713.2580	2,067.0141	2,335.4245	2,325.5891	2,064.7932	1,660.5912	1,172.9472	710.0503	533.0136
Vapor Space Expansion Factor												
Vapor Space Expansion Factor:	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232	0.0232
Daily Vapor Temperature Range (deg. R):	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650	11.8650
Daily Vapor Pressure Range (psia):	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008
Breather Vent Press. Setting Range(psia):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020
Daily Avg. Liquid Surface Temp. (deg R):	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939	513.5939
Daily Min. Liquid Surface Temp. (deg R):	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614	507.6614
Daily Max. Liquid Surface Temp. (deg R):	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264	519.5264
Daily Ambient Temp. Range (deg. R):	17.1000	19.0000	20.8000	23.4000	26.3000	27.4000	28.5000	27.6000	28.2000	25.9000	19.9000	16.2000
Vented Vapor Saturation Factor												
Vented Vapor Saturation Factor:	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991	0.9991
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Vapor Space Outage (ft):	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067	11.4067
Working Losses (lb):	1.9518	7.5706	4.4822	7.4338	5.5774	1.5245	5.3866	10.6404	0.5766	2.2359	1.0371	1.2320
Vapor Molecular Weight (lb/lb-mole):	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Net Throughput (gal/mo.):	414,569.3000	1,608,053.1000	952,055.6000	1,578,976.0000	1,184,672.6000	323,813.4000	1,144,140.8000	2,260,085.6000	122,476.4000	474,926.4000	220,281.3000	261,694.1000
Annual Turnovers:	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768	18.1768
Turnover Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Maximum Liquid Volume (gal):	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644	580,176.5644
Maximum Liquid Height (ft):	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000	39.5000
Tank Diameter (ft):	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000	50.0000
Working Loss Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	2.5283	8.0914	5.0588	7.9917	6.1539	2.0824	5.9631	11.2169	1.1345	2.8125	1.5950	1.8086

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 097 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Gas Oil	49.65	6.79	56.44

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 098 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Internal Floating Roof Tank
Description:	Regular Gasoline/FCC Gas

Tank Dimensions

Diameter (ft):	60.00
Volume (gallons):	845,968.00
Turnovers:	14.82
Self Supp. Roof? (y/n):	Y
No. of Columns:	0.00
Eff. Col. Diam. (ft):	0.00

Paint Characteristics

Internal Shell Condition:	Light Rust
Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Rim-Seal System

Primary Seal:	Liquid-mounted
Secondary Seal	Rim-mounted

Deck Characteristics

Deck Fitting Category:	Typical
Deck Type:	Welded

Deck Fitting/Status	Quantity
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1
Roof Leg or Hanger Well/Adjustable	17
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 098 - Expansion - Internal Floating Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Gasoline (RVP 8 WX Input)	Jan	42.19	38.38	46.01	51.98	2.7965	N/A	N/A	68.0000			68.00	Option 4: RVP=8, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0097	N/A	N/A	120.1900	0.0120	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						0.6975	N/A	N/A	78.1100	0.0220	0.0055	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						0.7324	N/A	N/A	84.1600	0.0110	0.0029	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.0568	N/A	N/A	106.1700	0.0110	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.1802	N/A	N/A	86.1700	0.0320	0.0135	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.1850	N/A	N/A	92.1300	0.0950	0.0063	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.3393	N/A	N/A	67.5629	0.7470	0.9704	62.10	
Xylene (-m)						0.0470	N/A	N/A	106.1700	0.0700	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Gasoline (RVP 8 WX Input)	Feb	45.35	40.84	49.87	51.98	2.9913	N/A	N/A	68.0000			68.00	Option 4: RVP=8, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0111	N/A	N/A	120.1900	0.0120	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						0.7668	N/A	N/A	78.1100	0.0220	0.0056	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						0.8033	N/A	N/A	84.1600	0.0110	0.0030	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.0640	N/A	N/A	106.1700	0.0110	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.2897	N/A	N/A	86.1700	0.0320	0.0138	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.2058	N/A	N/A	92.1300	0.0950	0.0065	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.5696	N/A	N/A	67.5493	0.7470	0.9696	62.10	
Xylene (-m)						0.0530	N/A	N/A	106.1700	0.0700	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Gasoline (RVP 8 WX Input)	Mar	49.25	43.96	54.55	51.98	3.2468	N/A	N/A	68.0000			68.00	Option 4: RVP=8, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0131	N/A	N/A	120.1900	0.0120	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						0.8602	N/A	N/A	78.1100	0.0220	0.0058	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						0.8987	N/A	N/A	84.1600	0.0110	0.0030	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.0739	N/A	N/A	106.1700	0.0110	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.4364	N/A	N/A	86.1700	0.0320	0.0142	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.2342	N/A	N/A	92.1300	0.0950	0.0069	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.8711	N/A	N/A	67.5325	0.7470	0.9685	62.10	
Xylene (-m)						0.0613	N/A	N/A	106.1700	0.0700	0.0013	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Gasoline (RVP 8 WX Input)	Apr	53.24	46.98	59.49	51.98	3.5258	N/A	N/A	68.0000			68.00	Option 4: RVP=8, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0155	N/A	N/A	120.1900	0.0120	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						0.9652	N/A	N/A	78.1100	0.0220	0.0060	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						1.0056	N/A	N/A	84.1600	0.0110	0.0031	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.0854	N/A	N/A	106.1700	0.0110	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.6001	N/A	N/A	86.1700	0.0320	0.0145	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.2665	N/A	N/A	92.1300	0.0950	0.0072	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						4.2001	N/A	N/A	67.5149	0.7470	0.9674	62.10	
Xylene (-m)						0.0710	N/A	N/A	106.1700	0.0700	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Gasoline (RVP 8 WX Input)	May	57.74	50.54	64.93	51.98	3.8641	N/A	N/A	68.0000			68.00	Option 4: RVP=8, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0187	N/A	N/A	120.1900	0.0120	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.0964	N/A	N/A	78.1100	0.0220	0.0062	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						1.1390	N/A	N/A	84.1600	0.0110	0.0032	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1003	N/A	N/A	106.1700	0.0110	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.8034	N/A	N/A	86.1700	0.0320	0.0149	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.3076	N/A	N/A	92.1300	0.0950	0.0076	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						4.5986	N/A	N/A	67.4948	0.7470	0.9662	62.10	
Xylene (-m)						0.0834	N/A	N/A	106.1700	0.0700	0.0015	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Gasoline (RVP 7 WX Input)	Jun	62.65	54.94	70.36	51.98	3.6770	N/A	N/A	66.0000			66.00	Option 4: RVP=7, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0227	N/A	N/A	120.1900	0.0320	0.0002	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.2564	N/A	N/A	78.1100	0.0060	0.0021	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Hexane (-n)						2.0492	N/A	N/A	86.1700	0.0110	0.0061	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.3584	N/A	N/A	92.1300	0.0220	0.0021	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						4.0209	N/A	N/A	65.7851	0.8530	0.9874	62.14	
Xylene (-m)						0.0991	N/A	N/A	106.1700	0.0760	0.0020	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Gasoline (RVP 7 WX Input)	Jul	66.53	58.63	74.43	51.98	3.9739	N/A	N/A	66.0000			66.00	Option 4: RVP=7, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0264	N/A	N/A	120.1900	0.0320	0.0002	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3960	N/A	N/A	78.1100	0.0060	0.0021	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Hexane (-n)						2.2621	N/A	N/A	86.1700	0.0110	0.0063	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.4034	N/A	N/A	92.1300	0.0220	0.0022	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						4.3443	N/A	N/A	65.7773	0.8530	0.9870	62.14	
Xylene (-m)						0.1133	N/A	N/A	106.1700	0.0760	0.0022	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Gasoline (RVP 8 WX Input)	Aug	65.15	57.72	72.57	51.98	4.4779	N/A	N/A	68.0000			68.00	Option 4: RVP=8, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0250	N/A	N/A	120.1900	0.0120	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.3448	N/A	N/A	78.1100	0.0220	0.0066	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						1.3904	N/A	N/A	84.1600	0.0110	0.0034	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1295	N/A	N/A	106.1700	0.0110	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						2.1842	N/A	N/A	86.1700	0.0320	0.0156	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.3868	N/A	N/A	92.1300	0.0950	0.0082	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						5.3203	N/A	N/A	67.4610	0.7470	0.9641	62.10	
Xylene (-m)						0.1081	N/A	N/A	106.1700	0.0700	0.0017	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Gasoline (RVP 8 WX Input)	Sep	59.98	52.93	67.04	51.98	4.0426	N/A	N/A	68.0000			68.00	Option 4: RVP=8, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0204	N/A	N/A	120.1900	0.0120	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						1.1674	N/A	N/A	78.1100	0.0220	0.0064	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						1.2109	N/A	N/A	84.1600	0.0110	0.0033	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.1085	N/A	N/A	106.1700	0.0110	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.9126	N/A	N/A	86.1700	0.0320	0.0151	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.3300	N/A	N/A	92.1300	0.0950	0.0078	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						4.8087	N/A	N/A	67.4847	0.7470	0.9655	62.10	
Xylene (-m)						0.0903	N/A	N/A	106.1700	0.0700	0.0016	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Gasoline (RVP 8 WX Input)	Oct	54.07	48.01	60.13	51.98	3.5867	N/A	N/A	68.0000			68.00	Option 4: RVP=8, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0161	N/A	N/A	120.1900	0.0120	0.0001	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						0.9885	N/A	N/A	78.1100	0.0220	0.0061	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						1.0294	N/A	N/A	84.1600	0.0110	0.0032	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.0880	N/A	N/A	106.1700	0.0110	0.0003	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.6364	N/A	N/A	86.1700	0.0320	0.0146	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.2738	N/A	N/A	92.1300	0.0950	0.0073	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						4.2720	N/A	N/A	67.5112	0.7470	0.9672	62.10	
Xylene (-m)						0.0732	N/A	N/A	106.1700	0.0700	0.0014	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Gasoline (RVP 8 WX Input)	Nov	48.04	43.61	52.46	51.98	3.1654	N/A	N/A	68.0000			68.00	Option 4: RVP=8, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0125	N/A	N/A	120.1900	0.0120	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						0.8301	N/A	N/A	78.1100	0.0220	0.0058	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						0.8680	N/A	N/A	84.1600	0.0110	0.0030	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.0707	N/A	N/A	106.1700	0.0110	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.3893	N/A	N/A	86.1700	0.0320	0.0140	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.2250	N/A	N/A	92.1300	0.0950	0.0068	92.13	Option 2: A=6.954, B=1344.8, C=219.48

Unidentified Components						3.7751	N/A	N/A	67.5377	0.7470	0.9688	62.10	
Xylene (-m)						0.0586	N/A	N/A	106.1700	0.0700	0.0013	106.17	Option 2: A=7.009, B=1462.266, C=215.11
Gasoline (RVP 8 WX Input)	Dec	42.89	39.34	46.44	51.98	2.8388	N/A	N/A	68.0000			68.00	Option 4: RVP=8, ASTM Slope=3
1,2,4-Trimethylbenzene						0.0100	N/A	N/A	120.1900	0.0120	0.0000	120.19	Option 2: A=7.04383, B=1573.267, C=208.56
Benzene						0.7124	N/A	N/A	78.1100	0.0220	0.0055	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Cyclohexane						0.7477	N/A	N/A	84.1600	0.0110	0.0029	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Ethylbenzene						0.0583	N/A	N/A	106.1700	0.0110	0.0002	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Hexane (-n)						1.2038	N/A	N/A	86.1700	0.0320	0.0136	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Toluene						0.1895	N/A	N/A	92.1300	0.0950	0.0063	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Unidentified Components						3.3893	N/A	N/A	67.5599	0.7470	0.9702	62.10	
Xylene (-m)						0.0483	N/A	N/A	106.1700	0.0700	0.0012	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 098 - Expansion - Internal Floating Roof Tank
Woods Cross, Utah

Month:	January	February	March	April	May	June	July	August	September	October	November	December
Rim Seal Losses (lb):	6.3658	6.8733	7.5538	8.3176	9.2745	8.4839	9.3107	11.1042	9.7938	8.4875	7.3351	6.4752
Seal Factor A (lb-mole/ft-yr):	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000	0.3000
Seal Factor B (lb-mole/ft-yr (mph)^n):	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000	0.6000
Value of Vapor Pressure Function:	0.0624	0.0674	0.0741	0.0815	0.0909	0.0857	0.0940	0.1089	0.0960	0.0832	0.0719	0.0635
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	2.7965	2.9913	3.2468	3.5258	3.8641	3.6770	3.9739	4.4779	4.0426	3.5867	3.1654	2.8388
Tank Diameter (ft):	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000
Vapor Molecular Weight (lb/lb-mole):	68.0000	68.0000	68.0000	68.0000	68.0000	66.0000	66.0000	68.0000	68.0000	68.0000	68.0000	68.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Withdrawal Losses (lb):	0.0000	3.3318	7.0680	8.2267	0.6676	7.5527	0.0128	1.0624	4.2113	11.1123	2.3720	5.7520
Number of Columns:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Effective Column Diameter (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Net Throughput (gal/mo.):	0.0000	813,110.8000	1,724,922.9000	2,007,710.0000	162,935.5000	1,843,207.8000	3,133.4000	259,286.8000	1,027,747.0000	2,711,936.1000	578,891.0000	1,403,752.0000
Shell Clingage Factor (bbl/1000 sqft):	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
Average Organic Liquid Density (lb/gal):	7.3000	7.3000	7.3000	7.3000	7.3000	7.3000	7.3000	7.3000	7.3000	7.3000	7.3000	7.3000
Tank Diameter (ft):	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000
Deck Fitting Losses (lb):	71.6153	77.3245	84.9804	93.5731	104.3385	95.4443	104.7458	124.9222	110.1806	95.4849	82.5195	72.8456
Value of Vapor Pressure Function:	0.0624	0.0674	0.0741	0.0815	0.0909	0.0857	0.0940	0.1089	0.0960	0.0832	0.0719	0.0635
Vapor Molecular Weight (lb/lb-mole):	68.0000	68.0000	68.0000	68.0000	68.0000	66.0000	66.0000	68.0000	68.0000	68.0000	68.0000	68.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Tot. Roof Fitting Loss Fact.(lb-mole/yr):	202.5000	202.5000	202.5000	202.5000	202.5000	202.5000	202.5000	202.5000	202.5000	202.5000	202.5000	202.5000
Deck Seam Losses (lb):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length (ft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Loss per Unit Length Factor (lb-mole/ft-yr):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Deck Seam Length Factor(ft/sqft):	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Tank Diameter (ft):	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000	60.0000
Vapor Molecular Weight (lb/lb-mole):	68.0000	68.0000	68.0000	68.0000	68.0000	66.0000	66.0000	68.0000	68.0000	68.0000	68.0000	68.0000
Product Factor:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total Losses (lb):	77.9811	87.5296	99.6022	110.1175	114.2806	111.4809	114.0694	137.0888	124.1857	115.0847	92.2266	85.0727

Roof Fitting/Status	Quantity	Roof Fitting Loss Factors KFa(lb-mole/yr)	KFb(lb-mole/(yr mph^n))	m	Losses(lb)
Access Hatch (24-in. Diam.)/Unbolted Cover, Ungasketed	1	36.00	5.90	1.20	198.9758
Automatic Gauge Float Well/Unbolted Cover, Ungasketed	1	14.00	5.40	1.10	77.3795
Roof Leg or Hanger Well/Adjustable	17	7.90	0.00	0.00	742.2904
Sample Pipe or Well (24-in. Diam.)/Slit Fabric Seal 10% Open	1	12.00	0.00	0.00	66.3253
Vacuum Breaker (10-in. Diam.)/Weighted Mech. Actuation, Gask.	1	6.20	1.20	0.94	34.2681

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 098 - Expansion - Internal Floating Roof Tank
Woods Cross, Utah

	Losses(lbs)				
Components	Rim Seal Loss	Withdrawl Loss	Deck Fitting Loss	Deck Seam Loss	Total Emissions
Gasoline (RVP 7 WX Input)	17.79	7.57	200.19	0.00	225.55
1,2,4-Trimethylbenzene	0.00	0.24	0.04	0.00	0.29
Benzene	0.04	0.05	0.42	0.00	0.50
Hexane (-n)	0.11	0.08	1.24	0.00	1.43
Toluene	0.04	0.17	0.44	0.00	0.64
Unidentified Components	17.57	6.45	197.63	0.00	221.65
Xylene (-m)	0.04	0.57	0.42	0.00	1.04
Gasoline (RVP 8 WX Input)	81.58	43.80	917.78	0.00	1,043.17
1,2,4-Trimethylbenzene	0.00	0.53	0.05	0.00	0.58
Benzene	0.49	0.96	5.52	0.00	6.98
Cyclohexane	0.26	0.48	2.88	0.00	3.61
Ethylbenzene	0.02	0.48	0.24	0.00	0.75
Hexane (-n)	1.18	1.40	13.31	0.00	15.90
Toluene	0.59	4.16	6.59	0.00	11.34
Unidentified Components	78.92	32.72	887.89	0.00	999.54
Xylene (-m)	0.12	3.07	1.30	0.00	4.48

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 099 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	ULSD #2

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	110.00
Liquid Height (ft) :	39.50
Avg. Liquid Height (ft):	34.23
Volume (gallons):	2,950,234.55
Turnovers:	8.49
Net Throughput(gal/yr):	25,054,216.20
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.80
Slope (ft/ft) (Cone Roof)	0.01

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 099 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	53.92	47.99	59.86	51.98	0.0056	0.0042	0.0074	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0074

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 099 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Annual Emission Calcaulations

Standing Losses (lb):	129.1201
Vapor Space Volume (cu ft):	57,368.3616
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0465
Vented Vapor Saturation Factor:	0.9982
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	57,368.3616
Tank Diameter (ft):	110.0000
Vapor Space Outage (ft):	6.0367
Tank Shell Height (ft):	40.0000
Average Liquid Height (ft):	34.2300
Roof Outage (ft):	0.2667
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.2667
Roof Height (ft):	0.8000
Roof Slope (ft/ft):	0.0100
Shell Radius (ft):	55.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0056
Daily Avg. Liquid Surface Temp. (deg. R):	513.5939
Daily Average Ambient Temp. (deg. F):	51.9625
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,452.1184
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0465
Daily Vapor Temperature Range (deg. R):	23.7301
Daily Vapor Pressure Range (psia):	0.0031
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0056
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0042
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0074
Daily Avg. Liquid Surface Temp. (deg R):	513.5939
Daily Min. Liquid Surface Temp. (deg R):	507.6614
Daily Max. Liquid Surface Temp. (deg R):	519.5264
Daily Ambient Temp. Range (deg. R):	23.3583
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9982
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0056
Vapor Space Outage (ft):	6.0367
Working Losses (lb):	437.2145
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0056
Annual Net Throughput (gal/yr.):	25,054,216.2000
Annual Turnovers:	8.4923
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	2,950,234.5499
Maximum Liquid Height (ft):	39.5000
Tank Diameter (ft):	110.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	566.3345

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 099 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	437.21	129.12	566.33

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tank 170 - Expansion
City:	Woods Cross
State:	Utah
Company:	Holly Refining & Marketing Company
Type of Tank:	Vertical Fixed Roof Tank
Description:	ULSD #2

Tank Dimensions

Shell Height (ft):	40.00
Diameter (ft):	110.00
Liquid Height (ft) :	39.50
Avg. Liquid Height (ft):	34.23
Volume (gallons):	2,950,234.55
Turnovers:	8.49
Net Throughput(gal/yr):	25,054,216.20
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Cone
Height (ft)	0.80
Slope (ft/ft) (Cone Roof)	0.01

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Salt Lake City, Utah (Avg Atmospheric Pressure = 12.64 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tank 170 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	53.92	47.99	59.86	51.98	0.0056	0.0042	0.0074	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0074

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tank 170 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

Annual Emission Calcaulations

Standing Losses (lb):	129.1201
Vapor Space Volume (cu ft):	57,368.3616
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0465
Vented Vapor Saturation Factor:	0.9982
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	57,368.3616
Tank Diameter (ft):	110.0000
Vapor Space Outage (ft):	6.0367
Tank Shell Height (ft):	40.0000
Average Liquid Height (ft):	34.2300
Roof Outage (ft):	0.2667
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.2667
Roof Height (ft):	0.8000
Roof Slope (ft/ft):	0.0100
Shell Radius (ft):	55.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0056
Daily Avg. Liquid Surface Temp. (deg. R):	513.5939
Daily Average Ambient Temp. (deg. F):	51.9625
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	511.6525
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,452.1184
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0465
Daily Vapor Temperature Range (deg. R):	23.7301
Daily Vapor Pressure Range (psia):	0.0031
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0056
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0042
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0074
Daily Avg. Liquid Surface Temp. (deg R):	513.5939
Daily Min. Liquid Surface Temp. (deg R):	507.6614
Daily Max. Liquid Surface Temp. (deg R):	519.5264
Daily Ambient Temp. Range (deg. R):	23.3583
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9982
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0056
Vapor Space Outage (ft):	6.0367
Working Losses (lb):	437.2145
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0056
Annual Net Throughput (gal/yr.):	25,054,216.2000
Annual Turnovers:	8.4923
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	2,950,234.5499
Maximum Liquid Height (ft):	39.5000
Tank Diameter (ft):	110.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	566.3345

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tank 170 - Expansion - Vertical Fixed Roof Tank
Woods Cross, Utah

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	437.21	129.12	566.33

Startup/Shutdown Emissions for New Units

Unit	Capacity (bbpd)	Ratio to Existing	Avg SD/yr*
New Crude Unit	15000	0.5	3.4
New FCC Unit	8500	1	2.6
New Poly Gas Unit	3000	1	2.6
New Hydro Isom Unit	15000	1.339	4.2

*Average shutdowns per year bashed on existing unit shutdowns from 2007 through 2011
South flare flow meter not in operation for startup period

Single Shutdown Event
Shutdown Emissions (LBS)

	New Crude	New FCC	Poly Gas	Hydro Isom
NOx	62.26	170.50	256.21	429.12
CO	338.78	927.71	1394.08	2334.93
SOx	1.49	4.13	6.15	10.39
PM10	4.23	11.71	17.43	29.41
PM2.5	4.23	11.71	17.43	29.41
VOC	3.06	8.47	12.61	21.29
Ammonia	1.78	4.93	7.34	12.39
Lead	0.00	0.00	0.00	0.00

Single Startup Event
Startup Emissions (LBS)

	New Crude	New FCC	Poly Gas	Hydro Isom
NOx	28.24	182.24	7.96	32.06
CO	153.66	991.60	43.31	174.45
SOx	1.01	6.54	0.29	1.15
PM10	2.87	18.51	0.81	3.26
PM2.5	2.87	18.51	0.81	3.26
VOC	2.08	13.39	0.58	2.36
Ammonia	1.21	7.79	0.34	1.37
Lead	0.00	0.00	0.00	0.00

X Shutdowns per Year
Shutdown Emissions (LBS/YR)

	New Crude	New FCC	Poly Gas	Hydro Isom
NOx	211.69	443.30	666.14	1802.32
CO	1151.84	2412.05	3624.60	9806.72
SOx	5.08	10.75	16.00	43.63
PM10	14.39	30.44	45.31	123.54
PM2.5	14.39	30.44	45.31	123.54
VOC	10.41	22.03	32.79	89.40
Ammonia	6.06	12.82	19.08	52.02
Lead	0.00	0.00	0.00	0.01

X Startups per Year
Startup Emissions (LBS/YR)

	New Crude	New FCC	Poly Gas	Hydro Isom
NOx	96.02	473.82	20.70	134.66
CO	522.45	2578.16	112.61	732.69
SOx	3.44	16.99	0.74	4.83
PM10	9.75	48.11	2.10	13.67
PM2.5	9.75	48.11	2.10	13.67
VOC	7.06	34.82	1.52	9.89
Ammonia	4.11	20.26	0.88	5.76
Lead	0.00	0.00	0.00	0.00

X Shutdowns per Year
Shutdown Emissions (TONS/YR)

	New Crude	New FCC	Poly Gas	Hydro Isom
NOx	0.106	0.222	0.333	0.901
CO	0.576	1.206	1.812	4.903
SOx	0.003	0.005	0.008	0.022
PM10	0.007	0.015	0.023	0.062
PM2.5	0.007	0.015	0.023	0.062
VOC	0.005	0.011	0.016	0.045
Ammonia	0.003	0.006	0.010	0.026
Lead	0.000	0.000	0.000	0.000

X Startups per Year
Startup Emissions (TONS/YR)

	New Crude	New FCC	Poly Gas	Hydro Isom
NOx	0.048	0.237	0.010	0.067
CO	0.261	1.289	0.056	0.366
SOx	0.002	0.008	0.000	0.002
PM10	0.005	0.024	0.001	0.007
PM2.5	0.005	0.024	0.001	0.007
VOC	0.004	0.017	0.001	0.005
Ammonia	0.002	0.010	0.000	0.003
Lead	0.000	0.000	0.000	0.000

Totals

SU/SD Emissions (TONS/YR)	New Crude	New FCC	Poly Gas	Hydro Isom
NOx	0.154	0.459	0.343	0.968
CO	0.837	2.495	1.869	5.270
SOx	0.004	0.014	0.008	0.024
PM10	0.012	0.039	0.024	0.069
PM2.5	0.012	0.039	0.024	0.069
VOC	0.009	0.028	0.017	0.050
Ammonia	0.005	0.017	0.010	0.029
Lead	0.000	0.000	0.000	0.000

New Crude Unit			
Capacity		15000	bbpd
Ratio New to Existing		0.5	
Basis	Unit 8		
Capacity		30000	bbpd
Emissions Point	8PSV3		8-V-1
Set Point		40	psi
Dimension	4x6		in
Pressure Control	8PC609		Crude Tower Pressure Control
Shutdown Venting Duration		16	hours

Shutdown Emissions (LBS)

	Existing Unit 8	New Crude Unit
NOx	124.52	62.26
CO	677.55	338.78
SOx	2.99	1.49
PM10	8.46	4.23
PM2.5	8.46	4.23
VOC	6.12	3.06
Ammonia	3.56	1.78
Lead	0.00	0.00

Startup Emissions (LBS)

	Existing Unit 8	New Crude Unit
NOx	56.48	28.24
CO	307.33	153.66
SOx	2.03	1.01
PM10	5.74	2.87
PM2.5	5.74	2.87
VOC	4.15	2.08
Ammonia	2.41	1.21
Lead	0.00	0.00

New FCCU			
Capacity		8500	bbpd
Ratio New to Existing		1	
Basis	Unit 4		
Capacity		8500	bbpd
Emissions Point	4PSV20		4-C-1
Set Point		35	psi
Dimension	6x8		in
Pressure Control	4PC675		from De2 Absorber Reboiler
Shutdown Venting Duration		21	hours

Shutdown Emissions (LBS)

	Existing Unit 4	New FCC Unit
NOx	170.50	170.50
CO	927.71	927.71
SOx	4.13	4.13
PM10	11.71	11.71
PM2.5	11.71	11.71
VOC	8.47	8.47
Ammonia	4.93	4.93
Lead	0.00	0.00

Startup Emissions (LBS)

	Existing Unit 4	New FCC Unit
NOx	182.24	182.24
CO	991.60	991.60
SOx	6.54	6.54
PM10	18.51	18.51
PM2.5	18.51	18.51
VOC	13.39	13.39
Ammonia	7.79	7.79
Lead	0.00	0.00

Assumptions:

Emissions based on the use of torch oil and refinery plant gas.

New Poly Gas Unit			
Capacity		3000	bbpd
Ratio New to Existing		1	
Basis	Unit 7		
Capacity		3000	bbpd
Emissions Point	7PSV28		off of 7-V-26
Set Point		308	psi
Dimension	3x4		in
Pressure Control	7PC642		off of 7-V-26

Shutdown Emissions (LBS)

	Existing Unit 7	New Poly Gas Unit
NOx	256.21	256.21
CO	1394.08	1394.08
SOx	6.15	6.15
PM10	17.43	17.43
PM2.5	17.43	17.43
VOC	12.61	12.61
Ammonia	7.34	7.34
Lead	0.00	0.00

Startup Emissions (LBS)

	Existing Unit 7	New Poly Gas Unit
NOx	7.96	7.96
CO	43.31	43.31
SOx	0.29	0.29
PM10	0.81	0.81
PM2.5	0.81	0.81
VOC	0.58	0.58
Ammonia	0.34	0.34
Lead	0.00	0.00

New Hydro Isom Unit		
Capacity	15000	bbpd
Ratio New to Existing	1.339285714	
Basis	Unit 19	
Capacity	11200	bbpd
Emissions Point	19PSV006	off 19-V-7
Set Point	1170	psi
Dimension	1x2	in
Pressure Control	19PIC612	off of 19-V-7

Shutdown Emissions (LBS)

	Existing Unit 19	New Hydro Isom Unit
NOx	320.41	429.12
CO	1743.42	2334.93
SOx	7.76	10.39
PM10	21.96	29.41
PM2.5	21.96	29.41
VOC	15.89	21.29
Ammonia	9.25	12.39
Lead	0.00	0.00

Startup Emissions (LBS)

	Existing Unit 19	New Hydro Isom Unit
NOx	23.94	32.06
CO	130.26	174.45
SOx	0.86	1.15
PM10	2.43	3.26
PM2.5	2.43	3.26
VOC	1.76	2.36
Ammonia	1.02	1.37
Lead	0.00	0.00

Vacuum Unit
H2 Plant
SWS

assumed no shutdown/startup emissions from the Vac, H2 and SWS Units.

Existing Crude Unit Shutdown Emissions

Emission Factors			
NOx	0.068	lb/MMBtu	AP-42 Table 13.5-1
CO	0.37	lb/MMBtu	AP-42 Table 13.5-1
SOx	2.73	lb/MMSCF	measured
PM10	7.73	lb/MMSCF	AP-42 Table 1.4-2
PM2.5	7.73	lb/MMSCF	AP-42 Table 1.4-2
VOC	5.594	lb/MMSCF	AP-42 Table 1.4-2
Ammonia	3.2549	lb/MMSCF	AP-42 Table 1.4-2
Lead	0.0005	lb/MMSCF	AP-42 Table 1.4-2

North Flare					South Flare			
Average Heat Content	1119.5	Btu/SCF	-test done 12/10/2008		Average Heat Content	1752.2	Btu/SCF	-test done 12/10/2008
Average Flowrate	366	SCFM			Average Flowrate	668	SCFM	
	21960	SCFH				40080	SCFH	
Unit 8 Shutdown								
Venting Period	Start	End			Venting Period	Start	End	
8/10/2008	0:00	15:00		16	8/10/2008	0:00	15:00	
Average Mol Weight	46.17				Average Mol Weight	23.79		
Average LB/HR	1046.72	LB/HR			Average LB/HR	3749.79	LB/HR	
Calculated Flow	8602.78	SCFH			Calculated Flow	59822.52	SCFH	
	0.01	MMSCFH				0.06	MMSCFH	
Calculated Heat	9.63	MMBtu/HR			Calculated Heat	104.82	MMBtu/HR	
NOx	0.655	LB/HR			NOx	7.128	LB/HR	
CO	3.563	LB/HR			CO	38.784	LB/HR	
SOx	0.023	LB/HR			SOx	0.163	LB/HR	
PM10	0.066	LB/HR			PM10	0.462	LB/HR	
PM2.5	0.066	LB/HR			PM2.5	0.462	LB/HR	
VOC	0.048	LB/HR			VOC	0.335	LB/HR	
Ammonia	0.028	LB/HR			Ammonia	0.195	LB/HR	
Lead	0.000	LB/HR			Lead	0.000	LB/HR	
Total Event Emissions								
NOx	124.52	LB						
CO	677.55	LB						
SOx	2.99	LB						
PM10	8.46	LB						
PM2.5	8.46	LB						
VOC	6.12	LB						
Ammonia	3.56	LB						
Lead	0.00	LB						

Unit 8 Startup							
Venting Period	Start	End		Venting Period	Start	End	
09/08/2008-09/12/2008	21:00	2:00	77	09/08/2008-09/12/2008	21:00	2:00	
Average Mol Weight	22.59			Average Mol Weight	0.0205		
Average LB/HR	573.62	LB/HR		Average LB/HR	35.042	LB/HR	
Calculated Flow	9635.66	SCFH		Calculated Flow	648704.34	SCFH	
	0.01	MMSCFH			0.65	MMSCFH	
Calculated Heat	10.79	MMBtu/HR		Calculated Heat	1136.66	MMBtu/HR	
NOx	0.734	LB/HR		NOx	77.29	LB/HR	
CO	3.991	LB/HR		CO	420.56	LB/HR	
SOx	0.026	LB/HR		SOx	1.77	LB/HR	
PM10	0.074	LB/HR		PM10	5.01	LB/HR	
PM2.5	0.074	LB/HR		PM2.5	5.01	LB/HR	
VOC	0.054	LB/HR		VOC	3.63	LB/HR	
Ammonia	0.031	LB/HR		Ammonia	2.11	LB/HR	
Lead	0.000	LB/HR		Lead	0.00	LB/HR	
Total Event Emissions							
NOx	56.48	LB					
CO	307.33	LB					
SOx	2.03	LB					
PM10	5.74	LB					
PM2.5	5.74	LB					
VOC	4.15	LB					
Ammonia	2.41	LB					
Lead	0.00	LB					

Existing FCC Unit Shutdown Emissions

Emission Factors			
NOx	0.068	lb/MMBtu	AP-42 Table 13.5-1
CO	0.37	lb/MMBtu	AP-42 Table 13.5-1
SOx	2.73	lb/MMSCF	measured
PM10	7.73	lb/MMSCF	AP-42 Table 1.4-2
PM2.5	7.73	lb/MMSCF	AP-42 Table 1.4-2
VOC	5.594	lb/MMSCF	AP-42 Table 1.4-2
Ammonia	3.2549	lb/MMSCF	AP-42 Table 1.4-2
Lead	0.0005	lb/MMSCF	AP-42 Table 1.4-2

North Flare				South Flare			
Average Heat Content	1119.5	Btu/SCF	-test done 12/10/2008	Average Heat Content	1752.2	Btu/SCF	-test done 12/10/2008
Average Flowrate	366	SCFM		Average Flowrate	668	SCFM	
	21960	SCFH			40080	SCFH	

Unit 4 Shutdown

Venting Period	Start	End		Venting Period	Start	End
08/08/2008-08/09/2008	9:00	6:00	21	08/08/2008-08/09/2008	9:00	6:00
Average Mol Weight	21.85			Average Mol Weight	37.91	
Average LB/HR	632.97	LB/HR		Average LB/HR	6105.82	LB/HR
Calculated Flow	10994.75	SCFH		Calculated Flow	61116.38	SCFH
	0.01	MMSCFH			0.06	MMSCFH
Calculated Heat	12.31	MMBtu/HR		Calculated Heat	107.09	MMBtu/HR
NOx	0.837	LB/HR		NOx	7.282	LB/HR
CO	4.554	LB/HR		CO	39.623	LB/HR
SOx	0.030	LB/HR		SOx	0.167	LB/HR
PM10	0.085	LB/HR		PM10	0.472	LB/HR
PM2.5	0.085	LB/HR		PM2.5	0.472	LB/HR
VOC	0.062	LB/HR		VOC	0.342	LB/HR
Ammonia	0.036	LB/HR		Ammonia	0.199	LB/HR
Lead	0.000	LB/HR		Lead	0.000	LB/HR
Total Event Emissions						
NOx	170.499	LB				
CO	927.713	LB				
SOx	4.134	LB				
PM10	11.706	LB				
PM2.5	11.706	LB				
VOC	8.471	LB				
Ammonia	4.929	LB				
Lead	0.001	LB				

Unit 4 Startup

Venting Period	Start	End		Venting Period	Start	End
09/05/2008-09/12/2008	13:00	22:00	177	09/05/2008-09/12/2008	13:00	22:00
Average Mol Weight	23.063			Average Mol Weight	0.023	
Average LB/HR	821.941	LB/HR		Average LB/HR	35.05	LB/HR
Calculated Flow	13524.980	SCFH		Calculated Flow	578275.50	SCFH
	0.014	MMSCFH			0.58	MMSCFH
Calculated Heat	15.141	MMBtu/HR		Calculated Heat	1013.25	MMBtu/HR
NOx	1.030	LB/HR		NOx	68.901	LB/HR
CO	5.602	LB/HR		CO	374.904	LB/HR
SOx	0.037	LB/HR		SOx	1.579	LB/HR
PM10	0.105	LB/HR		PM10	4.470	LB/HR
PM2.5	0.105	LB/HR		PM2.5	4.470	LB/HR
VOC	0.076	LB/HR		VOC	3.235	LB/HR
Ammonia	0.044	LB/HR		Ammonia	1.882	LB/HR
Lead	0.000	LB/HR		Lead	0.000	LB/HR
Total Event Emissions						
NOx	182.24	LB				
CO	991.60	LB				
SOx	6.54	LB				
PM10	18.51	LB				
PM2.5	18.51	LB				
VOC	13.39	LB				
Ammonia	7.79	LB				
Lead	0.00	LB				

Existing Alky Unit Shutdown Emissions

Emission Factors			
NOx	0.068	lb/MMBtu	AP-42 Table 13.5-1
CO	0.37	lb/MMBtu	AP-42 Table 13.5-1
SOx	2.73	lb/MMSCF	measured
PM10	7.73	lb/MMSCF	AP-42 Table 1.4-2
PM2.5	7.73	lb/MMSCF	AP-42 Table 1.4-2
VOC	5.594	lb/MMSCF	AP-42 Table 1.4-2
Ammonia	3.2549	lb/MMSCF	AP-42 Table 1.4-2
Lead	0.0005	lb/MMSCF	AP-42 Table 1.4-2

North Flare					South Flare			
Average Heat Content	1119.5	Btu/SCF	-test done 12/10/2008		Average Heat Content	1752.2	Btu/SCF	-test done 12/10/2008
Average Flowrate	366	SCFM			Average Flowrate	668	SCFM	
	21960	SCFH				40080	SCFH	
Unit 7 Shutdown								
Venting Period	Start	End			Venting Period	Start	End	
08/08/2008-08/09/2008	10:00	16:00		30	08/08/2008-08/09/2008	10:00	16:00	
Average Mol Weight	21.867				Average Mol Weight	34.888		
Average LB/HR	553.063	LB/HR			Average LB/HR	6025.61	LB/HR	
Calculated Flow	9598.363	SCFH			Calculated Flow	65544.60	SCFH	
	0.010	MMSCFH				0.07	MMSCFH	
Calculated Heat	10.745	MMBtu/HR			Calculated Heat	114.85	MMBtu/HR	
NOx	0.731	LB/HR			NOx	7.810	LB/HR	
CO	3.976	LB/HR			CO	42.493	LB/HR	
SOx	0.026	LB/HR			SOx	0.179	LB/HR	
PM10	0.074	LB/HR			PM10	0.507	LB/HR	
PM2.5	0.074	LB/HR			PM2.5	0.507	LB/HR	
VOC	0.054	LB/HR			VOC	0.367	LB/HR	
Ammonia	0.031	LB/HR			Ammonia	0.213	LB/HR	
Lead	0.000	LB/HR			Lead	0.000	LB/HR	
Total Event Emissions								
NOx	256.209	LB						
CO	1394.078	LB						
SOx	6.154	LB						
PM10	17.426	LB						
PM2.5	17.426	LB						
VOC	12.610	LB						
Ammonia	7.337	LB						
Lead	0.001	LB						

Unit 7 Startup							
Venting Period	Start	End		Venting Period	Start	End	
09/18/2008-09/19/2008	14:00	7:00	18	09/18/2008-09/19/2008	14:00	7:00	
Average Mol Weight	37.056			Average Mol Weight	0.0288		
Average LB/HR	567.231	LB/HR		Average LB/HR	35.144	LB/HR	
Calculated Flow	5809.158	SCFH		Calculated Flow	463095.42	SCFH	
	0.006	MMSCFH			0.46	MMSCFH	
Calculated Heat	6.503	MMBtu/HR		Calculated Heat	811.44	MMBtu/HR	
NOx	0.442	LB/HR		NOx	55.178	LB/HR	
CO	2.406	LB/HR		CO	300.231	LB/HR	
SOx	0.016	LB/HR		SOx	1.264	LB/HR	
PM10	0.045	LB/HR		PM10	3.580	LB/HR	
PM2.5	0.045	LB/HR		PM2.5	3.580	LB/HR	
VOC	0.032	LB/HR		VOC	2.591	LB/HR	
Ammonia	0.019	LB/HR		Ammonia	1.507	LB/HR	
Lead	0.000	LB/HR		Lead	0.000	LB/HR	
Total Event Emissions							
NOx	7.960	LB					
CO	43.312	LB					
SOx	0.285	LB					
PM10	0.808	LB					
PM2.5	0.808	LB					
VOC	0.585	LB					
Ammonia	0.340	LB					
Lead	0.000	LB					

Existing DHT Unit Shutdown Emissions

Emission Factors			
NOx	0.068	lb/MMBtu	AP-42 Table 13.5-1
CO	0.37	lb/MMBtu	AP-42 Table 13.5-1
SOx	2.73	lb/MMSCF	measured
PM10	7.73	lb/MMSCF	AP-42 Table 1.4-2
PM2.5	7.73	lb/MMSCF	AP-42 Table 1.4-2
VOC	5.594	lb/MMSCF	AP-42 Table 1.4-2
Ammonia	3.2549	lb/MMSCF	AP-42 Table 1.4-2
Lead	0.0005	lb/MMSCF	AP-42 Table 1.4-2

North Flare				South Flare			
Average Heat Content	1119.5	Btu/SCF	-test done 12/10/2008	Average Heat Content	1752.2	Btu/SCF	-test done 12/10/2008
Average Flowrate	366	SCFM		Average Flowrate	668	SCFM	
	21960	SCFH			40080	SCFH	

Unit 19 Shutdown							
Venting Period	Start	End		Venting Period	Start	End	
8/12/2008	6:00	20:00	14	8/12/2008	6:00	20:00	
Average Mol Weight	40.069			Average Mol Weight	17.861		
Average LB/HR	3174.44	LB/HR		Average LB/HR	8136.21	LB/HR	
Calculated Flow	30065.64	SCFH		Calculated Flow	172873.33	SCFH	
	0.03	MMSCFH			0.17	MMSCFH	
Calculated Heat	33.66	MMBtu/HR		Calculated Heat	302.91	MMBtu/HR	
NOx	2.289	LB/HR		NOx	20.598	LB/HR	
CO	12.454	LB/HR		CO	112.076	LB/HR	
SOx	0.082	LB/HR		SOx	0.472	LB/HR	
PM10	0.232	LB/HR		PM10	1.336	LB/HR	
PM2.5	0.232	LB/HR		PM2.5	1.336	LB/HR	
VOC	0.168	LB/HR		VOC	0.967	LB/HR	
Ammonia	0.098	LB/HR		Ammonia	0.563	LB/HR	
Lead	0.000	LB/HR		Lead	0.000	LB/HR	
Total Event Emissions							
NOx	320.412	LB					
CO	1743.418	LB					
SOx	7.756	LB					
PM10	21.962	LB					
PM2.5	21.962	LB					
VOC	15.893	LB					
Ammonia	9.248	LB					
Lead	0.001	LB					

Unit 19 Startup							
Venting Period	Start	End		Venting Period	Start	End	
09/03/2008-09/06/2008	13:00	1:00	60	09/03/2008-09/06/2008	13:00	1:00	
Average Mol Weight	21.318			Average Mol Weight	0.0316		
Average LB/HR	294.41	LB/HR		Average LB/HR	34.919	LB/HR	
Calculated Flow	5241.045	SCFH		Calculated Flow	419359.509	SCFH	
	0.005	MMSCFH			0.419	MMSCFH	
Calculated Heat	5.867	MMBtu/HR		Calculated Heat	734.802	MMBtu/HR	
NOx	0.399	LB/HR		NOx	49.967	LB/HR	
CO	2.171	LB/HR		CO	271.877	LB/HR	
SOx	0.014	LB/HR		SOx	1.145	LB/HR	
PM10	0.041	LB/HR		PM10	3.242	LB/HR	
PM2.5	0.041	LB/HR		PM2.5	3.242	LB/HR	
VOC	0.029	LB/HR		VOC	2.346	LB/HR	
Ammonia	0.017	LB/HR		Ammonia	1.365	LB/HR	
Lead	0.000	LB/HR		Lead	0.000	LB/HR	
Total Event Emissions							
NOx	23.939	LB					
CO	130.255	LB					
SOx	0.858	LB					
PM10	2.431	LB					
PM2.5	2.431	LB					
VOC	1.759	LB					
Ammonia	1.024	LB					
Lead	0.000	LB					

Sweet Black Wax Sulfur
Source: Albermarle (Black Wax Feed Tank 103)

DATE	API	Specific Gravity	Basic Nitrogen	Sulfur
1/12/11	33.8	0.8563	407	861
4/5/11	34.5	0.8525	417	839
5/10/11	34.0	0.8550	399	759
5/26/11	33.6	0.8571	412	858
6/8/11	34.9	0.8503	379	606
7/5/11	33.5	0.8575	389	783
9/1/11	32.6	0.8622	421	896
9/15/11	34.3	0.8536	383	863
9/28/11	32.7	0.8616	433	893
10/18/11	34.2	0.8539	376	846
10/25/11	34.0	0.8549	354	700
11/8/11	34.4	0.8529	375	744
11/22/11	34.2	0.8541	403	780
12/6/11	34.4	0.8532	396	784
12/20/11	30.5	0.8750	380	905
1/3/12	30.0	0.8756	369	778
1/17/12	33.1	0.8598	390	848
2/1/12	34.0	0.8548	369	958
2/14/12	34.4	0.8529	351	869

Appendix C
PTE Holly Refining & Marketing Operations

Holly Refining & Marketing Company Woods Cross Refinery

Potential to Emit Estimate

Note: Based on maximums and likely high values, not equivalent to emission limits nor based on AO factors for emission calculations

			Capacity	Maximum Rating		Emissions (Tons per year)						
A.O. #	ID	Description	bbls	MMBtu/hr	HP	PM 10	PM 2.5	SO2	NOx	VOC	CO	NH3
Approval Order Limited Sources												
II.A.3	4H1	4H1 FCC Furnace		39.9		1.3	1.3	1.7	7.0	0.9	14.4	5.5
II.A.4	4K1A	KVG Compressor (West)		1.7	660.0	0.1	0.1	0.0	6.2	0.9	4.1	1.4
II.A.5	4K1B	KVG Compressor (East)		1.7	660.0	0.1	0.1	0.0	6.2	0.9	4.1	1.4
II.A.6	4V82	FCC Scrubber				13.6	13.6	17.7	19.9	0.0	154.8	0.0
II.A.7	4-97-0010	Oxygen Injection Skid										
II.A.8	FCC 34"	FCC Flue gas bypass 34" stack										
II.A.10	6H1	Reformer Reheat Furnace		54.7		1.8	1.8	2.4	23.5	1.3	19.7	7.5
II.A.11	6H3	Reformer Reheater		37.7		1.2	1.2	1.6	16.2	0.9	13.6	5.2
II.A.12	6H2	Reformer Reboiler		12.0		0.4	0.4	0.5	5.2	0.3	4.3	1.6
II.A.13	6K1	SVG Compressor (East)		0.8	325.0	0.2	0.2	0.0	7.0	0.4	1.4	0.7
II.A.14	6K2	SVG Compressor (West)		0.8	325.0	0.2	0.2	0.0	7.0	0.4	1.4	0.7
II.A.16	7H3	7H3 H. F. Alkylation Reboiler		33.3		1.1	1.1	1.4	14.3	0.8	12.0	4.6
II.A.17	7H1	7H1 Alky Regen Furnace		4.4		0.1	0.1	0.2	1.9	0.1	1.6	0.6
II.A.19	8H1	Crude Furnace # 1		99.0		3.2	3.2	4.3	34.7	2.3	35.7	13.6
II.A.22	9H1	DHDS Reactor Charge Heater		8.1		0.3	0.3	0.4	3.5	0.2	2.9	1.1
II.A.23	9H2	DHDS Stripper Reboiler		4.1		0.1	0.1	0.2	1.8	0.1	1.5	0.6
II.A.25	10H1	Asphalt Mix Heater		13.2		0.4	0.4	0.6	5.7	0.3	4.8	1.8
II.A.26	10H2	Hot Oil Furnace		99.0		3.2	3.2	4.3	8.5	2.3	35.7	13.6
II.A.28	11H1	SRGP Depentanizer Reboiler		24.2		0.8	0.8	1.1	10.4	0.6	8.7	3.3
II.A.29	11K2	SRGP Electric Compressor										
II.A.31	12H1	NHDS Reactor Charge Furnace		50.2		1.6	1.6	2.2	15.4	1.2	18.1	6.9
II.A.33	13H1	Isomerization Reactor Feed Furnace		6.5		0.2	0.2	0.3	2.8	0.2	2.3	0.9
II.A.39	19H1	DHT Reactor Charge Heater		18.1		0.6	0.6	0.8	3.2	0.4	6.5	2.5
II.A.41	20H1	20H1: Reactor Charge Heater		14.9		0.5	0.5	0.6	2.6	0.4	5.4	2.0
II.A.42	20H2	20H2: Fractionator Charge Heater		47.0		1.5	1.5	2.0	8.3	1.1	17.0	6.5
New	20H3	20H3 Reactor Charge Heater		42.1		1.4	1.4	1.8	7.4	1.0	14.8	5.8
II.A.46	23H1	Reformate Splitter Reboiler Heater		21.0		0.7	0.7	0.9	3.7	0.5	7.6	2.9
New	24H1	Crude Furnace #3		60.0		2.0	2.0	2.6	10.5	1.4	21.0	8.2
New	25H1	FCC #2 Feed Heater		45.0		1.5	1.5	2.0	7.9	1.1	15.8	6.2
New	Scrubber	FCC #2 Scrubber				13.6	13.6	17.7	19.9	0.0	154.8	0.0
New	26H1	Hot Oil Furnace		14.0		0.5	0.5	0.6	2.5	0.3	4.9	1.9
New	27H1	27H1 Reactor Charge Furnace		99.0		3.2	3.2	4.3	8.7	2.3	34.7	13.6
II.A.48	30H1	Hydrogen Reformer Feed Furnace		123.1		4.0	4.0	5.4	10.6	2.9	44.4	16.9
II.A.49	30H2	Hydrogen Reformer Feed Furnace		123.1		4.0	4.0	5.4	10.6	2.9	44.4	16.9
Replace	33H1	Vacuum Furnace Heater		130.0		4.2	4.2	5.7	11.4	3.1	45.6	17.9
II.A.62	Boiler # 4	#4 Boiler		35.6		1.2	1.2	1.5	15.3	0.8	12.8	4.9
II.A.63	Boiler # 5	#5 Boiler		70.0		2.3	2.3	3.0	6.1	1.7	25.2	9.6
II.A.65	Boiler # 8	#8 Boiler		92.7		3.0	3.0	4.0	8.1	2.2	33.4	12.7
II.A.66	Boiler # 9	#9 Boiler		89.3		2.9	2.9	3.9	7.8	2.1	32.2	12.3
II.A.67	Boiler # 10	#10 Boiler		89.3		2.9	2.9	3.9	7.8	2.1	32.2	12.3
New	Boiler # 11	#11 Boiler		89.3		3.9	3.9	3.9	7.8	2.1	14.5	12.3
II.A.80	68H2	North In-Tank Asphalt Heater		0.8		0.0	0.0	0.0	0.3	0.0	0.3	0.1
II.A.81	68H3	South In-Tank Asphalt Heater		0.8		0.0	0.0	0.0	0.3	0.0	0.3	0.1
II.A.82	68H4	NW In-Tank Asphalt Heater		0.8		0.0	0.0	0.0	0.3	0.0	0.3	0.1
II.A.83	68H5	NE In-Tank Asphalt Heater		0.8		0.0	0.0	0.0	0.3	0.0	0.3	0.1
New	68H6	SE In-Tank Asphalt Heater		0.8		0.0	0.0	0.0	0.3	0.0	0.3	0.1
New	68H7	SW In-Tank Asphalt Heater		0.8		0.0	0.0	0.0	0.3	0.0	0.3	0.1
New	68H10	North In-Tank Asphalt Heater		0.8		0.0	0.0	0.0	0.3	0.0	0.3	0.1
New	68H11	South In-Tank Asphalt Heater		0.8		0.0	0.0	0.0	0.3	0.0	0.3	0.1
New	68H12	North In-Tank Asphalt Heater		0.8		0.0	0.0	0.0	0.3	0.0	0.3	0.1
New	68H13	South In-Tank Asphalt Heater		0.8		0.0	0.0	0.0	0.3	0.0	0.3	0.1
II.A.201	Generator	ETF portable Diesel Generator		0.5	208.0	0.3	0.3	0.3	4.2	0.0	0.9	
				Total		**84.4**	**84.4**	**109.5**	**364.87**	**42.7**	**912.2**	**237.6**
		Approval Order Limits				86.8	86.8	1659.7	668.6		796.3	15.6

Holly Refining & Marketing Company Woods Cross Refinery
Potential to Emit Estimate
Note: Based on maximums and likely high values, not equivalent to emission limits nor based on AO factors for emission calculations

			Capacity	Maximum Rating		Emissions (Tons per year)						
A.O. #	ID	Description	bbls	MMBtu/hr	HP	PM 10	PM 2.5	SO2	NOx	VOC	CO	NH3
Approval Order Non-Limited Sources												
II.A.69	CWT # 4	Cooling Tower # 4 (2 stacks)				21.9	0.1			1.1		
II.A.70	CWT # 6	Cooling Tower # 6 (1 stack)				19.8	0.1			0.9		
II.A.71	CWT # 7	Cooling Tower # 7 (2 stacks)				18.7	0.1			1.0		
II.A.72	CWT # 8	Cooling Tower # 8 (2 stacks)				39.8	0.3			2.3		
New	CWT # 10	Cooling Tower # 10 (1 stack)				0.1	0.0			1.6		
Expand	CWT # 11	Cooling Tower # 11 (2 stacks)				0.1	0.0			2.4		
II.A.74	Wastewater	Wastewater Treatment Plant								45.1		
II.A.76	Flare	Process Flare (south)		19.6		0.0	0.0	0.1	5.8	0.4	31.7	
II.A.77	Flare	Process Flare (north)		19.6		0.0	0.0	0.1	5.8	16.7	31.7	
II.A.79	Flare	Propane Pit Flare		0.7		0.0	0.0	3.2	0.0	0.0	0.0	0.0
II.A.85	Tank 11	Petroleum Liquids	9868.0							0.0		
II.A.86	Tank 12	Petroleum Liquids	9868.0							0.2		
II.A.87	Tank 14	Petroleum Liquids	2539.0							0.0		
II.A.88	Tank 15	Petroleum Liquids	5181.0							0.0		
II.A.89	Tank 19	Petroleum Liquids	7463.0							0.0		
II.A.90	Tank 20	Petroleum Liquids	7504.0							0.1		
II.A.91	Tank 21	Petroleum Liquids	354.0							0.0		
II.A.92	Tank 23	Petroleum Liquids	14600.0							0.3		
II.A.93	Tank 24	Petroleum Liquids	15016.0							0.3		
II.A.94	Tank 28	Petroleum Liquids	29663.0							0.0		
II.A.95	Tank 29	Petroleum Liquids	336.0							0.0		
II.A.96	Tank 31	Petroleum Liquids	29756.0							0.0		
II.A.97	Tank 35	Petroleum Liquids	105000.0							0.4		
II.A.98	Tank 37	Petroleum Liquids	3217.0							0.0		
II.A.99	Tank 42A	Petroleum Liquids	20.0							0.0		
II.A.100	Tank 47	Petroleum Liquids	30129.0							0.6		
II.A.101	Tank 48	Petroleum Liquids	29782.0							0.1		
II.A.103	Tank 50	Petroleum Liquids	700.0							0.0		
II.A.104	Tank 51	Petroleum Liquids	580.0							0.0		
II.A.105	Tank 52	Petroleum Liquids	1008.0							0.0		
II.A.106	Tank 53	Petroleum Liquids	1008.0							0.0		
II.A.107	Tank 54	Petroleum Liquids	1008.0							0.0		
II.A.108	Tank 55	Petroleum Liquids	1008.0							0.0		
II.A.109	Tank 56	Petroleum Liquids	1008.0							0.0		
II.A.110	Tank 57	Petroleum Liquids	1008.0							0.0		
II.A.111	Tank 58	Petroleum Liquids	15229.0							0.0		
II.A.112	Tank 59	Petroleum Liquids	30019.0							0.0		
II.A.114	Tank 61	Petroleum Liquids	1008.0							0.0		
II.A.115	Tank 63	Petroleum Liquids	30135.0							0.3		
II.A.116	Tank 64	Petroleum Liquids	1011.0							0.0		
II.A.117	Tank 65	Petroleum Liquids	1011.0							0.0		
II.A.118	Tank 70	Petroleum Liquids	80306.0							-1.4		
II.A.119	Tank 71	Petroleum Liquids	67155.0							-1.1		
II.A.120	Tank 72	Petroleum Liquids	106811.0							-1.8		
II.A.121	Tank 73	Petroleum Liquids	1077.0							0.0		
II.A.122	Tank 74	Petroleum Liquids	2039.0							0.0		
II.A.123	Tank 75	Petroleum Liquids	2039.0							0.0		
II.A.124	Tank 76	Petroleum Liquids	2039.0							0.0		
II.A.125	Tank 77	Petroleum Liquids	5141.0							0.0		
II.A.126	Tank 78	Petroleum Liquids	5141.0							0.0		
II.A.127	Tank 79	Petroleum Liquids	10000.0							0.0		
II.A.128	Tank 80	Petroleum Liquids	10000.0							0.0		
II.A.133	Tank 85	Petroleum Liquids	76540.0							0.9		
II.A.134	Tank 86	Petroleum Liquids	109660.0							0.3		
II.A.135	Tank 87	Petroleum Liquids	109660.0							0.3		
New	Tank 88	Petroleum Liquids	26730.0							0.0		
New	Tank 89	Petroleum Liquids	26730.0							0.0		
New	Tank 90	Petroleum Liquids	13600.0							0.0		
New	Tank 91	Petroleum Liquids	13600.0							0.0		
New	Tank 92	Petroleum Liquids	13600.0							0.0		
New	Tank 93	Petroleum Liquids	13600.0							0.0		
New	Tank 94	Petroleum Liquids	13600.0							0.0		
New	Tank 95	Petroleum Liquids	13600.0							0.0		
New	Tank 96	Petroleum Liquids	13600.0							0.0		
New	Tank 97	Petroleum Liquids	13600.0							0.0		
New	Tank 98	Petroleum Liquids	19600.0							0.6		
New	Tank 99	Petroleum Liquids	66000.0							0.3		

Holly Refining & Marketing Company Woods Cross Refinery

Potential to Emit Estimate

Note: Based on maximums and likely high values, not equivalent to emission limits nor based on AO factors for emission calculations

			Capacity	Maximum Rating		Emissions (Tons per year)						
A.O. #	ID	Description	bbls	MMBtu/hr	HP	PM 10	PM 2.5	SO2	NOx	VOC	CO	NH3
II.A.137	Tank 100	Petroleum Liquids	53372.0							1.3		
II.A.138	Tank 101	Petroleum Liquids	53564.0							2.7		
II.A.139	Tank 102	Petroleum Liquids	52990.0							0.1		
II.A.140	Tank 103	Petroleum Liquids	24686.0							0.5		
II.A.141	Tank 104	Petroleum Liquids	24435.0							1.9		
II.A.142	Tank 105	Petroleum Liquids	24501.0							1.1		
II.A.143	Tank 106	Petroleum Liquids	24524.0							1.5		
II.A.144	Tank 107	Petroleum Liquids	24501.0							3.3		
II.A.145	Tank 108	Petroleum Liquids	24450.0							2.3		
II.A.146	Tank 109	Petroleum Liquids	24490.0							1.1		
II.A.150	Tank 117	Petroleum Liquids	506.0							0.1		
II.A.151	Tank 118	Petroleum Liquids	657.0							0.1		
II.A.152	Tank 121	Petroleum Liquids	100129.0							3.2		
II.A.153	Tank 122	Petroleum Liquids	400.0							0.0		
II.A.154	Tank 123	Petroleum Liquids	400.0							0.0		
II.A.157	Tank 126	Petroleum Liquids	64675.0							1.3		
II.A.158	Tank 127	Petroleum Liquids	30497.0							0.6		
II.A.159	Tank 128	Petroleum Liquids	10100.0							0.0		
II.A.160	Tank 129	Petroleum Liquids	55074.0							0.2		
II.A.162	Tank 131	Petroleum Liquids	65159.0							0.0		
II.A.163	Tank 132	Petroleum Liquids	24455.0							2.4		
II.A.164	Tank 133	Petroleum Liquids	1582.0							0.0		
II.A.165	Tank 134	Petroleum Liquids	1582.0							0.0		
II.A.166	Tank 135	Petroleum Liquids	44154.0							1.9		
II.A.167	Tank 136	Petroleum Liquids	806.0							0.0		
II.A.168	Tank 137	Petroleum Liquids	141418.0							0.0		
II.A.169	Tank 138	Petroleum Liquids	44247.0							0.0		
II.A.170	Tank 139	Petroleum Liquids	14957.0							0.0		
II.A.171	Tank 140	Petroleum Liquids	14857.0							0.0		
II.A.172	Tank 141	Petroleum Liquids	1618.0							0.0		
II.A.173	Tank 143	Petroleum Liquids	4008.0							0.0		
II.A.174	Tank 145	Petroleum Liquids	3985.0							10.5		
II.A.175	Tank 146	Petroleum Liquids	3985.0							3.0		
II.A.176	Tank 147	Petroleum Liquids	714.0							0.0		
II.A.177	Tank 148	Petroleum Liquids	714.0							0.0		
II.A.178	Tank 149	Petroleum Liquids	714.0							0.0		
II.A.179	Tank 150	Petroleum Liquids	714.0							0.0		
II.A.180	Tank 151	Petroleum Liquids	714.0							0.0		
II.A.181	Tank 152	Petroleum Liquids	714.0							0.0		
II.A.182	Tank 153	Petroleum Liquids	714.0							0.0		
II.A.183	Tank 159	Petroleum Liquids	4999.0							0.0		
New	Tank 170	Petroleum Liquids	66000.0							0.3		
New	Tank 171	Petroleum Liquids	1600.0							0.0		
New	Tank 172	Petroleum Liquids	1600.0							0.0		
New	Tank 173	Petroleum Liquids	1600.0							0.0		
New	Tank 174	Petroleum Liquids	1600.0							0.0		
II.A.196	Tank 323	Petroleum Liquids	14686.0							0.2		
II.A.197	Tank 324	Petroleum Liquids	714.0							0.0		
II.A.202/3	Load/Unload1	Crude, Gas Oil, NGL, Fuel Oil								0.2		
II.A.204	Generators2	Emergency Equipment (10 items)		1.4	540.0	0.2	0.2	0.2	0.2	0.2	0.5	0.0
II.A.204	Generators	Emergency Equipment (10 items)		1.4	540.0	1.1	1.1	1.0	1.1	1.2	3.2	0.0
II.A.205	Water Tanks3	Water Storage Tanks										
				TOTAL		**101.7**	**1.9**	**4.5**	**12.87**	**113.6**	**67.1**	**0.0**
	Fugitives	Valves and Fittings								2018.2		
	Fugitives	Pumps								174.7		
	Fugitives	Compressors								79.9		
	Fugitives	Pressure Relief Valves								7.7		
	Fugitives	Connectors								91.6		
	Loading	Controlled to MACT limit								7.9		
	Tank Cleaning	Largest 20% of tanks, 2-week outage								85.5		
				TOTAL						**2465.5**		

	PM 10	PM 2.5	SO2	NOx	VOC	CO	NH3
Exisiting Total	**186.0**	**86.2**	**114.1**	**377.74**	**2621.7**	**979.3**	**237.6**

Fuel Gas	AP-42 heating value of natural/plant gas (Btu/scf):		1020			
Burners	NOx from uncontrolled burners:		100	lb/mmscf from AP-42 Table 1.4-1		
	NOx from controlled burners:		41	A.O. emissions factor	Changed from AP-42 value of 50 lb/mmscf	0.04 lb/MMBtu
	NOx from new SCR-controlled burners:		20	lb/mmscf estimate	based on 40 ppm	0.02 lb/MMBTu
	CO from all burners:		84	lb/mmscf from AP-42 Table 1.4-1		0.08 lb/Mmbtu
	SO2 from all burners:		10.12806	lb/mmscf @ 60 ppm average		
	PM10 from all burners:		7.6	lb/mmscf from AP-42 Table 1.4-2		
	PM2.5 from all burners:		7.6	All PM10 assumed to be PM2.5		
	VOC from all burners:		5.5	lb/mmscf from AP-42 Table 1.4-2		
	NH3 from all burners:		32	lb/mmscf from "Development and Selection of Ammonia Emission Factors," August 1994, Table 7.4		
Engines	NOx from uncontrolled 2-stroke lean burn engines:		1.94	lb/mmBTU from AP-42 Table 3.2-1 (lb/mmBtu)		
	CO from uncontrolled 2-stroke lean burn engines:		0.386	lb/mmBTU from AP-42 Table 3.2-1 (lb/mmBtu)		
	SO2 from uncontrolled 2-stroke lean burn engines:		0.00	lb/mmBTU from AP-42 Table 3.2-1 (lb/mmBtu)		
	PM10 from uncontrolled 2-stroke lean burn engines:		0.04831	lb/mmBTU from AP-42 Table 3.2-1 (lb/mmBtu)		
	PM2.5 from uncontrolled 2-stroke lean burn engines:		0.04831	All PM10 assumed to be PM2.5 (lb/HP-hr)		
	VOC from uncontrolled 2-stroke lean burn engines:		0.12	lb/mmBTU from AP-42 Table 3.2-1 (lb/mmBtu)		
	NOx from uncontrolled 4-stroke lean burn engines:		0.85	lb/mmBTU from AP-42 Table 3.2-2 (lb/mmBtu)		
	CO from uncontrolled 4-stroke lean burn engines:		0.56	lb/mmBTU from AP-42 Table 3.2-2 (lb/mmBtu)		
	SO2 from uncontrolled 4-stroke lean burn engines:		0.00	lb/mmBTU from AP-42 Table 3.2-2 (lb/mmBtu)		
	PM10 from uncontrolled 4-stroke lean burn engines:		0.009987	lb/mmBTU from AP-42 Table 3.2-2 (lb/mmBtu)		
	PM2.5 from uncontrolled 4-stroke lean burn engines:		0.009987	All PM10 assumed to be PM2.5 (lb/HP-hr)		
	VOC from uncontrolled 4-stroke lean burn engines:		0.1180	lb/mmBTU from AP-42 Table 3.2-2 (lb/mmBtu)		
	NOx from uncontrolled 4-stroke rich burn engines:		2.27	AP-42 Emission Factors from Table 3.2-3 (lb/mmBtu)		
	CO from uncontrolled 4-stroke rich burn engines:		3.72	AP-42 Emission Factors from Table 3.2-3 (lb/mmBtu)		
	SO2 from uncontrolled 4-stroke rich burn engines:		5.88E-04	AP-42 Emission Factors from Table 3.2-3 (lb/mmBtu)		
	PM10 from uncontrolled 4-stroke rich burn engines:		0.01941	AP-42 Emission Factors from Table 3.2-3 (lb/mmBtu)		
	PM2.5 from uncontrolled 4-stroke rich burn engines:		0.01941	All PM10 assumed to be PM2.5 (lb/HP-hr)		
	VOC from uncontrolled 4-stroke rich burn engines:		0.0296	AP-42 Emission Factors from Table 3.2-3 (lb/mmBtu)		
	NOx from uncontrolled diesel industrial engines:		3.10E-02	AP-42 Emission Factors from Table 3.3-1 (lb/HP-hr)		
	CO from uncontrolled diesel industrial engines:		6.68E-03	AP-42 Emission Factors from Table 3.3-1 (lb/HP-hr)		
	SOx from uncontrolled diesel industrial engines:		2.05E-03	AP-42 Emission Factors from Table 3.3-1 (lb/HP-hr)		
	PM10 from uncontrolled diesel industrial engines:		2.20E-03	AP-42 Emission Factors from Table 3.3-1 (lb/HP-hr)		
	PM2.5 from uncontrolled diesel industrial engines:		2.20E-03	All PM10 assumed to be PM2.5 (lb/HP-hr)		
	VOC from uncontrolled diesel industrial engines:		2.51E-03	AP-42 Emission Factors from Table 3.3-1 (lb/HP-hr) [TOC]		
	Horsepower(mechanical) conversion to Btu/hr:		2542.5	AP-42 Appendix A Conversion factors (HP to Btu/hr)		
	NH3 from reciprocating compressor engines:		200	AP-42 Emission Factors from Table 5.1-1 (lb/mmscf)		
FCC	NOx from CD controlled fluid catalytic cracking units:		40	Holly Consent Decree FCCU NOx final limits (ppmvd 0% O2 365 day average)		
	SO2 from CD controlled fluid catalytic cracking units:		25	Holly Consent Decree FCCU SOx final limits (ppmvd 0% O2 365 day average)		
	PM10 from CD controlled fluid catalytic cracking units:		0.5	Holly Consent Decree FCCU PM final limits (lb/1000 lb coke burn)		
	PM2.5 from CD controlled fluid catalytic cracking units:		0.5	All PM10 assumed to be PM2.5 (lb/1000 lb coke burn)		
	VOC from controlled fluid catalytic cracking units:	Neg		AP-42 Emission Factors from Table 5.1-1 (lb/10^3 bbl fresh feed) [TOC]		
	NH3 from controlled fluid catalytic cracking units:	Neg		AP-42 Emission Factors from Table 5.1-1 (lb/10^3 bbl fresh feed)		
Fugitives	VOC from uncontrolled cooling towers:		6	AP-42 Emission Factors from Table 5.1-2 (lb/10^6 gal cooling water)		
	VOC from controlled cooling towers:		0.7	AP-42 Emission Factors from Table 5.1-2 (lb/10^6 gal cooling water)		
	PM from cooling towers:		0.019	AP-42 Emission Factors from Table 13.4-1 (lb/1000 gal cooling water)		
	VOC from controlled Oil/water separators:		0.2	AP-42 Emission Factors from Table 5.1-2 (lb/10^3 gal waste water)		
	Unknown cooling water rate:		40	AP-42 Emission Factors from Table 5.1-2 note b, assume 40 times refinery feed rate in gallons (gallons)		
	Unknown waste water rate:		0.95	AP-42 Emission Factors from Table 5.1-2 note c, assume 0.95 times refinery feed rate in gallons (gallons)		
	Gas valves:	4869	0.0268	kg/hr/source, Protocol for Equipment Leak Emission Estimates, Table 2-2		

	Light liquid valves:	7051	0.0109	kg/hr/source,	Protocol for Equipment Leak Emission Estimates, Table 2-2		
	Heavy liquid valves:	7051	0.00023	kg/hr/source,	Protocol for Equipment Leak Emission Estimates, Table 2-2		
	Light liquid pump seals:	134	0.114	kg/hr/source,	Protocol for Equipment Leak Emission Estimates, Table 2-2		
	Heavy liquid pump seals:	134	0.021	kg/hr/source,	Protocol for Equipment Leak Emission Estimates, Table 2-2		
	Compressor seals:	13	0.636	kg/hr/source,	Protocol for Equipment Leak Emission Estimates, Table 2-2		
	Pressure relief valves:	5	0.16	kg/hr/source,	Protocol for Equipment Leak Emission Estimates, Table 2-2		
	Connectors:	37942	0.00025	kg/hr/source,	Protocol for Equipment Leak Emission Estimates, Table 2-2		
	Open-ended lines	0	0.0023	kg/hr/source,	Protocol for Equipment Leak Emission Estimates, Table 2-2		
	Sampling connections:	0	0.015	kg/hr/source,	Protocol for Equipment Leak Emission Estimates, Table 2-2		
Tanks	Tank 71		126	feet diameter		62	lb/lbmole
	Tank 72		160	feet diameter		62	lb/lbmole
	Tank 121		150	feet diameter		50	lb/lbmole
	Tank 126		114	feet diameter		50	lb/lbmole
	Days out of service with hydrocarbon		14	days			
Loading	MACT limit		10	mg/liter loaded			
	Loading limit		4500000	bbls			
Constants	Plant Wide Annual Operating Time:		8760	hr			
&	Conversion from scf to lb mol:		379.5	scf -> lb mol			
Basis	Maximum daily FCC flue gas flow rate:		23	mmscfd (Engineering Calculation)			
	Maximum hourly FCC regenerator coke burn rate:		6200	lbs coke burn / hr (Engineering Calculation)			
	Molecular Weight of CO:		28	lb/lb-mol			
	Molecular Weight of NOx:		45	lb/lb-mol			
	Molecular Weight of SOx:		64	lb/lb-mol			
	Annual Refinery Feed:		11315000	bbls			
Limitations taken from A.O. # DAQE-AN0101230032-10							
II.B.1.b	NOx emission limit from stack tests on 8H1 & 12H1:		0.08	lb/mmBtu (3 hr average basis)		0.07	12H1
II.B.1.b	NOx emission limit from boilers #5, #9 & #10, #11:		0.02	lb/mmBtu (3 hr average basis)	with SCR		
II.B.1.e	Refinery fuel gas H2S concentration:		160	ppm (3 hr average basis)			
II.B.1.h	ETF Emergency Generator Annual Operating Time:		1300	hr			
II.B.1.j	FCC Annual Throughput Limitation:		3250000	bbls			
II.B.2.a	CO Emission Limit for FCCU:		500	ppm (1 hr average 0% O2)			
II.B.4.a	SRU #1 SO2 limit		582	tpy SO2			
II.B.4.a	SRU #2 SO2 limit		90	tpy SO2			
II.B.4.a	SRU #3 SO2 limit		90	tpy SO2			
II.B.5.a	FCC PM10 limit		32	tpy PM10			
II.B.4.a	Cap source SO2 limit		192	tpy SO2			
II.B.5.a	Cap source PM10 limit		47.5	tpy PM10			
II.B.6.a	Cap source NOx limit		670	tpy NOx			
Limitations taken from HEP LOD A.O.							
	Annual Gasoline Loading Limitation:		4500000	bbls			
Organic HAPs	2-Methylnaphthalene		0.000024	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)			
for Heaters	3-Methylchloranthrene		0.000002	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)			
and Boilers	7,12-Dimethylbenz(a)anthracene		0.000016	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)			
	Acenaphthene		0.000002	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)			
	Acenaphtylene		0.000002	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)			
	Anthracene		0.000002	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)			
	Benz(a)anthracene		0.000002	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)			
	Benzene		0.002100	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)			
	Benzo(a)pyrene		0.000001	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)			
	Benzo(b)fluroanthene		0.000002	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)			
	Benzo(g,h,i)perylene		0.000001	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)			

	Benzo(k)fluroanthene	0.000002	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
	Chrysene	0.000002	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
	Dibenzo(a,h)anthracene	0.000001	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
	Dichlorobenzene	0.001200	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
	Fluoranthene	0.000003	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
	Fluorene	0.000003	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
	Formaldehyde	0.075000	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
	Hexane	1.800000	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
	Indeno(1,2,3-cd)pyrene	0.000002	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
	Naphthalene	0.000610	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
	Phenanathrene	0.000017	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
	Pyrene	0.000005	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
	Toluene	0.003400	AP-42 Emission Factors from Table 1.4-3 (lb/mmscf)	
Inorganic HAPs for Heaters and Boilers	Arsenic from natural/plant gas combustion:	0.0002	AP-42 Emission Factors from Table 1.4-4 (lb/mmscf)	
	Beryllium from natural/plant gas combustion:	0.000012	AP-42 Emission Factors from Table 1.4-4 (lb/mmscf)	
	Cadmium from natural/plant gas combustion:	0.0011	AP-42 Emission Factors from Table 1.4-4 (lb/mmscf)	
	Chromium from natural/plant gas combustion:	0.0014	AP-42 Emission Factors from Table 1.4-4 (lb/mmscf)	
	Cobalt from natural/plant gas combustion:	0.000084	AP-42 Emission Factors from Table 1.4-4 (lb/mmscf)	
	Manganese from natural/plant gas combustion:	0.00038	AP-42 Emission Factors from Table 1.4-4 (lb/mmscf)	
	Mercury from natural/plant gas combustion:	0.00026	AP-42 Emission Factors from Table 1.4-4 (lb/mmscf)	
	Nickel from natural/plant gas combustion:	0.0021	AP-42 Emission Factors from Table 1.4-4 (lb/mmscf)	
	Selenium from natural/plant gas combustion:	0.000024	AP-42 Emission Factors from Table 1.4-4 (lb/mmscf)	
	Lead from natural/plant gas combustion:	0.0005	AP-42 Emission Factors from Table 1.4-2 (lb/mmscf)	
HAPs for Emergency Generators	Benzene	0.000933	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Toluene	0.000409	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Xylenes	0.000285	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Propylene	0.000258	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	1,3-Butadiene	3.91E-05	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Formaldehyde	0.00118	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Acetaldehyde	0.000767	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Acrolein	9.25E-05	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Naphthalene	8.48E-05	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Acenaphtylene	5.06E-06	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Acenaphthene	1.42E-06	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Fluorene	2.92E-05	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Phenanthrene	2.94E-05	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Anthracene	1.87E-06	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Fluoranthene	7.61E-06	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Pyrene	4.78E-06	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Benz(a)anthracene	1.68E-06	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Chrysene	3.53E-07	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Benzo(b)fluroanthene	9.91E-08	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Benzo(k)fluroanthene	1.55E-07	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Benzo(a)pyrene	1.88E-07	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Indeno(1,2,3-cd)pyrene	3.75E-07	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Dibenzo(a,h)anthracene	5.83E-07	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
	Benzo(g,h,i)perylene	4.89E-07	AP-42 Emission Factors from Table 3.3-2 (lb/MMBtu)	
Flare North & South	Average non-upset throughput to flare:	17000	scfh	
	Average HHV of flare gas:	1150	BTU/scf	
	Assumed flare efficiency:	98	%	
	Average CH4 concentration of flare gas:	55	%	AP-42
	CO emission factor for industrial flares:	0.37	lb/MMBtu	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)
	NOx emission factor for industrial flares:	0.068	lb/MMBtu	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)

	HC emission factor for industrial flares:	0.14	lb/MMBtu	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)
	VOC emission factor for industrial flares:	1.8192	tn/MMscf	
	Benzene emission factor for industrial flares:	0.159	lb/MMscf	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)
	Formaldehyde emission factor for industrial flares:	1.169	lb/MMscf	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)
	Naphthalene emission factor for industrial flares:	0.011	lb/MMscf	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)
	Acetaldehyde emission factor for industrial flares:	0.043	lb/MMscf	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)
	Acrolein emission factor for industrial flares:	0.01	lb/MMscf	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)
	Propylene emission factor for industrial flares:	2.44	lb/MMscf	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)
	Toluene emission factor for industrial flares:	0.058	lb/MMscf	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)
	Xylenes emission factor for industrial flares:	0.029	lb/MMscf	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)
	Ethylbenzene emission factor for industrial flares:	1.44	lb/MMscf	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)
	Hexane emission factor for industrial flares:	0.029	lb/MMscf	AP-42 Emission Factors from Table 13.5 (lb/MMBtu)
	SO2 emission factor for industrial flares:	0.0238	lb/hr	
Wastewater	Average Beginning Inventory:	90370	Barrels	HOPs (2008, 2009, 2010)
	Average Reciepts:	8883931	Barrels	HOPs (2008, 2009, 2010)
	Average Ending Inventory:	86857	Barrels	HOPs (2008, 2009, 2010)
	2 x Standard Deviation + Avg Begin:	105868	Barrels	HOPs (2008, 2009, 2010)
	2 x Standard Deviation + Avg Recpt.:	10339027	Barrels	HOPs (2008, 2009, 2010)
	2 x Standard Deviation + Avg Ending:	105956	Barrels	HOPs (2008, 2009, 2010)
	VOC per 1000 gallons water:	0.2	lb/1000 gal	AP-42 Emission Factors from Table 5.1-2
		0.95		AP-42 Emission Factors from Table 5.1-2

	Benzene	Toluene	Ethylbenzen	Xylenes	Napthalen	Units	
Average	3.577695	5.410343	0.3018029	2.128819	0.024055	Tons/yr.	WATERS 9, (Years 2006, 2007, 2008, 2009, 2010)
Stand Dev	0.059255	1.279672	0.0883681	0.7022132	0.005787	Tons/yr.	
Total	3.696204	7.969686	0.4785391	3.5332454	0.035629	Tons/yr.	Average + 2*standard deviation

Flare	Average non-upset throughput to flare:	260	scfh
Propane	Average HHV of flare gas:	2518	BTU/scf
	SO2 emission factor for industrial flares:	3.64E-04	lb/hr

Appendix D
Modeling Protocol Approval Letter

State of Utah

GARY R. HERBERT
Governor

GREG BELL
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF AIR QUALITY
Bryce C. Bird
Director

FILE COPY

DAQE-GN101230041-12

February 3, 2012

Mike Astin
Holly Corporation
393 S. 800 W.
Woods Cross, UT 84087-1435

Dear Mr. Astin:

RE: Modeling Protocol – CDS A; NSR, PSD, MACT (Part 63), Major HAP source, Title V (Part 70) Major source, Nonattainment or Maintenance Area, PM_{10} SIP/Maint Plan, NESHAP (Part 61), NSPS (Part 60)
Project Number: N10123-0041

The Utah Division of Air Quality (UDAQ) recently received Prevention of Significant Deterioration (PSD) Class I and II Modeling Protocols from Environmental Resources Management (ERM) for a major modification to Holly Refining and Marketing Company's refinery in Bountiful, Utah.

The UDAQ, after reviewing the materials submitted, agrees that the proposed project would constitute a major modification to a Prevention of Significant Deterioration (PSD) source. Therefore, an air quality impact analysis consistent with the requirements of UAC307-410-3 would be required as part of a complete Notice of Intent. In doing so, the air quality analysis should address the requirements of UAC307-401, 403, 405, 406, and 410.

The UDAQ agrees with the protocol assertion that the EPA – AERMOD modeling system is the preferred model for near-field analyses, and should be used to address impacts from the proposed project in all of its near-field analyses. The UDAQ also agrees with the protocol assertion that based on emission increase estimates, no far-field modeling analyses will be required.

With respect to meteorological data, the UDAQ accepts the use of five-year of National Weather Services meteorological data collected between 2006 through 2010, at the Salt Lake City International Airport.

All other information included in the modeling protocol, including the processing of meteorological data, will be reviewed and approved during the New Source Review process, which is the proper legal forum for review and approval of permit applications.

If you have any questions, please feel free to contact me at 801-536-4052 or by email at caharry@utah.gov. Tom Orth will be the project lead on issues related to modeling. His contact information is 801-536-4005 or torth@utah.gov

Sincerely,

Camron Harry, Project Engineer
New Source Review

CAH:sa

cc: Tom Orth
George Wilkerson, MSI

Appendix E
Cost Analysis for Flare Gas Recovery System

NO_x Cost Analysis for Flare Recovery System

	Flare Recovery System	Factor	Basis for Cost and Factor
Direct Costs:			
Puchased Equipment:			
Primary and Auxiliary Equipment (PE)	$ 3,750,000	Estimate	
Instrumentation and Controls	$ 375,000	10% of PE	EPA[1]
Sales Tax	$ 112,500	3% of PE	EPA[1]
Freight	$ 187,500	5% of PE	EPA[1]
Total Purchased Equipment Cost (PEC)	**$ 4,425,000**		
Direct Installation			
Foundations	$ 531,000	12% of PEC	EPA[1]
Handling and Erection	$ 1,770,000	40% of PEC	EPA[1]
Electrical	$ 44,250	1% of PEC	EPA[1]
Piping	$ 88,500	2% of PEC	EPA[1]
Insulation and Ductwork	$ 44,250	1% of PEC	EPA[1]
Painting	$ 44,250	1% of PEC	EPA[1]
Total Direct Installation (DI)	**$ 2,522,250**		
Total Direct Cost (DC)	**$ 6,947,250**		
Indirect Installation Costs			
Engineering and Project Management	$ 442,500	10% of PEC	EPA[1]
Construction and Field Expenses	$ 442,500	10% of PEC	EPA[1]
Contractor Fees	$ -	0% of PEC	EPA[1]
Startup Expenses	$ 44,250	1% of PEC	EPA[1]
Performance Tests	$ 44,250	1% of PEC	EPA[1]
Contingencies	$ 132,750	3% of PEC	EPA[1]
Total Indirect Cost	**$ 1,106,250**		
Total Installed Cost (TIC)	**$ 8,053,500**		
Assumptions:			
EPA[1] - EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, EPA/452/B-002-001, Jan. 2002.			

NO_x Cost Analysis for Flare Recovery System

	Flare Recovery System	Basis for Cost and Factor
Capacity (kw)	400	flare gas compressor
Capitol Cost		
Total Installed Cost	**$ 8,053,500**	
NO_x Emissions Before Control, lb/MMBtu	0.068	
Annual Capacity Factor	100%	
NO_x Emissions Before Control, tn/yr	5.82	
NO_x Emissions After Control, lb/MMBtu	6.73268	
Control Efficiency (%)	99	
NO_x Emissions After Control, tn/yr	0.0582	
NO_x Emission Reduction, tn/yr	5.7618	
Annual Costs, $/year (Direct + Indirect)		
Direct Costs		
Operating Labor	$ 161,070	2% of capitol cost
Raw materials	$ -	
Replacement Parts	$ 161,070	2% of capitol cost
Utilities - Power	$ 245,280	$0.07/KW and a 400 KW flare gas compressor
Total Direct Costs, $/year	**$ 567,420**	
Indirect Costs		
Overhead	$ 128,856	80% of labor costs
Taxes, Insurance, and Administration	$ 322,140	4% of total installed cost - EPA[1]
Capitol Recovery	$ 1,094,471	6%, 10 years, CRF-.1359
Total Indirect Costs, $/year	**$ 1,545,467**	
Total Annual Cost	**$ 2,112,887**	
Cost Effectiveness, $ per ton NO_x reduction	**$ 366,706.00**	
Assumptions:		
EPA[1] - EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, EPA/452/B-002-001, Jan. 2002. Table		

CO Cost Analysis for Flare Recovery System

	Flare Recovery System	Factor	Basis for Cost and Factor
Direct Costs:			
Puchased Equipment:			
Primary and Auxiliary Equipment (PE)	$ 3,750,000	Estimate	
Instrumentation and Controls	$ 375,000	10% of PE	EPA[1]
Sales Tax	$ 112,500	3% of PE	EPA[1]
Freight	$ 187,500	5% of PE	EPA[1]
Total Purchased Equipment Cost (PEC)	**$ 4,425,000**		
Direct Installation			
Foundations	$ 531,000	12% of PEC	EPA[1]
Handling and Erection	$ 1,770,000	40% of PEC	EPA[1]
Electrical	$ 44,250	1% of PEC	EPA[1]
Piping	$ 88,500	2% of PEC	EPA[1]
Insulation and Ductwork	$ 44,250	1% of PEC	EPA[1]
Painting	$ 44,250	1% of PEC	EPA[1]
Total Direct Installation (DI)	**$ 2,522,250**		
Total Direct Cost (DC)	**$ 6,947,250**		
Indirect Installation Costs			
Engineering and Project Management	$ 442,500	10% of PEC	EPA[1]
Construction and Field Expenses	$ 442,500	10% of PEC	EPA[1]
Contractor Fees	$ -	0% of PEC	EPA[1]
Startup Expenses	$ 44,250	1% of PEC	EPA[1]
Performance Tests	$ 44,250	1% of PEC	EPA[1]
Contingencies	$ 132,750	3% of PEC	EPA[1]
Total Indirect Cost	**$ 1,106,250**		
Total Installed Cost (TIC)	**$ 8,053,500**		
Assumptions:			
EPA[1] - EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, EPA/452/B-002-001, Jan. 2002.			

CO Cost Analysis for Flare Recovery System

	Flare Recovery System	Basis for Cost and Factor
Capacity (kw)	400	flare gas compressor
Capitol Cost		
Total Installed Cost	**$ 8,053,500**	
CO Emissions Before Control, lb/MMBtu	0.37	
Annual Capacity Factor	100%	
CO Emissions Before Control, tn/yr	31.68	
CO Emissions After Control, lb/MMBtu	0.0037	
Control Efficiency (%)	99	
CO Emissions After Control, tn/yr	0.3168	
CO Emission Reduction, tn/yr	31.3632	
Annual Costs, $/year (Direct + Indirect)		
Direct Costs		
Operating Labor	$ 161,070	2% of capitol cost
Raw materials	$ -	
Replacement Parts	$ 161,070	2% of capitol cost
Utilities - Power	$ 245,280	$0.07/KW and a 400 KW flare gas compressor
Total Direct Costs, $/year	**$ 567,420**	
Indirect Costs		
Overhead	$ 128,856	80% of labor costs
Taxes, Insurance, and Administration	$ 322,140	4% of total installed cost - EPA[1]
Capitol Recovery	$ 1,094,471	6%, 10 years, CRF-.1359
Total Indirect Costs, $/year	**$ 1,545,467**	
Total Annual Cost	**$ 2,112,887**	
Cost Effectiveness, $ per ton CO reduction	**$ 67,368.34**	
Assumptions:		
EPA[1] - EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, EPA/452/B-002-001, Jan. 2002. Table		

VOC Cost Analysis for Flare Recovery System

	Flare Recovery System	Factor	Basis for Cost and Factor
Direct Costs:			
Puchased Equipment:			
Primary and Auxiliary Equipment (PE)	$ 3,750,000	Estimate	
Instrumentation and Controls	$ 375,000	10% of PE	EPA[1]
Sales Tax	$ 112,500	3% of PE	EPA[1]
Freight	$ 187,500	5% of PE	EPA[1]
Total Purchased Equipment Cost (PEC)	**$ 4,425,000**		
Direct Installation			
Foundations	$ 531,000	12% of PEC	EPA[1]
Handling and Erection	$ 1,770,000	40% of PEC	EPA[1]
Electrical	$ 44,250	1% of PEC	EPA[1]
Piping	$ 88,500	2% of PEC	EPA[1]
Insulation and Ductwork	$ 44,250	1% of PEC	EPA[1]
Painting	$ 44,250	1% of PEC	EPA[1]
Total Direct Installation (DI)	**$ 2,522,250**		
Total Direct Cost (DC)	**$ 6,947,250**		
Indirect Installation Costs			
Engineering and Project Management	$ 442,500	10% of PEC	EPA[1]
Construction and Field Expenses	$ 442,500	10% of PEC	EPA[1]
Contractor Fees	$ -	0% of PEC	EPA[1]
Startup Expenses	$ 44,250	1% of PEC	EPA[1]
Performance Tests	$ 44,250	1% of PEC	EPA[1]
Contingencies	$ 132,750	3% of PEC	EPA[1]
Total Indirect Cost	**$ 1,106,250**		
Total Installed Cost (TIC)	**$ 8,053,500**		
Assumptions:			
EPA[1] - EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, EPA/452/B-002-001, Jan. 2002.			

VOC Cost Analysis for Flare Recovery System

	Flare Recovery System	Basis for Cost and Factor
Capacity (kw)	400	flare gas compressor
Capitol Cost		
Total Installed Cost	**$ 8,053,500**	
VOC Emissions Before Control, lb/MMBtu	3.614	
Annual Capacity Factor	100%	
VOC Emissions Before Control, tn/yr	5.42	
VOC Emissions After Control, lb/MMBtu	0.03614	
Control Efficiency (%)	99	
VOC Emissions After Control, tn/yr	0.0542	
VOC Emission Reduction, tn/yr	5.3658	
Annual Costs, $/year (Direct + Indirect)		
Direct Costs		
Operating Labor	$ 161,070	2% of capitol cost
Raw materials	$ -	
Replacement Parts	$ 161,070	2% of capitol cost
Utilities - Power	$ 245,280	$0.07/KW and a 400 KW flare gas compressor
Total Direct Costs, $/year	**$ 567,420**	
Indirect Costs		
Overhead	$ 128,856	80% of labor costs
Taxes, Insurance, and Administration	$ 322,140	4% of total installed cost - EPA[1]
Capitol Recovery	$ 1,094,471	6%, 10 years, CRF-.1359
Total Indirect Costs, $/year	**$ 1,545,467**	
Total Annual Cost	**$ 2,112,887**	
Cost Effectiveness, $ per ton VOC reduction	**$ 393,769.18**	
Assumptions:		
EPA[1] - EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, EPA/452/B-002-001, Jan. 2002. Table		

Appendix F
GHG Cost Analysis for Flare Gas Recovery System

CO_2 Cost Analysis for Flare Recovery System

	Flare Recovery System	Factor	Basis for Cost and Factor
Direct Costs:			
Puchased Equipment:			
Primary and Auxiliary Equipment (PE)	$ 3,750,000	Estimate	
Instrumentation and Controls	$ 375,000	10% of PE	EPA[1]
Sales Tax	$ 112,500	3% of PE	EPA[1]
Freight	$ 187,500	5% of PE	EPA[1]
Total Purchased Equipment Cost (PEC)	**$ 4,425,000**		
Direct Installation			
Foundations	$ 531,000	12% of PEC	EPA[1]
Handling and Erection	$ 1,770,000	40% of PEC	EPA[1]
Electrical	$ 44,250	1% of PEC	EPA[1]
Piping	$ 88,500	2% of PEC	EPA[1]
Insulation and Ductwork	$ 44,250	1% of PEC	EPA[1]
Painting	$ 44,250	1% of PEC	EPA[1]
Total Direct Installation (DI)	**$ 2,522,250**		
Total Direct Cost (DC)	**$ 6,947,250**		
Indirect Installation Costs			
Engineering and Project Management	$ 442,500	10% of PEC	EPA[1]
Construction and Field Expenses	$ 442,500	10% of PEC	EPA[1]
Contractor Fees	$ -	0% of PEC	EPA[1]
Startup Expenses	$ 44,250	1% of PEC	EPA[1]
Performance Tests	$ 44,250	1% of PEC	EPA[1]
Contingencies	$ 132,750	3% of PEC	EPA[1]
Total Indirect Cost	**$ 1,106,250**		
Total Installed Cost (TIC)	**$ 8,053,500**		
Assumptions:			
EPA[1] - EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, EPA/452/B-002-001, Jan. 2002.			

CO_2 Cost Analysis for Flare Recovery System

	Flare Recovery System	Basis for Cost and Factor
Capacity (kw)	400	flare gas compressor
Capitol Cost		
Total Installed Cost	**$ 8,053,500**	
CO_2 Emissions Before Control, lb/MMBtu	132.3	
Annual Capacity Factor	100%	
CO_2 Emissions Before Control, Mtn/yr	10069.97	
CO_2 Emissions After Control, lb/MMBtu	6.615	
Control Efficiency (%)	95	
CO_2 Emissions After Control, Mtn/yr	503.4985	
CO_2 Emission Reduction, Mtn/yr	9566.4715	
Annual Costs, $/year (Direct + Indirect)		
Direct Costs		
Operating Labor	$ 161,070	2% of capitol cost
Raw materials	$ -	
Replacement Parts	$ 161,070	2% of capitol cost
Utilities - Power	$ 245,280	$0.07/KW and a 400 KW flare gas compressor
Total Direct Costs, $/year	**$ 567,420**	
Indirect Costs		
Overhead	$ 128,856	80% of labor costs
Taxes, Insurance, and Administration	$ 322,140	4% of total installed cost - EPA[1]
Capitol Recovery	$ 1,094,471	6%, 10 years, CRF-.1359
Total Indirect Costs, $/year	**$ 1,545,467**	
Total Annual Cost	**$ 2,112,887**	
Cost Effectiveness, $ per ton CO_2 reduction	**$ 220.86**	
Assumptions:		
EPA[1] - EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, EPA/452/B-002-001, Jan. 2002. Table		

CH_4 Cost Analysis for Flare Recovery System

	Flare Recovery System	Factor	Basis for Cost and Factor
Direct Costs:			
Puchased Equipment:			
Primary and Auxiliary Equipment (PE)	$ 3,750,000	Estimate	
Instrumentation and Controls	$ 375,000	10% of PE	EPA[1]
Sales Tax	$ 112,500	3% of PE	EPA[1]
Freight	$ 187,500	5% of PE	EPA[1]
Total Purchased Equipment Cost (PEC)	**$ 4,425,000**		
Direct Installation			
Foundations	$ 531,000	12% of PEC	EPA[1]
Handling and Erection	$ 1,770,000	40% of PEC	EPA[1]
Electrical	$ 44,250	1% of PEC	EPA[1]
Piping	$ 88,500	2% of PEC	EPA[1]
Insulation and Ductwork	$ 44,250	1% of PEC	EPA[1]
Painting	$ 44,250	1% of PEC	EPA[1]
Total Direct Installation (DI)	**$ 2,522,250**		
Total Direct Cost (DC)	**$ 6,947,250**		
Indirect Installation Costs			
Engineering and Project Management	$ 442,500	10% of PEC	EPA[1]
Construction and Field Expenses	$ 442,500	10% of PEC	EPA[1]
Contractor Fees	$ -	0% of PEC	EPA[1]
Startup Expenses	$ 44,250	1% of PEC	EPA[1]
Performance Tests	$ 44,250	1% of PEC	EPA[1]
Contingencies	$ 132,750	3% of PEC	EPA[1]
Total Indirect Cost	**$ 1,106,250**		
Total Installed Cost (TIC)	**$ 8,053,500**		
Assumptions:			
EPA[1] - EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, EPA/452/B-002-001, Jan. 2002.			

CH_4 Cost Analysis for Flare Recovery System

	Flare Recovery System	Basis for Cost and Factor
Capacity (kw)	400	flare gas compressor
Capitol Cost		
Total Installed Cost	**$ 8,053,500**	
CH_4 Emissions Before Control, lb/MMBtu	0.0066	
Annual Capacity Factor	100%	
CH_4 Emissions Before Control, Mtn/yr	30.4	
CH_4 Emissions After Control, lb/MMBtu	0.00033	
Control Efficiency (%)	95	
CH_4 Emissions After Control, Mtn/yr	1.52	
CH_4 Emission Reduction, Mtn/yr	28.88	
Annual Costs, $/year (Direct + Indirect)		
Direct Costs		
Operating Labor	$ 161,070	2% of capitol cost
Raw materials	$ -	
Replacement Parts	$ 161,070	2% of capitol cost
Utilities - Power	$ 245,280	$0.07/KW and a 400 KW flare gas compressor
Total Direct Costs, $/year	**$ 567,420**	
Indirect Costs		
Overhead	$ 128,856	80% of labor costs
Taxes, Insurance, and Administration	$ 322,140	4% of total installed cost - EPA[1]
Capitol Recovery	$ 1,094,471	6%, 10 years, CRF-.1359
Total Indirect Costs, $/year	**$ 1,545,467**	
Total Annual Cost	**$ 2,112,887**	
Cost Effectiveness, $ per ton CH_4 reduction	**$ 73,160.90**	
Assumptions:		

EPA[1] - EPA Air Pollution Control Cost Manual, Sixth Edition, Section 4, EPA/452/B-002-001, Jan. 2002. Table

Appendix G
In-Stack NO_x/NO_2 Ratio Test Results

CCI
Environmental Consultants

3855 South 500 West, Suite A, SLC, Utah 84115 *Phone (801) 269-0550 Fax (801) 265-3656*

To: Eric Benson February 16, 2012
Holly Frontier Refining

From: Larry Cottone

Subject: NO_2 fraction of NO_X in 4 combustion units

Eric:

Transmitted with this cover letter is a summary of the test results from yesterday and today on two heaters, a boiler and a compressor operated at the Holly-Frontier Woods Cross Refinery.

As we discussed, we will submit a more complete report in one to two weeks. If you have any questions regarding the test program or results, please do not hesitate to contact me.

Holly Frontier Woods Cross Refinery
Test Results, NO2:NOx Ratios

	Test Date	NOx ppmvd	NO2 ppmvd	CO2 % dry	Oxygen % dry	NO ppmvd	% of NO_X as NO2
Heater 8H1	**2/15/2012**	47.7	2.7	9.3	3.8	44.9	5.8
East KVB Compressor	**2/16/2012**	149.1	0.0	5.0	10.0	143.6	0.0
Boiler 5	**2/16/2012**	4.1	0.9	7.7	7.3	3.3	22.7
Heater 6	**2/16/2012**	100.2	0.0	8.5	6.7	99.3	0.0

TEST REPORT

Source Name: **Heaters 6 and 8H1, Boiler 5 and East KVB Compressor**
Purpose of Test: **Evaluation of NO_2 – NO_X Ratios**

Submitted to:

HOLLY Refining and Marketing Company Woods Cross LLC
Woods Cross Refinery
393 South 800 West
Woods Cross, Utah 84087

Submitted by:

CCI Environmental Consultants

3855 South 500 West, Suite A
Salt Lake City, Utah 84115

Test Dates: **February 15 and 16, 2012**
Report Date: **March 2, 2012**

TEST REPORT

Source Name: Heaters 6 and 8H1, Boiler 5 and East KVB Compressor
Purpose of Test: Evaluation of NO_2 – NO_X Ratios

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Appendix B - Calibration Gas Certificates

1.0 INTRODUCTION

1.1 Responsible Groups

Name of plant:	HOLLY Refining and Marketing Company Woods Cross LLC
Plant Test Representative:	Eric Benson
Phone Number:	801 299 6623
e-mail address:	Eric.Benson@hollycorp.com
Plant Address:	Woods Cross Refinery 393 South 800 West Woods Cross, UT 84087

Testing Company Name:	CCI Environmental Consultants, Inc.
Responsible Test Manager:	Larry Cottone
Phone Number:	801 269 0550
e-mail address:	larrycottone@ccienvironmental.com
Address:	3855 South 500 West, Suite A Salt Lake City, Utah 84115

1.2 Overall Purpose of the Emission Test

The Woods Cross Refinery was interested in quantifying the proportion of NO_2 in the total NO_X emissions from different combustion sources operated in the refinery. Four representative sources in the refinery were tested on February 15 and 16, 2012.

2.0 SUMMARY OF RESULTS

The results of the test program are summarized in Table 1.

Each of the four source stacks was monitored for a minimum of 21 minutes. There were no significant concentration or ratio changes during the monitoring period on any of the stacks.

Table 1
Summary of NO_2 to NO_X Ratios

	Test Date	NOx ppmvd	NO2 ppmvd	NO ppmvd	CO2 % dry	Oxygen % dry	% of NO_X as NO2
Heater 8H1	**2/15/2012**	47.7	2.7	44.9	9.3	3.8	5.66
East KVB Compressor	**2/16/2012**	149.1	0.0	143.6	5.0	10.0	0.00
Boiler 5	**2/16/2012**	4.1	0.9	3.3	7.7	7.3	21.95
Heater 6	**2/16/2012**	100.2	0.0	99.3	8.5	6.7	0.00

3.0 SAMPLING AND ANALYTICAL PROCEDURES

The sample gas was extracted from the stacks through a heated stainless steel sampling probe, a heated glass fiber filter and a heated Teflon sampling line. It was then drawn through a condenser to remove moisture and then pushed through an unheated Teflon sample line into the monitoring trailer.

An NO_X analyzer employing a chemiluminescent detector and equipped with a molybdenum NO_2 to NO converter was used for the test program. The instrument measures total NO_X on the sample (after it has passed through the converter) by detecting the light emitted from the NO to NO_2 reaction in the detector. In addition, the analyzer directly measures the NO fraction of the NO_X by the same detection process except without previously passing the sample through the molybdenum converter. NO_2 is determined by the analyzer by difference. Each of the three parameters was represented by a real-time analog output signal from the instrument. Data were recorded at 15 second intervals.

The analyzer was calibrated using Protocol 1 gases composed of NO, CO and SO2 in nitrogen. Both the NO and NO_X channels were zeroed and adjusted for the upscale calibration gases. Following the calibration, the instrument was challenged with an NO_2 calibration gas mixture and found to give an appropriate response with no additional calibration adjustments.

A Reference Method 7E direct calibration was performed each test day. A system bias check and the NO2 response were performed prior to and following testing on each of the source stacks.

Appendix A
Raw Field CEMS Data

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
dcg2	2/15/2012	11:24:15	1.9	1.9	3.9	14.5	2.0
dcg2	2/15/2012	11:24:30	1.8	1.8	4.9	16.2	1.9
dcg2	2/15/2012	11:24:45	0.7	0.7	18.5	22.5	0.8
dcg2	2/15/2012	11:25:00	1.2	1.2	19.6	24.7	1.3
dcg2	2/15/2012	11:25:15	2.0	2.1	19.6	25.2	2.1
dcg2	2/15/2012	11:25:30	1.9	2.0	19.7	25.3	2.0
dcg2	2/15/2012	11:25:45	0.6	0.6	19.7	25.2	0.7
dcg2	2/15/2012	11:26:00	1.2	1.2	19.8	25.2	1.3
dcg2	2/15/2012	11:26:15	1.9	1.9	19.7	24.4	2.0
dcg2	2/15/2012	11:26:30	2.0	2.0	19.4	24.3	2.1
dcg2	2/15/2012	11:26:45	0.5	0.5	19.5	24.3	0.5
co2high1	2/15/2012	11:26:15	1.9	1.9	19.7	24.4	2.0
o2high1	2/15/2012	11:26:15	1.9	1.9	19.7	24.4	2.0
dcg4	2/15/2012	11:27:15	2.0	2.0	13.1	20.7	2.1
dcg4	2/15/2012	11:27:30	1.9	1.9	0.5	5.1	1.9
dcg4	2/15/2012	11:27:45	0.5	0.5	0.2	1.1	0.8
dcg4	2/15/2012	11:28:00	1.2	1.2	0.1	0.5	1.5
dcg4	2/15/2012	11:28:15	2.1	2.1	0.1	0.2	2.3
dcg4	2/15/2012	11:28:30	2.0	2.0	0.1	0.2	2.2
dcg4	2/15/2012	11:28:45	0.6	0.6	0.1	0.2	0.9
dcg4	2/15/2012	11:29:00	1.2	1.2	0.1	0.2	1.3
dcg4	2/15/2012	11:29:15	2.0	2.0	0.1	0.2	2.1
dcg4	2/15/2012	11:29:30	2.1	2.1	0.1	0.2	2.3
dcg4	2/15/2012	11:29:45	0.7	0.7	0.1	0.2	0.9
dcg4	2/15/2012	11:30:00	1.0	1.1	0.1	0.2	1.3
dcg4	2/15/2012	11:30:15	4.7	8.0	0.1	0.2	11.5
dcg4	2/15/2012	11:30:30	17.1	18.3	-1.2	0.0	18.6
dcg4	2/15/2012	11:30:45	4.4	4.4	0.1	0.2	4.5
dcg4	2/15/2012	11:31:00	1.1	1.1	0.1	0.2	1.3
dcg4	2/15/2012	11:31:15	0.2	0.1	0.1	0.1	0.3
dcg4	2/15/2012	11:31:30	-0.1	-0.1	0.1	0.2	0.0
dcg4	2/15/2012	11:31:45	-0.1	-0.1	0.1	0.2	-0.1
dcg4	2/15/2012	11:32:00	-0.1	-0.1	0.1	0.1	-0.1
dcg4	2/15/2012	11:32:15	-0.1	0.0	0.1	0.2	0.0
dcg4	2/15/2012	11:32:30	1.7	2.0	0.1	0.2	6.5
dcg4	2/15/2012	11:32:45	3.4	7.0	0.1	0.2	9.7
dcg4	2/15/2012	11:35:00	0.9	0.9	0.2	0.4	1.2
dcg4	2/15/2012	11:35:15	1.4	1.4	0.2	0.7	1.7
dcg4	2/15/2012	11:35:30	1.6	1.6	0.1	0.2	1.8
dcg4	2/15/2012	11:35:45	0.6	0.6	0.1	0.2	0.8

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
dcg4	2/15/2012	11:36:00	0.8	0.8	0.1	0.2	1.0
dcg4	2/15/2012	11:36:15	1.8	1.8	0.1	0.2	2.0
dcg4	2/15/2012	11:36:30	1.9	1.9	0.1	0.2	2.1
dcg4	2/15/2012	11:36:45	0.3	0.3	0.1	0.1	0.5
dcg4	2/15/2012	11:37:00	1.1	0.7	0.1	0.2	1.5
dcg4	2/15/2012	11:37:15	1.2	0.7	0.1	0.2	1.7
dcg4	2/15/2012	11:37:30	0.4	0.0	0.1	0.2	0.9
dcg4	2/15/2012	11:37:45	0.5	0.2	0.1	0.2	0.6
dcg4	2/15/2012	11:38:00	1.6	1.0	0.1	0.2	1.7
dcg4	2/15/2012	11:38:15	0.6	0.0	0.1	0.1	0.7
dcg4	2/15/2012	11:38:30	2.5	2.1	0.1	0.2	2.7
dcg4	2/15/2012	11:38:45	0.1	-0.6	0.1	0.1	0.9
dcg4	2/15/2012	11:39:00	0.6	0.0	0.1	0.2	1.3
dcg4	2/15/2012	11:39:15	1.2	0.5	0.1	0.2	1.5
dcg4	2/15/2012	11:39:30	1.5	1.2	0.1	0.1	1.5
dcg4	2/15/2012	11:39:45	0.9	0.6	0.1	0.1	0.7
dcg4	2/15/2012	11:40:00	3.3	3.2	0.1	0.2	3.7
dcg4	2/15/2012	11:40:15	18.1	23.0	0.1	0.1	22.9
dcg4	2/15/2012	11:40:30	4.8	4.8	0.1	0.2	4.9
dcg4	2/15/2012	11:40:45	1.0	1.0	0.1	0.2	1.2
dcg6	2/15/2012	11:43:15	0.3	0.0	0.1	0.3	0.4
dcg6	2/15/2012	11:43:30	0.7	0.0	0.2	1.3	0.8
dcg6	2/15/2012	11:43:45	0.7	0.1	0.1	0.6	0.8
dcg6	2/15/2012	11:44:00	1.9	1.3	0.1	0.3	1.9
dcg6	2/15/2012	11:44:15	0.6	0.3	0.1	0.2	0.3
dcg6	2/15/2012	11:44:30	1.2	1.0	0.1	0.2	1.4
dcg6	2/15/2012	11:44:45	0.4	-0.2	0.1	0.2	0.7
dcg6	2/15/2012	11:45:00	0.9	0.2	0.1	0.2	1.0
dcg6	2/15/2012	11:45:15	0.6	0.0	0.1	0.2	0.7
dcg6	2/15/2012	11:45:30	0.8	0.1	0.1	0.2	0.8
dcg6	2/15/2012	11:45:45	1.8	1.3	0.1	0.2	1.9
dcg6	2/15/2012	11:46:00	0.7	0.2	0.1	0.2	0.6
dcg6	2/15/2012	11:46:15	1.2	0.6	0.1	0.2	1.3
dcg6	2/15/2012	11:46:30	0.7	-0.1	0.1	0.2	0.8
dcg6	2/15/2012	11:46:45	2.2	1.6	0.1	0.2	2.4
dcg6	2/15/2012	11:47:00	0.8	0.2	0.1	0.2	1.3
dcg6	2/15/2012	11:47:15	1.3	0.8	0.1	0.2	2.1
dcg6	2/15/2012	11:47:30	1.2	0.9	0.1	0.2	1.1
dcg5	2/15/2012	11:47:45	0.7	0.4	0.1	0.2	0.5
dcg6	2/15/2012	12:48:00	-0.1	0.1	0.3	8.4	0.2
dcg6	2/15/2012	12:48:15	-0.1	0.1	0.4	1.1	0.2

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
dcg6	2/15/2012	12:48:30	-0.1	0.1	0.3	0.2	0.2
dcg6	2/15/2012	12:48:45	-0.1	0.1	0.3	0.1	0.2
dcg6	2/15/2012	12:49:00	-0.1	0.1	0.2	0.1	0.2
dcg6	2/15/2012	12:49:15	-0.1	0.1	0.2	0.1	0.2
dcg6	2/15/2012	12:49:30	-0.1	0.1	0.1	0.1	0.2
dcg6	2/15/2012	12:49:45	-0.1	0.1	0.1	0.1	0.2
dcg6	2/15/2012	12:50:00	-0.1	0.1	0.1	0.1	0.2
dcg6	2/15/2012	12:50:15	-0.1	0.1	0.1	0.1	0.2
dcg6	2/15/2012	12:50:30	-0.1	0.1	0.1	0.1	0.2
dcg6	2/15/2012	12:50:45	-0.1	0.1	0.1	0.1	0.2
dcg6	2/15/2012	12:51:00	0.9	0.1	0.1	0.1	3.2
dcg6	2/15/2012	12:51:15	-0.1	0.1	0.1	0.1	0.0
dcg6	2/15/2012	12:51:30	-0.1	0.1	0.1	0.1	0.0
dcg6	2/15/2012	12:51:45	7.5	13.0	0.1	0.1	14.9
dcg6	2/15/2012	12:52:00	-0.1	0.1	0.1	0.1	0.0
dcg6	2/15/2012	12:52:15	0.0	0.1	0.1	0.1	0.0
dcg6	2/15/2012	12:52:30	0.3	0.3	0.1	0.1	0.0
dcg6	2/15/2012	12:52:45	-0.1	0.1	0.1	0.1	0.0
dcg6	2/15/2012	12:53:00	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	12:53:15	-0.1	0.1	0.1	0.1	0.1
dcg6	2/15/2012	12:53:30	-0.1	0.1	0.1	0.1	0.1
dcg6	2/15/2012	12:53:45	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	12:54:00	-0.1	0.1	0.1	0.1	0.0
dcg6	2/15/2012	12:54:15	-0.1	0.1	0.1	0.1	0.2
dcg6	2/15/2012	12:54:30	-0.1	0.1	0.1	0.1	0.2
dcg6	2/15/2012	12:54:45	-0.1	0.1	0.1	0.1	0.2
dcg6	2/15/2012	12:55:00	-0.1	0.1	0.1	0.2	0.2
dcg6	2/15/2012	12:55:15	-0.1	0.1	0.1	0.1	0.2
dcg6	2/15/2012	12:55:30	-0.1	0.1	0.1	0.2	0.2
dcg6	2/15/2012	12:55:45	-0.1	0.1	0.1	0.2	0.2
dcg6	2/15/2012	12:56:00	-0.1	0.1	0.1	0.1	0.2
dcg6	2/15/2012	12:56:15	-0.1	0.1	0.1	0.2	0.2
dcg6	2/15/2012	12:56:30	-0.1	0.1	0.1	0.1	0.2
dcg6	2/15/2012	12:56:45	-0.1	0.1	0.1	0.2	0.2
dcg6	2/15/2012	12:57:00	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	12:57:15	-0.1	0.1	0.1	0.1	0.0
dcg4	2/15/2012	13:04:00	-0.1	0.1	0.3	4.0	0.0
dcg4	2/15/2012	13:04:15	-0.1	0.1	0.4	1.6	0.0
dcg4	2/15/2012	13:04:30	-0.1	0.1	0.1	0.5	0.0
dcg4	2/15/2012	13:04:45	-0.1	0.1	0.1	0.2	0.0
dcg4	2/15/2012	13:08:00	-0.1	0.1	0.2	0.9	0.0

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
dcg4	2/15/2012	13:08:15	-0.1	0.1	0.2	0.4	0.0
dcg4	2/15/2012	13:08:30	-0.1	0.1	0.1	0.2	0.0
dcg4	2/15/2012	13:08:45	-0.1	0.1	0.1	0.2	0.1
dcg4	2/15/2012	13:09:00	-0.1	0.1	0.1	0.2	0.2
dcg4	2/15/2012	13:09:15	-0.1	0.1	0.1	0.2	0.1
dcg4	2/15/2012	13:09:30	-0.1	0.1	0.1	0.2	0.0
dcg4	2/15/2012	13:09:45	-0.1	0.1	0.1	0.2	0.0
dcg4	2/15/2012	13:10:00	-0.1	0.1	0.1	0.2	0.2
dcg4	2/15/2012	13:10:15	-0.1	0.1	0.1	0.2	0.0
dcg4	2/15/2012	13:10:30	-0.1	0.1	0.1	0.2	0.0
dcg4	2/15/2012	13:10:45	-0.1	0.1	0.1	0.2	0.0
dcg4	2/15/2012	13:11:00	-0.1	0.1	0.1	0.2	0.0
dcg4	2/15/2012	13:11:15	-0.1	0.1	0.1	0.2	0.0
dcg4	2/15/2012	13:11:30	-0.1	0.1	0.1	0.2	0.1
noxhigh1	2/15/2012	13:11:15	-0.1	0.1	0.1	0.2	0.0
dcg5	2/15/2012	13:11:45	-0.1	0.1	0.1	0.3	0.0
dcg5	2/15/2012	13:12:00	-0.1	0.1	0.1	1.2	0.0
dcg5	2/15/2012	13:12:15	-0.1	-0.1	0.1	1.3	0.1
dcg5	2/15/2012	13:12:30	-0.1	-0.1	0.1	1.4	0.2
dcg5	2/15/2012	13:12:45	-0.1	0.0	0.1	1.3	0.0
dcg5	2/15/2012	13:13:00	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:13:15	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:13:30	-0.1	0.1	0.1	1.4	0.2
dcg5	2/15/2012	13:13:45	-0.1	0.1	0.1	1.3	0.2
dcg5	2/15/2012	13:14:00	-0.1	0.1	0.1	1.4	0.1
dcg5	2/15/2012	13:14:15	-0.1	0.1	0.1	1.4	0.1
dcg5	2/15/2012	13:14:30	-0.1	0.1	0.1	1.4	0.1
dcg5	2/15/2012	13:14:45	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:15:00	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:15:15	-0.1	0.1	0.1	1.4	0.1
dcg5	2/15/2012	13:15:30	-0.1	0.1	0.1	1.4	0.1
dcg5	2/15/2012	13:15:45	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:16:00	-0.1	0.1	0.1	1.4	0.1
dcg6	2/15/2012	13:16:15	-0.1	0.1	0.1	1.4	0.1
dcg6	2/15/2012	13:16:30	-0.1	0.1	0.1	1.0	0.0
dcg6	2/15/2012	13:16:45	-0.1	0.1	0.1	0.5	0.0
dcg6	2/15/2012	13:17:00	-0.1	0.1	0.1	0.2	0.1
dcg6	2/15/2012	13:17:15	-0.1	0.1	0.1	0.2	0.2
dcg6	2/15/2012	13:17:30	-0.1	0.1	0.1	0.2	0.1
dcg6	2/15/2012	13:17:45	-0.1	0.1	0.1	0.1	0.1

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
dcg6	2/15/2012	13:18:00	-0.1	0.1	0.1	0.2	0.1
dcg6	2/15/2012	13:18:15	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:18:30	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:18:45	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:19:00	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:19:15	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:19:30	-0.1	0.1	0.1	0.2	0.2
dcg6	2/15/2012	13:19:45	-0.1	0.1	0.1	0.1	0.0
dcg6	2/15/2012	13:20:00	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:20:15	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:20:30	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:20:45	-0.1	0.1	0.1	0.2	0.1
dcg6	2/15/2012	13:21:00	-0.1	0.1	0.1	0.2	0.0
dcg5	2/15/2012	13:21:15	-0.1	0.1	0.1	0.2	0.0
dcg5	2/15/2012	13:21:30	-0.1	0.1	0.1	0.5	0.0
dcg5	2/15/2012	13:21:45	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:22:00	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:22:15	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:22:30	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:22:45	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:23:00	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:23:15	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:23:30	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:23:45	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:24:00	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:24:15	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:24:30	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:24:45	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:25:00	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:25:15	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:25:30	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:25:45	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:26:00	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:26:15	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:26:30	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:26:45	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:27:00	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:27:30	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:27:45	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:28:00	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:28:15	-0.1	0.1	0.1	1.4	0.0

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
dcg5	2/15/2012	13:28:30	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:28:45	-0.1	0.1	0.1	1.4	0.0
dcg6	2/15/2012	13:29:00	-0.1	0.1	0.1	1.3	0.0
dcg6	2/15/2012	13:29:15	-0.1	0.1	0.1	1.2	0.0
dcg6	2/15/2012	13:29:30	-0.1	0.1	0.1	0.5	0.0
dcg6	2/15/2012	13:29:45	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:30:00	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:30:15	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:30:30	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:30:45	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:31:00	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:31:15	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:31:30	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:31:45	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:32:00	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:32:15	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:32:30	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:32:45	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:33:00	-0.1	0.0	0.1	0.2	0.2
dcg6	2/15/2012	13:33:15	-0.1	0.1	0.1	0.2	0.1
dcg6	2/15/2012	13:33:30	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:33:45	-0.1	0.1	0.1	0.2	0.0
dcg6	2/15/2012	13:34:00	-0.1	0.1	0.1	0.2	0.0
dcg5	2/15/2012	13:34:15	-0.1	0.1	0.1	0.4	0.0
dcg5	2/15/2012	13:34:30	-0.1	0.1	0.1	1.3	0.1
dcg5	2/15/2012	13:34:45	-0.1	-0.1	0.1	1.3	0.2
dcg5	2/15/2012	13:35:00	-0.1	0.1	0.1	1.4	0.1
dcg5	2/15/2012	13:35:15	-0.1	0.1	0.1	1.3	0.0
dcg5	2/15/2012	13:35:30	-0.1	0.1	0.1	1.4	0.0
dcg5	2/15/2012	13:35:45	-0.1	0.1	0.1	1.4	0.0
scg1	2/15/2012	13:38:15	0.0	0.1	1.2	2.6	-0.4
scg1	2/15/2012	13:38:30	0.3	0.2	10.4	9.8	-12.4
scg1	2/15/2012	13:38:45	-0.1	0.1	11.2	12.0	0.0
scg1	2/15/2012	13:39:00	-0.1	0.1	11.3	12.2	0.0
scg1	2/15/2012	13:39:15	-0.1	0.1	11.3	12.2	0.0
scg1	2/15/2012	13:39:30	-0.1	0.1	11.4	12.2	0.0
scg1	2/15/2012	13:39:45	-0.1	0.1	11.4	12.2	0.0
scg1	2/15/2012	13:40:00	-0.1	0.1	11.4	12.2	0.0
scg1	2/15/2012	13:40:15	-0.1	0.1	11.4	12.2	0.0
scg1	2/15/2012	13:40:30	-0.1	0.1	11.4	12.2	0.0
scg1	2/15/2012	13:40:45	-0.1	0.1	11.4	12.2	0.0

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg1	2/15/2012	13:41:00	-0.1	0.1	11.4	12.2	0.2
scg1	2/15/2012	13:41:15	-0.1	0.1	11.5	12.2	0.1
scg1	2/15/2012	13:41:30	-0.1	0.1	11.4	12.2	0.0
scg1	2/15/2012	13:41:45	-0.1	0.1	11.4	12.2	0.0
scg1	2/15/2012	13:42:00	-0.1	0.1	11.7	12.6	0.0
scg1	2/15/2012	13:42:15	-0.1	0.1	11.1	11.6	0.0
scg1	2/15/2012	13:42:30	-0.1	0.1	10.8	11.8	0.0
scg1	2/15/2012	13:42:45	-0.1	0.1	10.8	11.8	0.0
scg1	2/15/2012	13:43:00	-0.1	0.1	10.9	11.8	0.1
scg1	2/15/2012	13:43:15	-0.1	0.1	10.9	11.8	0.0
scg4	2/15/2012	13:43:45	-0.1	0.1	10.2	10.7	0.0
scg4	2/15/2012	13:44:00	-0.1	0.1	5.5	8.3	0.0
scg4	2/15/2012	13:44:15	-0.1	0.1	0.3	1.4	0.0
scg4	2/15/2012	13:44:30	-0.1	0.1	0.3	0.5	0.0
scg4	2/15/2012	13:44:45	-0.1	0.1	0.2	0.3	0.0
scg4	2/15/2012	13:45:00	-0.1	0.1	0.2	0.3	0.0
scg4	2/15/2012	13:45:15	-0.1	0.1	0.2	0.3	0.0
scg4	2/15/2012	13:45:30	-0.1	0.1	0.1	0.3	0.0
scg4	2/15/2012	13:45:45	-0.1	0.1	0.1	0.2	0.0
scg4	2/15/2012	13:46:00	-0.1	0.1	0.1	0.3	0.0
scg4	2/15/2012	13:46:15	-0.1	0.1	0.1	0.2	0.0
scg4	2/15/2012	13:46:30	-0.1	0.1	0.1	0.2	0.0
scg4	2/15/2012	14:02:00	-0.1	-0.1	0.2	0.2	-0.1
scg4	2/15/2012	14:02:15	-0.1	-0.1	0.8	1.0	-0.1
scg4	2/15/2012	14:02:30	-0.4	-0.8	-0.1	-0.1	-1.0
scg4	2/15/2012	14:02:45	-0.1	-0.1	0.1	0.2	-0.1
scg4	2/15/2012	14:03:00	-0.1	-0.1	0.1	0.2	-0.1
scg4	2/15/2012	14:03:15	-0.1	-0.1	0.1	0.2	-0.1
scg4	2/15/2012	14:03:30	-0.1	-0.1	0.1	0.2	-0.1
scg4	2/15/2012	14:03:45	-0.1	-0.1	0.1	0.2	-0.1
scg6	2/15/2012	14:04:15	-0.1	-0.1	0.1	0.2	-0.1
scg6	2/15/2012	14:04:30	-0.1	-0.1	0.1	0.2	-0.1
scg6	2/15/2012	14:04:45	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:05:00	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:05:15	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:05:30	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:05:45	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:06:00	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:06:15	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:06:30	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:06:45	-0.1	-0.1	0.1	0.1	-0.1

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg6	2/15/2012	14:07:00	-0.1	-0.1	0.1	0.2	0.0
scg6	2/15/2012	14:07:15	-0.1	-0.1	0.1	0.1	0.0
scg6	2/15/2012	14:07:30	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:07:45	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:08:00	-0.1	-0.1	0.1	0.2	-0.1
scg6	2/15/2012	14:08:15	-0.1	-0.1	0.1	0.2	-0.1
scg6	2/15/2012	14:08:30	-0.5	-1.2	-0.1	-1.5	-0.8
scg6	2/15/2012	14:08:45	-0.1	-0.1	0.1	0.1	0.0
scg6	2/15/2012	14:09:00	-0.1	-0.1	0.1	0.2	-0.1
scg6	2/15/2012	14:09:15	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:09:30	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:09:45	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:10:00	-0.1	-0.1	0.1	0.1	-0.1
scg5	2/15/2012	14:11:00	-0.1	-0.1	0.1	0.4	-0.1
scg5	2/15/2012	14:11:15	-0.1	-0.1	0.1	1.2	-0.1
scg5	2/15/2012	14:11:30	-0.1	-0.1	0.1	1.3	-0.1
scg5	2/15/2012	14:11:45	-0.1	-0.1	0.1	1.3	0.0
scg5	2/15/2012	14:12:00	-0.1	-0.1	0.1	1.3	0.0
scg5	2/15/2012	14:12:15	-0.1	-0.1	0.1	1.3	-0.1
scg5	2/15/2012	14:12:30	-0.1	-0.1	0.1	1.3	-0.1
scg5	2/15/2012	14:12:45	-0.1	-0.1	0.1	1.3	0.0
scg5	2/15/2012	14:13:00	-0.1	-0.1	0.1	1.3	-0.1
scg5	2/15/2012	14:13:15	-0.1	-0.1	0.1	1.3	-0.1
scg6	2/15/2012	14:13:45	-0.1	-0.1	0.1	1.2	0.0
scg6	2/15/2012	14:14:00	-0.1	-0.1	0.1	0.7	-0.1
scg6	2/15/2012	14:14:15	-0.1	-0.1	0.1	0.2	-0.1
scg6	2/15/2012	14:14:30	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:14:45	-0.1	-0.1	0.1	0.1	0.0
scg6	2/15/2012	14:15:00	-0.1	-0.1	0.1	0.1	-0.1
scg6	2/15/2012	14:15:15	-0.1	-0.1	0.1	0.2	-0.1
scg4	2/15/2012	14:15:45	-0.1	-0.1	0.1	0.2	-0.1
scg4	2/15/2012	14:16:00	-0.1	-0.1	0.1	0.5	-0.1
scg4	2/15/2012	14:16:15	-0.1	-0.1	0.2	0.7	-0.1
scg4	2/15/2012	14:16:30	-0.1	-0.1	0.1	0.3	-0.1
scg4	2/15/2012	14:16:45	-0.1	-0.1	0.1	0.2	-0.1
scg4	2/15/2012	14:17:00	-0.1	-0.1	0.1	0.2	-0.1
scg4	2/15/2012	14:17:15	-0.1	-0.1	0.1	0.2	-0.1
scg4	2/15/2012	14:17:30	-0.1	-0.1	0.1	0.2	-0.1
scg4	2/15/2012	14:17:45	-0.1	-0.1	0.1	0.1	-0.1
scg4	2/15/2012	14:18:00	-0.1	-0.1	0.1	0.2	-0.1
scg4	2/15/2012	14:18:15	-0.1	-0.1	0.1	0.2	-0.1

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg4	2/15/2012	14:18:45	-0.1	-0.1	0.1	0.2	-0.1
scg4	2/15/2012	14:19:00	94.3	4.4	0.1	0.2	93.0
scg4	2/15/2012	14:19:15	200.5	10.4	0.1	0.2	197.0
scg4	2/15/2012	14:19:30	179.1	4.9	0.1	0.2	197.4
scg4	2/15/2012	14:19:45	130.6	-4.5	0.1	0.2	198.1
scg4	2/15/2012	14:20:00	118.5	-4.5	0.1	0.2	198.1
scg4	2/15/2012	14:20:15	107.6	-4.5	0.1	0.2	186.6
scg4	2/15/2012	14:20:30	57.8	-4.5	0.1	0.2	100.1
scg4	2/15/2012	14:20:45	57.8	-4.5	0.1	0.2	100.1
scg1	2/15/2012	14:21:15	57.6	-4.5	0.1	0.2	100.1
scg1	2/15/2012	14:21:30	50.4	-4.5	3.4	2.5	99.9
scg1	2/15/2012	14:21:45	13.0	-4.5	9.6	8.9	92.1
scg1	2/15/2012	14:22:00	-1.8	-4.5	9.8	10.6	66.8
scg1	2/15/2012	14:22:15	3.2	0.8	9.9	10.9	16.5
scg1	2/15/2012	14:22:30	1.4	0.5	9.9	10.9	1.1
scg1	2/15/2012	14:22:45	1.0	0.5	9.9	11.0	0.6
scg1	2/15/2012	14:23:00	0.9	0.5	9.9	11.0	0.5
scg1	2/15/2012	14:23:15	0.9	0.6	9.9	11.0	0.4
scg1	2/15/2012	14:23:30	0.9	0.7	9.9	11.0	0.3
scg1	2/15/2012	14:23:45	0.9	0.7	10.0	11.0	0.3
scg1	2/15/2012	14:24:00	0.9	0.6	9.9	11.0	0.3
scg6	2/15/2012	14:24:30	0.7	0.5	6.1	8.9	0.3
scg6	2/15/2012	14:24:45	0.4	-0.2	0.4	2.6	0.9
scg6	2/15/2012	14:25:00	20.5	12.8	0.3	0.9	7.9
scg6	2/15/2012	14:25:15	27.4	-1.1	0.3	0.4	40.2
scg6	2/15/2012	14:25:30	29.0	-4.5	0.2	0.2	50.6
scg6	2/15/2012	14:25:45	29.2	-4.5	0.2	0.2	50.9
scg6	2/15/2012	14:26:00	29.3	-4.5	0.1	0.2	50.9
scg6	2/15/2012	14:26:15	28.4	-4.5	0.1	0.2	49.3
scg6	2/15/2012	14:26:30	36.9	-2.7	0.1	0.2	49.1
scg6	2/15/2012	14:26:45	49.1	-0.1	0.1	0.2	49.1
scg5	2/15/2012	14:27:15	49.0	-0.1	0.1	0.4	49.1
scg5	2/15/2012	14:27:30	48.3	-0.3	0.1	1.2	48.6
scg5	2/15/2012	14:27:45	48.0	12.7	0.1	1.3	35.3
scg5	2/15/2012	14:28:00	60.3	55.2	0.1	1.3	5.1
scg5	2/15/2012	14:28:15	62.9	59.9	0.1	1.4	2.9
scg5	2/15/2012	14:28:30	61.9	59.5	0.1	1.4	2.5
scg5	2/15/2012	14:28:45	55.1	52.6	0.1	1.4	2.5
scg5	2/15/2012	14:29:00	49.1	46.6	0.1	1.3	2.5
scg5	2/15/2012	14:29:15	48.9	46.6	0.1	1.3	2.4
scg1	2/15/2012	14:45:45	0.3	0.0	0.2	1.3	0.1

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg1	2/15/2012	14:46:00	0.3	0.0	0.2	1.3	0.1
scg1	2/15/2012	14:46:15	-0.5	-35.3	0.2	-3.4	-1.1
scg1	2/15/2012	14:46:30	-0.1	-23.5	0.2	-0.3	-0.2
scg1	2/15/2012	14:46:45	0.3	0.0	0.2	1.3	0.1
scg1	2/15/2012	14:47:00	0.3	0.0	0.2	1.3	0.1
scg1	2/15/2012	14:47:15	0.3	0.0	0.2	1.3	0.1
scg1	2/15/2012	14:47:30	0.3	0.0	0.2	1.3	0.1
scg1	2/15/2012	14:47:45	0.3	0.0	0.2	1.3	0.1
scg1	2/15/2012	14:48:00	0.3	0.0	0.2	1.3	0.1
scg1	2/15/2012	14:48:15	0.3	0.0	0.2	1.3	0.1
scg1	2/15/2012	14:48:30	0.3	0.0	0.2	1.4	0.1
scg1	2/15/2012	14:48:45	0.1	0.0	0.2	1.3	0.0
scg1	2/15/2012	14:49:00	0.3	0.0	0.2	1.4	0.1
scg1	2/15/2012	14:49:15	0.2	0.0	0.2	1.1	-0.6
scg1	2/15/2012	14:49:30	0.0	0.1	0.2	1.3	-0.5
scg1	2/15/2012	14:49:45	0.1	0.0	0.2	1.4	0.1
scg1	2/15/2012	14:50:00	0.3	0.0	0.2	1.5	0.1
scg1	2/15/2012	14:50:15	0.1	0.0	0.2	1.5	0.1
scg1	2/15/2012	14:50:30	0.1	0.0	0.2	1.6	0.1
scg1	2/15/2012	14:50:45	0.3	0.0	0.2	1.6	0.1
scg1	2/15/2012	14:51:00	0.0	0.0	0.2	1.6	0.1
scg1	2/15/2012	14:51:15	0.0	0.0	0.2	1.7	0.1
scg1	2/15/2012	14:51:30	0.3	0.0	0.2	1.7	0.1
scg1	2/15/2012	14:53:30	0.0	0.0	0.3	6.5	0.1
scg1	2/15/2012	14:53:45	-0.4	-1.9	0.2	14.4	1.7
scg1	2/15/2012	14:54:00	8.9	5.3	0.2	18.6	4.0
scg1	2/15/2012	14:54:15	10.1	8.7	0.2	19.9	1.7
scg1	2/15/2012	14:54:30	2.4	1.7	0.2	19.5	0.8
scg1	2/15/2012	14:54:45	1.8	1.2	0.3	19.6	0.7
scg1	2/15/2012	14:55:00	4.7	3.6	1.2	19.5	1.1
scg1	2/15/2012	14:55:15	4.5	2.5	0.8	19.7	2.1
scg1	2/15/2012	14:55:30	1.9	0.8	6.4	17.3	1.2
scg1	2/15/2012	14:55:45	1.1	0.6	8.9	13.4	0.7
scg1	2/15/2012	14:56:00	1.1	0.7	9.0	11.7	0.5
scg1	2/15/2012	14:56:15	0.9	0.5	9.1	11.2	0.5
scg1	2/15/2012	14:56:30	0.9	0.4	9.1	11.1	0.5
scg1	2/15/2012	14:56:45	0.9	0.4	9.2	11.1	0.4
scg1	2/15/2012	14:57:00	0.8	0.4	9.2	11.0	0.3
scg1	2/15/2012	14:57:15	0.7	0.5	9.3	11.0	0.3
scg1	2/15/2012	14:57:30	0.7	0.5	9.3	11.0	0.3
cozero1	2/15/2012	14:57:00	0.8	0.4	9.2	11.0	0.3

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
noxzero1	2/15/2012	14:56:45	0.9	0.4	9.2	11.1	0.4
noxzero1	2/15/2012	14:56:45	0.9	0.4	9.2	11.1	0.4
co2span1	2/15/2012	14:57:15	0.7	0.5	9.3	11.0	0.3
o2span1	2/15/2012	14:57:30	0.7	0.5	9.3	11.0	0.3
scg6	2/15/2012	14:57:45	0.7	0.4	9.3	11.0	0.3
scg6	2/15/2012	14:58:00	0.6	0.4	9.3	10.8	0.3
scg6	2/15/2012	14:58:15	0.7	0.4	9.4	11.0	0.3
scg6	2/15/2012	14:58:30	0.7	0.2	9.4	11.0	0.3
scg6	2/15/2012	14:58:45	0.7	0.2	9.4	11.0	0.3
scg6	2/15/2012	14:59:00	0.7	0.2	9.5	10.9	0.3
scg6	2/15/2012	14:59:15	0.7	0.2	9.5	11.0	0.3
scg6	2/15/2012	14:59:30	0.5	0.2	9.5	11.0	0.3
scg6	2/15/2012	14:59:45	0.5	0.2	9.1	10.8	0.3
scg6	2/15/2012	15:00:00	0.5	0.2	3.1	7.0	0.3
scg6	2/15/2012	15:00:15	5.0	4.1	0.8	2.6	1.6
scg6	2/15/2012	15:00:30	10.7	-4.5	0.6	1.1	30.0
scg6	2/15/2012	15:00:45	30.1	-4.5	0.5	0.7	44.5
scg6	2/15/2012	15:01:00	34.5	-4.7	0.4	0.5	46.7
scg6	2/15/2012	15:01:15	35.1	-4.5	0.4	0.3	47.8
scg6	2/15/2012	15:01:30	35.3	-4.5	0.4	0.3	47.9
scg6	2/15/2012	15:01:45	36.1	-4.2	0.3	0.3	47.9
scg6	2/15/2012	15:02:00	49.7	1.3	0.3	0.3	48.6
scg6	2/15/2012	15:02:15	50.3	1.3	0.2	0.2	49.1
cospan1	2/15/2012	15:02:00	49.7	1.3	0.3	0.3	48.6
noxspan1	2/15/2012	15:02:00	49.7	1.3	0.3	0.3	48.6
scg5	2/15/2012	15:02:30	50.6	1.3	0.2	0.2	49.3
scg5	2/15/2012	15:02:45	50.5	1.3	0.2	0.2	49.3
scg5	2/15/2012	15:03:00	50.5	1.3	0.2	0.2	49.3
scg5	2/15/2012	15:03:15	50.6	1.3	0.2	0.2	49.3
scg5	2/15/2012	15:03:30	50.6	1.3	0.2	0.2	49.3
scg5	2/15/2012	15:03:45	50.6	1.3	0.2	0.2	49.3
scg5	2/15/2012	15:04:00	50.5	1.3	0.2	0.2	49.3
scg5	2/15/2012	15:04:15	50.6	1.3	0.2	0.2	49.3
scg5	2/15/2012	15:04:30	50.5	1.3	0.2	0.2	49.2
scg5	2/15/2012	15:04:45	50.3	1.2	0.2	0.8	49.3
scg5	2/15/2012	15:05:00	51.8	8.3	0.2	1.2	43.6
scg5	2/15/2012	15:05:15	39.5	15.1	0.2	1.3	24.4
scg5	2/15/2012	15:05:30	20.2	8.2	0.1	1.3	12.1
scg5	2/15/2012	15:05:45	21.8	13.8	0.1	1.3	8.2
scg5	2/15/2012	15:06:00	23.4	16.0	0.1	1.3	7.4
scg5	2/15/2012	15:06:15	24.9	17.6	0.1	1.3	7.3

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg5	2/15/2012	15:06:30	26.4	19.3	0.1	1.3	7.1
scg5	2/15/2012	15:06:45	27.2	20.2	0.1	1.3	7.1
scg5	2/15/2012	15:07:00	27.7	20.7	0.1	1.3	7.1
scg5	2/15/2012	15:07:15	28.2	21.2	0.1	1.3	7.1
scg5	2/15/2012	15:07:30	28.5	21.4	0.1	1.3	7.1
scg5	2/15/2012	15:07:45	28.7	21.5	0.1	1.3	7.3
scg5	2/15/2012	15:08:00	28.7	21.4	0.1	1.3	7.3
scg5	2/15/2012	15:08:15	28.7	21.3	0.1	1.3	7.5
scg5	2/15/2012	15:08:30	28.9	21.5	0.1	1.3	7.3
scg5	2/15/2012	15:08:45	29.1	21.8	0.1	1.3	7.3
scg5	2/15/2012	15:09:00	29.0	21.9	0.1	1.3	7.3
scg5	2/15/2012	15:09:15	29.1	21.9	0.1	1.3	7.3
scg5	2/15/2012	15:09:30	29.3	22.1	0.1	1.3	7.1
scg5	2/15/2012	15:09:45	29.5	22.4	0.1	1.3	7.1
scg5	2/15/2012	15:10:00	29.7	22.8	0.1	1.3	6.9
scg5	2/15/2012	15:10:15	30.0	23.1	0.1	1.3	7.1
scg5	2/15/2012	15:10:30	30.6	23.6	0.1	1.3	6.9
scg5	2/15/2012	15:10:45	30.9	24.1	0.1	1.3	6.9
scg5	2/15/2012	15:11:00	31.2	24.6	0.1	1.3	6.7
scg5	2/15/2012	15:11:15	31.5	25.0	0.1	1.3	6.6
scg5	2/15/2012	15:11:30	31.7	25.3	0.1	1.3	6.4
scg5	2/15/2012	15:11:45	31.7	25.4	0.1	1.3	6.3
scg5	2/15/2012	15:12:00	31.7	25.5	0.1	1.3	6.3
scg5	2/15/2012	15:12:15	32.3	26.1	0.1	1.4	6.3
scg5	2/15/2012	15:12:30	39.1	33.0	0.1	1.4	6.3
scg5	2/15/2012	15:12:45	39.1	33.0	0.1	1.4	6.3
scg5	2/15/2012	15:13:00	39.5	33.4	0.1	1.4	6.3
scg5	2/15/2012	15:13:15	42.2	36.0	0.1	1.4	6.3
scg5	2/15/2012	15:13:30	42.2	36.0	0.1	1.4	6.3
scg5	2/15/2012	15:13:45	34.1	29.1	0.1	1.4	5.1
scg5	2/15/2012	15:14:00	34.3	29.3	0.1	1.4	5.1
scg5	2/15/2012	15:14:15	29.3	25.0	0.1	1.6	4.4
scg5	2/15/2012	15:14:30	27.7	23.6	0.1	2.0	4.2
scg5	2/15/2012	15:14:45	27.7	23.6	0.1	2.0	4.2
scg5	2/15/2012	15:15:00	27.8	23.7	0.1	1.8	4.2
scg5	2/15/2012	15:15:15	27.5	23.6	0.1	1.5	4.0
scg5	2/15/2012	15:15:30	27.7	23.6	0.1	1.8	4.2
scg5	2/15/2012	15:15:45	27.5	23.5	0.1	2.9	4.2
scg5	2/15/2012	15:16:00	27.5	23.4	0.1	3.5	4.2
scg6	2/15/2012	15:16:15	26.1	21.9	0.1	2.2	4.2
scg6	2/15/2012	15:16:30	25.0	21.0	0.1	1.6	4.2

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg6	2/15/2012	15:16:45	26.6	22.6	0.1	1.7	4.2
scg6	2/15/2012	15:17:00	27.1	22.9	0.1	1.8	4.3
scg6	2/15/2012	15:17:15	27.1	22.9	0.1	1.6	4.3
scg6	2/15/2012	15:17:30	27.1	22.9	0.1	1.6	4.3
scg6	2/15/2012	15:17:45	27.1	22.9	0.1	1.5	4.4
scg6	2/15/2012	15:18:00	27.3	22.9	0.1	1.4	4.5
scg6	2/15/2012	15:18:15	27.5	23.1	0.1	1.2	4.5
scg6	2/15/2012	15:18:30	31.6	27.1	0.1	0.7	4.6
scg6	2/15/2012	15:18:45	39.8	21.6	0.1	0.4	18.1
scg6	2/15/2012	15:19:00	47.0	14.9	0.1	0.2	32.2
scg6	2/15/2012	15:19:15	50.8	17.4	0.1	0.2	33.4
scg6	2/15/2012	15:19:30	50.4	16.9	0.1	0.2	33.6
scg6	2/15/2012	15:19:45	50.1	16.5	0.1	0.2	33.7
scg6	2/15/2012	15:20:00	49.6	16.2	0.1	0.2	33.5
scg6	2/15/2012	15:20:15	64.4	20.8	0.1	0.2	43.6
scg6	2/15/2012	15:20:30	64.0	15.1	0.1	0.2	48.9
scg6	2/15/2012	15:20:45	48.9	0.2	0.1	0.2	48.8
scg5	2/15/2012	15:21:00	48.6	0.0	0.1	0.2	48.7
scg5	2/15/2012	15:21:15	48.5	0.0	0.1	0.2	48.5
scg5	2/15/2012	15:21:30	48.4	-0.1	0.1	0.2	48.5
scg5	2/15/2012	15:21:45	48.3	-0.1	0.1	0.2	48.5
scg5	2/15/2012	15:22:00	48.1	-0.1	0.1	0.2	48.3
scg5	2/15/2012	15:22:15	48.1	-0.1	0.1	0.2	48.3
scg5	2/15/2012	15:22:30	48.0	-0.2	0.1	0.2	48.3
scg5	2/15/2012	15:22:45	47.9	-0.3	0.1	0.2	48.3
scg5	2/15/2012	15:23:00	47.9	-0.3	0.1	0.4	48.2
scg5	2/15/2012	15:23:15	48.2	1.5	0.1	1.0	46.8
scg5	2/15/2012	15:23:30	45.3	14.7	0.1	1.2	30.8
scg5	2/15/2012	15:23:45	27.0	11.1	0.1	1.3	15.8
scg5	2/15/2012	15:24:00	26.2	19.8	0.1	1.3	6.5
scg5	2/15/2012	15:24:15	26.3	20.4	0.1	1.4	6.0
scg5	2/15/2012	15:24:30	26.7	20.8	0.1	1.8	6.0
scg5	2/15/2012	15:24:45	27.3	21.2	0.1	2.1	6.2
scg5	2/15/2012	15:25:00	27.7	21.6	0.1	1.5	6.3
scg5	2/15/2012	15:25:15	28.1	21.8	0.1	1.4	6.5
scg5	2/15/2012	15:25:30	28.4	22.0	0.1	1.3	6.5
scg5	2/15/2012	15:25:45	28.6	22.2	0.1	1.3	6.5
scg5	2/15/2012	15:26:00	28.5	22.3	0.1	1.2	6.5
scg5	2/15/2012	15:26:15	28.9	22.6	0.1	1.3	6.5
8H1	2/15/2012	15:30:00	39.0	5.7	8.8	-25.0	33.2
8H1	2/15/2012	15:30:15	50.4	3.3	8.9	-11.5	47.2

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
8H1	2/15/2012	15:30:30	52.5	2.5	8.9	3.9	50.2
8H1	2/15/2012	15:30:45	52.7	2.2	9.0	3.8	50.3
8H1	2/15/2012	15:31:00	52.3	2.1	9.0	3.8	50.2
8H1	2/15/2012	15:31:15	51.9	2.4	9.1	3.8	49.6
8H1	2/15/2012	15:31:30	51.4	2.1	9.1	3.8	49.5
8H1	2/15/2012	15:31:45	51.3	2.3	9.2	3.7	49.2
8H1	2/15/2012	15:34:45	50.6	2.7	9.2	3.9	47.9
8H1	2/15/2012	15:35:00	50.4	2.6	9.2	3.9	47.9
8H1	2/15/2012	15:38:00	49.0	2.8	9.2	-25.0	46.3
8H1	2/15/2012	15:38:15	48.9	2.7	9.2	-4.8	46.2
8H1	2/15/2012	15:38:30	48.7	2.7	9.3	3.7	46.1
8H1	2/15/2012	15:38:45	48.7	2.8	9.3	3.7	45.9
8H1	2/15/2012	15:39:00	48.3	2.7	9.3	3.7	45.8
8H1	2/15/2012	15:39:15	48.3	3.0	9.3	3.7	45.6
8H1	2/15/2012	15:39:30	48.4	3.0	9.3	3.7	45.4
8H1	2/15/2012	15:39:45	48.2	2.9	9.3	3.7	45.3
8H1	2/15/2012	15:40:00	48.1	2.8	9.3	3.7	45.4
8H1	2/15/2012	15:43:30	47.8	2.8	9.3	3.7	45.3
8H1	2/15/2012	15:43:45	46.9	2.7	9.2	3.6	45.1
8H1	2/15/2012	15:44:00	48.1	3.1	9.3	3.7	45.2
8H1	2/15/2012	15:44:15	48.0	3.0	9.3	3.7	45.1
8H1	2/15/2012	15:44:30	47.8	2.6	9.3	3.8	45.3
8H1	2/15/2012	15:44:45	48.2	2.9	9.3	3.8	45.3
8H1	2/15/2012	15:45:00	48.4	3.1	9.3	3.8	45.3
8H1	2/15/2012	15:45:15	48.3	3.0	9.3	3.8	45.3
8H1	2/15/2012	15:45:30	48.1	2.9	9.3	3.8	45.3
8H1	2/15/2012	15:45:45	47.9	2.9	9.3	3.8	45.2
8H1	2/15/2012	15:46:00	47.9	2.9	9.3	3.8	45.1
8H1	2/15/2012	15:46:15	47.7	2.8	9.3	3.7	45.1
8H1	2/15/2012	15:46:30	47.5	2.5	9.3	3.8	45.1
8H1	2/15/2012	15:46:45	47.5	2.5	9.4	3.8	45.0
8H1	2/15/2012	15:47:00	47.7	3.2	9.3	3.8	44.6
8H1	2/15/2012	15:47:15	47.7	2.8	9.4	3.8	45.0
8H1	2/15/2012	15:47:30	47.9	3.1	9.4	3.8	44.9
8H1	2/15/2012	15:47:45	47.8	2.9	9.4	3.7	44.9
8H1	2/15/2012	15:48:00	47.7	2.5	9.4	3.7	45.3
8H1	2/15/2012	15:48:15	47.8	2.9	9.4	3.7	45.0
8H1	2/15/2012	15:48:30	48.2	2.8	9.3	3.5	45.0
8H1	2/15/2012	15:48:45	48.2	2.3	9.1	2.4	43.3
8H1	2/15/2012	15:49:00	46.9	2.6	9.3	3.7	44.3
8H1	2/15/2012	15:49:15	47.4	2.5	9.4	3.7	45.0

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
8H1	2/15/2012	15:49:30	47.2	2.4	9.4	3.7	45.0
8H1	2/15/2012	15:49:45	47.6	2.7	9.4	3.8	45.0
8H1	2/15/2012	15:50:00	47.8	2.7	9.4	3.8	45.2
8H1	2/15/2012	15:50:15	47.9	2.7	9.3	3.8	45.3
8H1	2/15/2012	15:50:30	48.0	2.9	9.3	3.8	45.3
8H1	2/15/2012	15:50:45	48.1	3.0	9.3	3.8	45.2
8H1	2/15/2012	15:51:00	47.9	2.7	9.4	3.7	45.5
8H1	2/15/2012	15:51:15	47.9	2.8	9.4	3.7	45.2
8H1	2/15/2012	15:51:30	47.7	2.3	9.4	3.7	45.4
8H1	2/15/2012	15:51:45	48.3	2.8	9.4	3.7	45.5
8H1	2/15/2012	15:52:00	48.5	3.1	9.4	3.7	45.5
8H1	2/15/2012	15:52:15	48.2	3.1	9.4	3.7	45.3
8H1	2/15/2012	15:52:30	48.0	2.9	9.4	3.8	45.3
8H1	2/15/2012	15:52:45	48.1	2.8	9.4	3.8	45.4
8H1	2/15/2012	15:53:00	48.2	2.5	9.3	3.8	45.8
8H1	2/15/2012	15:53:15	48.4	2.9	9.3	3.8	45.6
8H1	2/15/2012	15:53:30	48.3	3.0	9.3	3.8	45.5
8H1	2/15/2012	15:53:45	47.8	2.7	9.3	3.8	45.2
8H1	2/15/2012	15:54:00	47.5	2.7	9.3	3.8	44.9
8H1	2/15/2012	15:54:15	47.6	2.4	9.4	3.8	45.2
8H1	2/15/2012	15:54:30	48.2	3.0	9.4	3.8	45.3
8H1	2/15/2012	15:54:45	48.0	3.0	9.4	3.8	45.2
8H1	2/15/2012	15:55:00	47.5	2.8	9.4	3.8	45.0
8H1	2/15/2012	15:55:15	47.4	2.5	9.4	3.8	45.0
8H1	2/15/2012	15:55:30	47.9	2.6	9.3	3.8	45.4
8H1	2/15/2012	15:55:45	48.3	2.6	9.3	3.8	45.7
8H1	2/15/2012	15:56:00	47.9	2.5	9.3	3.9	45.6
8H1	2/15/2012	15:56:15	47.7	2.6	9.3	3.9	45.1
8H1	2/15/2012	15:56:30	47.7	2.7	9.3	3.9	44.9
8H1	2/15/2012	15:56:45	47.4	2.4	9.3	3.9	44.9
8H1	2/15/2012	15:57:00	47.6	2.7	9.3	3.8	45.0
8H1	2/15/2012	15:57:15	47.7	2.8	9.3	3.8	45.1
8H1	2/15/2012	15:57:30	47.7	2.8	9.3	3.9	45.1
8H1	2/15/2012	15:57:45	47.4	2.6	9.3	3.9	44.9
8H1	2/15/2012	15:58:00	47.8	2.7	9.2	3.9	45.0
8H1	2/15/2012	15:58:15	47.9	2.6	9.3	3.9	45.4
8H1	2/15/2012	15:58:30	48.1	2.7	9.3	3.9	45.5
8H1	2/15/2012	15:58:45	47.7	2.6	9.3	3.9	45.3
8H1	2/15/2012	15:59:00	48.0	2.8	9.3	3.8	45.3
8H1	2/15/2012	15:59:15	47.9	3.0	9.3	3.8	45.1
8H1	2/15/2012	15:59:30	47.4	2.8	9.3	3.9	44.7

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
8H1	2/15/2012	15:59:45	47.5	3.0	9.3	3.9	44.7
8H1	2/15/2012	16:00:00	47.8	2.9	9.3	3.9	45.0
8H1	2/15/2012	16:00:15	47.7	2.5	9.3	3.9	45.3
8H1	2/15/2012	16:00:30	47.3	2.8	9.3	3.9	44.6
8H1	2/15/2012	16:00:45	46.8	3.0	9.2	3.7	44.2
8H1	2/15/2012	16:01:00	47.1	2.8	9.3	3.9	44.3
8H1	2/15/2012	16:01:15	47.0	2.6	9.3	3.8	44.4
8H1	2/15/2012	16:01:30	46.8	2.7	9.3	3.8	44.2
8H1	2/15/2012	16:01:45	46.8	2.8	9.3	3.9	44.0
8H1	2/15/2012	16:02:00	47.0	2.6	9.3	3.9	44.4
8H1	2/15/2012	16:02:15	47.1	3.0	9.3	3.9	44.2
8H1	2/15/2012	16:02:30	46.9	3.1	9.3	3.9	43.9
8H1	2/15/2012	16:02:45	46.8	3.0	9.3	3.8	43.9
8H1	2/15/2012	16:03:00	46.7	2.8	9.3	3.8	44.1
8H1	2/15/2012	16:03:15	46.9	2.8	9.3	3.8	44.1
8H1	2/15/2012	16:03:30	47.0	2.9	9.3	3.9	44.1
8H1	2/15/2012	16:03:45	47.1	3.0	9.3	3.9	44.2
8H1	2/15/2012	16:04:00	47.1	2.7	9.3	3.9	44.4
8H1	2/15/2012	16:04:15	47.2	2.2	9.3	3.9	45.0
8H1	2/15/2012	16:04:30	47.0	2.0	8.7	3.8	42.4
run4	2/15/2012	16:04:45	47.0	2.4	9.3	3.8	44.7
averun4	2/15/2012	15:44:00	47.7	2.7	9.3	3.8	44.9
scg1	2/15/2012	16:05:15	46.7	2.9	9.3	3.8	44.1
scg1	2/15/2012	16:05:30	46.8	2.7	9.3	3.9	44.1
scg1	2/15/2012	16:05:45	46.9	2.9	9.3	3.9	44.0
scg1	2/15/2012	16:06:00	46.9	3.0	9.3	3.9	44.0
scg1	2/15/2012	16:06:15	46.7	2.6	9.2	4.0	44.4
scg1	2/15/2012	16:06:30	46.9	2.7	8.4	4.5	44.2
scg1	2/15/2012	16:06:45	46.1	2.8	2.7	10.5	43.5
scg1	2/15/2012	16:07:00	43.5	6.6	0.8	13.9	37.3
scg1	2/15/2012	16:07:15	33.9	17.7	4.6	9.1	16.1
scg1	2/15/2012	16:07:30	8.1	0.1	8.9	9.9	8.1
scg1	2/15/2012	16:07:45	14.6	9.0	9.5	10.4	5.7
scg1	2/15/2012	16:08:00	9.2	6.3	9.5	10.6	2.9
scg1	2/15/2012	16:08:15	4.0	2.0	9.6	10.7	2.1
scg1	2/15/2012	16:08:30	3.5	1.7	9.6	10.7	1.9
scg1	2/15/2012	16:08:45	3.3	1.7	9.6	10.8	1.8
scg1	2/15/2012	16:09:00	3.1	1.6	9.7	10.8	1.7
scg1	2/15/2012	16:09:15	3.0	1.5	9.7	10.7	1.6
scg1	2/15/2012	16:09:30	2.9	1.5	9.7	10.8	1.5
scg1	2/15/2012	16:09:45	2.8	1.5	9.7	10.8	1.5

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
cozero1	2/15/2012	16:09:30	2.9	1.5	9.7	10.8	1.5
noxzero1	2/15/2012	16:09:30	2.9	1.5	9.7	10.8	1.5
noxzero1	2/15/2012	16:09:15	3.0	1.5	9.7	10.7	1.6
co2span1	2/15/2012	16:09:00	3.1	1.6	9.7	10.8	1.7
o2span1	2/15/2012	16:09:15	3.0	1.5	9.7	10.7	1.6
scg6	2/15/2012	16:10:00	2.7	1.5	9.7	10.8	1.5
scg6	2/15/2012	16:10:15	2.7	1.3	9.7	10.8	1.4
scg6	2/15/2012	16:10:30	2.6	1.3	9.7	10.8	1.3
scg6	2/15/2012	16:10:45	2.5	1.3	9.7	10.8	1.3
scg6	2/15/2012	16:11:00	2.5	1.3	9.7	10.8	1.3
scg6	2/15/2012	16:11:15	2.5	1.3	9.7	10.8	1.3
scg6	2/15/2012	16:11:30	2.4	1.3	9.7	10.8	1.3
scg6	2/15/2012	16:11:45	2.3	1.3	9.7	10.8	1.3
scg6	2/15/2012	16:12:00	2.3	1.3	8.6	10.5	1.2
scg6	2/15/2012	16:12:15	2.3	1.1	2.5	6.1	1.1
scg6	2/15/2012	16:12:30	7.9	-1.1	0.9	2.3	12.7
scg6	2/15/2012	16:12:45	38.7	11.5	0.7	1.1	27.3
scg6	2/15/2012	16:13:00	44.2	0.0	0.6	0.7	44.9
scg6	2/15/2012	16:13:15	45.4	-0.2	0.6	0.5	45.7
scg6	2/15/2012	16:13:30	45.9	-0.2	0.5	0.4	46.2
scg6	2/15/2012	16:13:45	46.1	-0.2	0.5	0.3	46.5
scg6	2/15/2012	16:14:00	46.3	-0.1	0.4	0.3	46.5
scg6	2/15/2012	16:14:15	46.3	-0.3	0.4	0.3	46.5
cospan1	2/15/2012	16:14:00	46.3	-0.1	0.4	0.3	46.5
noxspan1	2/15/2012	16:14:00	46.3	-0.1	0.4	0.3	46.5

gastype			Nitrogen Oxides	Nitrogen dioxide		Carbon dioxide	Oxygen	Nitrogen Oxide
dcg1	02/16/12	6:57:00	1.074481	0.879121	2.882999	6.346693	0.34188	
dcg1	02/16/12	6:57:15	2.016807	1.821447	10.12138	10.86188	0.34188	
dcg1	02/16/12	6:57:30	4.211736	3.780794	10.26733	11.34274	0.537241	
dcg1	02/16/12	6:57:45	2.090965	1.651404	10.29548	11.11493	0.647131	
dcg1	02/16/12	6:58:00	1.051498	0.853264	10.25066	11.15923	0.261438	
dcg1	02/16/12	6:58:15	0.879121	0.660777	10.20728	11.17108	0.34188	
dcg1	02/16/12	6:58:30	0.879121	0.669396	10.16735	11.18401	0.192487	
dcg1	02/16/12	6:58:45	0.787187	0.66365	10.15988	11.17863	0.14652	
dcg1	02/16/12	6:59:00	0.683761	0.657904	10.13862	11.18545	0.14652	
dcg1	02/16/12	6:59:15	0.683761	0.672269	10.16189	11.17144	0.14652	
dcg1	02/16/12	6:59:30	0.683761	0.66365	10.15385	11.19479	0.14652	
dcg1	02/16/12	6:59:45	0.683761	0.649285	10.16735	11.1991	0.14652	
dcg1	02/16/12	7:00:00	0.683761	0.666523	10.16591	11.19335	0.14652	
dcg1	02/16/12	7:00:15	0.683761	0.66365	10.15069	11.18868	0.14652	
dcg1	02/16/12	7:00:30	0.683761	0.620556	10.16189	11.17468	0.14652	
coezero1	02/16/12	7:00:00	0.683761	0.666523	10.16591	11.19335	0.14652	
noxezero1	02/16/12	7:00:00	0.683761	0.666523	10.16591	11.19335	0.14652	
noxezero1	02/16/12	7:00:00	0.683761	0.666523	10.16591	11.19335	0.14652	
co2mid1	02/16/12	6:59:45	0.683761	0.649285	10.16735	11.1991	0.14652	
o2mid1	02/16/12	7:00:00	0.683761	0.666523	10.16591	11.19335	0.14652	
dcg4	02/16/12	7:00:45	0.683761	0.43956	9.889248	10.68161	0.14652	
dcg4	02/16/12	7:01:00	0.683761	0.43956	6.742674	10.6891	0.14652	
dcg4	02/16/12	7:01:15	0.683761	0.43956	1.580407	5.790778	0.14652	
dcg4	02/16/12	7:01:30	4.366875	0.634921	0.30367	1.124039	14.79566	
dcg4	02/16/12	7:01:45	92.86217	46.66236	0.254543	0.417295	46.13086	
dcg4	02/16/12	7:02:00	103.969	15.61158	0.214322	0.219062	88.41485	
dcg4	02/16/12	7:02:15	87.59319	-3.69173	0.19536	0.152984	91.54349	
dcg4	02/16/12	7:02:30	87.46391	-3.05681	0.187029	0.147238	90.58393	
dcg4	02/16/12	7:02:45	87.47253	-3.03383	0.194498	0.158012	90.56669	
dcg4	02/16/12	7:03:00	88.94347	-1.5715	0.186167	0.135387	90.57243	
dcg4	02/16/12	7:03:15	99.19701	8.644689	0.187029	0.124255	90.57243	
dcg4	02/16/12	7:03:30	106.4167	9.242261	0.193636	0.137183	97.15722	
dcg4	02/16/12	7:03:45	102.5296	3.358472	0.185305	0.125332	99.19414	
dcg4	02/16/12	7:04:00	99.19414	4.88E-02	0.183761	0.11485	99.19414	

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
dcg4	02/16/12	7:04:15	99.19989	4.88E-02	0.182432	0.119586	99.19414
dcg4	02/16/12	7:04:30	99.19701	4.88E-02	0.181283	0.111686	99.19414
cohigh1	02/16/12	7:04:15	99.19989	4.88E-02	0.182432	0.119586	99.19414
noxhigh1	02/16/12	7:04:15	99.19989	4.88E-02	0.182432	0.119586	99.19414
dcg2	02/16/12	7:04:45	99.19701	4.88E-02	0.183294	0.14257	99.19127
dcg2	02/16/12	7:05:00	99.00165	-0.11204	1.532428	0.561661	99.19414
dcg2	02/16/12	7:05:15	98.89535	-5.46E-02	16.65043	14.96229	99.1022
dcg2	02/16/12	7:05:30	97.0423	24.69583	19.47195	22.51131	72.37233
dcg2	02/16/12	7:05:45	30.27221	2.321339	19.5251	24.11837	34.10759
dcg2	02/16/12	7:06:00	4.237592	1.723766	19.5771	24.32055	5.688429
dcg2	02/16/12	7:06:15	1.867414	0.982547	19.62163	24.42074	1.025641
dcg2	02/16/12	7:06:30	1.304317	0.729728	19.66559	24.40781	0.698125
dcg2	02/16/12	7:06:45	0.971055	0.657904	19.71615	24.35215	0.537241
co2high1	02/16/12	7:06:30	1.304317	0.729728	19.66559	24.40781	0.698125
o2high1	02/16/12	7:06:30	1.304317	0.729728	19.66559	24.40781	0.698125
dcg6	02/16/12	7:07:00	0.879121	0.623429	19.21626	23.52331	0.364864
dcg6	02/16/12	7:07:15	0.775695	0.43956	3.876463	2.514185	0.34188
dcg6	02/16/12	7:07:30	0.781441	0.372405	0.891636	1.697573	0.537241
dcg6	02/16/12	7:07:45	1.281333	-0.9021	0.295339	0.743733	2.525318
dcg6	02/16/12	7:08:00	7.596064	-0.92222	0.245924	0.296631	11.6268
dcg6	02/16/12	7:08:15	20.92652	-4.54212	0.210587	0.178482	41.37039
dcg6	02/16/12	7:08:30	56.80098	4.427207	0.1922	0.178482	55.17489
dcg6	02/16/12	7:08:45	56.03103	0.232708	0.188752	0.129282	55.97931
dcg6	02/16/12	7:09:00	53.39079	0.643539	0.187316	0.144725	52.83057
dcg6	02/16/12	7:09:15	51.71012	0.255692	0.190763	0.133233	51.4257
dcg6	02/16/12	7:09:30	51.1499	0.267184	0.191338	0.127487	50.93443
dcg6	02/16/12	7:09:45	50.83674	0.2442	0.182432	0.123537	50.64138
dcg6	02/16/12	7:10:00	50.71034	0.2442	0.185018	0.128205	50.51498
dcg6	02/16/12	7:10:15	50.54945	0.2442	0.186454	8.98E-02	50.35409
dcg6	02/16/12	7:10:30	50.54945	0.2442	0.168642	0.105222	50.35409
dcg6	02/16/12	7:10:45	50.43956	0.2442	0.169109	0.140034	50.35409
dcg6	02/16/12	7:11:00	50.31387	0.2442	0.168929	0.111686	50.19321
co2ezero1	02/16/12	7:09:45	50.83674	0.2442	0.182432	0.123537	50.64138
comid1	02/16/12	7:10:45	50.43956	0.2442	0.169109	0.140034	50.35409
noxmid1	02/16/12	7:10:45	50.43956	0.2442	0.169109	0.140034	50.35409

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
dcg6	02/16/12	7:12:15	49.95188	0.2442	0.174962	0.196438	49.85994
dcg6	02/16/12	7:12:30	51.34238	6.768656	0.205416	0.175968	44.63119
dcg6	02/16/12	7:12:45	48.29706	5.653954	0.17094	0.130719	42.70057
dcg6	02/16/12	7:13:00	48.06723	-1.71227	0.185305	0.135387	49.73928
dcg6	02/16/12	7:13:15	50.54945	0.2442	0.186508	0.12935	50.35409
dcg6	02/16/12	7:13:30	50.54945	0.2442	0.169504	0.103426	50.35409
co2ezero1	02/16/12	7:13:15	50.54945	0.2442	0.186508	0.12935	50.35409
o2ezero1	02/16/12	7:13:30	50.54945	0.2442	0.169504	0.103426	50.35409
comid1	02/16/12	7:13:15	50.54945	0.2442	0.186508	0.12935	50.35409
noxmid1	02/16/12	7:13:00	48.06723	-1.71227	0.185305	0.135387	49.73928
dcg5	02/16/12	7:14:00	50.33111	0.2442	0.172377	0.385334	50.35409
dcg5	02/16/12	7:14:15	50.32536	0.140774	0.191051	1.259786	50.35409
dcg5	02/16/12	7:14:30	56.83833	27.36192	0.170078	1.273432	29.40458
dcg5	02/16/12	7:14:45	61.33161	52.33929	0.169504	1.264814	8.923364
dcg5	02/16/12	7:15:00	66.23573	62.61582	0.168355	1.272714	3.596926
dcg5	02/16/12	7:15:15	70.79221	67.55153	0.166056	1.301803	3.02521
dcg5	02/16/12	7:15:30	73.3319	70.19751	0.168067	1.267687	2.936149
dcg5	02/16/12	7:15:45	74.48107	71.40128	0.169791	1.266968	2.939022
dcg5	02/16/12	7:16:00	74.27997	71.30647	0.168929	1.294261	2.939022
dcg5	02/16/12	7:16:15	73.30586	70.34188	0.166667	1.25	2.936508
dcg5	02/16/12	7:16:30	71.99598	69.0311	0.166631	1.293184	2.916038
dcg5	02/16/12	7:16:45	70.72614	67.77562	0.169504	1.288156	2.737916
dcg5	02/16/12	7:17:00	69.50226	66.72413	0.169216	1.285283	2.735043
dcg5	02/16/12	7:17:15	68.45651	65.80766	0.166343	1.277383	2.737916
dcg5	02/16/12	7:17:30	67.55153	65.00323	0.175824	1.289593	2.735043
dcg5	02/16/12	7:17:45	66.94822	64.26489	0.165769	1.29067	2.631617
dcg5	02/16/12	7:18:00	66.32191	63.58687	0.166631	1.2702	2.539683
dcg5	02/16/12	7:18:15	65.74732	63.17317	0.170078	1.27451	2.539683
dcg5	02/16/12	7:18:30	65.32787	62.74223	0.168929	1.271637	2.539683
dcg5	02/16/12	7:18:45	65.03771	62.44631	0.166343	1.29498	2.539683
dcg5	02/16/12	7:19:00	64.73892	62.09294	0.165769	1.27846	2.539683
dcg5	02/16/12	7:19:15	64.45163	61.76255	0.184443	1.260863	2.539683
dcg5	02/16/12	7:19:30	64.32234	61.59646	0.168498	1.271749	2.539683
dcg5	02/16/12	7:19:45	64.03792	61.39481	0.185592	1.287797	2.539683
dcg5	02/16/12	7:20:00	63.92013	61.20807	0.170653	1.280615	2.542555

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
dcg5	02/16/12	7:20:15	63.73626	60.96387	0.16778	1.274869	2.539683
dcg5	02/16/12	7:20:30	63.8914	61.05006	0.166631	1.275946	2.493715
dcg5	02/16/12	7:20:45	63.64146	60.87194	0.170366	1.273432	2.344322
dcg5	02/16/12	7:21:00	63.49494	60.71105	0.166918	1.260863	2.344322
dcg5	02/16/12	7:21:15	63.34554	60.71967	0.170366	1.283488	2.344322
dcg5	02/16/12	7:21:30	63.34554	60.72829	0.170078	1.269482	2.344322
dcg5	02/16/12	7:21:45	63.34554	60.80586	0.166056	1.271278	2.344322
dcg5	02/16/12	7:22:00	63.18179	60.75989	0.166918	1.295339	2.344322
dcg5	02/16/12	7:22:15	63.16167	60.6105	0.170078	1.271996	2.344322
dcg5	02/16/12	7:22:30	63.10709	60.6105	0.16778	1.279897	2.344322
dcg5	02/16/12	7:22:45	62.95482	60.6105	0.165482	1.27846	2.344322
dcg5	02/16/12	7:23:00	62.95177	60.61355	0.167277	1.275183	2.344322
dcg5	02/16/12	7:23:15	52.39101	50.07254	0.172664	1.263736	2.344322
dcg5	02/16/12	7:23:30	50.13	47.81441	0.166918	1.319759	2.344322
dcg5	02/16/12	7:23:45	50.12425	47.81441	0.168355	1.808518	2.344322
dcg5	02/16/12	7:24:00	50.08978	47.63629	0.169504	1.878546	2.344322
noxmid1	02/16/12	7:23:45	50.12425	47.81441	0.168355	1.808518	2.344322
dcg6	02/16/12	7:24:15	49.94901	47.61905	0.170078	1.552826	2.344322
dcg6	02/16/12	7:24:30	49.94326	47.61905	0.169791	0.760253	2.344322
dcg6	02/16/12	7:24:45	49.11011	33.05322	0.168642	0.226244	16.10572
dcg6	02/16/12	7:25:00	49.75077	1.901889	0.171227	0.192128	47.92645
dcg6	02/16/12	7:25:15	51.33089	1.301444	0.204554	0.189255	49.99785
dcg6	02/16/12	7:25:30	51.33089	1.485312	0.203979	0.193924	49.92889
dcg6	02/16/12	7:25:45	51.21597	1.643324	0.208288	0.196797	49.65309
dcg6	02/16/12	7:26:00	51.18437	1.694139	0.208486	0.168651	49.57265
dcg6	02/16/12	7:26:15	46.44401	-1.53128	0.204841	0.172377	49.46635
dcg6	02/16/12	7:26:30	32.61941	2.286863	0.205128	0.18315	30.75487
dcg6	02/16/12	7:26:45	19.36364	3.519356	0.204554	0.164835	15.81556
co2ezero1	02/16/12	7:26:00	51.18437	1.694139	0.208486	0.168651	49.57265
o2ezero1	02/16/12	7:25:45	51.21597	1.643324	0.208288	0.196797	49.65309
comid1	02/16/12	7:25:45	51.21597	1.643324	0.208288	0.196797	49.65309
noxmid1	02/16/12	7:26:00	51.18437	1.694139	0.208486	0.168651	49.57265
scg1	02/16/12	7:38:00	1.269841	-0.12928	0.188752	21.43324	0.537241
scg1	02/16/12	7:38:15	1.143432	-0.13503	0.197946	21.92523	0.537241

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg1	02/16/12	7:38:30	1.074481	-0.13503	0.188178	21.24865	0.537241
scg1	02/16/12	7:38:45	1.074481	-0.14077	2.346046	16.81426	0.410831
scg1	02/16/12	7:39:00	1.858974	-0.12821	9.431624	12.64843	0.744811
scg1	02/16/12	7:39:15	2.174819	-0.14077	9.889823	11.2878	2.881563
scg1	02/16/12	7:39:30	1.752496	-0.13503	9.936939	11.14164	1.628959
scg1	02/16/12	7:39:45	1.212382	-0.13503	9.982906	11.10429	0.422323
scg1	02/16/12	7:40:00	1.017022	-0.12928	10.0283	11.0734	0.34188
scg1	02/16/12	7:40:15	0.879121	-0.13503	10.07139	11.06335	0.34188
scg1	02/16/12	7:40:30	0.879121	-0.13503	10.11736	11.05257	0.34188
cozero1	02/16/12	7:40:15	0.879121	-0.13503	10.07139	11.06335	0.34188
noxzero1	02/16/12	7:40:15	0.879121	-0.13503	10.07139	11.06335	0.34188
noxzero1	02/16/12	7:40:00	1.017022	-0.12928	10.0283	11.0734	0.34188
co2span1	02/16/12	7:40:00	1.017022	-0.12928	10.0283	11.0734	0.34188
o2span1	02/16/12	7:40:00	1.017022	-0.12928	10.0283	11.0734	0.34188
scg6	02/16/12	7:40:45	0.879121	-0.13503	10.1254	11.03677	0.34188
scg6	02/16/12	7:41:00	0.879121	-0.1379	10.13804	11.05868	0.34188
scg6	02/16/12	7:41:15	0.879121	-0.13503	7.294692	9.723838	0.34188
scg6	02/16/12	7:41:30	2.286863	-0.13503	0.671694	3.447892	0.34188
scg6	02/16/12	7:41:45	8.133305	-0.13503	0.41514	1.33951	15.2266
scg6	02/16/12	7:42:00	35.65036	-0.13216	0.364289	1.006967	46.8491

scg6	02/16/12	7:42:15	48.98657	-0.13736	0.317766	0.868437	48.62943
scg6	02/16/12	7:42:30	49.56403	-0.13503	0.270919	0.719672	49.40889
scg6	02/16/12	7:42:45	49.88293	-0.13216	0.226963	0.421605	49.69906
scg6	02/16/12	7:43:00	50.38857	-0.1379	0.180421	0.136824	49.94039
co2zero1	02/16/12	7:42:45	49.88293	-0.13216	0.226963	0.421605	49.69906
o2zero1	02/16/12	7:42:45	49.88293	-0.13216	0.226963	0.421605	49.69906
cospan1	02/16/12	7:42:45	49.88293	-0.13216	0.226963	0.421605	49.69906
noxspan1	02/16/12	7:42:45	49.88293	-0.13216	0.226963	0.421605	49.69906
EKVB Comp	02/16/12	8:06:15	126.1424	2.456367	4.748115	10.15442	123.9762
EKVB Comp	02/16/12	8:06:30	131.5119	6.162465	4.791783	10.12282	125.292
EKVB Comp	02/16/12	8:06:45	134.1579	7.97242	4.825971	10.12749	126.1797
EKVB Comp	02/16/12	8:07:00	134.42	7.442002	4.849206	10.18086	127.0513
EKVB Comp	02/16/12	8:07:15	134.1435	10.95454	4.896071	10.06177	123.0281
EKVB Comp	02/16/12	8:07:30	134.4969	9.604252	4.928248	10.13	124.8064
EKVB Comp	02/16/12	8:07:45	138.8551	4.432953	4.916469	10.14652	127.3346

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
EKVB Comp	02/16/12	8:08:00	138.8436	3.447533	4.934569	10.06823	128.7539
EKVB Comp	02/16/12	8:08:15	141.2569	-9.48E-02	4.969331	10.05566	126.9956
EKVB Comp	02/16/12	8:08:30	144.2218	-0.11779	4.973353	10.00826	136.5999
EKVB Comp	02/16/12	8:08:45	142.8974	-0.12641	4.980823	10.07146	138.5161
EKVB Comp	02/16/12	8:09:00	142.4147	-0.12928	4.940889	10.13	135.7868
EKVB Comp	02/16/12	8:09:15	141.6649	-0.13216	4.914458	10.17166	137.3526
EKVB Comp	02/16/12	8:09:30	140.8547	-0.12641	4.944337	10.05171	134.0602
EKVB Comp	02/16/12	8:09:45	140.0589	-0.12928	4.98858	9.97953	133.3218
EKVB Comp	02/16/12	8:10:00	141.7511	-0.12641	4.996624	10.01185	136.4821
EKVB Comp	02/16/12	8:10:15	144.3254	-0.13431	4.969475	10.05991	141.4591
EKVB Comp	02/16/12	8:10:30	146.5173	-0.13503	4.972204	10.00108	141.8631
EKVB Comp	02/16/12	8:10:45	144.0465	-0.12928	5.017022	9.939668	139.3062
EKVB Comp	02/16/12	8:11:00	149.5798	-0.12641	5.04489	9.929972	137.6399
EKVB Comp	02/16/12	8:11:15	152.131	-0.12928	5.009265	9.997127	144.8969
EKVB Comp	02/16/12	8:11:30	152.6481	-0.11492	4.991166	9.957624	144.7447
EKVB Comp	02/16/12	8:11:45	152.2804	-8.91E-02	5.028801	9.937873	141.435
EKVB Comp	02/16/12	8:12:00	149.1747	-0.10343	5.008691	9.996768	140.5358
EKVB Comp	02/16/12	8:12:15	149.7091	-0.12641	5.001796	10.03304	147.9796
EKVB Comp	02/16/12	8:12:30	151.8035	-0.12641	4.996912	9.985994	147.6751
EKVB Comp	02/16/12	8:12:45	149.4505	-0.12928	5.025354	10.01365	148.7668

EKVB Comp	02/16/12	8:13:00	153.645	-0.13216	5.052647	9.926381	150.4733
EKVB Comp	02/16/12	8:13:15	154.4926	-0.12928	5.061266	9.977376	148.7955
EKVB Comp	02/16/12	8:13:30	153.2143	-0.13126	5.05525	10.02785	148.7271
EKVB Comp	02/16/12	8:13:45	153.4526	-0.12641	5.04805	10.00072	150.3211
EKVB Comp	02/16/12	8:14:00	156.7478	-0.13216	5.025641	10.01796	153.013
EKVB Comp	02/16/12	8:14:15	157.1874	-0.12641	5.042879	9.935	154.5816
EKVB Comp	02/16/12	8:14:30	156.0698	-0.12928	5.049774	9.960138	149.011
EKVB Comp	02/16/12	8:14:45	155.9721	-0.12928	5.062127	9.999641	147.4998
EKVB Comp	02/16/12	8:15:00	161.3158	-0.12928	5.076779	9.894778	150.4072
EKVB Comp	02/16/12	8:15:15	161.6864	-0.12641	5.07563	9.864253	155.5785
EKVB Comp	02/16/12	8:15:30	156.9001	-0.12928	5.073332	9.900883	154.8919
EKVB Comp	02/16/12	8:15:45	151.5449	-0.12928	5.081376	9.901602	154.981
EKVB Comp	02/16/12	8:16:00	160.3074	-0.32464	5.076205	9.905552	155.7193
EKVB Comp	02/16/12	8:16:15	165.3408	-0.13216	5.02995	9.972707	154.8948
EKVB Comp	02/16/12	8:16:30	163.5797	-0.13216	5.051498	9.89011	154.2512

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
EKVB Comp	02/16/12	8:16:45	155.9233	-0.13503	5.067011	9.891187	154.6104
EKVB Comp	02/16/12	8:17:00	158.602	-0.13126	5.081197	9.868742	154.7131
EKVB Comp	02/16/12	8:17:15	157.6959	-0.12641	5.083387	9.847016	153.3664
EKVB Comp	02/16/12	8:17:30	156.6214	-0.12641	5.069597	9.926381	155.5986
EKVB Comp	02/16/12	8:17:45	163.4475	-0.12354	5.047763	9.912016	152.4183
EKVB Comp	02/16/12	8:18:00	163.2091	-0.12354	5.071608	9.896215	147.3131
EKVB Comp	02/16/12	8:18:15	160.7958	-0.13216	5.065862	9.89011	148.31
EKVB Comp	02/16/12	8:18:30	157.9889	-0.12641	5.043453	9.926022	150.887
EKVB Comp	02/16/12	8:18:45	156.6932	-0.12928	5.077354	9.817209	148.5341
EKVB Comp	02/16/12	8:19:00	156.3571	-0.12928	5.082525	9.901602	145.483
EKVB Comp	02/16/12	8:19:15	157.4776	-0.12641	5.085398	10.31962	147.994
EKVB Comp	02/16/12	8:19:30	158.1297	-0.12928	5.048337	10.6342	150.8841
EKVB Comp	02/16/12	8:19:45	155.9836	-0.12928	5.024779	10.99188	150.6428
EKVB Comp	02/16/12	8:20:00	156.7033	-0.13126	5.025336	10.17552	149.707
EKVB Comp	02/16/12	8:20:15	156.2795	-0.13216	5.02047	9.985994	150.1257
EKVB Comp	02/16/12	8:20:30	154.5673	-0.12928	4.990304	9.973066	147.7986
EKVB Comp	02/16/12	8:20:45	152.4987	-0.12928	4.990591	9.974144	144.917
EKVB Comp	02/16/12	8:21:00	150.0855	-0.12641	5.017597	9.966243	143.1789
EKVB Comp	02/16/12	8:21:15	150.8727	-0.12354	5.030525	9.949005	145.0751
EKVB Comp	02/16/12	8:21:30	153.0302	-0.12928	5.004956	9.97558	147.405

EKVB Comp	02/16/12	8:21:45	153.4267	-0.13216	5.003807	9.980249	145.7904
EKVB Comp	02/16/12	8:22:00	151.0795	-0.12928	4.970193	9.987072	141.0558
EKVB Comp	02/16/12	8:22:15	142.1418	-0.12641	5.002657	9.989945	136.1373
EKVB Comp	02/16/12	8:22:30	136.8326	-0.12928	4.980536	10.11384	142.2797
EKVB Comp	02/16/12	8:22:45	147.6665	-0.12641	4.954392	10.05997	143.0008
EKVB Comp	02/16/12	8:23:00	141.3891	-0.12928	4.967608	10.06644	141.6677
EKVB Comp	02/16/12	8:23:15	143.953	-0.12515	4.948413	9.997711	143.6874
EKVB Comp	02/16/12	8:23:30	148.3703	-0.12928	4.98542	9.982044	139.7975
EKVB Comp	02/16/12	8:23:45	141.7884	-0.12928	4.961862	10.04094	141.0357
EKVB Comp	02/16/12	8:24:00	144.6326	-0.13216	4.933994	10.06213	143.4978
EKVB Comp	02/16/12	8:24:15	146.2817	-0.13216	4.950944	10.01041	140.3404
EKVB Comp	02/16/12	8:24:30	146.3018	-0.13216	4.952956	10.02119	141.0932
EKVB Comp	02/16/12	8:24:45	147.1493	-0.13216	4.96416	9.97558	141.4149
EKVB Comp	02/16/12	8:25:00	144.4861	-0.12928	4.984845	10.05207	141.1248
EKVB Comp	02/16/12	8:25:15	145.4773	-0.12928	4.958989	10.0395	140.7111

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
EKVB Comp	02/16/12	8:25:30	147.2441	-0.12928	4.934569	10.04884	139.74
EKVB Comp	02/16/12	8:25:45	146.4943	-0.12641	4.935718	10.04309	138.6512
EKVB Comp	02/16/12	8:26:00	146.8304	-0.12641	4.951806	9.978812	139.0792
EKVB Comp	02/16/12	8:26:15	144.7418	-0.12928	4.961	9.905552	140.9639
EKVB Comp	02/16/12	8:26:30	143.3181	-0.12515	4.989927	9.925214	136.0317
EKVB Comp	02/16/12	8:26:45	144.6958	-0.13216	4.951519	9.99174	138.723
EKVB Comp	02/16/12	8:27:00	146.9741	-0.13216	4.952381	9.953674	141.1966
EKVB Comp	02/16/12	8:27:15	145.2359	-0.12928	4.931121	9.992818	133.4483
EKVB Comp	02/16/12	8:27:30	142.8629	-0.12354	4.947784	9.936077	136.7119
EKVB Comp	02/16/12	8:27:45	145.733	-0.12641	4.941464	9.956906	135.172
EKVB Comp	02/16/12	8:28:00	144.5867	-0.12928	4.915607	10.00754	133.5057
EKVB Comp	02/16/12	8:28:15	142.7394	-0.12641	4.945773	9.893342	138.134
EKVB Comp	02/16/12	8:28:30	141.9005	-0.12928	4.967608	9.904475	136.8757
EKVB Comp	02/16/12	8:28:45	142.0154	-0.13216	4.92164	9.978453	137.9789
EKVB Comp	02/16/12	8:29:00	142.8284	-0.12928	4.913309	9.968757	138.8781
EKVB Comp	02/16/12	8:29:15	140.9093	-0.12641	4.948933	9.913812	137.1515
EKVB Comp	02/16/12	8:29:30	137.9588	-0.12928	4.915607	9.971989	136.5022
EKVB Comp	02/16/12	8:29:45	136.2576	-0.12515	4.914225	9.948107	133.6538
EKVB Comp	02/16/12	8:30:00	136.0167	-0.12066	4.904403	9.9429	131.2074
EKVB Comp	02/16/12	8:30:15	135.1203	-0.12641	4.938304	9.912734	131.713

EKVB Comp	02/16/12	8:30:30	134.54	-0.13216	4.966171	9.882928	129.7508
EKVB Comp	02/16/12	8:30:45	134.7066	-0.13216	4.933707	9.951878	134.8072
EKVB Comp	02/16/12	8:31:00	137.3411	-0.13216	4.913884	9.960138	139.5877
EKVB Comp	02/16/12	8:31:15	140.1106	-0.13503	4.904403	9.923149	136.1689
EKVB Comp	02/16/12	8:31:30	138.6282	-0.13216	4.942326	9.92279	131.3165
EKVB Comp	02/16/12	8:31:45	131.7072	-0.64067	4.907276	9.720247	130.9229
EKVB Comp	02/16/12	8:32:00	138.9873	-0.12641	4.93658	9.947928	135.3932
averun5	02/16/12	8:11:15	149.3224	-0.13639	4.995955	9.985497	143.8576
scg6	02/16/12	8:32:30	137.14	-0.98829	4.738634	9.615744	129.8973
scg6	02/16/12	8:32:45	136.3212	-1.08023	1.782662	13.70143	130.5954
scg6	02/16/12	8:33:00	140.9158	21.71245	0.478938	9.987408	116.1935
scg6	02/16/12	8:33:15	79.86497	20.41514	0.458809	2.160095	66.34202
scg6	02/16/12	8:33:30	25.29627	-3.58543	0.410831	0.625943	59.35215
scg6	02/16/12	8:33:45	53.38217	1.014149	0.361991	0.182073	55.76959
scg6	02/16/12	8:34:00	55.19787	2.21504	0.314587	6.82E-02	52.34504

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg6	02/16/12	8:34:15	54.18947	0.316024	0.267184	8.94E-02	51.96581
scg6	02/16/12	8:34:30	53.82748	-0.12641	0.218631	7.15E-02	51.92272
scg6	02/16/12	8:34:45	53.5172	-0.12354	0.169791	9.23E-02	51.92559
scg6	02/16/12	8:35:00	53.33333	-0.12928	0.143647	9.01E-02	51.92272
scg6	02/16/12	8:35:15	53.16096	-0.12928	0.146233	7.83E-02	51.91697
scg6	02/16/12	8:35:30	53.03455	-0.12928	0.13905	8.33E-02	51.91984
scg6	02/16/12	8:35:45	52.94261	-0.12928	0.138476	0.086547	51.87388
scg6	02/16/12	8:36:00	52.94261	-0.12821	0.143468	8.32E-02	51.72161
scg6	02/16/12	8:36:15	52.78173	-0.12641	0.145946	7.90E-02	51.72161
scg6	02/16/12	8:36:30	52.02902	-0.13216	0.143934	8.98E-02	51.72161
scg6	02/16/12	8:36:45	51.52625	-0.12928	0.145371	7.54E-02	51.8825
scg6	02/16/12	8:37:00	50.94879	-0.28155	9.19E-02	-0.14329	51.86813
co2zero1	02/16/12	8:36:30	52.02902	-0.13216	0.143934	8.98E-02	51.72161
o2zero1	02/16/12	8:36:30	52.02902	-0.13216	0.143934	8.98E-02	51.72161
cospan1	02/16/12	8:36:45	51.52625	-0.12928	0.145371	7.54E-02	51.8825
noxspan1	02/16/12	8:36:30	52.02902	-0.13216	0.143934	8.98E-02	51.72161
scg1	02/16/12	8:37:15	50.77354	-1.58299	9.65E-02	-0.10019	51.46305
scg1	02/16/12	8:37:30	51.33089	-0.12354	0.143934	6.36E-02	51.72161
scg1	02/16/12	8:37:45	50.89995	-0.7642	3.334626	2.719242	51.75609
scg1	02/16/12	8:38:00	49.75939	0.554478	9.626086	8.307477	49.429
scg1	02/16/12	8:38:15	27.1091	-3.53085	9.902464	10.63169	38.87668
scg1	02/16/12	8:38:30	6.803132	0.112045	9.94642	10.93119	11.20161
scg1	02/16/12	8:38:45	2.062774	1.117575	9.982331	10.96208	1.05437
scg1	02/16/12	8:39:00	1.350284	0.876248	10.02686	11.00409	0.732601
scg1	02/16/12	8:39:15	1.269841	0.879121	10.06868	11.0161	0.561661
scg1	02/16/12	8:39:30	1.269841	0.749838	10.1119	11.02923	0.537241
cozero1	02/16/12	8:39:30	1.269841	0.749838	10.1119	11.02923	0.537241
noxzero1	02/16/12	8:39:15	1.269841	0.879121	10.06868	11.0161	0.561661
noxzero1	02/16/12	8:39:15	1.269841	0.879121	10.06868	11.0161	0.561661
co2span1	02/16/12	8:39:15	1.269841	0.879121	10.06868	11.0161	0.561661
o2span1	02/16/12	8:39:15	1.269841	0.879121	10.06868	11.0161	0.561661
scg1	02/16/12	9:12:00	0.683761	0.4884	0.163126	20.59341	0.336996
scg1	02/16/12	9:12:15	0.683761	0.39072	0.168642	20.83639	0.416577
scg1	02/16/12	9:12:30	0.996912	0.445306	0.646412	20.74589	0.675142
scg1	02/16/12	9:12:45	1.338792	0.718236	7.451555	15.60727	0.652158

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg1	02/16/12	9:13:00	0.79006	-0.14077	9.632694	11.91159	1.011276
scg1	02/16/12	9:13:15	0.971055	-0.20398	9.676076	11.20951	1.275587
scg1	02/16/12	9:13:32	0.909646	0.558608	9.720391	11.05159	0.479243
scg1	02/16/12	9:13:45	0.4884	0.371184	9.772405	11.01954	0.336996
cozero1	02/16/12	9:13:15	0.971055	-0.20398	9.676076	11.20951	1.275587
noxzero1	02/16/12	9:13:15	0.971055	-0.20398	9.676076	11.20951	1.275587
noxzero1	02/16/12	9:13:32	0.909646	0.558608	9.720391	11.05159	0.479243
co2span1	02/16/12	9:13:32	0.909646	0.558608	9.720391	11.05159	0.479243
o2span1	02/16/12	9:13:32	0.909646	0.558608	9.720391	11.05159	0.479243
scg6	02/16/12	9:14:00	0.4884	0.34188	9.815413	11.01307	0.339007
scg6	02/16/12	9:14:15	0.4884	0.267184	9.861093	11.01199	0.34188
scg6	02/16/12	9:14:30	0.4884	0.2442	5.823745	8.929469	0.324643
scg6	02/16/12	9:14:45	2.720678	2.479351	0.48524	2.442362	0.333262
scg6	02/16/12	9:15:00	11.17863	-2.14034	0.353659	0.756303	21.40343
scg6	02/16/12	9:15:15	37.56374	-3.31538	0.303957	0.237018	51.24758
scg6	02/16/12	9:15:30	49.59563	-1.38476	0.257128	0.130001	51.00912
scg6	02/16/12	9:15:45	49.76801	-1.33592	0.214609	0.11384	51.13553
scg6	02/16/12	9:16:00	49.91453	-1.33089	0.164225	0.125153	51.13553
scg6	02/16/12	9:16:15	49.96337	-1.25835	0.15083	0.10163	51.21597
scg6	02/16/12	9:16:30	50.10127	-1.03139	0.13273	9.98E-02	51.33089
scg6	02/16/12	9:16:45	50.5552	-0.65216	0.135028	0.105581	51.33089
scg6	02/16/12	9:17:34	50.72261	-0.51948	0.137196	0.112665	51.33089
scg6	02/16/12	9:17:45	51.18437	-0.33103	0.118844	0.106498	51.48284
co2zero1	02/16/12	9:17:34	50.72261	-0.51948	0.137196	0.112665	51.33089
o2zero1	02/16/12	9:17:34	50.72261	-0.51948	0.137196	0.112665	51.33089
cospan1	02/16/12	9:17:34	50.72261	-0.51948	0.137196	0.112665	51.33089
noxspan1	02/16/12	9:17:34	50.72261	-0.51948	0.137196	0.112665	51.33089
scg5	02/16/12	9:18:45	51.17001	-0.33901	0.142498	7.404295	51.52625
scg5	02/16/12	9:19:00	48.67916	3.051067	0.13589	6.292825	46.26589
scg5	02/16/12	9:19:15	21.44078	-4.54212	0.114343	2.400704	32.07929
scg5	02/16/12	9:19:30	24.55505	19.42685	0.119227	1.435036	6.918049
scg5	02/16/12	9:19:45	43.7061	41.30719	0.117216	1.310781	2.539683
scg5	02/16/12	9:20:00	45.1397	42.7925	0.1221	1.30288	2.390289
scg5	02/16/12	9:20:15	46.02456	43.69461	0.131581	1.288515	2.344322
scg5	02/16/12	9:20:30	46.54457	44.22897	0.119802	1.289234	2.344322

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg5	02/16/12	9:20:45	47.02076	44.72527	0.134615	1.282051	2.344322
scg5	02/16/12	9:21:00	47.45816	45.14544	0.134166	1.285283	2.344322
scg5	02/16/12	9:21:15	47.76557	45.42125	0.119514	1.283129	2.344322
scg5	02/16/12	9:21:30	47.92645	45.58213	0.114918	1.253322	2.344322
scg5	02/16/12	9:21:45	48.15629	45.82058	0.124973	1.297134	2.344322
scg5	02/16/12	9:22:00	48.30568	45.96423	0.119514	1.289234	2.344322
BLR 5	02/16/12	9:36:45	3.295267	0.856137	7.530274	7.200675	2.539683
BLR 5	02/16/12	9:37:00	3.599799	0.994039	7.577965	7.22294	2.6546
BLR 5	02/16/12	9:37:15	3.691733	1.074481	7.625943	7.207498	2.735043
BLR 5	02/16/12	9:37:30	3.823889	1.074481	7.668175	7.237305	2.735043
BLR 5	02/16/12	9:37:45	3.907204	1.258349	7.671048	7.234432	2.735043
BLR 5	02/16/12	9:38:00	3.907204	1.269841	7.690297	7.230123	2.735043
BLR 5	02/16/12	9:38:15	4.091072	1.315808	7.692882	7.240537	2.78101
BLR 5	02/16/12	9:38:30	4.102564	1.350284	7.668175	7.238742	2.930403
BLR 5	02/16/12	9:38:45	4.102564	1.269841	7.664835	7.261523	2.930403
BLR 5	02/16/12	9:39:00	4.102564	1.269841	7.712706	7.238383	2.930403
BLR 5	02/16/12	9:39:15	4.102564	1.223874	7.731092	7.235869	2.930403
BLR 5	02/16/12	9:39:30	4.102564	1.074481	7.727645	7.22725	2.930403
BLR 5	02/16/12	9:39:45	4.102564	1.246858	7.730518	7.249874	2.930403
BLR 5	02/16/12	9:40:00	4.102564	1.269841	7.715866	7.257057	3.045321
BLR 5	02/16/12	9:40:15	4.102564	1.097465	7.693744	7.278963	3.125763
BLR 5	02/16/12	9:40:30	4.102564	1.074481	7.712418	7.24341	3.125763
BLR 5	02/16/12	9:40:45	4.102564	1.074481	7.730518	7.233714	3.125763
BLR 5	02/16/12	9:41:00	4.102564	1.074481	7.716153	7.240896	3.125763
BLR 5	02/16/12	9:41:15	4.102564	1.074481	7.712706	7.223659	3.125763
BLR 5	02/16/12	9:41:30	4.102564	1.074481	7.743159	7.25957	3.125763
BLR 5	02/16/12	9:41:45	4.102564	1.074481	7.729656	7.281477	3.309632
BLR 5	02/16/12	9:42:00	4.102564	1.074481	7.735043	7.564103	3.321123
BLR 5	02/16/12	9:42:15	4.102564	1.028514	7.739137	7.416864	3.321123
BLR 5	02/16/12	9:42:30	4.102564	0.879121	7.728219	7.244488	3.321123
BLR 5	02/16/12	9:42:45	4.102564	0.879121	7.730518	7.248438	3.321123
BLR 5	02/16/12	9:43:00	4.102564	0.879121	7.733678	7.227968	3.321123
BLR 5	02/16/12	9:43:15	4.102564	0.879121	7.737988	7.220427	3.321123
BLR 5	02/16/12	9:43:30	4.102564	0.879121	7.729656	7.209653	3.321123
BLR 5	02/16/12	9:43:45	4.286433	0.879121	7.755512	7.250233	3.519356

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
BLR 5	02/16/12	9:44:00	4.412842	0.879121	7.725634	7.249156	3.651512
BLR 5	02/16/12	9:44:15	4.493284	0.879121	7.718739	7.252029	3.743446
BLR 5	02/16/12	9:44:30	4.493284	0.879121	7.727645	7.237305	3.746319
BLR 5	02/16/12	9:44:45	4.493284	0.879121	7.744308	7.226891	3.674495
BLR 5	02/16/12	9:45:00	4.371184	0.879121	7.744811	7.244734	3.516484
BLR 5	02/16/12	9:45:15	4.297924	0.879121	7.725634	7.233714	3.516484
BLR 5	02/16/12	9:45:30	4.297924	0.879121	7.730518	7.25562	3.516484
BLR 5	02/16/12	9:45:45	4.297924	0.879121	7.71328	7.254543	3.519356
BLR 5	02/16/12	9:46:00	4.297924	0.879121	7.712418	7.280399	3.401566
BLR 5	02/16/12	9:46:15	4.114056	0.879121	7.727358	7.254902	3.321123
BLR 5	02/16/12	9:46:30	4.102564	0.879121	7.729369	7.254543	3.206206
BLR 5	02/16/12	9:46:45	3.976155	0.879121	7.744021	7.253106	3.183222
BLR 5	02/16/12	9:47:00	4.102564	0.879121	7.727932	7.239819	3.321123
BLR 5	02/16/12	9:47:15	4.102564	0.879121	7.74517	7.222222	3.321123
BLR 5	02/16/12	9:47:30	4.102564	0.879121	7.740286	7.227609	3.321123
BLR 5	02/16/12	9:47:45	4.102564	0.879121	7.769015	7.226891	3.321123
BLR 5	02/16/12	9:48:00	4.102564	0.879121	7.750265	7.226699	3.321123
BLR 5	02/16/12	9:48:15	4.102564	0.93658	7.746032	7.224736	3.321123
BLR 5	02/16/12	9:48:30	4.102564	0.959563	7.764419	7.226532	3.321123
BLR 5	02/16/12	9:48:45	4.102564	0.879121	7.733391	7.243051	3.321123
BLR 5	02/16/12	9:49:00	4.224664	0.879121	7.727411	7.26572	3.321123
BLR 5	02/16/12	9:49:15	4.297924	0.879121	7.749192	7.264957	3.507865
BLR 5	02/16/12	9:49:30	4.297924	0.879121	7.741435	7.261366	3.519356
BLR 5	02/16/12	9:49:45	4.481793	0.879121	7.732816	7.249874	3.516484
BLR 5	02/16/12	9:50:00	4.493284	0.879121	7.709545	7.266753	3.525102
BLR 5	02/16/12	9:50:15	4.297924	0.879121	7.728507	7.25993	3.516484
BLR 5	02/16/12	9:50:30	4.297924	0.879121	7.730159	7.261142	3.516484
BLR 5	02/16/12	9:50:45	4.297924	1.017022	7.728219	7.270344	3.473389
BLR 5	02/16/12	9:51:00	4.183007	0.994039	7.725347	7.265676	3.321123
BLR 5	02/16/12	9:51:15	4.045105	1.017022	7.722761	7.268548	3.137255
BLR 5	02/16/12	9:51:30	3.907204	0.879121	7.723335	7.224377	3.125763
BLR 5	02/16/12	9:51:45	3.907204	0.879121	7.764131	7.21109	3.125763
BLR 5	02/16/12	9:52:00	3.907204	0.879121	7.738849	7.243051	3.252173
BLR 5	02/16/12	9:52:15	4.091072	0.879121	7.712131	7.245565	3.321123
BLR 5	02/16/12	9:52:30	4.102564	0.879121	7.725059	7.252029	3.321123

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
BLR 5	02/16/12	9:52:45	4.160023	0.879121	7.695181	7.273576	3.378582
BLR 5	02/16/12	9:53:00	4.297924	0.879121	7.723048	7.249156	3.519356
BLR 5	02/16/12	9:53:15	4.297924	0.879121	7.741435	7.245206	3.516484
BLR 5	02/16/12	9:53:30	4.297924	0.879121	7.704949	7.261725	3.516484
BLR 5	02/16/12	9:53:45	4.297924	0.879121	7.699939	7.271444	3.516484
BLR 5	02/16/12	9:54:00	4.412842	0.879121	7.689435	7.273576	3.516484
BLR 5	02/16/12	9:54:15	4.493284	0.93658	7.688573	7.237305	3.519356
BLR 5	02/16/12	9:54:30	4.493284	1.074481	7.689722	7.27214	3.516484
BLR 5	02/16/12	9:54:45	4.309416	1.074481	7.67507	7.295482	3.516484
BLR 5	02/16/12	9:55:00	4.297924	0.948072	7.69949	7.251311	3.519356
BLR 5	02/16/12	9:55:15	4.297924	0.879121	7.697192	7.276449	3.516484
BLR 5	02/16/12	9:55:30	4.424334	0.879121	7.719026	7.254184	3.657258
BLR 5	02/16/12	9:55:45	4.435826	1.017022	7.715866	7.257775	3.519356
BLR 5	02/16/12	9:56:00	4.297924	0.879121	7.732816	7.266035	3.519356
BLR 5	02/16/12	9:56:15	4.297924	0.879121	7.742584	7.257775	3.447533
BLR 5	02/16/12	9:56:30	4.297924	0.879121	7.705523	7.2883	3.321123
BLR 5	02/16/12	9:56:45	4.102564	0.948072	7.708109	7.271781	3.321123
BLR 5	02/16/12	9:57:00	4.102564	0.940171	7.710012	7.285562	3.321123
BLR 5	02/16/12	9:57:15	4.102564	0.879121	7.694319	7.305538	3.321123
BLR 5	02/16/12	9:57:30	4.102564	0.879121	7.708109	7.275372	3.194714
BLR 5	02/16/12	9:57:45	4.045105	1.00553	7.729369	7.268189	3.068304
BLR 5	02/16/12	9:58:00	3.763557	0.879121	7.739137	7.252747	2.930403
BLR 5	02/16/12	9:58:15	3.68886	1.074481	7.730231	7.245565	2.930403
BLR 5	02/16/12	9:58:30	3.68886	0.948072	7.719313	7.276808	2.933276
BLR 5	02/16/12	9:58:45	3.467643	0.93658	7.712706	7.264957	2.666092
BLR 5	02/16/12	9:59:00	3.467643	0.948072	7.719026	7.23946	2.539683
BLR 5	02/16/12	9:59:15	3.467643	0.879121	7.693457	7.258134	2.666092
BLR 5	02/16/12	9:59:30	3.341234	0.879121	7.728507	7.25993	2.539683
BLR 5	02/16/12	9:59:45	3.272283	0.879121	7.712418	7.267112	2.539683
BLR 5	02/16/12	10:00:00	3.306759	0.672269	7.719601	7.219349	2.533937
averun6	02/16/12	9:39:15	4.128147	0.93457	7.724482	7.258104	3.288768
scg1	02/16/12	10:00:45	2.68333	-0.44531	7.501544	6.809955	0.29304
scg1	02/16/12	10:01:00	-0.45967	-4.89262	7.201609	2.627307	-5.0018
scg1	02/16/12	10:01:15	3.467643	0.93658	2.335416	13.85765	2.68333
scg1	02/16/12	10:01:30	2.962005	0.695252	7.390074	11.42606	2.413273

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg1	02/16/12	10:01:45	2.298355	-4.54212	9.807369	11.1463	11.532
scg1	02/16/12	10:02:00	5.174172	-2.99073	9.858795	11.12763	11.02349
scg1	02/16/12	10:02:15	2.982116	2.427638	9.906198	11.13158	0.66365
scg1	02/16/12	10:02:30	1.137686	0.879121	9.956475	11.13553	0.399339
scg1	02/16/12	10:02:45	1.074481	0.879121	10.00388	11.11829	0.34188
scg1	02/16/12	10:03:00	1.074481	0.879121	10.05186	11.12655	0.34188
scg1	02/16/12	10:03:15	1.074481	0.879121	10.10156	11.10824	0.34188
scg1	02/16/12	10:03:30	1.074481	0.879121	10.1456	11.12256	0.34188
scg1	02/16/12	10:03:45	0.879121	0.879121	10.16677	11.12619	0.34188
scg1	02/16/12	10:04:00	0.879121	0.879121	10.18516	11.1147	0.34188
scg1	02/16/12	10:04:15	0.879121	0.879121	10.18085	11.12943	0.34188
scg1	02/16/12	10:04:30	0.603318	0.626302	10.11822	10.91001	-0.33901
scg1	02/16/12	10:04:45	0.879121	0.879121	10.18001	11.11809	0.34188
cozero1	02/16/12	10:04:30	0.603318	0.626302	10.11822	10.91001	-0.33901
noxzero1	02/16/12	10:04:30	0.603318	0.626302	10.11822	10.91001	-0.33901
noxzero1	02/16/12	10:04:30	0.603318	0.626302	10.11822	10.91001	-0.33901
co2span1	02/16/12	10:04:30	0.603318	0.626302	10.11822	10.91001	-0.33901
o2span1	02/16/12	10:04:30	0.603318	0.626302	10.11822	10.91001	-0.33901
scg6	02/16/12	10:05:00	0.879121	0.879121	10.17195	11.13948	0.34188
scg6	02/16/12	10:05:15	0.879121	0.81017	10.17022	11.11901	0.34188
scg6	02/16/12	10:05:30	0.879121	0.683761	7.901745	9.814695	0.34188
scg6	02/16/12	10:05:45	1.867414	1.735258	0.992889	3.024492	0.34188
scg6	02/16/12	10:06:00	4.8208	-2.12885	0.542412	0.816275	18.69712
scg6	02/16/12	10:06:15	36.68175	-2.92178	0.493859	0.359477	52.48294
scg6	02/16/12	10:06:30	52.34504	0.186741	0.445019	0.170581	52.05775
scg6	02/16/12	10:06:45	52.23012	0.17525	0.397615	0.170581	52.16117
scg6	02/16/12	10:07:00	52.35653	0.186741	0.348201	0.169145	52.17266
scg6	02/16/12	10:07:15	52.35653	0.2442	0.30051	0.183509	52.26747
scg6	02/16/12	10:07:30	52.35653	0.2442	0.256105	0.14652	52.16117
scg6	02/16/12	10:07:45	52.35653	0.2442	0.207427	0.167349	52.35653
co2zero1	02/16/12	10:07:45	52.35653	0.2442	0.207427	0.167349	52.35653
o2zero1	02/16/12	10:07:45	52.35653	0.2442	0.207427	0.167349	52.35653
cospan1	02/16/12	10:07:45	52.35653	0.2442	0.207427	0.167349	52.35653
noxspan1	02/16/12	10:07:45	52.35653	0.2442	0.207427	0.167349	52.35653

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg1	02/16/12	10:47:15	0.4884	-9.77E-02	0.163919	-25.0061	0.299145
scg1	02/16/12	10:47:30	0.4884	-9.77E-02	0.156863	-25.0061	0.29304
scg1	02/16/12	10:47:45	0.4884	-9.77E-02	0.168355	-22.4779	0.29304
scg1	02/16/12	10:48:00	0.4884	-9.77E-02	5.348847	13.80378	0.29304
scg1	02/16/12	10:48:15	1.580119	-0.14365	9.84127	11.32981	5.737269
scg1	02/16/12	10:48:30	8.153415	-9.19E-02	9.924873	11.00158	6.777275
scg1	02/16/12	10:48:45	4.320908	-0.07182	9.979458	10.93586	1.060116
scg1	02/16/12	10:49:00	0.4884	-9.77E-02	10.026	10.92796	0.382102
scg1	02/16/12	10:49:15	0.4884	-9.77E-02	10.07139	10.93012	0.295913
cozero1	02/16/12	10:49:15	0.4884	-9.77E-02	10.07139	10.93012	0.295913
noxzero1	02/16/12	10:49:15	0.4884	-9.77E-02	10.07139	10.93012	0.295913
noxzero1	02/16/12	10:49:15	0.4884	-9.77E-02	10.07139	10.93012	0.295913
co2span1	02/16/12	10:49:15	0.4884	-9.77E-02	10.07139	10.93012	0.295913
o2span1	02/16/12	10:49:15	0.4884	-9.77E-02	10.07139	10.93012	0.295913
scg6	02/16/12	10:49:45	0.4884	-0.10055	10.13029	10.93514	0.295913
scg6	02/16/12	10:50:00	0.4884	-9.77E-02	10.10788	10.92904	0.295913
scg6	02/16/12	10:50:15	0.4884	-0.10055	6.954248	9.341018	0.295913
scg6	02/16/12	10:50:30	0.3663	-0.10684	0.754274	2.804869	0.689866
scg6	02/16/12	10:50:45	24.67284	0.775695	0.459671	0.703512	7.501257
scg6	02/16/12	10:51:00	43.47339	9.77E-02	0.411118	7.40E-02	41.22962
scg6	02/16/12	10:51:15	50.88846	-0.11779	0.361991	8.62E-03	51.82216
scg6	02/16/12	10:51:30	51.60957	-0.10917	0.316311	8.98E-03	52.11521
scg6	02/16/12	10:51:45	51.58658	-0.11492	0.268908	1.54E-02	52.11808
scg6	02/16/12	10:52:00	51.71463	-0.11861	0.216292	-2.18E-03	52.2763
co2zero1	02/16/12	10:51:45	51.58658	-0.11492	0.268908	1.54E-02	52.11808
o2zero1	02/16/12	10:51:45	51.58658	-0.11492	0.268908	1.54E-02	52.11808
cospan1	02/16/12	10:51:45	51.58658	-0.11492	0.268908	1.54E-02	52.11808
noxspan1	02/16/12	10:51:45	51.58658	-0.11492	0.268908	1.54E-02	52.11808
scg5	02/16/12	10:52:15	51.77045	-0.11204	0.170078	1.58E-02	52.33355
scg5	02/16/12	10:52:30	51.77045	-0.1063	0.123249	0.668678	52.33068
scg5	02/16/12	10:52:45	51.83078	0.376356	0.10199	1.17252	45.51318
scg5	02/16/12	10:53:00	50.94592	21.33736	0.11463	1.209509	14.00848
scg5	02/16/12	10:53:15	46.91518	32.85212	0.108023	1.240394	4.013503
scg5	02/16/12	10:53:30	46.4239	33.51289	0.101415	1.229979	2.803993

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg5	02/16/12	10:53:45	46.62788	33.84041	0.11463	1.238957	2.482224
scg5	02/16/12	10:54:00	46.88357	34.35466	0.101128	1.252604	2.344322
scg5	02/16/12	10:54:15	47.00244	35.86386	0.10348	1.385836	2.344322
scg5	02/16/12	10:54:30	47.38921	36.23357	9.71E-02	1.330891	2.344322
scg5	02/16/12	10:54:45	47.81153	36.9317	9.65E-02	1.25799	2.344322
scg5	02/16/12	10:55:00	48.08446	37.64993	0.101702	1.251526	2.344322
scg5	02/16/12	10:55:15	48.34016	37.71601	1.00E-01	1.248294	2.344322
scg5	02/16/12	10:55:30	48.47806	38.40839	9.71E-02	1.267327	2.344322
scg5	02/16/12	10:55:45	48.73088	40.28729	0.10084	1.250449	2.344322
scg5	02/16/12	10:56:00	48.8774	40.37348	9.88E-02	1.266968	2.338576
scg5	02/16/12	10:56:15	48.94347	41.99382	9.62E-02	1.242907	2.329958
scg5	02/16/12	10:56:30	49.08712	44.4387	9.65E-02	1.256195	2.338576
scg5	02/16/12	10:56:45	49.17331	44.0135	0.10084	1.263736	2.344322
scg5	02/16/12	10:57:00	49.30547	44.10544	8.39E-02	1.25404	2.344322
scg5	02/16/12	10:57:15	49.37729	44.24621	8.25E-02	1.255836	2.344322
scg5	02/16/12	10:57:30	49.37729	44.25214	9.43E-02	1.254197	2.344322
scg5	02/16/12	10:57:45	49.56116	44.30654	8.39E-02	1.271637	2.344322
scg5	02/16/12	10:58:00	49.57265	44.26058	9.94E-02	1.247576	2.344322
scg5	02/16/12	11:02:30	0.879121	-0.0632	0.152553	20.83351	0.537241
scg5	02/16/12	11:02:45	0.879121	-0.0632	0.12957	11.6541	0.537241
scg5	02/16/12	11:03:00	3.470516	0.163758	0.100266	2.709545	0.537241
scg5	02/16/12	11:03:15	15.76384	9.322703	0.101128	1.455864	1.614595
scg5	02/16/12	11:03:30	42.72068	37.89988	9.97E-02	1.317245	2.283991
scg5	02/16/12	11:03:45	48.82856	43.42455	0.099691	1.321554	2.539683
scg5	02/16/12	11:04:00	49.09646	43.07998	9.52E-02	1.3038	2.405372
scg5	02/16/12	11:04:15	49.37442	42.66897	0.101702	1.306112	2.344322
scg5	02/16/12	11:04:30	49.5037	35.74517	0.094807	1.306471	2.344322
scg5	02/16/12	11:04:45	49.57265	34.62185	9.94E-02	1.312217	2.344322
scg5	02/16/12	11:05:00	49.71055	36.91733	9.74E-02	1.291029	2.344322
scg5	02/16/12	11:05:15	49.77663	37.44883	9.57E-02	1.287079	2.344322
scg5	02/16/12	11:05:30	49.95475	37.67004	9.97E-02	1.32335	2.344322
scg5	02/16/12	11:05:45	50.22768	37.9085	9.65E-02	1.312217	2.344322
scg5	02/16/12	11:06:30	50.35409	37.24772	0.14336	15.70351	2.344322
scg5	02/16/12	11:06:45	18.56784	12.5404	0.102564	4.123393	1.982331
scg5	02/16/12	11:07:00	20.56741	14.2182	0.101702	1.627523	0.824535

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg5	02/16/12	11:07:15	48.4707	35.56471	0.100733	1.327076	1.773504
scg5	02/16/12	11:07:30	49.67608	35.95489	0.094807	1.318322	2.344322
scg5	02/16/12	11:07:45	50.15873	35.73368	9.88E-02	1.292825	2.344322
scg5	02/16/12	11:08:00	50.15873	35.78826	9.60E-02	1.30288	2.344322
scg5	02/16/12	11:08:15	50.22768	36.14738	9.60E-02	1.298571	2.344322
scg5	02/16/12	11:08:30	50.35409	35.86009	0.099117	1.308626	2.344322
scg5	02/16/12	11:08:45	50.35409	35.32859	0.108597	1.3273	2.344322
scg5	02/16/12	11:09:00	50.35409	36.26517	9.60E-02	1.296416	2.344322
scg5	02/16/12	11:09:15	50.35409	42.442	9.85E-02	1.292825	2.344322
scg5	02/16/12	11:09:30	50.36558	44.31803	0.095382	1.283488	2.344322
scg5	02/16/12	11:09:45	50.54945	34.3719	9.60E-02	1.292466	2.344322
scg5	02/16/12	11:10:00	50.5552	33.38648	9.83E-02	1.31114	2.344322
scg5	02/16/12	11:10:15	50.54945	48.22237	0.100266	1.317245	2.344322
scg5	02/16/12	11:10:30	50.54945	48.25397	9.77E-02	1.325549	2.344322
scg5	02/16/12	11:10:45	50.55232	48.25397	9.94E-02	1.322632	2.344322
scg5	02/16/12	11:11:00	50.54945	48.25397	9.77E-02	1.317245	2.206421
scg5	02/16/12	11:11:15	50.54945	48.2511	0.111183	1.321913	2.146089
scg5	02/16/12	11:11:30	50.54945	48.24822	0.10831	1.266968	2.148962
scg5	02/16/12	11:11:45	50.54945	48.25397	9.94E-02	1.297134	2.148962
noxspan1	02/16/12	11:11:45	50.54945	48.25397	9.94E-02	1.297134	2.148962
Heater 6	02/16/12	12:12:45	100.9237	-3.73E-02	8.354234	6.639733	100.2399
Heater 6	02/16/12	12:13:00	100.0819	-6.90E-02	8.400776	6.611362	99.66243
Heater 6	02/16/12	12:13:15	99.43834	-5.46E-02	8.391295	6.642965	98.80916
Heater 6	02/16/12	12:13:30	99.15679	-1.72E-02	8.404223	6.649788	98.09667
Heater 6	02/16/12	12:13:45	97.64275	-4.88E-02	8.387847	6.621418	97.05954
Heater 6	02/16/12	12:14:00	95.7581	-0.07182	8.396754	6.64907	95.39611
Heater 6	02/16/12	12:14:15	94.35897	-9.77E-02	8.389859	6.663794	94.29577
Heater 6	02/16/12	12:14:30	92.57488	-1.15E-02	8.399052	6.635423	91.41995
Heater 6	02/16/12	12:14:45	89.27386	-5.75E-02	8.442433	6.562522	88.72226
Heater 6	02/16/12	12:15:00	87.18236	-4.02E-02	8.452201	6.582992	86.35495
Heater 6	02/16/12	12:15:15	85.51893	-4.60E-02	8.40882	6.722689	84.89837
Heater 6	02/16/12	12:15:30	83.27803	1.44E-02	8.392731	6.646556	81.70653
Heater 6	02/16/12	12:15:45	80.99691	-5.75E-03	8.392444	6.642606	79.63226
Heater 6	02/16/12	12:16:00	79.90232	0	8.394383	6.610577	78.69658
Heater 6	02/16/12	12:16:15	79.3737	-3.45E-02	8.415428	6.626445	78.42275

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
Heater 6	02/16/12	12:16:30	79.06629	-5.75E-02	8.409969	6.621059	78.33657
Heater 6	02/16/12	12:16:45	79.44839	-6.61E-02	8.426058	6.574014	78.93988
Heater 6	02/16/12	12:17:00	81.28133	-6.03E-02	8.448754	6.55929	80.63205
Heater 6	02/16/12	12:17:15	83.24068	-9.48E-02	8.446168	6.602385	83.24643
Heater 6	02/16/12	12:17:30	85.73727	-8.33E-02	8.418013	6.635783	85.43561
Heater 6	02/16/12	12:17:45	87.73684	-5.75E-02	8.382963	6.70186	87.11916
Heater 6	02/16/12	12:18:00	89.72204	-7.47E-02	8.388709	6.655175	89.16756
Heater 6	02/16/12	12:18:15	91.46879	-7.47E-02	8.424334	6.648711	90.92581
Heater 6	02/16/12	12:18:30	93.80162	-8.33E-02	8.397903	6.7428	93.64361
Heater 6	02/16/12	12:18:45	94.62329	-0.1063	8.369461	6.783021	94.89047
Heater 6	02/16/12	12:19:00	94.2814	-0.14365	8.403936	6.702219	94.95942
Heater 6	02/16/12	12:19:15	94.77717	-0.12821	8.404762	6.687653	94.83516
Heater 6	02/16/12	12:19:30	96.43899	-4.88E-02	8.405947	6.695037	95.68627
Heater 6	02/16/12	12:19:45	96.90728	-6.61E-02	8.374345	6.717302	96.2781
Heater 6	02/16/12	12:20:00	96.85844	-8.91E-02	8.38756	6.715866	96.61711
Heater 6	02/16/12	12:20:15	97.09976	-3.45E-02	8.387273	6.72628	96.23788
Heater 6	02/16/12	12:20:30	97.55369	-5.17E-02	8.399052	6.715148	96.9044
Heater 6	02/16/12	12:20:45	97.87258	-8.62E-02	8.370035	6.776916	97.35833
Heater 6	02/16/12	12:21:00	98.19723	-4.31E-02	8.369173	6.769015	97.63126
Heater 6	02/16/12	12:21:15	98.49889	-0.0632	8.362566	6.825756	97.89844
Heater 6	02/16/12	12:21:30	98.27767	-0.1063	8.359118	6.774402	98.43281
Heater 6	02/16/12	12:21:45	98.55635	-0.10917	8.37061	6.758242	98.81204
Heater 6	02/16/12	12:22:00	99.37513	-8.62E-02	8.336422	6.79164	99.16541
Heater 6	02/16/12	12:22:15	99.3895	-9.16E-02	8.35989	6.752137	99.17277
Heater 6	02/16/12	12:22:30	98.72585	-9.77E-02	8.366588	6.767938	98.66552
Heater 6	02/16/12	12:22:45	98.84364	-5.46E-02	8.326366	6.87711	98.36386
Heater 6	02/16/12	12:23:00	98.32938	-9.19E-02	8.33556	6.798463	98.0622
Heater 6	02/16/12	12:23:15	98.40408	-4.02E-02	8.383251	6.732026	97.637
Heater 6	02/16/12	12:23:30	98.89535	-0.07182	8.402212	6.747827	98.66264
Heater 6	02/16/12	12:23:45	99.16541	-0.10055	8.397903	6.703297	99.24873
Heater 6	02/16/12	12:24:00	99.54751	-7.76E-02	8.40135	6.688932	99.13381
Heater 6	02/16/12	12:24:15	100.0848	-0.11492	8.35567	6.822524	100.0761
Heater 6	02/16/12	12:24:30	100.4956	-8.91E-02	8.320046	6.857717	100.148
Heater 6	02/16/12	12:24:45	100.0991	-0.11779	8.304245	6.834375	100.1594
Heater 6	02/16/12	12:25:00	99.76011	-0.14077	8.348775	6.771888	100.1796

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
Heater 6	02/16/12	12:25:15	100.4898	-0.1379	8.391582	6.71838	101.1219
Heater 6	02/16/12	12:25:30	101.9536	-0.10684	8.436813	6.627366	101.8926
Heater 6	02/16/12	12:25:45	102.3573	-9.77E-02	8.483229	6.607771	102.2998
Heater 6	02/16/12	12:26:00	102.9002	-8.33E-02	8.496445	6.61244	102.6474
Heater 6	02/16/12	12:26:15	103.0266	-8.62E-02	8.500467	6.636142	102.8054
Heater 6	02/16/12	12:26:30	102.7853	-5.75E-02	8.480356	6.643683	102.2538
Heater 6	02/16/12	12:26:45	102.6244	-7.47E-02	8.500467	6.627523	102.1016
Heater 6	02/16/12	12:27:00	102.9922	-5.46E-02	8.503627	6.623573	102.5842
Heater 6	02/16/12	12:27:15	103.4921	-3.73E-02	8.507649	6.62034	102.7221
Heater 6	02/16/12	12:27:30	103.9661	-8.62E-03	8.519141	6.6286	102.9548
Heater 6	02/16/12	12:27:45	103.7075	-8.33E-02	8.502478	6.616749	103.3973
Heater 6	02/16/12	12:28:00	103.8368	-0.11204	8.533506	6.586224	104.0408
Heater 6	02/16/12	12:28:15	104.1126	-0.10917	8.559937	6.545644	104.3137
Heater 6	02/16/12	12:28:30	104.7906	-9.48E-02	8.540401	6.573296	104.6355
Heater 6	02/16/12	12:28:45	105.2819	-3.45E-02	8.537528	6.581915	104.4631
Heater 6	02/16/12	12:29:00	104.4017	-6.41E-02	8.508242	6.634615	103.7759
Heater 6	02/16/12	12:29:15	103.7075	-2.01E-02	8.50966	6.577605	102.8457
Heater 6	02/16/12	12:29:30	103.6357	-6.61E-02	8.553329	6.465201	103.0927
Heater 6	02/16/12	12:29:45	104.2936	-4.88E-02	8.551318	6.543489	103.6185
Heater 6	02/16/12	12:30:00	104.15	-8.33E-02	8.559075	6.562522	103.9086
Heater 6	02/16/12	12:30:15	104.4401	-2.01E-02	8.531207	6.599512	103.4978
Heater 6	02/16/12	12:30:30	105.167	5.75E-03	8.50018	6.637937	103.719
Heater 6	02/16/12	12:30:45	104.9084	0	8.532931	6.55929	103.6932
Heater 6	02/16/12	12:31:00	104.9745	2.87E-02	8.561373	6.542771	103.3053
Heater 6	02/16/12	12:31:15	105.2963	2.87E-03	8.524025	6.625727	103.8512
Heater 6	02/16/12	12:31:30	105.4859	4.60E-02	8.509086	6.613517	103.696
Heater 6	02/16/12	12:31:45	104.1902	-5.17E-02	8.540975	6.578683	103.5811
Heater 6	02/16/12	12:32:00	105.1526	6.11E-03	8.508547	6.73573	103.6874
Heater 6	02/16/12	12:32:15	105.1986	-2.59E-02	8.479782	7.007829	104.1011
Heater 6	02/16/12	12:32:30	104.0293	2.30E-02	8.518279	7.325648	102.2969
Heater 6	02/16/12	12:32:45	103.9086	3.45E-02	8.517992	6.850176	102.07
Heater 6	02/16/12	12:33:00	104.443	-2.59E-02	8.496732	6.676722	103.3484
Heater 6	02/16/12	12:33:15	104.8423	0	8.52345	6.643324	103.3484
Heater 6	02/16/12	12:33:30	104.8337	1.72E-02	8.528622	6.599871	103.0899
Heater 6	02/16/12	12:33:45	104.8596	8.62E-03	8.545859	6.607053	103.1157

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
Heater 6	02/16/12	12:34:00	105.1785	5.75E-03	8.540401	6.647633	103.426
Heater 6	02/16/12	12:34:15	105.2905	0	8.553042	6.551749	103.8368
Heater 6	02/16/12	12:34:30	105.3825	3.45E-02	8.589528	6.698269	103.3944
Heater 6	02/16/12	12:34:45	106.569	0.140774	8.57229	6.926668	103.6127
Heater 6	02/16/12	12:35:00	106.0256	4.88E-02	8.563492	7.290522	103.9469
Heater 6	02/16/12	12:35:15	105.2474	0.071824	8.540688	6.974431	103.0554
Heater 6	02/16/12	12:35:30	104.6412	0.129282	8.582058	6.716943	101.6821
Heater 6	02/16/12	12:35:45	105.325	0.163758	8.610501	6.694319	102.159
Heater 6	02/16/12	12:36:00	105.7818	5.46E-02	8.637794	6.382963	103.8311
Heater 6	02/16/12	12:36:15	106.6035	0.12641	8.665948	6.366803	104.0207
Heater 6	02/16/12	12:36:30	107.5918	8.33E-02	8.637794	6.396251	105.2561
Heater 6	02/16/12	12:36:45	108.2209	8.62E-02	8.588666	6.476334	105.7847
Heater 6	02/16/12	12:37:00	107.632	4.88E-02	8.388422	6.87711	105.5692
Heater 6	02/16/12	12:37:15	106.4972	2.30E-02	8.295051	6.717302	104.6183
Heater 6	02/16/12	12:37:30	105.5261	0.229836	8.340731	6.609926	101.5442
Heater 6	02/16/12	12:37:45	99.1769	-12.2905	7.6676	5.2442	94.62041
Heater 6	02/16/12	12:38:00	104.7016	3.030956	8.434964	6.430726	101.5557
Heater 6	02/16/12	12:38:15	104.2247	2.686203	8.477717	6.521673	101.5659
averun7	02/16/12	12:17:15	101.4094	-0.14457	8.455517	6.671648	100.4589
scg6	02/16/12	12:38:45	104.7791	2.962005	8.564246	6.41708	101.8229
scg6	02/16/12	12:39:00	105.6554	3.740573	8.558788	6.497522	101.7051
scg6	02/16/12	12:39:15	105.7445	3.484881	4.599009	8.533362	102.2222
scg6	02/16/12	12:39:30	97.99325	-12.2158	0.351074	3.304604	97.77778
scg6	02/16/12	12:39:45	69.38447	-4.46168	0.355096	0.799756	86.02744
scg6	02/16/12	12:40:00	59.75724	-0.66652	0.317748	0.372764	60.52431
scg6	02/16/12	12:40:15	56.23788	1.014149	0.214034	0.151189	53.98262
scg6	02/16/12	12:40:30	53.5603	0.34188	0.231559	0.202902	53.25289
scg6	02/16/12	12:40:45	53.56317	0.482655	0.181283	0.215112	53.14946
scg6	02/16/12	12:41:00	53.64648	0.485528	0.148819	0.202902	53.33333
co2zero1	02/16/12	12:41:00	53.64648	0.485528	0.148819	0.202902	53.33333
o2zero1	02/16/12	12:41:00	53.64648	0.485528	0.148819	0.202902	53.33333
cospan1	02/16/12	12:41:00	53.64648	0.485528	0.148819	0.202902	53.33333
noxspan1	02/16/12	12:41:00	53.64648	0.485528	0.148819	0.202902	53.33333
scg1	02/16/12	12:41:15	53.74499	0.477935	0.139543	0.244636	53.33333
scg1	02/16/12	12:41:30	53.67234	0.384975	0.141636	0.207211	53.33333

gastype			Nitrogen Oxides	Nitrogen dioxide	Carbon dioxide	Oxygen	Nitrogen Oxide
scg1	02/16/12	12:41:45	53.02593	-0.2126	-2.30985	0.316742	51.88537
scg1	02/16/12	12:42:00	53.26313	0.482295	1.273504	6.061508	52.86935
scg1	02/16/12	12:42:15	49.06127	-2.43051	9.026503	9.751849	51.81642
scg1	02/16/12	12:42:30	36.26517	4.993177	9.992387	10.89708	31.36393
scg1	02/16/12	12:42:45	9.813977	-2.03979	10.04238	11.15025	13.64361
scg1	02/16/12	12:43:00	2.689076	1.373267	10.09265	11.15349	1.47382
scg1	02/16/12	12:43:15	1.718021	0.81017	10.14063	11.16785	1.192272
scg1	02/16/12	12:43:30	1.660562	0.683761	10.18631	11.18653	1.048625
scg1	02/16/12	12:43:45	1.52266	0.683761	10.21245	11.17108	0.927961
scg1	02/16/12	12:44:01	1.480229	0.683761	10.23274	11.19705	0.931718
scg1	02/16/12	12:44:15	1.474359	0.683761	10.21947	11.16682	0.781441
cozero1	02/16/12	12:44:15	1.474359	0.683761	10.21947	11.16682	0.781441
noxzero1	02/16/12	12:44:01	1.480229	0.683761	10.23274	11.19705	0.931718
noxzero1	02/16/12	12:44:15	1.474359	0.683761	10.21947	11.16682	0.781441
co2span1	02/16/12	12:43:45	1.52266	0.683761	10.21245	11.17108	0.927961
o2span1	02/16/12	12:43:45	1.52266	0.683761	10.21245	11.17108	0.927961
scg5	02/16/12	12:44:30	1.292825	0.683761	10.2159	11.17503	0.732601
scg5	02/16/12	12:44:45	1.289952	0.683761	4.509086	7.767363	0.732601
scg5	02/16/12	12:45:00	1.295698	0.683761	0.205416	2.372693	0.732601
scg5	02/16/12	12:45:15	23.06399	22.34576	0.154277	1.403792	0.79006
scg5	02/16/12	12:45:30	53.70682	51.71299	0.122387	1.342383	2.143216
scg5	02/16/12	12:45:45	52.78173	50.24492	0.128708	1.31509	2.591396
scg5	02/16/12	12:46:00	53.01587	50.52503	0.128205	1.315247	2.539683
scg5	02/16/12	12:46:15	52.99145	50.50061	0.113481	1.321913	2.539683
scg5	02/16/12	12:46:30	52.66681	50.17597	0.126122	1.321554	2.539683
scg5	02/16/12	12:46:45	52.26173	49.91166	0.108597	1.303239	2.401781
scg5	02/16/12	12:47:00	51.87388	49.58989	0.112332	1.321554	2.344322
scg5	02/16/12	12:47:15	51.5952	49.31408	0.112332	1.314372	2.344322
noxspan1	02/16/12	12:47:15	51.5952	49.31408	0.112332	1.314372	2.344322

Appendix B
Calibration Gas Certificates

Airgas

Airgas Speciality Gases
12722 S. Wentworth Ave.
Chicago, IL 60628
(773) 785-3000 Fax: (773) 785-1928
www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E03NI56E15A38L8	Reference Number:	54-124271667-3
Cylinder Number:	CC15105	Cylinder Volume:	160 Cu.Ft.
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12011	Valve Outlet:	296
		Analysis Date:	Jul 11, 2011

Expiration Date: Jul 11, 2014

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig,i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	19.75 %	19.60 %	G1	+/- 1% NIST Traceable
OXYGEN	24.25 %	24.19 %	G2	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM/CO2	06120403	CC185079	19.66% CARBON DIOXIDE/NITROGEN	May 01, 2016
NTRM/O2	98120402	CC59030	4.974% OXYGEN/NITROGEN	Jan 01, 2013

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
(CO2-1)HORIBA VIA-510	NDIR	Jun 27, 2011
(O2-1)HORIBA MPA-510	Paramagnetic	Jun 27, 2011

Triad Data Available Upon Request

Notes:

Approved for Release

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Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Airgas Speciality Gases
12722 S. Wentworth Avenue
Chicago IL 60628
(773) 785-3000
http://www.airgas.com

Part Number:	E03NI79E15A0088	Reference Number:	54-124244893-4
Cylinder Number:	CC110546	Cylinder Volume:	151 Cu.Ft.
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
Analysis Date:	Dec 16, 2010	Valve Outlet:	590

Expiration Date: Dec 16, 2013

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON DIOXIDE	10.00 %	9.906 %	G1	+/- 1% NIST Traceable
OXYGEN	11.00 %	10.98 %	G1	+/- 1% NIST Traceable
NITROGEN	Balance			

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM/CO2	98120809	CC59142	13.78% CARBON DIOXIDE/	Oct 02, 2012
NTRM/O2	98120211	CC73607	14.84% OXYGEN/	Oct 02, 2012

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
(CO-2)HORIBA VIA-510	NDIR	Dec 02, 2010
(O2-1)HORIBA MPA-510	Paramagnetic	Dec 02, 2010

Triad Data Available Upon Request

Notes:

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Airgas

Airgas Speciality Gases
12722 S. Wentworth Avenue
Chicago IL 60628
(773) 785-3000
http://www.airgas.com

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E04NI99E15A0078	Reference Number:	54-124244893-5
Cylinder Number:	CC1281	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
Analysis Date:	Dec 21, 2010	Valve Outlet:	660

Expiration Date: Dec 21, 2012

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95% There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	50.00 PPM	50.12 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	50.00 PPM	49.80 PPM	G1	+/- 1% NIST Traceable
SULFUR DIOXIDE	50.00 PPM	50.52 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		49.82 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM/CO	051203	CC179906	49.33PPM CARBON MONOXIDE/NITROGEN	Feb 02, 2011
NTRM/SO2	08061529	CC255782	94.67PPM SULFUR DIOXIDE/	Oct 15, 2012
NTRM/NO	09060808	CC268503	94.26PPM NITRIC OXIDE/	Mar 15, 2011

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Dec 02, 2010
Nicolet 6700 AHR0801332	FTIR	Dec 02, 2010
Nicolet 6700 AHR0801332	FTIR	Dec 02, 2010

Triad Data Available Upon Request

Notes:

Approved for Release

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Airgas

CERTIFICATE OF ANALYSIS
Grade of Product: EPA Protocol

Part Number:	E04NI99E15A0568	Reference Number:	54-124262498-1
Cylinder Number:	CC104289	Cylinder Volume:	144 Cu.Ft.
Laboratory:	ASG - Chicago - IL	Cylinder Pressure:	2015 PSIG
PGVP Number:	B12011	Valve Outlet:	660
Analysis Date:	May 04, 2011		

Expiration Date: May 04, 2013

Certification performed in accordance with "EPA Traceability Protocol (Sept. 1997)" using the assay procedures listed. Analytical Methodology does not require correction for analytical interferences. This cylinder has a total analytical uncertainty as stated below with a confidence level of 95%. There are no significant impurities which affect the use of this calibration mixture. All concentrations are on a volume/volume basis unless otherwise noted.
Do Not Use This Cylinder below 150 psig.i.e. 1 Mega Pascal

ANALYTICAL RESULTS

Component	Requested Concentration	Actual Concentration	Protocol Method	Total Relative Uncertainty
CARBON MONOXIDE	100.0 PPM	100.9 PPM	G1	+/- 1% NIST Traceable
NITRIC OXIDE	100.0 PPM	99.26 PPM	G1	+/- 1% NIST Traceable
SULFUR DIOXIDE	100.0 PPM	102.7 PPM	G1	+/- 1% NIST Traceable
NITROGEN	Balance			
Total oxides of nitrogen		99.30 PPM		For Reference Only

CALIBRATION STANDARDS

Type	Lot ID	Cylinder No	Concentration	Expiration Date
NTRM/SO2	08061529	CC255782	94.67PPM SULFUR DIOXIDE/	Oct 15, 2012
NTRM/NO	09060804	CC268494	94.26PPM NITRIC OXIDE/	Jan 20, 2015
NTRM/CO	09060516	CC280693	98.88PPM CARBON MONOXIDE/	Feb 11, 2013

ANALYTICAL EQUIPMENT

Instrument/Make/Model	Analytical Principle	Last Multipoint Calibration
Nicolet 6700 AHR0801332	FTIR	Apr 21, 2011
Nicolet 6700 AHR0801332	FTIR	Apr 21, 2011
Nicolet 6700 AHR0801332	FTIR	Apr 21, 2011

Triad Data Available Upon Request

Notes:

Signature on file

Approved for Release

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End of Document

Appendix H
Near-Field Analysis AERMOD Results – Existing and Proposed Holly Refining & Marketing Operations

```
                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for    50 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay for URBAN/Non-SO2.
        6. Urban Roughness Length of 1.0 Meter Assumed.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  2 Short Term Average(s) of:   1-HR   8-HR

**This Run Includes:     50 Source(s);      52 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  CO

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     38.1 MB of RAM.

**Input Runstream File:          Holly_V17_2006_CO.DTA
**Output Print File:             Holly_V17_2006_CO.LST

**File for Summary of Results:   C:\beast\Holly\Holly_V17_2006_CO.SUM
```



```
                                          *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                             (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                    *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                          (METERS/SEC)

                                                1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2006.SFC Met Version: 11059
Profile file: SY2006.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2006 Year: 2006

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
06	01	01	1	01	-11.8	0.241	-9.000	-9.000	-999.	273.	91.0	0.09	0.28	1.00	3.20	185.	10.0	276.0	10.0
06	01	01	1	02	-11.9	0.244	-9.000	-9.000	-999.	277.	93.0	0.01	0.28	1.00	4.60	248.	10.0	276.5	10.0
06	01	01	1	03	-24.7	0.504	-9.000	-9.000	-999.	824.	399.2	0.01	0.28	1.00	9.00	269.	10.0	277.0	10.0
06	01	01	1	04	-40.4	0.427	-9.000	-9.000	-999.	646.	146.0	0.02	0.28	1.00	7.00	290.	10.0	276.9	10.0
06	01	01	1	05	-15.9	0.324	-9.000	-9.000	-999.	430.	164.1	0.04	0.28	1.00	4.80	301.	10.0	276.4	10.0
06	01	01	1	06	-18.0	0.366	-9.000	-9.000	-999.	508.	209.4	0.02	0.28	1.00	5.90	298.	10.0	276.4	10.0
06	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.02	0.28	1.00	6.30	289.	10.0	275.9	10.0
06	01	01	1	08	-34.7	0.381	-9.000	-9.000	-999.	540.	122.8	0.02	0.28	1.00	6.30	282.	10.0	275.4	10.0
06	01	01	1	09	-21.0	0.324	-9.000	-9.000	-999.	425.	124.8	0.01	0.28	0.51	6.00	268.	10.0	275.1	10.0
06	01	01	1	10	10.5	0.195	0.315	0.005	92.	206.	-54.3	0.01	0.28	0.30	3.20	249.	10.0	276.1	10.0
06	01	01	1	11	27.6	0.203	0.649	0.005	307.	211.	-23.6	0.01	0.28	0.22	3.20	248.	10.0	277.5	10.0
06	01	01	1	12	38.6	0.170	0.825	0.005	450.	161.	-9.8	0.01	0.28	0.19	2.50	249.	10.0	278.4	10.0
06	01	01	1	13	42.5	0.283	0.942	0.005	608.	346.	-41.1	0.09	0.28	0.19	3.00	207.	10.0	279.2	10.0
06	01	01	1	14	32.3	0.382	0.913	0.005	729.	543.	-133.3	0.12	0.28	0.19	4.00	168.	10.0	279.9	10.0
06	01	01	1	15	4.8	0.338	0.487	0.005	746.	452.	-623.1	0.07	0.28	0.22	4.20	148.	10.0	279.8	10.0
06	01	01	1	16	0.4	0.444	0.218	0.005	747.	681.	-8888.0	0.12	0.28	0.29	4.90	155.	10.0	279.4	10.0
06	01	01	1	17	-17.9	0.410	-9.000	-9.000	-999.	605.	298.0	0.12	0.28	0.49	4.70	161.	10.0	278.4	10.0
06	01	01	1	18	-25.2	0.339	-9.000	-9.000	-999.	457.	119.9	0.12	0.28	1.00	4.10	163.	10.0	277.4	10.0
06	01	01	1	19	-21.1	0.284	-9.000	-9.000	-999.	349.	83.7	0.07	0.28	1.00	4.00	149.	10.0	276.6	10.0
06	01	01	1	20	-9.3	0.189	-9.000	-9.000	-999.	192.	55.7	0.07	0.28	1.00	2.80	124.	10.0	276.0	10.0
06	01	01	1	21	-18.7	0.381	-9.000	-9.000	-999.	540.	227.2	0.07	0.28	1.00	5.00	140.	10.0	276.9	10.0
06	01	01	1	22	-12.9	0.262	-9.000	-9.000	-999.	316.	108.2	0.12	0.28	1.00	3.20	165.	10.0	277.1	10.0
06	01	01	1	23	-14.5	0.296	-9.000	-9.000	-999.	371.	138.0	0.07	0.28	1.00	4.00	134.	10.0	277.2	10.0
06	01	01	1	24	-18.2	0.372	-9.000	-9.000	-999.	522.	218.0	0.07	0.28	1.00	4.90	133.	10.0	277.8	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
06	01	01	01	10.0	1	185.	3.20	276.1	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	258.85616	ON 06032413:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
NEW	HIGH 1ST HIGH VALUE IS	62.39868	ON 06110718:	AT (424650.00, 4526200.00, 1322.00, 2867.37, 0.00)	DC
4H1	HIGH 1ST HIGH VALUE IS	30.24470	ON 06122316:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4K1A	HIGH 1ST HIGH VALUE IS	41.91883	ON 06102813:	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC
4K1B	HIGH 1ST HIGH VALUE IS	33.95317	ON 06012512:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
4V82	HIGH 1ST HIGH VALUE IS	197.97369	ON 06032413:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
6H1	HIGH 1ST HIGH VALUE IS	5.33420	ON 06083023:	AT (423971.90, 4526311.70, 1306.95, 2867.37, 0.00)	DC
6H3	HIGH 1ST HIGH VALUE IS	4.26347	ON 06052711:	AT (424150.00, 4526200.00, 1311.00, 2867.37, 0.00)	DC
6H2	HIGH 1ST HIGH VALUE IS	6.22758	ON 06030318:	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC
6K1	HIGH 1ST HIGH VALUE IS	7.72959	ON 06061101:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
6K2	HIGH 1ST HIGH VALUE IS	7.72989	ON 06061102:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
7H3	HIGH 1ST HIGH VALUE IS	2.90841	ON 06010607:	AT (424250.00, 4527300.00, 1303.51, 2867.37, 0.00)	DC
7H1	HIGH 1ST HIGH VALUE IS	3.94412	ON 06031914:	AT (424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC

8H1	HIGH	1ST HIGH VALUE IS	5.85598	ON 06070809: AT (	423900.00,	4526250.00,	1305.93,	2867.37,	0.00)	DC
9H1	HIGH	1ST HIGH VALUE IS	7.27703	ON 06012615: AT (	424100.00,	4526500.00,	1308.69,	2867.37,	0.00)	DC
9H2	HIGH	1ST HIGH VALUE IS	8.92758	ON 06111404: AT (	424000.00,	4526500.00,	1306.05,	2867.37,	0.00)	DC
10H1	HIGH	1ST HIGH VALUE IS	3.25751	ON 06111812: AT (	423998.10,	4526485.90,	1306.00,	2867.37,	0.00)	DC
10H2	HIGH	1ST HIGH VALUE IS	6.36072	ON 06070809: AT (	423900.00,	4526200.00,	1306.00,	2867.37,	0.00)	DC
11H1	HIGH	1ST HIGH VALUE IS	3.30262	ON 06110813: AT (	424000.00,	4526600.00,	1304.70,	2867.37,	0.00)	DC
12H1	HIGH	1ST HIGH VALUE IS	2.43832	ON 06070809: AT (	423900.00,	4526200.00,	1306.00,	2867.37,	0.00)	DC
13H1	HIGH	1ST HIGH VALUE IS	4.26398	ON 06112212: AT (	423997.30,	4526411.20,	1307.00,	2867.37,	0.00)	DC
19H1	HIGH	1ST HIGH VALUE IS	2.67738	ON 06090210: AT (	423800.80,	4526311.60,	1303.75,	2867.37,	0.00)	DC
20H1	HIGH	1ST HIGH VALUE IS	2.48246	ON 06092710: AT (	423900.00,	4526250.00,	1305.93,	2867.37,	0.00)	DC
20H2	HIGH	1ST HIGH VALUE IS	4.18169	ON 06081109: AT (	423900.00,	4526200.00,	1306.00,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	4.15800	ON 06081109: AT (	423900.00,	4526200.00,	1306.00,	2867.37,	0.00)	DC

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)					OF TYPE
23H1	HIGH	1ST HIGH VALUE IS	2.97123	ON 06092711: AT (	423898.60,	4526311.60,	1305.71,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	3.48573	ON 06050109: AT (	423841.00,	4527079.80,	1298.99,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	3.23947	ON 06050109: AT (	423840.40,	4526987.00,	1299.47,	2867.37,	0.00)	DC
SCRUBBER	HIGH	1ST HIGH VALUE IS	42.58501	ON 06110718: AT (	424500.00,	4526300.00,	1316.04,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	3.20884	ON 06032918: AT (	423585.50,	4527067.50,	1295.96,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	3.99452	ON 06091009: AT (	423863.80,	4527102.50,	1299.00,	2867.37,	0.00)	DC
30H1	HIGH	1ST HIGH VALUE IS	6.15922	ON 06091009: AT (	423839.70,	4527180.00,	1297.98,	2867.37,	0.00)	DC
30H2	HIGH	1ST HIGH VALUE IS	6.18712	ON 06091009: AT (	423841.20,	4527102.90,	1298.97,	2867.37,	0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	4.58350	ON 06110718: AT (	424750.00,	4525900.00,	1323.99,	2867.37,	0.00)	DC
BOILER4	HIGH	1ST HIGH VALUE IS	20.73114	ON 06070601: AT (	423999.10,	4526585.40,	1305.28,	2867.37,	0.00)	DC
BOILER5	HIGH	1ST HIGH VALUE IS	19.38288	ON 06060918: AT (	423999.10,	4526585.40,	1305.28,	2867.37,	0.00)	DC
BOILER8	HIGH	1ST HIGH VALUE IS	27.93860	ON 06032608: AT (	424000.00,	4526650.00,	1305.00,	2867.37,	0.00)	DC
BOILER9	HIGH	1ST HIGH VALUE IS	31.78986	ON 06072401: AT (	423999.60,	4526635.10,	1305.00,	2867.37,	0.00)	DC
BOILER10	HIGH	1ST HIGH VALUE IS	30.84611	ON 06102515: AT (	423999.90,	4526660.00,	1304.88,	2867.37,	0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	14.38084	ON 06040113: AT (	423998.40,	4526510.70,	1306.00,	2867.37,	0.00)	DC
68H2	HIGH	1ST HIGH VALUE IS	5.20399	ON 06072921: AT (	424198.40,	4526780.00,	1307.25,	2867.37,	0.00)	DC
68H3	HIGH	1ST HIGH VALUE IS	6.76738	ON 06111919: AT (	424255.60,	4526656.80,	1310.07,	2867.37,	0.00)	DC
68H4	HIGH	1ST HIGH VALUE IS	7.11874	ON 06112003: AT (	424173.90,	4526712.00,	1308.32,	2867.37,	0.00)	DC
68H5	HIGH	1ST HIGH VALUE IS	5.82124	ON 06102822: AT (	424021.80,	4526830.80,	1304.02,	2867.37,	0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	6.23359	ON 06071624: AT (	424021.30,	4526781.80,	1304.07,	2867.37,	0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	6.69109	ON 06012119: AT (	424231.00,	4526870.60,	1306.99,	2867.37,	0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.60604	ON 06031817: AT (	423998.90,	4526560.50,	1305.38,	2867.37,	0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.57229	ON 06121615: AT (	423727.50,	4526311.50,	1303.00,	2867.37,	0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.57753	ON 06012517: AT (	424000.00,	4526500.00,	1306.05,	2867.37,	0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.54415	ON 06121614: AT (	423776.40,	4526311.50,	1303.07,	2867.37,	0.00)	DC

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
FLARES	HIGH	1ST HIGH VALUE IS	4.45658	ON 06120903:	AT (424400.00, 4525800.00, 1320.00, 2867.37, 0.00)	DC
FLAREN	HIGH	1ST HIGH VALUE IS	4.45689	ON 06120903:	AT (424400.00, 4525800.00, 1320.00, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	77.54336	ON 06100316:	AT (423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC
NEW	HIGH	1ST HIGH VALUE IS	30.25040	ON 06100316:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
4H1	HIGH	1ST HIGH VALUE IS	15.73684	ON 06053116:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4K1A	HIGH	1ST HIGH VALUE IS	15.34951	ON 06081816:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4K1B	HIGH	1ST HIGH VALUE IS	16.33405m	ON 06051016:	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC
4V82	HIGH	1ST HIGH VALUE IS	40.72454m	ON 06022124:	AT (423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC
6H1	HIGH	1ST HIGH VALUE IS	3.06473	ON 06092216:	AT (423950.00, 4526300.00, 1306.66, 2867.37, 0.00)	DC
6H3	HIGH	1ST HIGH VALUE IS	1.80205	ON 06052716:	AT (424100.00, 4526250.00, 1310.00, 2867.37, 0.00)	DC
6H2	HIGH	1ST HIGH VALUE IS	2.23745	ON 06120816:	AT (424018.60, 4526512.50, 1306.56, 2867.37, 0.00)	DC
6K1	HIGH	1ST HIGH VALUE IS	2.94200	ON 06021924:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
6K2	HIGH	1ST HIGH VALUE IS	2.91482	ON 06021924:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
7H3	HIGH	1ST HIGH VALUE IS	1.59277	ON 06092216:	AT (423822.10, 4526182.10, 1304.50, 2867.37, 0.00)	DC
7H1	HIGH	1ST HIGH VALUE IS	1.95627	ON 06122808:	AT (423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC
8H1	HIGH	1ST HIGH VALUE IS	3.59087	ON 06092216:	AT (423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC
9H1	HIGH	1ST HIGH VALUE IS	3.36862	ON 06102516:	AT (424100.00, 4526500.00, 1308.69, 2867.37, 0.00)	DC
9H2	HIGH	1ST HIGH VALUE IS	3.83424m	ON 06032616:	AT (424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC
10H1	HIGH	1ST HIGH VALUE IS	1.94452	ON 06120816:	AT (424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC
10H2	HIGH	1ST HIGH VALUE IS	3.77061	ON 06092216:	AT (423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC
11H1	HIGH	1ST HIGH VALUE IS	2.13733	ON 06092216:	AT (423820.50, 4526280.80, 1304.00, 2867.37, 0.00)	DC
12H1	HIGH	1ST HIGH VALUE IS	1.45379	ON 06092216:	AT (423950.00, 4526000.00, 1308.00, 2867.37, 0.00)	DC
13H1	HIGH	1ST HIGH VALUE IS	2.45930	ON 06120816:	AT (424017.60, 4526414.50, 1307.94, 2867.37, 0.00)	DC
19H1	HIGH	1ST HIGH VALUE IS	1.41443	ON 06120816:	AT (424100.00, 4526350.00, 1310.00, 2867.37, 0.00)	DC
20H1	HIGH	1ST HIGH VALUE IS	1.30519	ON 06120816:	AT (424050.00, 4526350.00, 1309.00, 2867.37, 0.00)	DC
20H2	HIGH	1ST HIGH VALUE IS	2.51387	ON 06092216:	AT (423950.00, 4526050.00, 1308.90, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	2.33331	ON 06092216:	AT (423950.00, 4526050.00, 1308.90, 2867.37, 0.00)	DC

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
23H1	HIGH	1ST HIGH VALUE IS	1.56623	ON 06092216:	AT (423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	1.95939	ON 06092216:	AT (423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	1.85074	ON 06092216:	AT (423874.10, 4526311.60, 1305.39, 2867.37, 0.00)	DC
SCRUBBER	HIGH	1ST HIGH VALUE IS	16.67598	ON 06100316:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	1.55404	ON 06120816:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	2.55628	ON 06092216:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC
30H1	HIGH	1ST HIGH VALUE IS	3.49434	ON 06082316:	AT (423792.90, 4527219.80, 1296.88, 2867.37, 0.00)	DC
30H2	HIGH	1ST HIGH VALUE IS	3.51311	ON 06082316:	AT (423792.90, 4527219.80, 1296.88, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	2.89377	ON 06092216:	AT (423950.00, 4525950.00, 1308.08, 2867.37, 0.00)	DC
BOILER4	HIGH	1ST HIGH VALUE IS	10.60833m	ON 06032616:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
BOILER5	HIGH	1ST HIGH VALUE IS	5.09336m	ON 06032616:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
BOILER8	HIGH	1ST HIGH VALUE IS	10.74641	ON 06102516:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
BOILER9	HIGH	1ST HIGH VALUE IS	17.08784	ON 06102516:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
BOILER10	HIGH	1ST HIGH VALUE IS	10.56392	ON 06032608:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	8.14668	ON 06122816:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H2	HIGH	1ST HIGH VALUE IS	2.22533	ON 06092016:	AT (424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC
68H3	HIGH	1ST HIGH VALUE IS	3.64163	ON 06120816:	AT (424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC
68H4	HIGH	1ST HIGH VALUE IS	2.87990	ON 06020708:	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC
68H5	HIGH	1ST HIGH VALUE IS	3.11818m	ON 06090408:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	2.70249	ON 06092508:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	3.12340	ON 06013008:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.27191	ON 06112916:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.30018	ON 06112916:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.29284	ON 06112916:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.27559	ON 06092216:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
FLARES	HIGH	1ST HIGH VALUE IS	1.64593	ON 06100316:	AT (423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC
FLAREN	HIGH	1ST HIGH VALUE IS	1.64605	ON 06100316:	AT (423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 10 Warning Message(s)
A Total of 525 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 525 Missing Hours Identified (5.99 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

```
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          4H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          9H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          9H2
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         12H1
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:          7H3
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:         10H2
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:       FLARES
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:       FLAREN
CN W305      13 WAKFLG:Stack height > or = EPA formula height for SRCID:         33H1
CN W305      72 WAKFLG:Stack height > or = EPA formula height for SRCID:         19H1
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                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for    50 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay for URBAN/Non-SO2.
        6. Urban Roughness Length of 1.0 Meter Assumed.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  2 Short Term Average(s) of:   1-HR   8-HR

**This Run Includes:     50 Source(s);      52 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  CO

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     38.1 MB of RAM.

**Input Runstream File:          Holly_V17_2007_CO.DTA
**Output Print File:             Holly_V17_2007_CO.LST

**File for Summary of Results:   C:\beast\Holly\Holly_V17_2007_CO.SUM
```



```
                                          *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                 *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                          (METERS/SEC)

                                               1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2007.SFC Met Version: 11059
Profile file: SY2007.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2007 Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-2.0	0.051	-9.000	-9.000	-999.	27.	5.4	0.01	0.28	1.00	1.80	267.	10.0	270.4	10.0
07	01	01	1	02	-1.2	0.042	-9.000	-9.000	-999.	20.	4.6	0.02	0.28	1.00	1.30	295.	10.0	270.9	10.0
07	01	01	1	03	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	93.	10.0	270.6	10.0
07	01	01	1	04	-0.8	0.036	-9.000	-9.000	-999.	16.	4.4	0.07	0.28	1.00	0.90	141.	10.0	270.6	10.0
07	01	01	1	05	-2.4	0.063	-9.000	-9.000	-999.	37.	8.4	0.12	0.28	1.00	1.40	172.	10.0	270.4	10.0
07	01	01	1	06	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	114.	10.0	270.4	10.0
07	01	01	1	07	-0.5	0.029	-9.000	-9.000	-999.	11.	3.3	0.04	0.28	1.00	0.80	87.	10.0	270.0	10.0
07	01	01	1	08	-0.5	0.026	-9.000	-9.000	-999.	9.	2.7	0.01	0.28	1.00	0.90	262.	10.0	269.5	10.0
07	01	01	1	09	-4.5	0.099	-9.000	-9.000	-999.	71.	16.8	0.09	0.28	0.51	1.90	347.	10.0	269.0	10.0
07	01	01	1	10	9.0	0.139	0.572	0.017	655.	119.	-23.4	0.04	0.28	0.30	1.70	315.	10.0	271.0	10.0
07	01	01	1	11	22.7	0.145	0.787	0.018	677.	128.	-10.7	0.06	0.28	0.22	1.50	14.	10.0	272.8	10.0
07	01	01	1	12	31.5	0.186	0.891	0.018	707.	184.	-16.0	0.06	0.28	0.19	2.00	13.	10.0	272.9	10.0
07	01	01	1	13	34.6	0.222	0.934	0.018	740.	241.	-25.0	0.06	0.28	0.19	2.50	5.	10.0	273.4	10.0
07	01	01	1	14	38.8	0.298	0.985	0.018	777.	374.	-53.6	0.09	0.28	0.19	3.20	359.	10.0	273.9	10.0
07	01	01	1	15	28.3	0.138	0.898	0.018	805.	136.	-7.3	0.04	0.28	0.22	1.50	64.	10.0	275.4	10.0
07	01	01	1	16	11.6	0.177	0.671	0.018	816.	171.	-37.4	0.05	0.28	0.29	2.10	111.	10.0	275.1	10.0
07	01	01	1	17	-7.2	0.120	-9.000	-9.000	-999.	96.	18.8	0.07	0.28	0.49	2.30	134.	10.0	273.6	10.0
07	01	01	1	18	-4.8	0.077	-9.000	-9.000	-999.	49.	7.5	0.12	0.28	1.00	1.70	152.	10.0	272.0	10.0
07	01	01	1	19	-2.1	0.045	-9.000	-9.000	-999.	22.	3.4	0.01	0.28	1.00	1.50	221.	10.0	271.0	10.0
07	01	01	1	20	-0.8	0.029	-9.000	-9.000	-999.	11.	2.4	0.01	0.28	1.00	1.00	242.	10.0	270.4	10.0
07	01	01	1	21	-6.2	0.083	-9.000	-9.000	-999.	55.	7.3	0.07	0.28	1.00	2.10	128.	10.0	269.8	10.0
07	01	01	1	22	-8.2	0.095	-9.000	-9.000	-999.	68.	8.4	0.07	0.28	1.00	2.40	136.	10.0	269.4	10.0
07	01	01	1	23	-9.6	0.103	-9.000	-9.000	-999.	76.	9.1	0.07	0.28	1.00	2.60	142.	10.0	268.8	10.0
07	01	01	1	24	-5.1	0.075	-9.000	-9.000	-999.	48.	6.6	0.07	0.28	1.00	1.90	148.	10.0	269.0	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	10.0	1	267.	1.80	270.5	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	254.92307	ON 07020513:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
NEW	HIGH 1ST HIGH VALUE IS	70.25235	ON 07012406:	AT (424850.00, 4526750.00, 1319.27, 2867.37, 0.00)	DC
4H1	HIGH 1ST HIGH VALUE IS	36.65420	ON 07030318:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
4K1A	HIGH 1ST HIGH VALUE IS	41.23328	ON 07040413:	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC
4K1B	HIGH 1ST HIGH VALUE IS	36.03203	ON 07031813:	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC
4V82	HIGH 1ST HIGH VALUE IS	193.06319	ON 07020513:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
6H1	HIGH 1ST HIGH VALUE IS	10.75822	ON 07041018:	AT (424073.10, 4526413.90, 1308.34, 2867.37, 0.00)	DC
6H3	HIGH 1ST HIGH VALUE IS	2.96462	ON 07021317:	AT (424050.00, 4526150.00, 1310.00, 2867.37, 0.00)	DC
6H2	HIGH 1ST HIGH VALUE IS	6.01561	ON 07032713:	AT (424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC
6K1	HIGH 1ST HIGH VALUE IS	7.49888	ON 07122121:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
6K2	HIGH 1ST HIGH VALUE IS	7.62910	ON 07112107:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
7H3	HIGH 1ST HIGH VALUE IS	2.91956	ON 07013007:	AT (424350.00, 4527200.00, 1305.73, 2867.37, 0.00)	DC
7H1	HIGH 1ST HIGH VALUE IS	4.52045	ON 07030117:	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC

8H1	HIGH	1ST HIGH VALUE IS	5.26445	ON 07013111: AT (	423900.00,	4526200.00,	1306.00,	2867.37,	0.00)	DC
9H1	HIGH	1ST HIGH VALUE IS	7.16772	ON 07042015: AT (	424092.30,	4526485.40,	1308.49,	2867.37,	0.00)	DC
9H2	HIGH	1ST HIGH VALUE IS	9.88603	ON 07042012: AT (	424000.00,	4526500.00,	1306.05,	2867.37,	0.00)	DC
10H1	HIGH	1ST HIGH VALUE IS	3.35992	ON 07062309: AT (	423998.60,	4526535.60,	1306.00,	2867.37,	0.00)	DC
10H2	HIGH	1ST HIGH VALUE IS	5.60545	ON 07031010: AT (	423950.00,	4526150.00,	1307.00,	2867.37,	0.00)	DC
11H1	HIGH	1ST HIGH VALUE IS	3.58087	ON 07062310: AT (	424000.00,	4526550.00,	1305.81,	2867.37,	0.00)	DC
12H1	HIGH	1ST HIGH VALUE IS	2.19101	ON 07041509: AT (	423850.00,	4526100.00,	1305.14,	2867.37,	0.00)	DC
13H1	HIGH	1ST HIGH VALUE IS	4.23358	ON 07020713: AT (	423997.30,	4526411.20,	1307.00,	2867.37,	0.00)	DC
19H1	HIGH	1ST HIGH VALUE IS	2.59125	ON 07062310: AT (	424079.80,	4526430.90,	1308.90,	2867.37,	0.00)	DC
20H1	HIGH	1ST HIGH VALUE IS	2.35073	ON 07060209: AT (	423962.20,	4526296.80,	1306.98,	2867.37,	0.00)	DC
20H2	HIGH	1ST HIGH VALUE IS	4.03073	ON 07013111: AT (	423900.00,	4526150.00,	1306.00,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	3.91956	ON 07021411: AT (	423950.00,	4526200.00,	1307.00,	2867.37,	0.00)	DC

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)					OF TYPE
23H1	HIGH	1ST HIGH VALUE IS	2.74733	ON 07040209: AT (	424016.60,	4526316.60,	1308.01,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	3.50575	ON 07053109: AT (	423841.00,	4527079.80,	1298.99,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	3.23385	ON 07053109: AT (	423840.40,	4526987.00,	1299.47,	2867.37,	0.00)	DC
SCRUBBER	HIGH	1ST HIGH VALUE IS	48.29667	ON 07012406: AT (	424750.00,	4526750.00,	1317.76,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	3.30347	ON 07010616: AT (	423538.80,	4527067.90,	1294.00,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	3.98389	ON 07012406: AT (	424950.00,	4526800.00,	1320.50,	2867.37,	0.00)	DC
30H1	HIGH	1ST HIGH VALUE IS	6.26471	ON 07042210: AT (	424000.00,	4527150.00,	1301.96,	2867.37,	0.00)	DC
30H2	HIGH	1ST HIGH VALUE IS	6.25266	ON 07042210: AT (	424000.00,	4527150.00,	1301.96,	2867.37,	0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	5.22166	ON 07012406: AT (	424950.00,	4526450.00,	1324.14,	2867.37,	0.00)	DC
BOILER4	HIGH	1ST HIGH VALUE IS	20.58108	ON 07030102: AT (	423999.60,	4526635.10,	1305.00,	2867.37,	0.00)	DC
BOILER5	HIGH	1ST HIGH VALUE IS	19.38062	ON 07032711: AT (	424001.20,	4526784.40,	1303.92,	2867.37,	0.00)	DC
BOILER8	HIGH	1ST HIGH VALUE IS	28.94196	ON 07060610: AT (	423999.60,	4526635.10,	1305.00,	2867.37,	0.00)	DC
BOILER9	HIGH	1ST HIGH VALUE IS	31.98416	ON 07060611: AT (	423999.90,	4526660.00,	1304.88,	2867.37,	0.00)	DC
BOILER10	HIGH	1ST HIGH VALUE IS	29.16814	ON 07060612: AT (	423999.90,	4526660.00,	1304.88,	2867.37,	0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	13.65077	ON 07041016: AT (	423998.10,	4526485.90,	1306.00,	2867.37,	0.00)	DC
68H2	HIGH	1ST HIGH VALUE IS	5.18375	ON 07021207: AT (	424226.70,	4526768.00,	1308.00,	2867.37,	0.00)	DC
68H3	HIGH	1ST HIGH VALUE IS	6.83065	ON 07042021: AT (	424278.70,	4526656.80,	1308.99,	2867.37,	0.00)	DC
68H4	HIGH	1ST HIGH VALUE IS	7.16487	ON 07040621: AT (	424173.90,	4526712.00,	1308.32,	2867.37,	0.00)	DC
68H5	HIGH	1ST HIGH VALUE IS	6.11535	ON 07082921: AT (	424021.80,	4526830.80,	1304.02,	2867.37,	0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	6.22557	ON 07051603: AT (	424021.30,	4526781.80,	1304.07,	2867.37,	0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	6.39643	ON 07123108: AT (	424214.70,	4526825.30,	1307.63,	2867.37,	0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.67158	ON 07012817: AT (	423999.10,	4526585.40,	1305.28,	2867.37,	0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.59951	ON 07012817: AT (	423999.10,	4526585.40,	1305.28,	2867.37,	0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.66002	ON 07012817: AT (	423998.90,	4526560.50,	1305.38,	2867.37,	0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.59434	ON 07010316: AT (	423750.00,	4526300.00,	1303.46,	2867.37,	0.00)	DC

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
FLARES	HIGH	1ST HIGH VALUE IS	4.52094	ON 07021723:	AT (424600.00, 4526000.00, 1322.00, 2867.37, 0.00)	DC
FLAREN	HIGH	1ST HIGH VALUE IS	4.52126	ON 07021723:	AT (424600.00, 4526000.00, 1322.00, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	75.81056	ON 07041908:	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC
NEW	HIGH	1ST HIGH VALUE IS	28.77804m	ON 07030216:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
4H1	HIGH	1ST HIGH VALUE IS	16.70874	ON 07062616:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
4K1A	HIGH	1ST HIGH VALUE IS	15.23730m	ON 07050816:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4K1B	HIGH	1ST HIGH VALUE IS	16.57532	ON 07062616:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4V82	HIGH	1ST HIGH VALUE IS	40.14545	ON 07052016:	AT (424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC
6H1	HIGH	1ST HIGH VALUE IS	2.81168m	ON 07041024:	AT (424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC
6H3	HIGH	1ST HIGH VALUE IS	1.66139	ON 07020716:	AT (424150.00, 4526450.00, 1310.00, 2867.37, 0.00)	DC
6H2	HIGH	1ST HIGH VALUE IS	2.88729m	ON 07050224:	AT (424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC
6K1	HIGH	1ST HIGH VALUE IS	2.98800	ON 07111208:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
6K2	HIGH	1ST HIGH VALUE IS	3.25138	ON 07111208:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
7H3	HIGH	1ST HIGH VALUE IS	1.56540	ON 07020716:	AT (423997.60, 4526436.10, 1307.00, 2867.37, 0.00)	DC
7H1	HIGH	1ST HIGH VALUE IS	2.14162	ON 07011208:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
8H1	HIGH	1ST HIGH VALUE IS	3.06957m	ON 07030216:	AT (423900.00, 4526100.00, 1306.02, 2867.37, 0.00)	DC
9H1	HIGH	1ST HIGH VALUE IS	3.31624	ON 07041616:	AT (424100.00, 4526500.00, 1308.69, 2867.37, 0.00)	DC
9H2	HIGH	1ST HIGH VALUE IS	4.85545	ON 07030108:	AT (424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC
10H1	HIGH	1ST HIGH VALUE IS	1.91079	ON 07020716:	AT (423997.30, 4526411.20, 1307.00, 2867.37, 0.00)	DC
10H2	HIGH	1ST HIGH VALUE IS	3.33543m	ON 07030216:	AT (423900.00, 4526050.00, 1306.00, 2867.37, 0.00)	DC
11H1	HIGH	1ST HIGH VALUE IS	1.84232	ON 07020716:	AT (424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC
12H1	HIGH	1ST HIGH VALUE IS	1.29728m	ON 07030216:	AT (423900.00, 4525950.00, 1307.00, 2867.37, 0.00)	DC
13H1	HIGH	1ST HIGH VALUE IS	2.53199	ON 07020716:	AT (424017.30, 4526390.10, 1308.00, 2867.37, 0.00)	DC
19H1	HIGH	1ST HIGH VALUE IS	1.50736	ON 07020716:	AT (424050.00, 4526350.00, 1309.00, 2867.37, 0.00)	DC
20H1	HIGH	1ST HIGH VALUE IS	1.34526	ON 07020716:	AT (424035.70, 4526336.00, 1308.43, 2867.37, 0.00)	DC
20H2	HIGH	1ST HIGH VALUE IS	2.11710m	ON 07030216:	AT (423900.00, 4526050.00, 1306.00, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	2.14354	ON 07020716:	AT (424100.00, 4526300.00, 1310.00, 2867.37, 0.00)	DC

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
23H1	HIGH	1ST HIGH VALUE IS	1.56062	ON 07020716:	AT (424066.40, 4526397.00, 1308.57, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	1.84039	ON 07052416:	AT (423815.90, 4527180.20, 1297.21, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	1.67881m	ON 07030216:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
SCRUBBER	HIGH	1ST HIGH VALUE IS	17.17352	ON 07020716:	AT (424116.80, 4526553.40, 1308.40, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	1.50905	ON 07020716:	AT (424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	2.29142m	ON 07030216:	AT (423850.00, 4526300.00, 1305.00, 2867.37, 0.00)	DC
30H1	HIGH	1ST HIGH VALUE IS	3.35986	ON 07022016:	AT (423850.00, 4527250.00, 1297.74, 2867.37, 0.00)	DC
30H2	HIGH	1ST HIGH VALUE IS	3.36939	ON 07022016:	AT (423850.00, 4527250.00, 1297.74, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	2.57820m	ON 07030216:	AT (423900.00, 4525950.00, 1307.00, 2867.37, 0.00)	DC
BOILER4	HIGH	1ST HIGH VALUE IS	12.37537	ON 07030108:	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC
BOILER5	HIGH	1ST HIGH VALUE IS	9.69280	ON 07041016:	AT (423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC
BOILER8	HIGH	1ST HIGH VALUE IS	19.45559	ON 07041908:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
BOILER9	HIGH	1ST HIGH VALUE IS	24.10270	ON 07041908:	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC
BOILER10	HIGH	1ST HIGH VALUE IS	16.40483	ON 07041908:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	8.94561	ON 07041908:	AT (424141.30, 4526621.40, 1308.11, 2867.37, 0.00)	DC
68H2	HIGH	1ST HIGH VALUE IS	2.09977	ON 07031216:	AT (424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC
68H3	HIGH	1ST HIGH VALUE IS	3.40258	ON 07020716:	AT (424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC
68H4	HIGH	1ST HIGH VALUE IS	3.04688	ON 07120624:	AT (424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC
68H5	HIGH	1ST HIGH VALUE IS	2.96116	ON 07110408:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	2.78718m	ON 07102424:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	2.84617	ON 07102208:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.26631m	ON 07030216:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.25567m	ON 07030216:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.28651m	ON 07030216:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.31407m	ON 07030216:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
FLARES	HIGH	1ST HIGH VALUE IS	1.68588	ON 07120724:	AT (424450.00, 4525900.00, 1320.98, 2867.37, 0.00)	DC
FLAREN	HIGH	1ST HIGH VALUE IS	1.68600	ON 07120724:	AT (424450.00, 4525900.00, 1320.98, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 10 Warning Message(s)
A Total of 2026 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 2026 Missing Hours Identified (23.13 Percent)

CAUTION!: Number of Missing Hours Exceeds 10 Percent of Total!
Data May Not Be Acceptable for Regulatory Applications.
See Section 5.3.2 of "Meteorological Monitoring Guidance
for Regulatory Modeling Applications" (EPA-454/R-99-005).

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

```
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:      7H3
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:     10H2
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:     12H1
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:   FLARES
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:   FLAREN
CN W305      4 WAKFLG:Stack height > or = EPA formula height for SRCID:      9H2
CN W305      5 WAKFLG:Stack height > or = EPA formula height for SRCID:      4H1
CN W305      5 WAKFLG:Stack height > or = EPA formula height for SRCID:      9H1
CN W305     11 WAKFLG:Stack height > or = EPA formula height for SRCID:     33H1
CN W305     15 WAKFLG:Stack height > or = EPA formula height for SRCID:     19H1
```

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                                         ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for    50 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay for URBAN/Non-SO2.
        6. Urban Roughness Length of 1.0 Meter Assumed.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  2 Short Term Average(s) of:   1-HR   8-HR

**This Run Includes:     50 Source(s);      52 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  CO

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ; Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     38.1 MB of RAM.

**Input Runstream File:          Holly_V17_2008_CO.DTA
**Output Print File:             Holly_V17_2008_CO.LST

**File for Summary of Results:   C:\beast\Holly\Holly_V17_2008_CO.SUM
```



```
                                         *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                            (1=YES; 0=NO)

          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

              NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                  *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                         (METERS/SEC)

                                                 1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2008.SFC Met Version: 11059
Profile file: SY2008.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2008 Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-24.3	0.228	-9.000	-9.000	-999.	250.	38.8	0.07	0.28	1.00	3.60	144.	10.0	264.2	10.0
08	01	01	1	02	-9.9	0.103	-9.000	-9.000	-999.	85.	8.9	0.07	0.28	1.00	2.60	130.	10.0	263.6	10.0
08	01	01	1	03	-3.8	0.064	-9.000	-9.000	-999.	37.	5.5	0.07	0.28	1.00	1.60	127.	10.0	263.0	10.0
08	01	01	1	04	-10.3	0.109	-9.000	-9.000	-999.	82.	10.0	0.12	0.28	1.00	2.40	153.	10.0	263.6	10.0
08	01	01	1	05	-8.5	0.095	-9.000	-9.000	-999.	68.	8.2	0.07	0.28	1.00	2.40	123.	10.0	263.1	10.0
08	01	01	1	06	-7.9	0.091	-9.000	-9.000	-999.	63.	7.6	0.05	0.28	1.00	2.40	93.	10.0	262.9	10.0
08	01	01	1	07	-7.2	0.086	-9.000	-9.000	-999.	58.	7.0	0.04	0.28	1.00	2.40	63.	10.0	262.6	10.0
08	01	01	1	08	-11.6	0.116	-9.000	-9.000	-999.	91.	10.9	0.05	0.28	1.00	2.90	30.	10.0	261.4	10.0
08	01	01	1	09	-13.2	0.185	-9.000	-9.000	-999.	184.	38.9	0.06	0.28	0.51	3.00	24.	10.0	262.9	10.0
08	01	01	1	10	10.3	0.229	0.258	0.005	54.	252.	-94.0	0.06	0.28	0.30	2.80	26.	10.0	264.2	10.0
08	01	01	1	11	27.2	0.247	0.447	0.005	105.	283.	-44.5	0.06	0.28	0.22	2.90	23.	10.0	265.8	10.0
08	01	01	1	12	31.4	0.256	0.518	0.005	142.	298.	-43.0	0.06	0.28	0.19	3.00	24.	10.0	267.2	10.0
08	01	01	1	13	34.5	0.201	0.582	0.007	183.	208.	-18.9	0.05	0.28	0.19	2.30	54.	10.0	268.6	10.0
08	01	01	1	14	31.7	0.255	0.602	0.005	220.	296.	-41.7	0.05	0.28	0.19	3.10	37.	10.0	267.6	10.0
08	01	01	1	15	23.3	0.252	0.565	0.005	247.	291.	-55.2	0.06	0.28	0.22	3.00	3.	10.0	267.8	10.0
08	01	01	1	16	-0.3	0.246	-9.000	-9.000	-999.	281.	4710.6	0.06	0.28	0.29	3.20	17.	10.0	267.4	10.0
08	01	01	1	17	-8.9	0.196	-9.000	-9.000	-999.	200.	68.0	0.06	0.28	0.49	2.90	13.	10.0	266.1	10.0
08	01	01	1	18	-13.0	0.244	-9.000	-9.000	-999.	277.	88.9	0.06	0.28	1.00	3.50	8.	10.0	264.5	10.0
08	01	01	1	19	-5.5	0.104	-9.000	-9.000	-999.	90.	16.1	0.05	0.28	1.00	2.20	35.	10.0	264.2	10.0
08	01	01	1	20	-2.6	0.056	-9.000	-9.000	-999.	31.	5.3	0.05	0.28	1.00	1.50	48.	10.0	264.2	10.0
08	01	01	1	21	-2.5	0.062	-9.000	-9.000	-999.	35.	7.4	0.06	0.28	1.00	1.60	17.	10.0	263.4	10.0
08	01	01	1	22	-2.9	0.066	-9.000	-9.000	-999.	39.	7.9	0.06	0.28	1.00	1.70	26.	10.0	263.9	10.0
08	01	01	1	23	-8.6	0.160	-9.000	-9.000	-999.	147.	38.2	0.06	0.28	1.00	2.60	24.	10.0	263.0	10.0
08	01	01	1	24	-26.9	0.273	-9.000	-9.000	-999.	327.	60.1	0.06	0.28	1.00	4.10	15.	10.0	262.9	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	10.0	1	144.	3.60	264.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	218.96997	ON 08051610:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
NEW	HIGH 1ST HIGH VALUE IS	69.54713	ON 08102407:	AT (424800.00, 4526900.00, 1316.60, 2867.37, 0.00)	DC
4H1	HIGH 1ST HIGH VALUE IS	30.21301	ON 08102816:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4K1A	HIGH 1ST HIGH VALUE IS	108.35734	ON 08050220:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
4K1B	HIGH 1ST HIGH VALUE IS	35.19775	ON 08121613:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
4V82	HIGH 1ST HIGH VALUE IS	181.92401	ON 08051610:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
6H1	HIGH 1ST HIGH VALUE IS	9.92529	ON 08083116:	AT (424066.40, 4526397.00, 1308.57, 2867.37, 0.00)	DC
6H3	HIGH 1ST HIGH VALUE IS	4.24941	ON 08042008:	AT (424150.00, 4526250.00, 1311.00, 2867.37, 0.00)	DC
6H2	HIGH 1ST HIGH VALUE IS	5.39835	ON 08041915:	AT (424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC
6K1	HIGH 1ST HIGH VALUE IS	7.78921	ON 08032321:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
6K2	HIGH 1ST HIGH VALUE IS	7.64586	ON 08052723:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
7H3	HIGH 1ST HIGH VALUE IS	2.83194	ON 08082810:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
7H1	HIGH 1ST HIGH VALUE IS	4.12798	ON 08052610:	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC

8H1	HIGH	1ST HIGH VALUE IS	5.84104	ON 08082810: AT (	423900.00,	4526300.00,	1306.00,	2867.37,	0.00)	DC
9H1	HIGH	1ST HIGH VALUE IS	7.58412	ON 08111015: AT (	424124.90,	4526576.10,	1308.06,	2867.37,	0.00)	DC
9H2	HIGH	1ST HIGH VALUE IS	10.07795	ON 08101116: AT (	424000.00,	4526500.00,	1306.05,	2867.37,	0.00)	DC
10H1	HIGH	1ST HIGH VALUE IS	3.29672	ON 08111912: AT (	423998.40,	4526510.70,	1306.00,	2867.37,	0.00)	DC
10H2	HIGH	1ST HIGH VALUE IS	6.42027	ON 08082810: AT (	423900.00,	4526250.00,	1305.93,	2867.37,	0.00)	DC
11H1	HIGH	1ST HIGH VALUE IS	3.42979	ON 08112512: AT (	423998.40,	4526510.70,	1306.00,	2867.37,	0.00)	DC
12H1	HIGH	1ST HIGH VALUE IS	2.50005	ON 08082810: AT (	423900.00,	4526200.00,	1306.00,	2867.37,	0.00)	DC
13H1	HIGH	1ST HIGH VALUE IS	4.48244	ON 08062809: AT (	424000.00,	4526400.00,	1307.79,	2867.37,	0.00)	DC
19H1	HIGH	1ST HIGH VALUE IS	2.70435	ON 08070809: AT (	423850.00,	4526300.00,	1305.00,	2867.37,	0.00)	DC
20H1	HIGH	1ST HIGH VALUE IS	2.44545	ON 08071209: AT (	423962.90,	4526257.70,	1307.00,	2867.37,	0.00)	DC
20H2	HIGH	1ST HIGH VALUE IS	4.38449	ON 08082809: AT (	423900.00,	4526200.00,	1306.00,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	4.26563	ON 08071209: AT (	423972.40,	4526218.80,	1307.00,	2867.37,	0.00)	DC

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)					OF TYPE
23H1	HIGH	1ST HIGH VALUE IS	2.87728	ON 08071209: AT (	423996.30,	4526311.70,	1308.14,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	3.58704	ON 08061410: AT (	423841.00,	4527079.80,	1298.99,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	3.16447	ON 08032311: AT (	423933.50,	4526984.90,	1300.98,	2867.37,	0.00)	DC
SCRUBBER	HIGH	1ST HIGH VALUE IS	47.29883	ON 08102407: AT (	424800.00,	4526900.00,	1316.60,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	3.36722	ON 08022417: AT (	423585.50,	4527067.50,	1295.96,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	4.08272	ON 08061410: AT (	423863.80,	4527102.50,	1299.00,	2867.37,	0.00)	DC
30H1	HIGH	1ST HIGH VALUE IS	6.68134	ON 08061410: AT (	423841.20,	4527102.90,	1298.97,	2867.37,	0.00)	DC
30H2	HIGH	1ST HIGH VALUE IS	6.74715	ON 08061410: AT (	423841.20,	4527102.90,	1298.97,	2867.37,	0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	5.22298	ON 08102407: AT (	424950.00,	4526600.00,	1322.48,	2867.37,	0.00)	DC
BOILER4	HIGH	1ST HIGH VALUE IS	20.69978	ON 08012902: AT (	423999.40,	4526610.20,	1304.83,	2867.37,	0.00)	DC
BOILER5	HIGH	1ST HIGH VALUE IS	19.60129	ON 08052610: AT (	424001.20,	4526784.40,	1303.92,	2867.37,	0.00)	DC
BOILER8	HIGH	1ST HIGH VALUE IS	27.77773	ON 08042010: AT (	424000.00,	4526600.00,	1304.70,	2867.37,	0.00)	DC
BOILER9	HIGH	1ST HIGH VALUE IS	32.51990	ON 08041922: AT (	423999.40,	4526610.20,	1304.83,	2867.37,	0.00)	DC
BOILER10	HIGH	1ST HIGH VALUE IS	27.43416	ON 08072921: AT (	424020.60,	4526708.40,	1305.02,	2867.37,	0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	14.24718	ON 08042009: AT (	423998.40,	4526510.70,	1306.00,	2867.37,	0.00)	DC
68H2	HIGH	1ST HIGH VALUE IS	5.19294	ON 08041119: AT (	424218.60,	4526745.80,	1308.03,	2867.37,	0.00)	DC
68H3	HIGH	1ST HIGH VALUE IS	6.75975	ON 08082304: AT (	424232.60,	4526656.80,	1309.65,	2867.37,	0.00)	DC
68H4	HIGH	1ST HIGH VALUE IS	6.98226	ON 08030721: AT (	424173.90,	4526712.00,	1308.32,	2867.37,	0.00)	DC
68H5	HIGH	1ST HIGH VALUE IS	6.06450	ON 08090722: AT (	424021.80,	4526830.80,	1304.02,	2867.37,	0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	6.05533	ON 08060804: AT (	424001.20,	4526784.40,	1303.92,	2867.37,	0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	6.55131	ON 08111419: AT (	424231.00,	4526870.60,	1306.99,	2867.37,	0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.65018	ON 08111015: AT (	424000.00,	4526600.00,	1304.70,	2867.37,	0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.54940	ON 08012416: AT (	423703.10,	4526311.50,	1302.74,	2867.37,	0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.61827	ON 08111015: AT (	423999.10,	4526585.40,	1305.28,	2867.37,	0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.59638	ON 08112416: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
FLARES	HIGH	1ST HIGH VALUE IS	4.55266	ON 08122904:	AT (424850.00, 4527350.00, 1312.08, 2867.37, 0.00)	DC
FLAREN	HIGH	1ST HIGH VALUE IS	4.55297	ON 08122904:	AT (424850.00, 4527350.00, 1312.08, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	82.11604	ON 08071116:	AT (423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC
NEW	HIGH	1ST HIGH VALUE IS	32.70350	ON 08021816:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
4H1	HIGH	1ST HIGH VALUE IS	14.18012	ON 08050516:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
4K1A	HIGH	1ST HIGH VALUE IS	13.55064	ON 08050224:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
4K1B	HIGH	1ST HIGH VALUE IS	12.45995	ON 08032416:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
4V82	HIGH	1ST HIGH VALUE IS	44.60784	ON 08051616:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
6H1	HIGH	1ST HIGH VALUE IS	3.57828	ON 08031616:	AT (423947.40, 4526311.70, 1306.11, 2867.37, 0.00)	DC
6H3	HIGH	1ST HIGH VALUE IS	1.84820	ON 08022016:	AT (423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC
6H2	HIGH	1ST HIGH VALUE IS	2.11031	ON 08100924:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC
6K1	HIGH	1ST HIGH VALUE IS	3.24059m	ON 08022824:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
6K2	HIGH	1ST HIGH VALUE IS	3.11844m	ON 08022824:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
7H3	HIGH	1ST HIGH VALUE IS	1.75397	ON 08022016:	AT (423768.50, 4526277.50, 1303.49, 2867.37, 0.00)	DC
7H1	HIGH	1ST HIGH VALUE IS	1.72640	ON 08031624:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
8H1	HIGH	1ST HIGH VALUE IS	3.51295	ON 08071116:	AT (423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC
9H1	HIGH	1ST HIGH VALUE IS	2.70361	ON 08013016:	AT (424100.00, 4526500.00, 1308.69, 2867.37, 0.00)	DC
9H2	HIGH	1ST HIGH VALUE IS	4.33030	ON 08042016:	AT (424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC
10H1	HIGH	1ST HIGH VALUE IS	2.23235	ON 08022016:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
10H2	HIGH	1ST HIGH VALUE IS	4.10065	ON 08031616:	AT (423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC
11H1	HIGH	1ST HIGH VALUE IS	2.04771	ON 08022016:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
12H1	HIGH	1ST HIGH VALUE IS	1.46205	ON 08071116:	AT (423950.00, 4526050.00, 1308.90, 2867.37, 0.00)	DC
13H1	HIGH	1ST HIGH VALUE IS	2.54486	ON 08022016:	AT (423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC
19H1	HIGH	1ST HIGH VALUE IS	1.60656	ON 08021816:	AT (423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC
20H1	HIGH	1ST HIGH VALUE IS	1.52586	ON 08021816:	AT (423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC
20H2	HIGH	1ST HIGH VALUE IS	2.43219	ON 08071116:	AT (423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	2.36373	ON 08071116:	AT (423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
23H1	HIGH	1ST HIGH VALUE IS	1.78560	ON 08022016:	AT (423900.00, 4526300.00, 1306.00, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	2.13874	ON 08040416:	AT (423792.10, 4527180.50, 1297.01, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	2.00815	ON 08111216:	AT (423678.90, 4527221.00, 1295.53, 2867.37, 0.00)	DC
SCRUBBER	HIGH	1ST HIGH VALUE IS	19.66061	ON 08021816:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	1.27172	ON 08111816:	AT (424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	2.49998	ON 08071116:	AT (423947.40, 4526311.70, 1306.11, 2867.37, 0.00)	DC
30H1	HIGH	1ST HIGH VALUE IS	3.83703	ON 08040416:	AT (423792.90, 4527219.80, 1296.88, 2867.37, 0.00)	DC
30H2	HIGH	1ST HIGH VALUE IS	3.84924	ON 08040416:	AT (423792.90, 4527219.80, 1296.88, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	2.93237	ON 08071116:	AT (423950.00, 4526000.00, 1308.00, 2867.37, 0.00)	DC
BOILER4	HIGH	1ST HIGH VALUE IS	12.50129	ON 08042016:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
BOILER5	HIGH	1ST HIGH VALUE IS	7.20030	ON 08042016:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
BOILER8	HIGH	1ST HIGH VALUE IS	15.69183	ON 08042016:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
BOILER9	HIGH	1ST HIGH VALUE IS	20.81490	ON 08042016:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
BOILER10	HIGH	1ST HIGH VALUE IS	6.23351	ON 08042016:	AT (424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	8.72376	ON 08031616:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H2	HIGH	1ST HIGH VALUE IS	2.15184	ON 08111816:	AT (424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC
68H3	HIGH	1ST HIGH VALUE IS	3.32395	ON 08053016:	AT (424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC
68H4	HIGH	1ST HIGH VALUE IS	2.75940m	ON 08021508:	AT (424020.30, 4526683.90, 1305.00, 2867.37, 0.00)	DC
68H5	HIGH	1ST HIGH VALUE IS	2.72016	ON 08011808:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	2.47297	ON 08090208:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	2.49539	ON 08100708:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.29972	ON 08110516:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.28283	ON 08110516:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.30322	ON 08110516:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.41829	ON 08110516:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
FLARES	HIGH	1ST HIGH VALUE IS	1.77189	ON 08071116:	AT (423768.50, 4526277.50, 1303.49, 2867.37, 0.00)	DC
FLAREN	HIGH	1ST HIGH VALUE IS	1.77201	ON 08071116:	AT (423768.50, 4526277.50, 1303.49, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 10 Warning Message(s)
A Total of 146 Informational Message(s)

A Total of 8784 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 146 Missing Hours Identified (1.66 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

```
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:      9H2
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:     12H1
CN W305      5 WAKFLG:Stack height > or = EPA formula height for SRCID:   FLARES
CN W305      5 WAKFLG:Stack height > or = EPA formula height for SRCID:   FLAREN
CN W305      7 WAKFLG:Stack height > or = EPA formula height for SRCID:     10H2
CN W305      7 WAKFLG:Stack height > or = EPA formula height for SRCID:     19H1
CN W305      7 WAKFLG:Stack height > or = EPA formula height for SRCID:     33H1
CN W305      8 WAKFLG:Stack height > or = EPA formula height for SRCID:      9H1
CN W305      9 WAKFLG:Stack height > or = EPA formula height for SRCID:      4H1
CN W305     44 WAKFLG:Stack height > or = EPA formula height for SRCID:      7H3
```

```
 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Short Term Averages           ***        05/07/12
                                   *** 4-years Met Data - Syracuse 2006-2009                               ***        17:21:02
                                                                                                                      PAGE   1
**MODELOPTs:  RegDFAULT CONC                                                 ELEV


                                           ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for    50 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay for URBAN/Non-SO2.
        6. Urban Roughness Length of 1.0 Meter Assumed.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  2 Short Term Average(s) of:   1-HR   8-HR

**This Run Includes:     50 Source(s);      52 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  CO

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     38.1 MB of RAM.

**Input Runstream File:          Holly_V17_2009_CO.DTA
**Output Print File:             Holly_V17_2009_CO.LST

**File for Summary of Results:   C:\beast\Holly\Holly_V17_2009_CO.SUM

*** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Short Term Averages           ***        05/07/12
                                  *** 4-years Met Data - Syracuse 2006-2009                               ***        17:21:02
                                                                                                                     PAGE   2
**MODELOPTs:  RegDFAULT CONC                                                 ELEV


                                          *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                         (METERS/SEC)

                                               1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2009.SFC Met Version: 11059
Profile file: SY2009.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 72572
Name: SALT_LAKE_CITY,UT Name: UNKNOWN
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.00	127.	10.0	267.9	10.0
09	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	1.80	120.	10.0	268.0	10.0
09	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	3.00	106.	10.0	269.1	10.0
09	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.10	132.	10.0	270.2	10.0
09	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.80	141.	10.0	269.8	10.0
09	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.50	148.	10.0	269.4	10.0
09	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	1.90	96.	10.0	269.2	10.0
09	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.12	0.28	1.00	0.80	178.	10.0	269.6	10.0
09	01	01	1	09	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	0.51	2.70	149.	10.0	270.9	10.0
09	01	01	1	10	9.0	0.274	0.144	0.005	10.	330.	-177.5	0.12	0.28	0.30	2.90	154.	10.0	271.9	10.0
09	01	01	1	11	22.7	0.173	0.298	0.012	36.	169.	-17.8	0.09	0.28	0.22	1.70	190.	10.0	273.9	10.0
09	01	01	1	12	31.6	0.109	0.420	0.018	73.	84.	-3.2	0.05	0.28	0.19	1.00	46.	10.0	275.6	10.0
09	01	01	1	13	34.8	0.258	0.504	0.005	114.	301.	-38.1	0.12	0.28	0.19	2.50	163.	10.0	277.0	10.0
09	01	01	1	14	32.1	0.113	0.539	0.013	151.	102.	-3.5	0.12	0.28	0.19	0.80	154.	10.0	277.9	10.0
09	01	01	1	15	4.7	0.155	0.288	0.013	157.	141.	-62.0	0.07	0.28	0.22	1.80	124.	10.0	278.8	10.0
09	01	01	1	16	0.4	0.334	0.124	0.005	158.	444.	-7805.0	0.07	0.28	0.29	4.20	143.	10.0	278.6	10.0
09	01	01	1	17	-14.1	0.342	-9.000	-9.000	-999.	460.	219.8	0.07	0.28	0.49	4.50	146.	10.0	277.9	10.0
09	01	01	1	18	-26.4	0.354	-9.000	-9.000	-999.	485.	130.6	0.07	0.28	1.00	4.80	146.	10.0	277.4	10.0
09	01	01	1	19	-35.5	0.392	-9.000	-9.000	-999.	564.	131.3	0.12	0.28	1.00	4.70	169.	10.0	277.4	10.0
09	01	01	1	20	-28.1	0.311	-9.000	-9.000	-999.	402.	82.5	0.12	0.28	1.00	3.90	150.	10.0	277.6	10.0
09	01	01	1	21	-29.8	0.330	-9.000	-9.000	-999.	437.	93.6	0.07	0.28	1.00	4.60	129.	10.0	278.5	10.0
09	01	01	1	22	-14.1	0.288	-9.000	-9.000	-999.	356.	130.9	0.07	0.28	1.00	3.90	131.	10.0	278.8	10.0
09	01	01	1	23	-23.6	0.320	-9.000	-9.000	-999.	416.	107.0	0.07	0.28	1.00	4.40	122.	10.0	278.9	10.0
09	01	01	1	24	-24.9	0.337	-9.000	-9.000	-999.	450.	118.7	0.07	0.28	1.00	4.60	130.	10.0	278.4	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	127.	3.00	267.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	249.74640	ON 09113012:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
NEW	HIGH 1ST HIGH VALUE IS	70.57777	ON 09122107:	AT (424650.00, 4527450.00, 1308.10, 2867.37, 0.00)	DC
4H1	HIGH 1ST HIGH VALUE IS	31.95460	ON 09111209:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
4K1A	HIGH 1ST HIGH VALUE IS	38.74993	ON 09031414:	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC
4K1B	HIGH 1ST HIGH VALUE IS	35.67548	ON 09042614:	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC
4V82	HIGH 1ST HIGH VALUE IS	191.95510	ON 09113012:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
6H1	HIGH 1ST HIGH VALUE IS	6.10795	ON 09032908:	AT (423996.60, 4526336.60, 1307.76, 2867.37, 0.00)	DC
6H3	HIGH 1ST HIGH VALUE IS	3.46632	ON 09111213:	AT (424200.00, 4526150.00, 1312.08, 2867.37, 0.00)	DC
6H2	HIGH 1ST HIGH VALUE IS	6.05804	ON 09032114:	AT (424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC
6K1	HIGH 1ST HIGH VALUE IS	7.70240	ON 09110206:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
6K2	HIGH 1ST HIGH VALUE IS	7.77427	ON 09013021:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
7H3	HIGH 1ST HIGH VALUE IS	3.06207	ON 09122120:	AT (424700.00, 4526600.00, 1318.06, 2867.37, 0.00)	DC
7H1	HIGH 1ST HIGH VALUE IS	4.22441	ON 09030318:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC

8H1	HIGH	1ST HIGH VALUE IS	5.88492	ON 09082010: AT (	423850.00,	4526300.00,	1305.00,	2867.37,	0.00)	DC
9H1	HIGH	1ST HIGH VALUE IS	7.48601	ON 09033112: AT (	424100.50,	4526508.10,	1308.47,	2867.37,	0.00)	DC
9H2	HIGH	1ST HIGH VALUE IS	10.22549	ON 09032512: AT (	424000.00,	4526500.00,	1306.05,	2867.37,	0.00)	DC
10H1	HIGH	1ST HIGH VALUE IS	3.24250	ON 09020412: AT (	423997.90,	4526461.00,	1306.61,	2867.37,	0.00)	DC
10H2	HIGH	1ST HIGH VALUE IS	5.89998	ON 09062208: AT (	423900.00,	4526150.00,	1306.00,	2867.37,	0.00)	DC
11H1	HIGH	1ST HIGH VALUE IS	3.55823	ON 09020413: AT (	423998.60,	4526535.60,	1306.00,	2867.37,	0.00)	DC
12H1	HIGH	1ST HIGH VALUE IS	2.51677	ON 09082010: AT (	423850.00,	4526200.00,	1305.72,	2867.37,	0.00)	DC
13H1	HIGH	1ST HIGH VALUE IS	4.29301	ON 09112713: AT (	423997.10,	4526386.30,	1307.42,	2867.37,	0.00)	DC
19H1	HIGH	1ST HIGH VALUE IS	2.67119	ON 09092310: AT (	423923.00,	4526311.70,	1306.13,	2867.37,	0.00)	DC
20H1	HIGH	1ST HIGH VALUE IS	2.40809	ON 09091010: AT (	423820.50,	4526280.80,	1304.00,	2867.37,	0.00)	DC
20H2	HIGH	1ST HIGH VALUE IS	4.54921	ON 09082010: AT (	423850.00,	4526200.00,	1305.72,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	4.32870	ON 09082010: AT (	423850.00,	4526200.00,	1305.72,	2867.37,	0.00)	DC

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)					OF TYPE
23H1	HIGH	1ST HIGH VALUE IS	2.91773	ON 09082010: AT (	423874.10,	4526311.60,	1305.39,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	3.67756	ON 09091910: AT (	423840.90,	4527056.60,	1299.00,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	3.37974	ON 09091910: AT (	423840.40,	4526987.00,	1299.47,	2867.37,	0.00)	DC
SCRUBBER	HIGH	1ST HIGH VALUE IS	46.45012	ON 09122107: AT (	424500.00,	4527350.00,	1306.98,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	3.28118	ON 09032518: AT (	423589.10,	4527089.50,	1296.00,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	3.92550	ON 09091910: AT (	423863.80,	4527102.50,	1299.00,	2867.37,	0.00)	DC
30H1	HIGH	1ST HIGH VALUE IS	6.27990	ON 09051210: AT (	424231.00,	4526870.60,	1306.99,	2867.37,	0.00)	DC
30H2	HIGH	1ST HIGH VALUE IS	6.22151	ON 09051210: AT (	424231.00,	4526870.60,	1306.99,	2867.37,	0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	5.14672	ON 09122107: AT (	424700.00,	4527100.00,	1314.35,	2867.37,	0.00)	DC
BOILER4	HIGH	1ST HIGH VALUE IS	20.55719	ON 09050320: AT (	423999.10,	4526585.40,	1305.28,	2867.37,	0.00)	DC
BOILER5	HIGH	1ST HIGH VALUE IS	19.53760	ON 09030418: AT (	423998.90,	4526560.50,	1305.38,	2867.37,	0.00)	DC
BOILER8	HIGH	1ST HIGH VALUE IS	27.62770	ON 09032213: AT (	423998.90,	4526560.50,	1305.38,	2867.37,	0.00)	DC
BOILER9	HIGH	1ST HIGH VALUE IS	32.75924	ON 09030417: AT (	423999.40,	4526610.20,	1304.83,	2867.37,	0.00)	DC
BOILER10	HIGH	1ST HIGH VALUE IS	30.24649	ON 09032212: AT (	424000.20,	4526684.90,	1304.50,	2867.37,	0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	14.37888	ON 09032913: AT (	423998.60,	4526535.60,	1306.00,	2867.37,	0.00)	DC
68H2	HIGH	1ST HIGH VALUE IS	5.06229	ON 09041820: AT (	424218.60,	4526745.80,	1308.03,	2867.37,	0.00)	DC
68H3	HIGH	1ST HIGH VALUE IS	6.75513	ON 09121124: AT (	424278.70,	4526656.80,	1308.99,	2867.37,	0.00)	DC
68H4	HIGH	1ST HIGH VALUE IS	7.17259	ON 09012023: AT (	424182.00,	4526734.70,	1308.06,	2867.37,	0.00)	DC
68H5	HIGH	1ST HIGH VALUE IS	6.17487	ON 09113019: AT (	424021.80,	4526830.80,	1304.02,	2867.37,	0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	6.13968	ON 09011122: AT (	424001.20,	4526784.40,	1303.92,	2867.37,	0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	6.55442	ON 09112622: AT (	424222.80,	4526848.00,	1307.57,	2867.37,	0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.61182	ON 09111816: AT (	424000.00,	4526550.00,	1305.81,	2867.37,	0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.58842	ON 09111416: AT (	423678.60,	4526311.50,	1302.00,	2867.37,	0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.58617	ON 09041114: AT (	424000.00,	4526550.00,	1305.81,	2867.37,	0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.62643	ON 09112215: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
FLARES	HIGH	1ST HIGH VALUE IS	4.55747	ON 09012518:	AT (424850.00, 4526550.00, 1321.77, 2867.37, 0.00)	DC
FLAREN	HIGH	1ST HIGH VALUE IS	4.55778	ON 09012518:	AT (424850.00, 4526550.00, 1321.77, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	86.92595	ON 09031216:	AT (423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC
NEW	HIGH	1ST HIGH VALUE IS	32.62552	ON 09041716:	AT (423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC
4H1	HIGH	1ST HIGH VALUE IS	14.79146	ON 09051316:	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC
4K1A	HIGH	1ST HIGH VALUE IS	13.99093	ON 09110716:	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC
4K1B	HIGH	1ST HIGH VALUE IS	15.74811	ON 09051316:	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC
4V82	HIGH	1ST HIGH VALUE IS	48.63468	ON 09030516:	AT (424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC
6H1	HIGH	1ST HIGH VALUE IS	3.53649	ON 09102816:	AT (423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC
6H3	HIGH	1ST HIGH VALUE IS	1.87972	ON 09031216:	AT (424002.40, 4526232.10, 1308.24, 2867.37, 0.00)	DC
6H2	HIGH	1ST HIGH VALUE IS	2.24723	ON 09012116:	AT (424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC
6K1	HIGH	1ST HIGH VALUE IS	2.38502m	ON 09013024:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
6K2	HIGH	1ST HIGH VALUE IS	2.31788m	ON 09013024:	AT (423731.50, 4526277.70, 1303.00, 2867.37, 0.00)	DC
7H3	HIGH	1ST HIGH VALUE IS	1.70174	ON 09031216:	AT (423850.00, 4526250.00, 1305.00, 2867.37, 0.00)	DC
7H1	HIGH	1ST HIGH VALUE IS	1.64418	ON 09102724:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
8H1	HIGH	1ST HIGH VALUE IS	3.48783	ON 09031216:	AT (424000.00, 4526150.00, 1308.53, 2867.37, 0.00)	DC
9H1	HIGH	1ST HIGH VALUE IS	3.35539	ON 09032416:	AT (424108.60, 4526530.70, 1308.63, 2867.37, 0.00)	DC
9H2	HIGH	1ST HIGH VALUE IS	5.04659	ON 09032516:	AT (424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC
10H1	HIGH	1ST HIGH VALUE IS	1.98357	ON 09121916:	AT (423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC
10H2	HIGH	1ST HIGH VALUE IS	4.12053	ON 09102816:	AT (423900.00, 4526100.00, 1306.02, 2867.37, 0.00)	DC
11H1	HIGH	1ST HIGH VALUE IS	2.23968	ON 09031216:	AT (423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC
12H1	HIGH	1ST HIGH VALUE IS	1.46993	ON 09031216:	AT (424000.00, 4526050.00, 1310.00, 2867.37, 0.00)	DC
13H1	HIGH	1ST HIGH VALUE IS	2.50089	ON 09121916:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC
19H1	HIGH	1ST HIGH VALUE IS	1.51134	ON 09031216:	AT (423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC
20H1	HIGH	1ST HIGH VALUE IS	1.39416	ON 09121916:	AT (423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC
20H2	HIGH	1ST HIGH VALUE IS	2.58583	ON 09031216:	AT (423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	2.43903	ON 09031216:	AT (424000.00, 4526050.00, 1310.00, 2867.37, 0.00)	DC

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
23H1	HIGH	1ST HIGH VALUE IS	1.68953	ON 09031216:	AT (423972.40, 4526218.80, 1307.00, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	2.01696	ON 09032816:	AT (423770.10, 4527220.00, 1296.87, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	1.84825	ON 09031216:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC
SCRUBBER	HIGH	1ST HIGH VALUE IS	16.69910	ON 09041716:	AT (423850.00, 4526300.00, 1305.00, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	1.50743	ON 09012116:	AT (424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	2.39422	ON 09102816:	AT (423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC
30H1	HIGH	1ST HIGH VALUE IS	3.40353	ON 09032816:	AT (423770.10, 4527220.00, 1296.87, 2867.37, 0.00)	DC
30H2	HIGH	1ST HIGH VALUE IS	3.42191	ON 09032816:	AT (423770.10, 4527220.00, 1296.87, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	2.65185	ON 09031216:	AT (424000.00, 4526000.00, 1310.67, 2867.37, 0.00)	DC
BOILER4	HIGH	1ST HIGH VALUE IS	11.18699	ON 09032516:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
BOILER5	HIGH	1ST HIGH VALUE IS	7.35707	ON 09040816:	AT (424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC
BOILER8	HIGH	1ST HIGH VALUE IS	11.13569	ON 09032916:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
BOILER9	HIGH	1ST HIGH VALUE IS	15.06467	ON 09032516:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
BOILER10	HIGH	1ST HIGH VALUE IS	14.62401	ON 09040824:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	8.65004	ON 09032616:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H2	HIGH	1ST HIGH VALUE IS	2.38742m	ON 09011624:	AT (424133.10, 4526598.70, 1307.86, 2867.37, 0.00)	DC
68H3	HIGH	1ST HIGH VALUE IS	3.23560m	ON 09011624:	AT (424124.90, 4526576.10, 1308.06, 2867.37, 0.00)	DC
68H4	HIGH	1ST HIGH VALUE IS	2.48604m	ON 09012124:	AT (424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC
68H5	HIGH	1ST HIGH VALUE IS	2.64460	ON 09112308:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	2.83153m	ON 09020908:	AT (424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	2.92326c	ON 09011024:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.29058	ON 09061816:	AT (423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.30133	ON 09031216:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.28650	ON 09031216:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.28616	ON 09031116:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CO IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
FLARES	HIGH	1ST HIGH VALUE IS	1.70962	ON 09041716:	AT (423768.50, 4526277.50, 1303.49, 2867.37, 0.00)	DC
FLAREN	HIGH	1ST HIGH VALUE IS	1.70974	ON 09041716:	AT (423768.50, 4526277.50, 1303.49, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 10 Warning Message(s)
A Total of 802 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 9 Calm Hours Identified

A Total of 793 Missing Hours Identified (9.05 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

```
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:          9H2
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         12H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          4H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          9H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:         33H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:       FLARES
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:       FLAREN
CN W305     233 WAKFLG:Stack height > or = EPA formula height for SRCID:          7H3
CN W305     252 WAKFLG:Stack height > or = EPA formula height for SRCID:         10H2
CN W305     253 WAKFLG:Stack height > or = EPA formula height for SRCID:         19H1
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                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for    50 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m

**Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
           with an Equilibrium NO2/NOx Ratio of  0.900
           and with a Default In-stack Ratio of  0.250
        7. Urban Roughness Length of 1.0 Meter Used.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR

**This Run Includes:     50 Source(s);       2 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  NO2

**Note that special processing requirements apply for the 1-hour NO2 NAAQS - check available guidance.
  Model will process user-specified ranks of daily maximum 1-hour values averaged across the number of years modeled.
  For annual NO2 NAAQS modeling, the multi-year maximum of PERIOD values can be simulated using the MULTYEAR keyword.
  Multi-year PERIOD and 1-hour values should only be done in a single model run using the MULTYEAR option with a
  single multi-year meteorological data file using STARTEND keyword.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs External File(s) of Maximum Daily 1-hr Values by Year (MXDYBYYR Keyword)
         Model Outputs External File(s) of Contributions to Maximum Daily Values Paired in Time & Space (MAXDCONT Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =    131.7 MB of RAM.

**Input Runstream File:          Holly_V17_2006_NO2.DTA
**Output Print File:             Holly_V17_2006_NO2.LST

**File for Summary of Results:   C:\beast\Holly\Holly_V17_2006_NO2.SUM
```



```
                                          *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                 *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                        (METERS/SEC)

                                                  1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2006.SFC Met Version: 11059
Profile file: SY2006.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2006 Year: 2006

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
06	01	01	1	01	-11.8	0.241	-9.000	-9.000	-999.	273.	91.0	0.09	0.28	1.00	3.20	185.	10.0	276.0	10.0
06	01	01	1	02	-11.9	0.244	-9.000	-9.000	-999.	277.	93.0	0.01	0.28	1.00	4.60	248.	10.0	276.5	10.0
06	01	01	1	03	-24.7	0.504	-9.000	-9.000	-999.	824.	399.2	0.01	0.28	1.00	9.00	269.	10.0	277.0	10.0
06	01	01	1	04	-40.4	0.427	-9.000	-9.000	-999.	646.	146.0	0.02	0.28	1.00	7.00	290.	10.0	276.9	10.0
06	01	01	1	05	-15.9	0.324	-9.000	-9.000	-999.	430.	164.1	0.04	0.28	1.00	4.80	301.	10.0	276.4	10.0
06	01	01	1	06	-18.0	0.366	-9.000	-9.000	-999.	508.	209.4	0.02	0.28	1.00	5.90	298.	10.0	276.4	10.0
06	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.02	0.28	1.00	6.30	289.	10.0	275.9	10.0
06	01	01	1	08	-34.7	0.381	-9.000	-9.000	-999.	540.	122.8	0.02	0.28	1.00	6.30	282.	10.0	275.4	10.0
06	01	01	1	09	-21.0	0.324	-9.000	-9.000	-999.	425.	124.8	0.01	0.28	0.51	6.00	268.	10.0	275.1	10.0
06	01	01	1	10	10.5	0.195	0.315	0.005	92.	206.	-54.3	0.01	0.28	0.30	3.20	249.	10.0	276.1	10.0
06	01	01	1	11	27.6	0.203	0.649	0.005	307.	211.	-23.6	0.01	0.28	0.22	3.20	248.	10.0	277.5	10.0
06	01	01	1	12	38.6	0.170	0.825	0.005	450.	161.	-9.8	0.01	0.28	0.19	2.50	249.	10.0	278.4	10.0
06	01	01	1	13	42.5	0.283	0.942	0.005	608.	346.	-41.1	0.09	0.28	0.19	3.00	207.	10.0	279.2	10.0
06	01	01	1	14	32.3	0.382	0.913	0.005	729.	543.	-133.3	0.12	0.28	0.19	4.00	168.	10.0	279.9	10.0
06	01	01	1	15	4.8	0.338	0.487	0.005	746.	452.	-623.1	0.07	0.28	0.22	4.20	148.	10.0	279.8	10.0
06	01	01	1	16	0.4	0.444	0.218	0.005	747.	681.	-8888.0	0.12	0.28	0.29	4.90	155.	10.0	279.4	10.0
06	01	01	1	17	-17.9	0.410	-9.000	-9.000	-999.	605.	298.0	0.12	0.28	0.49	4.70	161.	10.0	278.4	10.0
06	01	01	1	18	-25.2	0.339	-9.000	-9.000	-999.	457.	119.9	0.12	0.28	1.00	4.10	163.	10.0	277.4	10.0
06	01	01	1	19	-21.1	0.284	-9.000	-9.000	-999.	349.	83.7	0.07	0.28	1.00	4.00	149.	10.0	276.6	10.0
06	01	01	1	20	-9.3	0.189	-9.000	-9.000	-999.	192.	55.7	0.07	0.28	1.00	2.80	124.	10.0	276.0	10.0
06	01	01	1	21	-18.7	0.381	-9.000	-9.000	-999.	540.	227.2	0.07	0.28	1.00	5.00	140.	10.0	276.9	10.0
06	01	01	1	22	-12.9	0.262	-9.000	-9.000	-999.	316.	108.2	0.12	0.28	1.00	3.20	165.	10.0	277.1	10.0
06	01	01	1	23	-14.5	0.296	-9.000	-9.000	-999.	371.	138.0	0.07	0.28	1.00	4.00	134.	10.0	277.2	10.0
06	01	01	1	24	-18.2	0.372	-9.000	-9.000	-999.	522.	218.0	0.07	0.28	1.00	4.90	133.	10.0	277.8	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
06	01	01	01	10.0	1	185.	3.20	276.1	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	112.36776	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	111.37128	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	106.13325	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	103.24789	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	99.67746	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	98.57343	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	97.67494	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	93.33864	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	85.57640	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	85.30258	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	10.91989	AT (423300.00, 4525900.00, 1299.86, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	10.88136	AT (423250.00, 4525800.00, 1299.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	10.81882	AT (424100.00, 4527600.00, 1299.04, 2912.70, 0.00)	DC	
	4TH HIGHEST VALUE IS	10.80373	AT (424100.00, 4527550.00, 1299.58, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	10.76570	AT (423250.00, 4525850.00, 1298.96, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	10.75841	AT (423200.00, 4525700.00, 1299.14, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	10.73362	AT (424100.00, 4527650.00, 1298.62, 2912.70, 0.00)	DC	
	8TH HIGHEST VALUE IS	10.72769	AT (423200.00, 4525750.00, 1298.98, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	10.72517	AT (424150.00, 4527650.00, 1299.03, 2912.70, 0.00)	DC	
	10TH HIGHEST VALUE IS	10.68899	AT (424150.00, 4527700.00, 1298.53, 2912.70, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	99.51444 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	92.63800 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	89.82868 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	87.23897 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	84.62637 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	82.88577 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	80.81667 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	75.85892 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	70.73323 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	67.72023 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	9.12253 AT	(423886.40, 4527102.10, 1299.37, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	8.97153 AT	(423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	8.95204 AT	(423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	8.93536 AT	(423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	8.91944 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	8.85688 AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	8.85530 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	8.84814 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	8.82330 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	8.79142 AT	(423886.60, 4527121.40, 1299.87, 2867.37, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 10 Warning Message(s)
A Total of 525 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 525 Missing Hours Identified (5.99 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

```
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:      4H1
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:      9H1
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:      9H2
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:     12H1
CN W305      2 WAKFLG:Stack height > or = EPA formula height for SRCID:      7H3
CN W305      2 WAKFLG:Stack height > or = EPA formula height for SRCID:     10H2
CN W305      2 WAKFLG:Stack height > or = EPA formula height for SRCID:   FLARES
CN W305      2 WAKFLG:Stack height > or = EPA formula height for SRCID:   FLAREN
CN W305     13 WAKFLG:Stack height > or = EPA formula height for SRCID:     33H1
CN W305     72 WAKFLG:Stack height > or = EPA formula height for SRCID:     19H1
```

*** MODEL SETUP OPTIONS SUMMARY ***

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses URBAN Dispersion Algorithm for the SBL for 50 Source(s),
for Total of 1 Urban Area(s):
Urban Population = 306479.0 ; Urban Roughness Length = 1.000 m

**Model Allows User-Specified Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.
6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
with an Equilibrium NO2/NOx Ratio of 0.900
and with a Default In-stack Ratio of 0.250
7. Urban Roughness Length of 1.0 Meter Used.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 1 Short Term Average(s) of: 1-HR

**This Run Includes: 50 Source(s); 2 Source Group(s); and 10025 Receptor(s)

**The Model Assumes A Pollutant Type of: NO2

**Note that special processing requirements apply for the 1-hour NO2 NAAQS - check available guidance.
Model will process user-specified ranks of daily maximum 1-hour values averaged across the number of years modeled.
For annual NO2 NAAQS modeling, the multi-year maximum of PERIOD values can be simulated using the MULTYEAR keyword.
Multi-year PERIOD and 1-hour values should only be done in a single model run using the MULTYEAR option with a
single multi-year meteorological data file using STARTEND keyword.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs External File(s) of Maximum Daily 1-hr Values by Year (MXDYBYYR Keyword)
Model Outputs External File(s) of Contributions to Maximum Daily Values Paired in Time & Space (MAXDCONT Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1288.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 131.7 MB of RAM.

**Input Runstream File: Holly_V17_2007_NO2.DTA
**Output Print File: Holly_V17_2007_NO2.LST

**File for Summary of Results: C:\beast\Holly\Holly_V17_2007_NO2.SUM

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2007.SFC Met Version: 11059
Profile file: SY2007.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2007 Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-2.0	0.051	-9.000	-9.000	-999.	27.	5.4	0.01	0.28	1.00	1.80	267.	10.0	270.4	10.0
07	01	01	1	02	-1.2	0.042	-9.000	-9.000	-999.	20.	4.6	0.02	0.28	1.00	1.30	295.	10.0	270.9	10.0
07	01	01	1	03	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	93.	10.0	270.6	10.0
07	01	01	1	04	-0.8	0.036	-9.000	-9.000	-999.	16.	4.4	0.07	0.28	1.00	0.90	141.	10.0	270.6	10.0
07	01	01	1	05	-2.4	0.063	-9.000	-9.000	-999.	37.	8.4	0.12	0.28	1.00	1.40	172.	10.0	270.4	10.0
07	01	01	1	06	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	114.	10.0	270.4	10.0
07	01	01	1	07	-0.5	0.029	-9.000	-9.000	-999.	11.	3.3	0.04	0.28	1.00	0.80	87.	10.0	270.0	10.0
07	01	01	1	08	-0.5	0.026	-9.000	-9.000	-999.	9.	2.7	0.01	0.28	1.00	0.90	262.	10.0	269.5	10.0
07	01	01	1	09	-4.5	0.099	-9.000	-9.000	-999.	71.	16.8	0.09	0.28	0.51	1.90	347.	10.0	269.0	10.0
07	01	01	1	10	9.0	0.139	0.572	0.017	655.	119.	-23.4	0.04	0.28	0.30	1.70	315.	10.0	271.0	10.0
07	01	01	1	11	22.7	0.145	0.787	0.018	677.	128.	-10.7	0.06	0.28	0.22	1.50	14.	10.0	272.8	10.0
07	01	01	1	12	31.5	0.186	0.891	0.018	707.	184.	-16.0	0.06	0.28	0.19	2.00	13.	10.0	272.9	10.0
07	01	01	1	13	34.6	0.222	0.934	0.018	740.	241.	-25.0	0.06	0.28	0.19	2.50	5.	10.0	273.4	10.0
07	01	01	1	14	38.8	0.298	0.985	0.018	777.	374.	-53.6	0.09	0.28	0.19	3.20	359.	10.0	273.9	10.0
07	01	01	1	15	28.3	0.138	0.898	0.018	805.	136.	-7.3	0.04	0.28	0.22	1.50	64.	10.0	275.4	10.0
07	01	01	1	16	11.6	0.177	0.671	0.018	816.	171.	-37.4	0.05	0.28	0.29	2.10	111.	10.0	275.1	10.0
07	01	01	1	17	-7.2	0.120	-9.000	-9.000	-999.	96.	18.8	0.07	0.28	0.49	2.30	134.	10.0	273.6	10.0
07	01	01	1	18	-4.8	0.077	-9.000	-9.000	-999.	49.	7.5	0.12	0.28	1.00	1.70	152.	10.0	272.0	10.0
07	01	01	1	19	-2.1	0.045	-9.000	-9.000	-999.	22.	3.4	0.01	0.28	1.00	1.50	221.	10.0	271.0	10.0
07	01	01	1	20	-0.8	0.029	-9.000	-9.000	-999.	11.	2.4	0.01	0.28	1.00	1.00	242.	10.0	270.4	10.0
07	01	01	1	21	-6.2	0.083	-9.000	-9.000	-999.	55.	7.3	0.07	0.28	1.00	2.10	128.	10.0	269.8	10.0
07	01	01	1	22	-8.2	0.095	-9.000	-9.000	-999.	68.	8.4	0.07	0.28	1.00	2.40	136.	10.0	269.4	10.0
07	01	01	1	23	-9.6	0.103	-9.000	-9.000	-999.	76.	9.1	0.07	0.28	1.00	2.60	142.	10.0	268.8	10.0
07	01	01	1	24	-5.1	0.075	-9.000	-9.000	-999.	48.	6.6	0.07	0.28	1.00	1.90	148.	10.0	269.0	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	10.0	1	267.	1.80	270.5	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	113.83168 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	110.62788 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	107.71741 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	100.12827 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	94.48497 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	94.40700 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	92.29203 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	88.82191 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	80.51801 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	79.82136 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	12.44371 AT	(424750.00, 4527350.00, 1310.47, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	12.43914 AT	(424800.00, 4527350.00, 1311.54, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	12.42055 AT	(424900.00, 4526750.00, 1320.27, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	12.41964 AT	(424700.00, 4527300.00, 1309.84, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	12.40954 AT	(424850.00, 4527400.00, 1311.62, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	12.40569 AT	(424950.00, 4526750.00, 1321.17, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	12.40311 AT	(424850.00, 4526750.00, 1319.27, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	12.35717 AT	(424800.00, 4527400.00, 1311.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	12.35293 AT	(424750.00, 4527300.00, 1310.19, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	12.35037 AT	(424800.00, 4526750.00, 1319.15, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	81.95610 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	76.67055 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	76.19498 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	71.85956 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	70.38288 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	68.60682 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	65.49870 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	61.64426 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	61.44612 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	57.29866 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	9.07083 AT	(423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	8.81876 AT	(423700.00, 4526300.00, 1302.93, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	8.76800 AT	(423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	8.67842 AT	(423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	8.62651 AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	8.55829 AT	(423678.60, 4526311.50, 1302.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	8.46161 AT	(423750.00, 4526300.00, 1303.46, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	8.36245 AT	(423713.00, 4526277.80, 1302.99, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	8.34588 AT	(423771.40, 4526280.90, 1303.56, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	8.31339 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 10 Warning Message(s)
A Total of 2026 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 2026 Missing Hours Identified (23.13 Percent)

CAUTION!: Number of Missing Hours Exceeds 10 Percent of Total!
Data May Not Be Acceptable for Regulatory Applications.
See Section 5.3.2 of "Meteorological Monitoring Guidance
for Regulatory Modeling Applications" (EPA-454/R-99-005).

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

CN W305	1	WAKFLG:Stack height > or = EPA formula height for SRCID: 7H3
CN W305	1	WAKFLG:Stack height > or = EPA formula height for SRCID: 10H2
CN W305	1	WAKFLG:Stack height > or = EPA formula height for SRCID: 12H1
CN W305	1	WAKFLG:Stack height > or = EPA formula height for SRCID: FLARES
CN W305	1	WAKFLG:Stack height > or = EPA formula height for SRCID: FLAREN
CN W305	4	WAKFLG:Stack height > or = EPA formula height for SRCID: 9H2
CN W305	5	WAKFLG:Stack height > or = EPA formula height for SRCID: 4H1
CN W305	5	WAKFLG:Stack height > or = EPA formula height for SRCID: 9H1
CN W305	11	WAKFLG:Stack height > or = EPA formula height for SRCID: 33H1
CN W305	15	WAKFLG:Stack height > or = EPA formula height for SRCID: 19H1

*** MODEL SETUP OPTIONS SUMMARY ***

- -

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**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for    50 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m

**Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
           with an Equilibrium NO2/NOx Ratio of  0.900
           and with a Default In-stack Ratio of  0.250
        7. Urban Roughness Length of 1.0 Meter Used.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR

**This Run Includes:     50 Source(s);       2 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  NO2

**Note that special processing requirements apply for the 1-hour NO2 NAAQS - check available guidance.
  Model will process user-specified ranks of daily maximum 1-hour values averaged across the number of years modeled.
  For annual NO2 NAAQS modeling, the multi-year maximum of PERIOD values can be simulated using the MULTYEAR keyword.
  Multi-year PERIOD and 1-hour values should only be done in a single model run using the MULTYEAR option with a
  single multi-year meteorological data file using STARTEND keyword.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs External File(s) of Maximum Daily 1-hr Values by Year (MXDYBYYR Keyword)
         Model Outputs External File(s) of Contributions to Maximum Daily Values Paired in Time & Space (MAXDCONT Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =    131.7 MB of RAM.

**Input Runstream File:          Holly_V17_2008_NO2.DTA
**Output Print File:             Holly_V17_2008_NO2.LST

**File for Summary of Results:   C:\beast\Holly\Holly_V17_2008_NO2.SUM
```


*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2008.SFC Met Version: 11059
Profile file: SY2008.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2008 Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-24.3	0.228	-9.000	-9.000	-999.	250.	38.8	0.07	0.28	1.00	3.60	144.	10.0	264.2	10.0
08	01	01	1	02	-9.9	0.103	-9.000	-9.000	-999.	85.	8.9	0.07	0.28	1.00	2.60	130.	10.0	263.6	10.0
08	01	01	1	03	-3.8	0.064	-9.000	-9.000	-999.	37.	5.5	0.07	0.28	1.00	1.60	127.	10.0	263.0	10.0
08	01	01	1	04	-10.3	0.109	-9.000	-9.000	-999.	82.	10.0	0.12	0.28	1.00	2.40	153.	10.0	263.6	10.0
08	01	01	1	05	-8.5	0.095	-9.000	-9.000	-999.	68.	8.2	0.07	0.28	1.00	2.40	123.	10.0	263.1	10.0
08	01	01	1	06	-7.9	0.091	-9.000	-9.000	-999.	63.	7.6	0.05	0.28	1.00	2.40	93.	10.0	262.9	10.0
08	01	01	1	07	-7.2	0.086	-9.000	-9.000	-999.	58.	7.0	0.04	0.28	1.00	2.40	63.	10.0	262.6	10.0
08	01	01	1	08	-11.6	0.116	-9.000	-9.000	-999.	91.	10.9	0.05	0.28	1.00	2.90	30.	10.0	261.4	10.0
08	01	01	1	09	-13.2	0.185	-9.000	-9.000	-999.	184.	38.9	0.06	0.28	0.51	3.00	24.	10.0	262.9	10.0
08	01	01	1	10	10.3	0.229	0.258	0.005	54.	252.	-94.0	0.06	0.28	0.30	2.80	26.	10.0	264.2	10.0
08	01	01	1	11	27.2	0.247	0.447	0.005	105.	283.	-44.5	0.06	0.28	0.22	2.90	23.	10.0	265.8	10.0
08	01	01	1	12	31.4	0.256	0.518	0.005	142.	298.	-43.0	0.06	0.28	0.19	3.00	24.	10.0	267.2	10.0
08	01	01	1	13	34.5	0.201	0.582	0.007	183.	208.	-18.9	0.05	0.28	0.19	2.30	54.	10.0	268.6	10.0
08	01	01	1	14	31.7	0.255	0.602	0.005	220.	296.	-41.7	0.05	0.28	0.19	3.10	37.	10.0	267.6	10.0
08	01	01	1	15	23.3	0.252	0.565	0.005	247.	291.	-55.2	0.06	0.28	0.22	3.00	3.	10.0	267.8	10.0
08	01	01	1	16	-0.3	0.246	-9.000	-9.000	-999.	281.	4710.6	0.06	0.28	0.29	3.20	17.	10.0	267.4	10.0
08	01	01	1	17	-8.9	0.196	-9.000	-9.000	-999.	200.	68.0	0.06	0.28	0.49	2.90	13.	10.0	266.1	10.0
08	01	01	1	18	-13.0	0.244	-9.000	-9.000	-999.	277.	88.9	0.06	0.28	1.00	3.50	8.	10.0	264.5	10.0
08	01	01	1	19	-5.5	0.104	-9.000	-9.000	-999.	90.	16.1	0.05	0.28	1.00	2.20	35.	10.0	264.2	10.0
08	01	01	1	20	-2.6	0.056	-9.000	-9.000	-999.	31.	5.3	0.05	0.28	1.00	1.50	48.	10.0	264.2	10.0
08	01	01	1	21	-2.5	0.062	-9.000	-9.000	-999.	35.	7.4	0.06	0.28	1.00	1.60	17.	10.0	263.4	10.0
08	01	01	1	22	-2.9	0.066	-9.000	-9.000	-999.	39.	7.9	0.06	0.28	1.00	1.70	26.	10.0	263.9	10.0
08	01	01	1	23	-8.6	0.160	-9.000	-9.000	-999.	147.	38.2	0.06	0.28	1.00	2.60	24.	10.0	263.0	10.0
08	01	01	1	24	-26.9	0.273	-9.000	-9.000	-999.	327.	60.1	0.06	0.28	1.00	4.10	15.	10.0	262.9	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	10.0	1	144.	3.60	264.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	153.86314 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	141.10015 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	127.39807 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	118.38235 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	109.55201 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	103.21628 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	98.03284 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	94.35827 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	93.17011 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	93.03962 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	12.61955 AT	(424800.00, 4526900.00, 1316.60, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	12.61048 AT	(424750.00, 4526900.00, 1315.26, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	12.60761 AT	(424950.00, 4526950.00, 1318.72, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	12.58867 AT	(424900.00, 4526950.00, 1318.01, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	12.57355 AT	(424850.00, 4526900.00, 1317.94, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	12.53819 AT	(424700.00, 4526900.00, 1314.59, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	12.50708 AT	(424850.00, 4526950.00, 1317.37, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	12.48318 AT	(424900.00, 4526900.00, 1318.63, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	12.36711 AT	(424650.00, 4526900.00, 1314.19, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	12.36190 AT	(424950.00, 4526900.00, 1319.40, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	85.98223 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	85.60152 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	83.44553 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	79.05275 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	76.70559 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	76.11086 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	74.68237 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	73.83081 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	70.65676 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	69.68118 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	8.97151 AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	8.92613 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	8.91592 AT	(423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	8.90251 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	8.86946 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	8.80544 AT	(423750.00, 4526300.00, 1303.46, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	8.78978 AT	(423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	8.74325 AT	(423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	8.73831 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	8.70846 AT	(423863.80, 4527102.50, 1299.00, 2867.37, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 10 Warning Message(s)
A Total of 146 Informational Message(s)

A Total of 8784 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 146 Missing Hours Identified (1.66 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

```
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:          9H2
CN W305      1 WAKFLG:Stack height > or = EPA formula height for SRCID:         12H1
CN W305      5 WAKFLG:Stack height > or = EPA formula height for SRCID:       FLARES
CN W305      5 WAKFLG:Stack height > or = EPA formula height for SRCID:       FLAREN
CN W305      7 WAKFLG:Stack height > or = EPA formula height for SRCID:         10H2
CN W305      7 WAKFLG:Stack height > or = EPA formula height for SRCID:         19H1
CN W305      7 WAKFLG:Stack height > or = EPA formula height for SRCID:         33H1
CN W305      8 WAKFLG:Stack height > or = EPA formula height for SRCID:          9H1
CN W305      9 WAKFLG:Stack height > or = EPA formula height for SRCID:          4H1
CN W305     44 WAKFLG:Stack height > or = EPA formula height for SRCID:          7H3
```

**MODELOPTs: NonDFAULT CONC ELEV PVMRM

*** MODEL SETUP OPTIONS SUMMARY ***

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses URBAN Dispersion Algorithm for the SBL for 50 Source(s),
for Total of 1 Urban Area(s):
Urban Population = 306479.0 ; Urban Roughness Length = 1.000 m

**Model Allows User-Specified Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.
6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
with an Equilibrium NO2/NOx Ratio of 0.900
and with a Default In-stack Ratio of 0.250
7. Urban Roughness Length of 1.0 Meter Used.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 1 Short Term Average(s) of: 1-HR

**This Run Includes: 50 Source(s); 2 Source Group(s); and 10025 Receptor(s)

**The Model Assumes A Pollutant Type of: NO2

**Note that special processing requirements apply for the 1-hour NO2 NAAQS - check available guidance.
Model will process user-specified ranks of daily maximum 1-hour values averaged across the number of years modeled.
For annual NO2 NAAQS modeling, the multi-year maximum of PERIOD values can be simulated using the MULTYEAR keyword.
Multi-year PERIOD and 1-hour values should only be done in a single model run using the MULTYEAR option with a
single multi-year meteorological data file using STARTEND keyword.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs External File(s) of Maximum Daily 1-hr Values by Year (MXDYBYYR Keyword)
Model Outputs External File(s) of Contributions to Maximum Daily Values Paired in Time & Space (MAXDCONT Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1288.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 131.7 MB of RAM.

**Input Runstream File: Holly_V17_2009_NO2.DTA
**Output Print File: Holly_V17_2009_NO2.LST

**File for Summary of Results: C:\beast\Holly\Holly_V17_2009_NO2.SUM

**MODELOPTs: NonDFAULT CONC ELEV PVMRM

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2009.SFC Met Version: 11059
Profile file: SY2009.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 72572
Name: SALT_LAKE_CITY,UT Name: UNKNOWN
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.00	127.	10.0	267.9	10.0
09	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	1.80	120.	10.0	268.0	10.0
09	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	3.00	106.	10.0	269.1	10.0
09	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.10	132.	10.0	270.2	10.0
09	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.80	141.	10.0	269.8	10.0
09	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.50	148.	10.0	269.4	10.0
09	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	1.90	96.	10.0	269.2	10.0
09	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.12	0.28	1.00	0.80	178.	10.0	269.6	10.0
09	01	01	1	09	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	0.51	2.70	149.	10.0	270.9	10.0
09	01	01	1	10	9.0	0.274	0.144	0.005	10.	330.	-177.5	0.12	0.28	0.30	2.90	154.	10.0	271.9	10.0
09	01	01	1	11	22.7	0.173	0.298	0.012	36.	169.	-17.8	0.09	0.28	0.22	1.70	190.	10.0	273.9	10.0
09	01	01	1	12	31.6	0.109	0.420	0.018	73.	84.	-3.2	0.05	0.28	0.19	1.00	46.	10.0	275.6	10.0
09	01	01	1	13	34.8	0.258	0.504	0.005	114.	301.	-38.1	0.12	0.28	0.19	2.50	163.	10.0	277.0	10.0
09	01	01	1	14	32.1	0.113	0.539	0.013	151.	102.	-3.5	0.12	0.28	0.19	0.80	154.	10.0	277.9	10.0
09	01	01	1	15	4.7	0.155	0.288	0.013	157.	141.	-62.0	0.07	0.28	0.22	1.80	124.	10.0	278.8	10.0
09	01	01	1	16	0.4	0.334	0.124	0.005	158.	444.	-7805.0	0.07	0.28	0.29	4.20	143.	10.0	278.6	10.0
09	01	01	1	17	-14.1	0.342	-9.000	-9.000	-999.	460.	219.8	0.07	0.28	0.49	4.50	146.	10.0	277.9	10.0
09	01	01	1	18	-26.4	0.354	-9.000	-9.000	-999.	485.	130.6	0.07	0.28	1.00	4.80	146.	10.0	277.4	10.0
09	01	01	1	19	-35.5	0.392	-9.000	-9.000	-999.	564.	131.3	0.12	0.28	1.00	4.70	169.	10.0	277.4	10.0
09	01	01	1	20	-28.1	0.311	-9.000	-9.000	-999.	402.	82.5	0.12	0.28	1.00	3.90	150.	10.0	277.6	10.0
09	01	01	1	21	-29.8	0.330	-9.000	-9.000	-999.	437.	93.6	0.07	0.28	1.00	4.60	129.	10.0	278.5	10.0
09	01	01	1	22	-14.1	0.288	-9.000	-9.000	-999.	356.	130.9	0.07	0.28	1.00	3.90	131.	10.0	278.8	10.0
09	01	01	1	23	-23.6	0.320	-9.000	-9.000	-999.	416.	107.0	0.07	0.28	1.00	4.40	122.	10.0	278.9	10.0
09	01	01	1	24	-24.9	0.337	-9.000	-9.000	-999.	450.	118.7	0.07	0.28	1.00	4.60	130.	10.0	278.4	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	127.	3.00	267.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	117.06826 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	112.28249 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	101.97205 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	98.75627 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	97.43473 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	89.62565 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	85.99536 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	85.02498 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	82.39721 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	80.09211 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	12.46923 AT	(424650.00, 4527450.00, 1308.10, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	12.44775 AT	(424700.00, 4527500.00, 1308.04, 2912.70, 0.00)	DC	
	3RD HIGHEST VALUE IS	12.42631 AT	(424750.00, 4527500.00, 1308.65, 2912.70, 0.00)	DC	
	4TH HIGHEST VALUE IS	12.42513 AT	(424700.00, 4527450.00, 1308.70, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	12.40829 AT	(424600.00, 4527400.00, 1307.94, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	12.36811 AT	(424800.00, 4527550.00, 1308.64, 2912.70, 0.00)	DC	
	7TH HIGHEST VALUE IS	12.36548 AT	(424750.00, 4527550.00, 1308.02, 2912.70, 0.00)	DC	
	8TH HIGHEST VALUE IS	12.34598 AT	(424650.00, 4527400.00, 1308.59, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	12.26187 AT	(424850.00, 4527600.00, 1308.30, 2912.70, 0.00)	DC	
	10TH HIGHEST VALUE IS	12.25518 AT	(424550.00, 4527350.00, 1307.22, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID	AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS 93.08334	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS 92.33349	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS 84.11922	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS 82.45275	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS 75.58497	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS 75.26668	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS 75.05519	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS 74.29885	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS 68.97361	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS 66.60333	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS 8.95491	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS 8.94699	AT (423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS 8.89300	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS 8.85345	AT (423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS 8.82265	AT (423900.00, 4527100.00, 1300.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS 8.75470	AT (423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS 8.74742	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS 8.74505	AT (423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS 8.70956	AT (423750.00, 4526300.00, 1303.46, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS 8.70935	AT (423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 10 Warning Message(s)
A Total of 802 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 9 Calm Hours Identified

A Total of 793 Missing Hours Identified (9.05 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

```
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:          9H2
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         12H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          4H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          9H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:         33H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:       FLARES
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:       FLAREN
CN W305     233 WAKFLG:Stack height > or = EPA formula height for SRCID:          7H3
CN W305     252 WAKFLG:Stack height > or = EPA formula height for SRCID:         10H2
CN W305     253 WAKFLG:Stack height > or = EPA formula height for SRCID:         19H1
```

*** MODEL SETUP OPTIONS SUMMARY ***

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses URBAN Dispersion Algorithm for the SBL for   54 Source(s),
for Total of   1 Urban Area(s):
Urban Population =   306479.0 ; Urban Roughness Length = 1.000 m

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay for URBAN/Non-SO2.
6. Urban Roughness Length of 1.0 Meter Assumed.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 1 Short Term Average(s) of: 24-HR

**This Run Includes: 54 Source(s);   56 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of: PM-10

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1288.00 ; Decay Coef. =   0.000   ; Rot. Angle =   0.0
Emission Units = GRAMS/SEC   ; Emission Rate Unit Factor =   0.10000E+07
Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =   36.4 MB of RAM.

**Input Runstream File: Holly_V17_2006_PM-10.DTA
**Output Print File: Holly_V17_2006_PM-10.LST

**File for Summary of Results: C:\beast\Holly\Holly_V17_2006_PM-10.SUM

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

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1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
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NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2006.SFC Met Version: 11059
Profile file: SY2006.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2006 Year: 2006

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
06	01	01	1	01	-11.8	0.241	-9.000	-9.000	-999.	273.	91.0	0.09	0.28	1.00	3.20	185.	10.0	276.0	10.0
06	01	01	1	02	-11.9	0.244	-9.000	-9.000	-999.	277.	93.0	0.01	0.28	1.00	4.60	248.	10.0	276.5	10.0
06	01	01	1	03	-24.7	0.504	-9.000	-9.000	-999.	824.	399.2	0.01	0.28	1.00	9.00	269.	10.0	277.0	10.0
06	01	01	1	04	-40.4	0.427	-9.000	-9.000	-999.	646.	146.0	0.02	0.28	1.00	7.00	290.	10.0	276.9	10.0
06	01	01	1	05	-15.9	0.324	-9.000	-9.000	-999.	430.	164.1	0.04	0.28	1.00	4.80	301.	10.0	276.4	10.0
06	01	01	1	06	-18.0	0.366	-9.000	-9.000	-999.	508.	209.4	0.02	0.28	1.00	5.90	298.	10.0	276.4	10.0
06	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.02	0.28	1.00	6.30	289.	10.0	275.9	10.0
06	01	01	1	08	-34.7	0.381	-9.000	-9.000	-999.	540.	122.8	0.02	0.28	1.00	6.30	282.	10.0	275.4	10.0
06	01	01	1	09	-21.0	0.324	-9.000	-9.000	-999.	425.	124.8	0.01	0.28	0.51	6.00	268.	10.0	275.1	10.0
06	01	01	1	10	10.5	0.195	0.315	0.005	92.	206.	-54.3	0.01	0.28	0.30	3.20	249.	10.0	276.1	10.0
06	01	01	1	11	27.6	0.203	0.649	0.005	307.	211.	-23.6	0.01	0.28	0.22	3.20	248.	10.0	277.5	10.0
06	01	01	1	12	38.6	0.170	0.825	0.005	450.	161.	-9.8	0.01	0.28	0.19	2.50	249.	10.0	278.4	10.0
06	01	01	1	13	42.5	0.283	0.942	0.005	608.	346.	-41.1	0.09	0.28	0.19	3.00	207.	10.0	279.2	10.0
06	01	01	1	14	32.3	0.382	0.913	0.005	729.	543.	-133.3	0.12	0.28	0.19	4.00	168.	10.0	279.9	10.0
06	01	01	1	15	4.8	0.338	0.487	0.005	746.	452.	-623.1	0.07	0.28	0.22	4.20	148.	10.0	279.8	10.0
06	01	01	1	16	0.4	0.444	0.218	0.005	747.	681.	-8888.0	0.12	0.28	0.29	4.90	155.	10.0	279.4	10.0
06	01	01	1	17	-17.9	0.410	-9.000	-9.000	-999.	605.	298.0	0.12	0.28	0.49	4.70	161.	10.0	278.4	10.0
06	01	01	1	18	-25.2	0.339	-9.000	-9.000	-999.	457.	119.9	0.12	0.28	1.00	4.10	163.	10.0	277.4	10.0
06	01	01	1	19	-21.1	0.284	-9.000	-9.000	-999.	349.	83.7	0.07	0.28	1.00	4.00	149.	10.0	276.6	10.0
06	01	01	1	20	-9.3	0.189	-9.000	-9.000	-999.	192.	55.7	0.07	0.28	1.00	2.80	124.	10.0	276.0	10.0
06	01	01	1	21	-18.7	0.381	-9.000	-9.000	-999.	540.	227.2	0.07	0.28	1.00	5.00	140.	10.0	276.9	10.0
06	01	01	1	22	-12.9	0.262	-9.000	-9.000	-999.	316.	108.2	0.12	0.28	1.00	3.20	165.	10.0	277.1	10.0
06	01	01	1	23	-14.5	0.296	-9.000	-9.000	-999.	371.	138.0	0.07	0.28	1.00	4.00	134.	10.0	277.2	10.0
06	01	01	1	24	-18.2	0.372	-9.000	-9.000	-999.	522.	218.0	0.07	0.28	1.00	4.90	133.	10.0	277.8	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
06	01	01	01	10.0	1	185.	3.20	276.1	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	80.63441	ON 06122824:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	42.44445m	ON 06122924:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
NEW	HIGH 1ST HIGH VALUE IS	1.23733	ON 06092224:	AT (423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	1.18301	ON 06100324:	AT (423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC
4H1	HIGH 1ST HIGH VALUE IS	0.76134m	ON 06042524:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.61744	ON 06081824:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4K1A	HIGH 1ST HIGH VALUE IS	0.12101	ON 06081824:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.10510m	ON 06042524:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4K1B	HIGH 1ST HIGH VALUE IS	0.10490	ON 06083124:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.10411m	ON 06053024:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4V82	HIGH 1ST HIGH VALUE IS	1.60733m	ON 06022124:	AT (423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	1.06431	ON 06072324:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
6H1	HIGH 1ST HIGH VALUE IS	0.11827	ON 06122824:	AT (423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.10683	ON 06092224:	AT (423950.00, 4526250.00, 1307.01, 2867.37, 0.00)	DC
6H3	HIGH 1ST HIGH VALUE IS	0.06469	ON 06100324:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.06018	ON 06100324:	AT (423963.20, 4526238.10, 1307.00, 2867.37, 0.00)	DC
6H2	HIGH 1ST HIGH VALUE IS	0.12439	ON 06122824:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.08783	ON 06092224:	AT (423947.40, 4526311.70, 1306.11, 2867.37, 0.00)	DC

6K1	HIGH	1ST HIGH VALUE IS	0.15012 ON 06122824: AT (	423874.10,	4526311.60,	1305.39,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10781m ON 06101724: AT (	423874.10,	4526311.60,	1305.39,	2867.37,	0.00)	DC
6K2	HIGH	1ST HIGH VALUE IS	0.15280 ON 06122824: AT (	423849.70,	4526311.60,	1305.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10788m ON 06101724: AT (	423874.10,	4526311.60,	1305.39,	2867.37,	0.00)	DC
7H3	HIGH	1ST HIGH VALUE IS	0.06025 ON 06092224: AT (	423850.00,	4526150.00,	1305.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.05764 ON 06100324: AT (	423822.10,	4526206.20,	1304.94,	2867.37,	0.00)	DC
7H1	HIGH	1ST HIGH VALUE IS	0.14693 ON 06122824: AT (	423825.30,	4526311.60,	1304.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.09840m ON 06101724: AT (	423825.30,	4526311.60,	1304.00,	2867.37,	0.00)	DC
8H1	HIGH	1ST HIGH VALUE IS	0.13165 ON 06092224: AT (	423950.00,	4526100.00,	1307.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10488m ON 06050224: AT (	423950.00,	4526100.00,	1307.00,	2867.37,	0.00)	DC
9H1	HIGH	1ST HIGH VALUE IS	0.12573m ON 06010324: AT (	424116.80,	4526553.40,	1308.40,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10592m ON 06032624: AT (	424100.00,	4526500.00,	1308.69,	2867.37,	0.00)	DC
9H2	HIGH	1ST HIGH VALUE IS	0.13680m ON 06032624: AT (	424018.30,	4526488.00,	1307.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12835m ON 06041924: AT (	424018.30,	4526488.00,	1307.00,	2867.37,	0.00)	DC

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID			AVERAGE CONC / DATE (YYMMDDHH)	RECEPTOR (XR,	YR,	ZELEV,	ZHILL,	ZFLAG)	OF TYPE GRID-ID
10H1	HIGH	1ST HIGH VALUE IS	0.06855 ON 06122824: AT (	423850.00,	4526050.00,	1305.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.06030 ON 06100324: AT (	423850.00,	4526300.00,	1305.00,	2867.37,	0.00)	DC
10H2	HIGH	1ST HIGH VALUE IS	0.13513 ON 06092224: AT (	424000.00,	4526050.00,	1310.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.11467 ON 06092224: AT (	423950.00,	4525950.00,	1308.08,	2867.37,	0.00)	DC
11H1	HIGH	1ST HIGH VALUE IS	0.08451 ON 06122824: AT (	423822.20,	4526085.60,	1305.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.07388 ON 06122824: AT (	423822.00,	4526230.30,	1304.69,	2867.37,	0.00)	DC
12H1	HIGH	1ST HIGH VALUE IS	0.05279 ON 06092224: AT (	423950.00,	4526000.00,	1308.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04607m ON 06050224: AT (	423950.00,	4526000.00,	1308.00,	2867.37,	0.00)	DC
13H1	HIGH	1ST HIGH VALUE IS	0.09659 ON 06122824: AT (	423950.00,	4526150.00,	1307.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.07778 ON 06092224: AT (	423950.00,	4526250.00,	1307.01,	2867.37,	0.00)	DC
19H1	HIGH	1ST HIGH VALUE IS	0.05271 ON 06092224: AT (	423950.00,	4526100.00,	1307.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04675m ON 06070824: AT (	423900.00,	4526200.00,	1306.00,	2867.37,	0.00)	DC
20H1	HIGH	1ST HIGH VALUE IS	0.04811 ON 06092224: AT (	423950.00,	4526100.00,	1307.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04283m ON 06070824: AT (	423900.00,	4526200.00,	1306.00,	2867.37,	0.00)	DC
20H2	HIGH	1ST HIGH VALUE IS	0.09637 ON 06092224: AT (	423950.00,	4526050.00,	1308.90,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08136m ON 06070824: AT (	423900.00,	4526100.00,	1306.02,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.08738 ON 06092224: AT (	423950.00,	4526050.00,	1308.90,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08068m ON 06070824: AT (	423900.00,	4526150.00,	1306.00,	2867.37,	0.00)	DC
23H1	HIGH	1ST HIGH VALUE IS	0.05832 ON 06092224: AT (	423950.00,	4526200.00,	1307.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.05246 ON 06100324: AT (	423950.00,	4526200.00,	1307.00,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.07487 ON 06092224: AT (	423898.60,	4526311.60,	1305.71,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.06318m ON 06050224: AT (	423874.10,	4526311.60,	1305.39,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.07122 ON 06092224: AT (	423898.60,	4526311.60,	1305.71,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.05981m ON 06050224: AT (	423849.70,	4526311.60,	1305.00,	2867.37,	0.00)	DC
SCRUBBER	HIGH	1ST HIGH VALUE IS	0.63260 ON 06100324: AT (	423800.80,	4526311.60,	1303.75,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.52366m ON 06050224: AT (	423821.50,	4526247.10,	1304.09,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.06519 ON 06122824: AT (	423825.30,	4526311.60,	1304.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04046 ON 06092224: AT (	423874.10,	4526311.60,	1305.39,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.09440 ON 06092224: AT (	423947.40,	4526311.70,	1306.11,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.07854m ON 06050224: AT (	423898.60,	4526311.60,	1305.71,	2867.37,	0.00)	DC
30H1	HIGH	1ST HIGH VALUE IS	0.12644m ON 06022824: AT (	423800.00,	4527400.00,	1296.89,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.11952 ON 06122824: AT (	423898.60,	4526311.60,	1305.71,	2867.37,	0.00)	DC

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
30H2	HIGH	1ST HIGH VALUE IS	0.12660m	ON 06022824:	AT (423800.00, 4527400.00, 1296.89, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.11940	ON 06122824:	AT (423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.10414	ON 06092224:	AT (423950.00, 4525950.00, 1308.08, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08635m	ON 06050224:	AT (423950.00, 4525950.00, 1308.08, 2867.37, 0.00)	DC
BOILER4	HIGH	1ST HIGH VALUE IS	0.52131	ON 06122824:	AT (423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.32572m	ON 06041924:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
BOILER5	HIGH	1ST HIGH VALUE IS	0.28744	ON 06030324:	AT (424002.70, 4526933.60, 1302.97, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.16988	ON 06092224:	AT (423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC
BOILER8	HIGH	1ST HIGH VALUE IS	0.41141m	ON 06032624:	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.29064	ON 06102524:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
BOILER9	HIGH	1ST HIGH VALUE IS	0.57761m	ON 06032624:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.47073m	ON 06032624:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
BOILER10	HIGH	1ST HIGH VALUE IS	0.45828m	ON 06032624:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.39150	ON 06052224:	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.40702	ON 06122824:	AT (423795.90, 4526280.90, 1304.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.31418	ON 06092224:	AT (423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC
68H2	HIGH	1ST HIGH VALUE IS	0.11400m	ON 06050224:	AT (424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10202	ON 06122824:	AT (424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC
68H3	HIGH	1ST HIGH VALUE IS	0.16816m	ON 06042524:	AT (424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.14651m	ON 06123124:	AT (424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC
68H4	HIGH	1ST HIGH VALUE IS	0.12631	ON 06020724:	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.09444m	ON 06042524:	AT (424206.50, 4526802.70, 1307.25, 2867.37, 0.00)	DC
68H5	HIGH	1ST HIGH VALUE IS	0.11993m	ON 06093024:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10835m	ON 06122024:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.10119m	ON 06101924:	AT (424022.80, 4526928.70, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.09699m	ON 06101224:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.13924m	ON 06101924:	AT (424022.80, 4526928.70, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12525m	ON 06122024:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.01923	ON 06122824:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01193m	ON 06122924:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.01698	ON 06122824:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01136	ON 06092224:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
68H12	HIGH	1ST HIGH VALUE IS	0.01728	ON 06122824:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01180	ON 06122824:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.01820	ON 06122824:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01219	ON 06092224:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
CWT4	HIGH	1ST HIGH VALUE IS	17.72175	ON 06122824:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	9.20418m	ON 06122924:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
CWT6	HIGH	1ST HIGH VALUE IS	16.51207	ON 06122824:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	8.53204m	ON 06122924:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC

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CWT7     HIGH   1ST HIGH VALUE IS      18.40901  ON 06122824: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS      10.49853m ON 06101724: AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC

CWT8     HIGH   1ST HIGH VALUE IS      29.75310  ON 06122824: AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS      15.32700m ON 06122924: AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC

CWT10    HIGH   1ST HIGH VALUE IS       0.10147m ON 06022824: AT (  423863.70,  4526986.50,  1300.17,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.07542m ON 06022824: AT (  423840.40,  4526987.00,  1299.47,  2867.37,    0.00)  DC

CWT11    HIGH   1ST HIGH VALUE IS       0.13019  ON 06122824: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.08762m ON 06052724: AT (  423825.30,  4526311.60,  1304.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
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 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            8 Warning Message(s)
 A Total of          525 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of          525 Missing Hours Identified (  5.99 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           4H1
 CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H1
 CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H2
 CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          12H1
 CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
 CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
 CN W305      13 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
 CN W305      72 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
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                                           ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for    54 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay for URBAN/Non-SO2.
        6. Urban Roughness Length of 1.0 Meter Assumed.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:  24-HR

**This Run Includes:     54 Source(s);      56 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  PM-10

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     36.4 MB of RAM.

**Input Runstream File:          Holly_V17_2007_PM-10.DTA
**Output Print File:             Holly_V17_2007_PM-10.LST

**File for Summary of Results:   C:\beast\Holly\Holly_V17_2007_PM-10.SUM
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                                           *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                              (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                  *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                           (METERS/SEC)

                                               1.54,   3.09,   5.14,   8.23,  10.80,
```

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2007.SFC Met Version: 11059
Profile file: SY2007.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2007 Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-2.0	0.051	-9.000	-9.000	-999.	27.	5.4	0.01	0.28	1.00	1.80	267.	10.0	270.4	10.0
07	01	01	1	02	-1.2	0.042	-9.000	-9.000	-999.	20.	4.6	0.02	0.28	1.00	1.30	295.	10.0	270.9	10.0
07	01	01	1	03	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	93.	10.0	270.6	10.0
07	01	01	1	04	-0.8	0.036	-9.000	-9.000	-999.	16.	4.4	0.07	0.28	1.00	0.90	141.	10.0	270.6	10.0
07	01	01	1	05	-2.4	0.063	-9.000	-9.000	-999.	37.	8.4	0.12	0.28	1.00	1.40	172.	10.0	270.4	10.0
07	01	01	1	06	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	114.	10.0	270.4	10.0
07	01	01	1	07	-0.5	0.029	-9.000	-9.000	-999.	11.	3.3	0.04	0.28	1.00	0.80	87.	10.0	270.0	10.0
07	01	01	1	08	-0.5	0.026	-9.000	-9.000	-999.	9.	2.7	0.01	0.28	1.00	0.90	262.	10.0	269.5	10.0
07	01	01	1	09	-4.5	0.099	-9.000	-9.000	-999.	71.	16.8	0.09	0.28	0.51	1.90	347.	10.0	269.0	10.0
07	01	01	1	10	9.0	0.139	0.572	0.017	655.	119.	-23.4	0.04	0.28	0.30	1.70	315.	10.0	271.0	10.0
07	01	01	1	11	22.7	0.145	0.787	0.018	677.	128.	-10.7	0.06	0.28	0.22	1.50	14.	10.0	272.8	10.0
07	01	01	1	12	31.5	0.186	0.891	0.018	707.	184.	-16.0	0.06	0.28	0.19	2.00	13.	10.0	272.9	10.0
07	01	01	1	13	34.6	0.222	0.934	0.018	740.	241.	-25.0	0.06	0.28	0.19	2.50	5.	10.0	273.4	10.0
07	01	01	1	14	38.8	0.298	0.985	0.018	777.	374.	-53.6	0.09	0.28	0.19	3.20	359.	10.0	273.9	10.0
07	01	01	1	15	28.3	0.138	0.898	0.018	805.	136.	-7.3	0.04	0.28	0.22	1.50	64.	10.0	275.4	10.0
07	01	01	1	16	11.6	0.177	0.671	0.018	816.	171.	-37.4	0.05	0.28	0.29	2.10	111.	10.0	275.1	10.0
07	01	01	1	17	-7.2	0.120	-9.000	-9.000	-999.	96.	18.8	0.07	0.28	0.49	2.30	134.	10.0	273.6	10.0
07	01	01	1	18	-4.8	0.077	-9.000	-9.000	-999.	49.	7.5	0.12	0.28	1.00	1.70	152.	10.0	272.0	10.0
07	01	01	1	19	-2.1	0.045	-9.000	-9.000	-999.	22.	3.4	0.01	0.28	1.00	1.50	221.	10.0	271.0	10.0
07	01	01	1	20	-0.8	0.029	-9.000	-9.000	-999.	11.	2.4	0.01	0.28	1.00	1.00	242.	10.0	270.4	10.0
07	01	01	1	21	-6.2	0.083	-9.000	-9.000	-999.	55.	7.3	0.07	0.28	1.00	2.10	128.	10.0	269.8	10.0
07	01	01	1	22	-8.2	0.095	-9.000	-9.000	-999.	68.	8.4	0.07	0.28	1.00	2.40	136.	10.0	269.4	10.0
07	01	01	1	23	-9.6	0.103	-9.000	-9.000	-999.	76.	9.1	0.07	0.28	1.00	2.60	142.	10.0	268.8	10.0
07	01	01	1	24	-5.1	0.075	-9.000	-9.000	-999.	48.	6.6	0.07	0.28	1.00	1.90	148.	10.0	269.0	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	10.0	1	267.	1.80	270.5	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	73.28437m	ON 07030124:	AT (423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	55.71731m	ON 07030124:	AT (424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC
NEW	HIGH	1ST HIGH VALUE IS	1.32705	ON 07041524:	AT (423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	1.20588m	ON 07050424:	AT (423795.90, 4526280.90, 1304.00, 2867.37, 0.00)	DC
4H1	HIGH	1ST HIGH VALUE IS	0.71391	ON 07062624:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.57378m	ON 07050824:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
4K1A	HIGH	1ST HIGH VALUE IS	0.13066	ON 07062624:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10160m	ON 07050824:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4K1B	HIGH	1ST HIGH VALUE IS	0.13248	ON 07062624:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.09645m	ON 07051524:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4V82	HIGH	1ST HIGH VALUE IS	1.18850	ON 07022224:	AT (423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	1.08782	ON 07052024:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
6H1	HIGH	1ST HIGH VALUE IS	0.13892	ON 07041524:	AT (423950.00, 4526250.00, 1307.01, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.11090m	ON 07050424:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC
6H3	HIGH	1ST HIGH VALUE IS	0.06124m	ON 07050424:	AT (423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.05334m	ON 07050424:	AT (423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC
6H2	HIGH	1ST HIGH VALUE IS	0.11633	ON 07041524:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08606m	ON 07050424:	AT (423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC

6K1	HIGH	1ST HIGH VALUE IS	0.18008m	ON 07111224: AT (	423727.50,	4526311.50,	1303.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.14299m	ON 07111224: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
6K2	HIGH	1ST HIGH VALUE IS	0.19336m	ON 07111224: AT (	423727.50,	4526311.50,	1303.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.13614m	ON 07122124: AT (	423731.50,	4526277.70,	1303.00,	2867.37,	0.00)	DC
7H3	HIGH	1ST HIGH VALUE IS	0.05786m	ON 07050424: AT (	423778.80,	4526085.40,	1304.13,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.05118	ON 07041524: AT (	423800.50,	4526085.50,	1304.24,	2867.37,	0.00)	DC
7H1	HIGH	1ST HIGH VALUE IS	0.09957	ON 07041924: AT (	423998.90,	4526560.50,	1305.38,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08069m	ON 07030124: AT (	423998.60,	4526535.60,	1306.00,	2867.37,	0.00)	DC
8H1	HIGH	1ST HIGH VALUE IS	0.12797m	ON 07050424: AT (	423900.00,	4526050.00,	1306.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.11008	ON 07041524: AT (	423900.00,	4525950.00,	1307.00,	2867.37,	0.00)	DC
9H1	HIGH	1ST HIGH VALUE IS	0.14561	ON 07051424: AT (	424116.80,	4526553.40,	1308.40,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12540	ON 07052324: AT (	424100.50,	4526508.10,	1308.47,	2867.37,	0.00)	DC
9H2	HIGH	1ST HIGH VALUE IS	0.19451m	ON 07030124: AT (	424000.00,	4526500.00,	1306.05,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12186	ON 07041824: AT (	424018.30,	4526488.00,	1307.00,	2867.37,	0.00)	DC

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR,	YR,	ZELEV,	ZHILL,	ZFLAG)	OF TYPE
10H1	HIGH	1ST HIGH VALUE IS	0.06997	ON 07041524: AT (	423850.00,	4526200.00,	1305.72,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.06475m	ON 07050424: AT (	423822.00,	4526230.30,	1304.69,	2867.37,	0.00)	DC
10H2	HIGH	1ST HIGH VALUE IS	0.14854	ON 07041524: AT (	423950.00,	4526000.00,	1308.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12610m	ON 07050424: AT (	423950.00,	4526000.00,	1308.00,	2867.37,	0.00)	DC
11H1	HIGH	1ST HIGH VALUE IS	0.09277	ON 07041524: AT (	423821.50,	4526247.10,	1304.09,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.07714m	ON 07050424: AT (	423795.90,	4526280.90,	1304.00,	2867.37,	0.00)	DC
12H1	HIGH	1ST HIGH VALUE IS	0.05147m	ON 07050424: AT (	423900.00,	4525950.00,	1307.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04383m	ON 07050424: AT (	423950.00,	4525900.00,	1309.31,	2867.37,	0.00)	DC
13H1	HIGH	1ST HIGH VALUE IS	0.08684	ON 07041524: AT (	423950.00,	4526250.00,	1307.01,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.06328	ON 07012924: AT (	424017.60,	4526414.50,	1307.94,	2867.37,	0.00)	DC
19H1	HIGH	1ST HIGH VALUE IS	0.05137	ON 07041524: AT (	423900.00,	4526050.00,	1306.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04974	ON 07041524: AT (	423900.00,	4526100.00,	1306.02,	2867.37,	0.00)	DC
20H1	HIGH	1ST HIGH VALUE IS	0.04628m	ON 07050424: AT (	423900.00,	4526050.00,	1306.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04458	ON 07041524: AT (	423900.00,	4526050.00,	1306.00,	2867.37,	0.00)	DC
20H2	HIGH	1ST HIGH VALUE IS	0.09960	ON 07041524: AT (	423950.00,	4525950.00,	1308.08,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.09152	ON 07041524: AT (	423900.00,	4526000.00,	1308.26,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.08396m	ON 07050424: AT (	423900.00,	4526000.00,	1308.26,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.07553	ON 07041524: AT (	423900.00,	4525950.00,	1307.00,	2867.37,	0.00)	DC
23H1	HIGH	1ST HIGH VALUE IS	0.06070	ON 07041524: AT (	423950.00,	4526100.00,	1307.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04908	ON 07041524: AT (	423900.00,	4526050.00,	1306.00,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.07815	ON 07041524: AT (	423874.10,	4526311.60,	1305.39,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.07317m	ON 07050424: AT (	423849.70,	4526311.60,	1305.00,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.07237	ON 07041524: AT (	423874.10,	4526311.60,	1305.39,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.06688m	ON 07050424: AT (	423849.70,	4526311.60,	1305.00,	2867.37,	0.00)	DC
SCRUBBER	HIGH	1ST HIGH VALUE IS	0.63176	ON 07062624: AT (	424250.00,	4526550.00,	1310.69,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.50271	ON 07020724: AT (	424124.90,	4526576.10,	1308.06,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.05457	ON 07041524: AT (	423825.30,	4526311.60,	1304.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04483	ON 07022224: AT (	423840.90,	4527056.60,	1299.00,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.08970m	ON 07050424: AT (	423850.00,	4526250.00,	1305.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08246	ON 07041524: AT (	423900.00,	4526250.00,	1305.93,	2867.37,	0.00)	DC
30H1	HIGH	1ST HIGH VALUE IS	0.15534	ON 07041524: AT (	423898.60,	4526311.60,	1305.71,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.13188m	ON 07050424: AT (	423849.70,	4526311.60,	1305.00,	2867.37,	0.00)	DC

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
30H2	HIGH	1ST HIGH VALUE IS	0.15565	ON 07041524:	AT (423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.13253m	ON 07050424:	AT (423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.10026m	ON 07050424:	AT (423900.00, 4525850.00, 1308.77, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08313m	ON 07050424:	AT (423950.00, 4525850.00, 1309.72, 2867.37, 0.00)	DC
BOILER4	HIGH	1ST HIGH VALUE IS	0.51184m	ON 07030124:	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.34964	ON 07062624:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
BOILER5	HIGH	1ST HIGH VALUE IS	0.35738m	ON 07041024:	AT (423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.19871m	ON 07050424:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
BOILER8	HIGH	1ST HIGH VALUE IS	0.63355	ON 07041924:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.44466	ON 07041824:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
BOILER9	HIGH	1ST HIGH VALUE IS	0.83100m	ON 07030124:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.52287	ON 07041824:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
BOILER10	HIGH	1ST HIGH VALUE IS	0.54685	ON 07041924:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.31633	ON 07060624:	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.43875	ON 07041524:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.34259m	ON 07050424:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
68H2	HIGH	1ST HIGH VALUE IS	0.09501	ON 07021324:	AT (424141.30, 4526621.40, 1308.11, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.09105m	ON 07112024:	AT (424141.30, 4526621.40, 1308.11, 2867.37, 0.00)	DC
68H3	HIGH	1ST HIGH VALUE IS	0.14460m	ON 07111824:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12852m	ON 07112424:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H4	HIGH	1ST HIGH VALUE IS	0.14959m	ON 07120924:	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.11496m	ON 07120924:	AT (424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC
68H5	HIGH	1ST HIGH VALUE IS	0.15197m	ON 07110324:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12561m	ON 07092624:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.17471m	ON 07102424:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10809m	ON 07102724:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.14682m	ON 07110324:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.13873m	ON 07083124:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.01463	ON 07041524:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01223	ON 07041524:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.01349	ON 07041524:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01151m	ON 07050424:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
68H12	HIGH	1ST HIGH VALUE IS	0.01498	ON 07041524:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01250	ON 07041524:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.01578m	ON 07050424:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01447	ON 07041524:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
CWT4	HIGH	1ST HIGH VALUE IS	17.52271m	ON 07030124:	AT (423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	13.60628m	ON 07030124:	AT (424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC
CWT6	HIGH	1ST HIGH VALUE IS	15.24163m	ON 07030124:	AT (423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	10.55648m	ON 07030124:	AT (424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC

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CWT7     HIGH   1ST HIGH VALUE IS      15.10932m ON 07030124: AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS      10.01287  ON 07041924: AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC

CWT8     HIGH   1ST HIGH VALUE IS      24.81168m ON 07030124: AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS      18.74849m ON 07030124: AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC

CWT10    HIGH   1ST HIGH VALUE IS       0.12812  ON 07041924: AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.08632m ON 07092824: AT (  423910.20,  4526985.50,  1300.67,  2867.37,    0.00)  DC

CWT11    HIGH   1ST HIGH VALUE IS       0.13006  ON 07041524: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.09145  ON 07032824: AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



```
 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            8 Warning Message(s)
 A Total of         2026 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of         2026 Missing Hours Identified ( 23.13 Percent)

 CAUTION!:  Number of Missing Hours Exceeds 10 Percent of Total!
            Data May Not Be Acceptable for Regulatory Applications.
            See Section 5.3.2 of "Meteorological Monitoring Guidance
            for Regulatory Modeling Applications" (EPA-454/R-99-005).


    ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
 CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
 CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          12H1
 CN W305       4 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H2
 CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:           4H1
 CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H1
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
 CN W305      15 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
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                                        ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for    54 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay for URBAN/Non-SO2.
        6. Urban Roughness Length of 1.0 Meter Assumed.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:  24-HR

**This Run Includes:     54 Source(s);      56 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  PM-10

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     36.4 MB of RAM.

**Input Runstream File:          Holly_V17_2008_PM-10.DTA
**Output Print File:             Holly_V17_2008_PM-10.LST

**File for Summary of Results:   C:\beast\Holly\Holly_V17_2008_PM-10.SUM
```



```
                                        *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                              *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                        (METERS/SEC)

                                             1.54,   3.09,   5.14,   8.23,  10.80,
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**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2008.SFC Met Version: 11059
Profile file: SY2008.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2008 Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-24.3	0.228	-9.000	-9.000	-999.	250.	38.8	0.07	0.28	1.00	3.60	144.	10.0	264.2	10.0
08	01	01	1	02	-9.9	0.103	-9.000	-9.000	-999.	85.	8.9	0.07	0.28	1.00	2.60	130.	10.0	263.6	10.0
08	01	01	1	03	-3.8	0.064	-9.000	-9.000	-999.	37.	5.5	0.07	0.28	1.00	1.60	127.	10.0	263.0	10.0
08	01	01	1	04	-10.3	0.109	-9.000	-9.000	-999.	82.	10.0	0.12	0.28	1.00	2.40	153.	10.0	263.6	10.0
08	01	01	1	05	-8.5	0.095	-9.000	-9.000	-999.	68.	8.2	0.07	0.28	1.00	2.40	123.	10.0	263.1	10.0
08	01	01	1	06	-7.9	0.091	-9.000	-9.000	-999.	63.	7.6	0.05	0.28	1.00	2.40	93.	10.0	262.9	10.0
08	01	01	1	07	-7.2	0.086	-9.000	-9.000	-999.	58.	7.0	0.04	0.28	1.00	2.40	63.	10.0	262.6	10.0
08	01	01	1	08	-11.6	0.116	-9.000	-9.000	-999.	91.	10.9	0.05	0.28	1.00	2.90	30.	10.0	261.4	10.0
08	01	01	1	09	-13.2	0.185	-9.000	-9.000	-999.	184.	38.9	0.06	0.28	0.51	3.00	24.	10.0	262.9	10.0
08	01	01	1	10	10.3	0.229	0.258	0.005	54.	252.	-94.0	0.06	0.28	0.30	2.80	26.	10.0	264.2	10.0
08	01	01	1	11	27.2	0.247	0.447	0.005	105.	283.	-44.5	0.06	0.28	0.22	2.90	23.	10.0	265.8	10.0
08	01	01	1	12	31.4	0.256	0.518	0.005	142.	298.	-43.0	0.06	0.28	0.19	3.00	24.	10.0	267.2	10.0
08	01	01	1	13	34.5	0.201	0.582	0.007	183.	208.	-18.9	0.05	0.28	0.19	2.30	54.	10.0	268.6	10.0
08	01	01	1	14	31.7	0.255	0.602	0.005	220.	296.	-41.7	0.05	0.28	0.19	3.10	37.	10.0	267.6	10.0
08	01	01	1	15	23.3	0.252	0.565	0.005	247.	291.	-55.2	0.06	0.28	0.22	3.00	3.	10.0	267.8	10.0
08	01	01	1	16	-0.3	0.246	-9.000	-9.000	-999.	281.	4710.6	0.06	0.28	0.29	3.20	17.	10.0	267.4	10.0
08	01	01	1	17	-8.9	0.196	-9.000	-9.000	-999.	200.	68.0	0.06	0.28	0.49	2.90	13.	10.0	266.1	10.0
08	01	01	1	18	-13.0	0.244	-9.000	-9.000	-999.	277.	88.9	0.06	0.28	1.00	3.50	8.	10.0	264.5	10.0
08	01	01	1	19	-5.5	0.104	-9.000	-9.000	-999.	90.	16.1	0.05	0.28	1.00	2.20	35.	10.0	264.2	10.0
08	01	01	1	20	-2.6	0.056	-9.000	-9.000	-999.	31.	5.3	0.05	0.28	1.00	1.50	48.	10.0	264.2	10.0
08	01	01	1	21	-2.5	0.062	-9.000	-9.000	-999.	35.	7.4	0.06	0.28	1.00	1.60	17.	10.0	263.4	10.0
08	01	01	1	22	-2.9	0.066	-9.000	-9.000	-999.	39.	7.9	0.06	0.28	1.00	1.70	26.	10.0	263.9	10.0
08	01	01	1	23	-8.6	0.160	-9.000	-9.000	-999.	147.	38.2	0.06	0.28	1.00	2.60	24.	10.0	263.0	10.0
08	01	01	1	24	-26.9	0.273	-9.000	-9.000	-999.	327.	60.1	0.06	0.28	1.00	4.10	15.	10.0	262.9	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	10.0	1	144.	3.60	264.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	55.10338	ON 08031624:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	43.31865	ON 08052124:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
NEW	HIGH 1ST HIGH VALUE IS	1.32040	ON 08032924:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	1.13035	ON 08100924:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
4H1	HIGH 1ST HIGH VALUE IS	0.56857	ON 08050524:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.43305	ON 08053024:	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC
4K1A	HIGH 1ST HIGH VALUE IS	0.11684	ON 08050224:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.07837	ON 08032424:	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC
4K1B	HIGH 1ST HIGH VALUE IS	0.08790	ON 08050524:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.07641	ON 08050524:	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC
4V82	HIGH 1ST HIGH VALUE IS	1.30730	ON 08051624:	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.99630	ON 08052624:	AT (423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC
6H1	HIGH 1ST HIGH VALUE IS	0.19809m	ON 08122524:	AT (423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.13392	ON 08020324:	AT (423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC
6H3	HIGH 1ST HIGH VALUE IS	0.06290	ON 08022024:	AT (423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.05753	ON 08021824:	AT (423900.00, 4526250.00, 1305.93, 2867.37, 0.00)	DC
6H2	HIGH 1ST HIGH VALUE IS	0.10395	ON 08031624:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC
	HIGH 2ND HIGH VALUE IS	0.09404	ON 08100924:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC

GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	XR	YR	ZELEV	ZHILL	ZFLAG	OF TYPE
6K1	HIGH	1ST HIGH VALUE IS	0.15088m	ON 08022824: AT (	423750.00,	4526300.00,	1303.46,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10921	ON 08082224: AT (	423731.50,	4526277.70,	1303.00,	2867.37,	0.00)	DC
6K2	HIGH	1ST HIGH VALUE IS	0.13516m	ON 08022824: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10866	ON 08012224: AT (	423713.00,	4526277.80,	1302.99,	2867.37,	0.00)	DC
7H3	HIGH	1ST HIGH VALUE IS	0.05977	ON 08022024: AT (	423768.50,	4526277.50,	1303.49,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.05404	ON 08022024: AT (	423795.90,	4526280.90,	1304.00,	2867.37,	0.00)	DC
7H1	HIGH	1ST HIGH VALUE IS	0.12651	ON 08031624: AT (	423800.80,	4526311.60,	1303.75,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.07686	ON 08043024: AT (	423849.70,	4526311.60,	1305.00,	2867.37,	0.00)	DC
8H1	HIGH	1ST HIGH VALUE IS	0.13133m	ON 08122524: AT (	423724.50,	4527220.50,	1296.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.11420	ON 08071124: AT (	423950.00,	4526100.00,	1307.00,	2867.37,	0.00)	DC
9H1	HIGH	1ST HIGH VALUE IS	0.08927m	ON 08040324: AT (	424108.60,	4526530.70,	1308.63,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08916	ON 08050224: AT (	424108.60,	4526530.70,	1308.63,	2867.37,	0.00)	DC
9H2	HIGH	1ST HIGH VALUE IS	0.13376	ON 08042024: AT (	424018.30,	4526488.00,	1307.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12580	ON 08031424: AT (	424018.30,	4526488.00,	1307.00,	2867.37,	0.00)	DC

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR,	YR,	ZELEV,	ZHILL,	ZFLAG)	OF TYPE GRID-ID
10H1	HIGH	1ST HIGH VALUE IS	0.07699	ON 08022024: AT (	423800.80,	4526311.60,	1303.75,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.07014	ON 08022024: AT (	423825.30,	4526311.60,	1304.00,	2867.37,	0.00)	DC
10H2	HIGH	1ST HIGH VALUE IS	0.16180m	ON 08122524: AT (	423840.40,	4526987.00,	1299.47,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12486	ON 08020324: AT (	423840.40,	4526987.00,	1299.47,	2867.37,	0.00)	DC
11H1	HIGH	1ST HIGH VALUE IS	0.07846	ON 08031624: AT (	423821.00,	4526264.00,	1304.01,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.07022	ON 08071124: AT (	423825.30,	4526311.60,	1304.00,	2867.37,	0.00)	DC
12H1	HIGH	1ST HIGH VALUE IS	0.05217	ON 08032924: AT (	423850.00,	4525950.00,	1306.17,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04748	ON 08031624: AT (	423950.00,	4526000.00,	1308.00,	2867.37,	0.00)	DC
13H1	HIGH	1ST HIGH VALUE IS	0.08841	ON 08022024: AT (	423923.00,	4526311.70,	1306.13,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.07822	ON 08021824: AT (	423923.00,	4526311.70,	1306.13,	2867.37,	0.00)	DC
19H1	HIGH	1ST HIGH VALUE IS	0.05273	ON 08022024: AT (	423850.00,	4526200.00,	1305.72,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04982	ON 08022024: AT (	423900.00,	4526200.00,	1306.00,	2867.37,	0.00)	DC
20H1	HIGH	1ST HIGH VALUE IS	0.05040	ON 08022024: AT (	423900.00,	4526200.00,	1306.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04849	ON 08021824: AT (	423900.00,	4526200.00,	1306.00,	2867.37,	0.00)	DC
20H2	HIGH	1ST HIGH VALUE IS	0.09474	ON 08032924: AT (	423850.00,	4526000.00,	1306.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.07904	ON 08032924: AT (	423900.00,	4526000.00,	1308.26,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.08321	ON 08032924: AT (	423850.00,	4526000.00,	1306.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.07318	ON 08021824: AT (	423900.00,	4526150.00,	1306.00,	2867.37,	0.00)	DC
23H1	HIGH	1ST HIGH VALUE IS	0.06044	ON 08022024: AT (	423900.00,	4526300.00,	1306.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.05333	ON 08021824: AT (	423900.00,	4526250.00,	1305.93,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.08383m	ON 08122524: AT (	423700.00,	4527400.00,	1295.49,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.06879	ON 08031924: AT (	423800.00,	4527200.00,	1297.31,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.07268m	ON 08122524: AT (	423650.00,	4527300.00,	1295.00,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.06078	ON 08031624: AT (	423825.30,	4526311.60,	1304.00,	2867.37,	0.00)	DC
SCRUBBER	HIGH	1ST HIGH VALUE IS	0.62251	ON 08021824: AT (	423800.80,	4526311.60,	1303.75,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.58303	ON 08021824: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.05922m	ON 08122524: AT (	423678.90,	4527221.00,	1295.53,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.04644	ON 08020324: AT (	423701.70,	4527220.80,	1295.89,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.09322m	ON 08122524: AT (	423700.00,	4527500.00,	1294.93,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08309	ON 08071124: AT (	423923.00,	4526311.70,	1306.13,	2867.37,	0.00)	DC
30H1	HIGH	1ST HIGH VALUE IS	0.21049m	ON 08122524: AT (	423700.00,	4527400.00,	1295.49,	2867.37,	0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.13988	ON 08020324: AT (	423750.00,	4527400.00,	1295.83,	2867.37,	0.00)	DC

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
30H2	HIGH	1ST HIGH VALUE IS	0.21105m	ON 08122524:	AT (423700.00, 4527400.00, 1295.49, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.14020	ON 08020324:	AT (423750.00, 4527400.00, 1295.83, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.09949	ON 08032924:	AT (423850.00, 4525950.00, 1306.17, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.09451	ON 08031624:	AT (423950.00, 4525950.00, 1308.08, 2867.37, 0.00)	DC
BOILER4	HIGH	1ST HIGH VALUE IS	0.41708	ON 08031624:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.32268	ON 08050524:	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC
BOILER5	HIGH	1ST HIGH VALUE IS	0.23659	ON 08040924:	AT (423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.20524	ON 08012824:	AT (423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC
BOILER8	HIGH	1ST HIGH VALUE IS	0.47718	ON 08042024:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.30252	ON 08042024:	AT (424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC
BOILER9	HIGH	1ST HIGH VALUE IS	0.63219	ON 08042024:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.42256	ON 08042024:	AT (424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC
BOILER10	HIGH	1ST HIGH VALUE IS	0.27147m	ON 08122524:	AT (423603.30, 4527177.70, 1295.64, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.23209	ON 08031624:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.37767	ON 08031624:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.30549	ON 08100924:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
68H2	HIGH	1ST HIGH VALUE IS	0.10332	ON 08030224:	AT (424133.10, 4526598.70, 1307.86, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.09712	ON 08031624:	AT (424141.30, 4526621.40, 1308.11, 2867.37, 0.00)	DC
68H3	HIGH	1ST HIGH VALUE IS	0.12814	ON 08030224:	AT (424124.90, 4526576.10, 1308.06, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12220	ON 08031624:	AT (424133.10, 4526598.70, 1307.86, 2867.37, 0.00)	DC
68H4	HIGH	1ST HIGH VALUE IS	0.10038	ON 08103024:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.09421	ON 08011124:	AT (424022.60, 4526904.20, 1303.05, 2867.37, 0.00)	DC
68H5	HIGH	1ST HIGH VALUE IS	0.10906	ON 08090324:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10449	ON 08111524:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.09140	ON 08100724:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08854	ON 08111024:	AT (424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.12378	ON 08090624:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12080	ON 08120124:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.01512	ON 08031624:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01083	ON 08032924:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.01302	ON 08032924:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01020	ON 08031624:	AT (423731.50, 4526277.70, 1303.00, 2867.37, 0.00)	DC

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
68H12	HIGH	1ST HIGH VALUE IS	0.01418	ON 08031624:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01131	ON 08032924:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.01810	ON 08031624:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01275	ON 08110524:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
CWT4	HIGH	1ST HIGH VALUE IS	11.87976	ON 08031624:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	8.84116	ON 08052124:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
CWT6	HIGH	1ST HIGH VALUE IS	10.95013	ON 08031624:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	8.47248	ON 08052124:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC

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CWT7     HIGH   1ST HIGH VALUE IS      13.32065  ON 08031624: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS       9.03697  ON 08052124: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

CWT8     HIGH   1ST HIGH VALUE IS      19.18044  ON 08031624: AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS      15.59364  ON 08052124: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

CWT10    HIGH   1ST HIGH VALUE IS       0.11881m ON 08122524: AT (  423840.40,  4526987.00,  1299.47,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.08734  ON 08012724: AT (  423863.70,  4526986.50,  1300.17,  2867.37,    0.00)  DC

CWT11    HIGH   1ST HIGH VALUE IS       0.08899  ON 08031624: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.08329  ON 08100924: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
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 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            8 Warning Message(s)
 A Total of          146 Informational Message(s)

 A Total of         8784 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of          146 Missing Hours Identified (  1.66 Percent)


    ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          9H2
 CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         12H1
 CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:         10H2
 CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:         19H1
 CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:         33H1
 CN W305       8 WAKFLG:Stack height > or = EPA formula height for SRCID:          9H1
 CN W305       9 WAKFLG:Stack height > or = EPA formula height for SRCID:          4H1
 CN W305      44 WAKFLG:Stack height > or = EPA formula height for SRCID:
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7H3

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**MODELOPTs:  RegDFAULT CONC                                          ELEV


                                        ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for    54 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay for URBAN/Non-SO2.
        6. Urban Roughness Length of 1.0 Meter Assumed.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:  24-HR

**This Run Includes:     54 Source(s);      56 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  PM-10

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     36.4 MB of RAM.

**Input Runstream File:          Holly_V17_2009_PM-10.DTA
**Output Print File:             Holly_V17_2009_PM-10.LST

**File for Summary of Results:   C:\beast\Holly\Holly_V17_2009_PM-10.SUM
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**MODELOPTs:  RegDFAULT CONC                                          ELEV


                                        *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                     (1=YES; 0=NO)

          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1

              NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                        *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                          (METERS/SEC)

                                                  1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2009.SFC Met Version: 11059
Profile file: SY2009.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 72572
Name: SALT_LAKE_CITY,UT Name: UNKNOWN
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.00	127.	10.0	267.9	10.0
09	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	1.80	120.	10.0	268.0	10.0
09	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	3.00	106.	10.0	269.1	10.0
09	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.10	132.	10.0	270.2	10.0
09	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.80	141.	10.0	269.8	10.0
09	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.50	148.	10.0	269.4	10.0
09	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	1.90	96.	10.0	269.2	10.0
09	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.12	0.28	1.00	0.80	178.	10.0	269.6	10.0
09	01	01	1	09	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	0.51	2.70	149.	10.0	270.9	10.0
09	01	01	1	10	9.0	0.274	0.144	0.005	10.	330.	-177.5	0.12	0.28	0.30	2.90	154.	10.0	271.9	10.0
09	01	01	1	11	22.7	0.173	0.298	0.012	36.	169.	-17.8	0.09	0.28	0.22	1.70	190.	10.0	273.9	10.0
09	01	01	1	12	31.6	0.109	0.420	0.018	73.	84.	-3.2	0.05	0.28	0.19	1.00	46.	10.0	275.6	10.0
09	01	01	1	13	34.8	0.258	0.504	0.005	114.	301.	-38.1	0.12	0.28	0.19	2.50	163.	10.0	277.0	10.0
09	01	01	1	14	32.1	0.113	0.539	0.013	151.	102.	-3.5	0.12	0.28	0.19	0.80	154.	10.0	277.9	10.0
09	01	01	1	15	4.7	0.155	0.288	0.013	157.	141.	-62.0	0.07	0.28	0.22	1.80	124.	10.0	278.8	10.0
09	01	01	1	16	0.4	0.334	0.124	0.005	158.	444.	-7805.0	0.07	0.28	0.29	4.20	143.	10.0	278.6	10.0
09	01	01	1	17	-14.1	0.342	-9.000	-9.000	-999.	460.	219.8	0.07	0.28	0.49	4.50	146.	10.0	277.9	10.0
09	01	01	1	18	-26.4	0.354	-9.000	-9.000	-999.	485.	130.6	0.07	0.28	1.00	4.80	146.	10.0	277.4	10.0
09	01	01	1	19	-35.5	0.392	-9.000	-9.000	-999.	564.	131.3	0.12	0.28	1.00	4.70	169.	10.0	277.4	10.0
09	01	01	1	20	-28.1	0.311	-9.000	-9.000	-999.	402.	82.5	0.12	0.28	1.00	3.90	150.	10.0	277.6	10.0
09	01	01	1	21	-29.8	0.330	-9.000	-9.000	-999.	437.	93.6	0.07	0.28	1.00	4.60	129.	10.0	278.5	10.0
09	01	01	1	22	-14.1	0.288	-9.000	-9.000	-999.	356.	130.9	0.07	0.28	1.00	3.90	131.	10.0	278.8	10.0
09	01	01	1	23	-23.6	0.320	-9.000	-9.000	-999.	416.	107.0	0.07	0.28	1.00	4.40	122.	10.0	278.9	10.0
09	01	01	1	24	-24.9	0.337	-9.000	-9.000	-999.	450.	118.7	0.07	0.28	1.00	4.60	130.	10.0	278.4	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	127.	3.00	267.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	69.27879	ON 09102824:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	46.73236m	ON 09042424:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
NEW	HIGH	1ST HIGH VALUE IS	1.47186	ON 09102824:	AT (423768.50, 4526277.50, 1303.49, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	1.24884m	ON 09050924:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
4H1	HIGH	1ST HIGH VALUE IS	0.62458m	ON 09051724:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.49228m	ON 09052324:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4K1A	HIGH	1ST HIGH VALUE IS	0.08671	ON 09071324:	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08291	ON 09051324:	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC
4K1B	HIGH	1ST HIGH VALUE IS	0.09471	ON 09051324:	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08814	ON 09112124:	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC
4V82	HIGH	1ST HIGH VALUE IS	1.43569m	ON 09092924:	AT (423980.00, 4526983.90, 1302.23, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	1.22624m	ON 09073024:	AT (424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC
6H1	HIGH	1ST HIGH VALUE IS	0.15620m	ON 09092924:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.13003	ON 09032624:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC
6H3	HIGH	1ST HIGH VALUE IS	0.06577	ON 09041724:	AT (423972.40, 4526218.80, 1307.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.06145	ON 09031124:	AT (423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC
6H2	HIGH	1ST HIGH VALUE IS	0.15226	ON 09102824:	AT (423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10022	ON 09102824:	AT (423947.40, 4526311.70, 1306.11, 2867.37, 0.00)	DC

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6K1      HIGH   1ST HIGH VALUE IS       0.12840  ON 09102824: AT (  423825.30,  4526311.60,  1304.00,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.11504m ON 09021224: AT (  423731.50,  4526277.70,  1303.00,  2867.37,     0.00)  DC

6K2      HIGH   1ST HIGH VALUE IS       0.12249  ON 09102824: AT (  423825.30,  4526311.60,  1304.00,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.10920m ON 09021224: AT (  423731.50,  4526277.70,  1303.00,  2867.37,     0.00)  DC

7H3      HIGH   1ST HIGH VALUE IS       0.06160  ON 09041724: AT (  423850.00,  4526200.00,  1305.72,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.05962m ON 09042424: AT (  423850.00,  4526150.00,  1305.00,  2867.37,     0.00)  DC

7H1      HIGH   1ST HIGH VALUE IS       0.11513  ON 09102824: AT (  423800.80,  4526311.60,  1303.75,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.08573  ON 09102024: AT (  423800.80,  4526311.60,  1303.75,  2867.37,     0.00)  DC

8H1      HIGH   1ST HIGH VALUE IS       0.13057m ON 09092924: AT (  424105.60,  4527054.50,  1304.00,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.12822  ON 09032624: AT (  423950.00,  4526100.00,  1307.00,  2867.37,     0.00)  DC

9H1      HIGH   1ST HIGH VALUE IS       0.13635  ON 09032424: AT (  424108.60,  4526530.70,  1308.63,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.10854  ON 09112124: AT (  424100.00,  4526500.00,  1308.69,  2867.37,     0.00)  DC

9H2      HIGH   1ST HIGH VALUE IS       0.15445  ON 09032524: AT (  424000.00,  4526500.00,  1306.05,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.11056m ON 09042624: AT (  424018.30,  4526488.00,  1307.00,  2867.37,     0.00)  DC
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                                  *** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

                        ** CONC OF PM-10    IN MICROGRAMS/M**3                        **

                                                  DATE
NETWORK
GROUP ID                             AVERAGE CONC     (YYMMDDHH)            RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

10H1     HIGH   1ST HIGH VALUE IS       0.08150  ON 09102824: AT (  423822.10,  4526182.10,  1304.50,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.06678m ON 09050924: AT (  423821.00,  4526264.00,  1304.01,  2867.37,     0.00)  DC

10H2     HIGH   1ST HIGH VALUE IS       0.15960  ON 09032624: AT (  423950.00,  4526050.00,  1308.90,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.13499m ON 09042424: AT (  423950.00,  4526050.00,  1308.90,  2867.37,     0.00)  DC

11H1     HIGH   1ST HIGH VALUE IS       0.10185  ON 09102824: AT (  423778.80,  4526085.40,  1304.13,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.08387  ON 09032624: AT (  423821.00,  4526264.00,  1304.01,  2867.37,     0.00)  DC

12H1     HIGH   1ST HIGH VALUE IS       0.05307  ON 09032624: AT (  423950.00,  4525950.00,  1308.08,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.05052m ON 09042424: AT (  423950.00,  4525950.00,  1308.08,  2867.37,     0.00)  DC

13H1     HIGH   1ST HIGH VALUE IS       0.11162  ON 09102824: AT (  423900.00,  4526250.00,  1305.93,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.08050m ON 09042424: AT (  423950.00,  4526200.00,  1307.00,  2867.37,     0.00)  DC

19H1     HIGH   1ST HIGH VALUE IS       0.05925  ON 09102824: AT (  423850.00,  4525950.00,  1306.17,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.05151  ON 09041724: AT (  423950.00,  4526100.00,  1307.00,  2867.37,     0.00)  DC

20H1     HIGH   1ST HIGH VALUE IS       0.05255  ON 09102824: AT (  423850.00,  4525950.00,  1306.17,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.04793m ON 09042424: AT (  423950.00,  4526100.00,  1307.00,  2867.37,     0.00)  DC

20H2     HIGH   1ST HIGH VALUE IS       0.10559  ON 09102824: AT (  423850.00,  4525850.00,  1307.00,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.09295  ON 09032624: AT (  423900.00,  4526000.00,  1308.26,  2867.37,     0.00)  DC

20H3     HIGH   1ST HIGH VALUE IS       0.08780  ON 09102824: AT (  423850.00,  4525800.00,  1307.58,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.08544  ON 09041724: AT (  423950.00,  4526050.00,  1308.90,  2867.37,     0.00)  DC

23H1     HIGH   1ST HIGH VALUE IS       0.06749  ON 09102824: AT (  423900.00,  4526050.00,  1306.00,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.05660  ON 09041724: AT (  423950.00,  4526200.00,  1307.00,  2867.37,     0.00)  DC

24H1     HIGH   1ST HIGH VALUE IS       0.08176m ON 09092924: AT (  424000.00,  4527300.00,  1301.13,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.07604m ON 09042424: AT (  423874.10,  4526311.60,  1305.39,  2867.37,     0.00)  DC

25H1     HIGH   1ST HIGH VALUE IS       0.07523m ON 09092924: AT (  424000.00,  4527200.00,  1301.00,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.06968  ON 09032624: AT (  423874.10,  4526311.60,  1305.39,  2867.37,     0.00)  DC

SCRUBBER HIGH   1ST HIGH VALUE IS       0.58766m ON 09052124: AT (  423800.80,  4526311.60,  1303.75,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.56595m ON 09052124: AT (  423776.40,  4526311.50,  1303.07,  2867.37,     0.00)  DC

26H1     HIGH   1ST HIGH VALUE IS       0.07246  ON 09102824: AT (  423776.40,  4526311.50,  1303.07,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.05025m ON 09042424: AT (  423849.70,  4526311.60,  1305.00,  2867.37,     0.00)  DC

27H1     HIGH   1ST HIGH VALUE IS       0.09563  ON 09032624: AT (  423900.00,  4526300.00,  1306.00,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.08915m ON 09042424: AT (  423923.00,  4526311.70,  1306.13,  2867.37,     0.00)  DC

30H1     HIGH   1ST HIGH VALUE IS       0.17290m ON 09092924: AT (  424000.00,  4527350.00,  1300.74,  2867.37,     0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.13952  ON 09032624: AT (  423849.70,  4526311.60,  1305.00,  2867.37,     0.00)  DC
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*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
30H2	HIGH	1ST HIGH VALUE IS	0.17373m	ON 09092924:	AT (424000.00, 4527300.00, 1301.13, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.14022	ON 09102824:	AT (423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.10530	ON 09032624:	AT (423950.00, 4525900.00, 1309.31, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.09675m	ON 09042424:	AT (423950.00, 4525900.00, 1309.31, 2867.37, 0.00)	DC
BOILER4	HIGH	1ST HIGH VALUE IS	0.45945	ON 09102824:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.31943	ON 09112124:	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC
BOILER5	HIGH	1ST HIGH VALUE IS	0.29211	ON 09102824:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.23778	ON 09032624:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
BOILER8	HIGH	1ST HIGH VALUE IS	0.51456	ON 09032924:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.30110	ON 09032524:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
BOILER9	HIGH	1ST HIGH VALUE IS	0.64842	ON 09032924:	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.54874	ON 09032524:	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC
BOILER10	HIGH	1ST HIGH VALUE IS	0.58718	ON 09040824:	AT (424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.25483	ON 09032624:	AT (423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.51769	ON 09102824:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.40394	ON 09032624:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H2	HIGH	1ST HIGH VALUE IS	0.12382	ON 09030124:	AT (424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.10241	ON 09041724:	AT (424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC
68H3	HIGH	1ST HIGH VALUE IS	0.14557	ON 09112124:	AT (424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12861	ON 09040424:	AT (424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC
68H4	HIGH	1ST HIGH VALUE IS	0.11319	ON 09061924:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.08619	ON 09092624:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
68H5	HIGH	1ST HIGH VALUE IS	0.12524	ON 09082824:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.12424m	ON 09072224:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.09932m	ON 09072224:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.09528m	ON 09020924:	AT (424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.12547	ON 09061924:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.11156	ON 09092624:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.01728	ON 09102824:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01394m	ON 09042424:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.01571	ON 09102824:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01210	ON 09040324:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF PM-10 IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
68H12	HIGH	1ST HIGH VALUE IS	0.01675	ON 09102824:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01276	ON 09102824:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.01846	ON 09102824:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	0.01332m	ON 09042424:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
CWT4	HIGH	1ST HIGH VALUE IS	14.97269	ON 09102824:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	9.71187m	ON 09042424:	AT (423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC
CWT6	HIGH	1ST HIGH VALUE IS	13.68530	ON 09102824:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
	HIGH	2ND HIGH VALUE IS	9.07382m	ON 09042424:	AT (423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC

```
CWT7     HIGH   1ST HIGH VALUE IS      13.57039  ON 09102824: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS       9.35209m ON 09042424: AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC

CWT8     HIGH   1ST HIGH VALUE IS      26.09559  ON 09102824: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS      17.43858m ON 09042424: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC

CWT10    HIGH   1ST HIGH VALUE IS       0.09554m ON 09092924: AT (  423933.50,  4526984.90,  1300.98,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.07524  ON 09032124: AT (  423933.50,  4526984.90,  1300.98,  2867.37,    0.00)  DC

CWT11    HIGH   1ST HIGH VALUE IS       0.13556  ON 09102824: AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
         HIGH   2ND HIGH VALUE IS       0.09787m ON 09042424: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



```
 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            8 Warning Message(s)
 A Total of          802 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            9 Calm Hours Identified

 A Total of          793 Missing Hours Identified (  9.05 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H2
 CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:          12H1
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:           4H1
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H1
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
 CN W305     233 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
 CN W305     252 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
 CN W305     253 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
```

*** MODEL SETUP OPTIONS SUMMARY ***

```
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for    50 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. Half-life of 4 hrs for URBAN SO2.
        6. Urban Roughness Length of 1.0 Meter Assumed.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR

**This Run Includes:     50 Source(s);      52 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  SO2

**Note that special processing requirements apply for the 1-hour SO2 NAAQS - check available guidance.
  Model will process user-specified ranks of daily maximum
1-hour values averaged across the number of years modeled.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs External File(s) of Maximum Daily 1-hr Values by Year (MXDYBYYR Keyword)
         Model Outputs External File(s) of Contributions to Maximum Daily Values Paired in Time & Space (MAXDCONT Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =    149.6 MB of RAM.

**Input Runstream File:          Holly_V17_2006_SO2.DTA
**Output Print File:             Holly_V17_2006_SO2.LST

**File for Summary of Results:   C:\beast\Holly\Holly_V17_2006_SO2.SUM
```


*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2006.SFC Met Version: 11059
Profile file: SY2006.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2006 Year: 2006

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
06	01	01	1	01	-11.8	0.241	-9.000	-9.000	-999.	273.	91.0	0.09	0.28	1.00	3.20	185.	10.0	276.0	10.0
06	01	01	1	02	-11.9	0.244	-9.000	-9.000	-999.	277.	93.0	0.01	0.28	1.00	4.60	248.	10.0	276.5	10.0
06	01	01	1	03	-24.7	0.504	-9.000	-9.000	-999.	824.	399.2	0.01	0.28	1.00	9.00	269.	10.0	277.0	10.0
06	01	01	1	04	-40.4	0.427	-9.000	-9.000	-999.	646.	146.0	0.02	0.28	1.00	7.00	290.	10.0	276.9	10.0
06	01	01	1	05	-15.9	0.324	-9.000	-9.000	-999.	430.	164.1	0.04	0.28	1.00	4.80	301.	10.0	276.4	10.0
06	01	01	1	06	-18.0	0.366	-9.000	-9.000	-999.	508.	209.4	0.02	0.28	1.00	5.90	298.	10.0	276.4	10.0
06	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.02	0.28	1.00	6.30	289.	10.0	275.9	10.0
06	01	01	1	08	-34.7	0.381	-9.000	-9.000	-999.	540.	122.8	0.02	0.28	1.00	6.30	282.	10.0	275.4	10.0
06	01	01	1	09	-21.0	0.324	-9.000	-9.000	-999.	425.	124.8	0.01	0.28	0.51	6.00	268.	10.0	275.1	10.0
06	01	01	1	10	10.5	0.195	0.315	0.005	92.	206.	-54.3	0.01	0.28	0.30	3.20	249.	10.0	276.1	10.0
06	01	01	1	11	27.6	0.203	0.649	0.005	307.	211.	-23.6	0.01	0.28	0.22	3.20	248.	10.0	277.5	10.0
06	01	01	1	12	38.6	0.170	0.825	0.005	450.	161.	-9.8	0.01	0.28	0.19	2.50	249.	10.0	278.4	10.0
06	01	01	1	13	42.5	0.283	0.942	0.005	608.	346.	-41.1	0.09	0.28	0.19	3.00	207.	10.0	279.2	10.0
06	01	01	1	14	32.3	0.382	0.913	0.005	729.	543.	-133.3	0.12	0.28	0.19	4.00	168.	10.0	279.9	10.0
06	01	01	1	15	4.8	0.338	0.487	0.005	746.	452.	-623.1	0.07	0.28	0.22	4.20	148.	10.0	279.8	10.0
06	01	01	1	16	0.4	0.444	0.218	0.005	747.	681.	-8888.0	0.12	0.28	0.29	4.90	155.	10.0	279.4	10.0
06	01	01	1	17	-17.9	0.410	-9.000	-9.000	-999.	605.	298.0	0.12	0.28	0.49	4.70	161.	10.0	278.4	10.0
06	01	01	1	18	-25.2	0.339	-9.000	-9.000	-999.	457.	119.9	0.12	0.28	1.00	4.10	163.	10.0	277.4	10.0
06	01	01	1	19	-21.1	0.284	-9.000	-9.000	-999.	349.	83.7	0.07	0.28	1.00	4.00	149.	10.0	276.6	10.0
06	01	01	1	20	-9.3	0.189	-9.000	-9.000	-999.	192.	55.7	0.07	0.28	1.00	2.80	124.	10.0	276.0	10.0
06	01	01	1	21	-18.7	0.381	-9.000	-9.000	-999.	540.	227.2	0.07	0.28	1.00	5.00	140.	10.0	276.9	10.0
06	01	01	1	22	-12.9	0.262	-9.000	-9.000	-999.	316.	108.2	0.12	0.28	1.00	3.20	165.	10.0	277.1	10.0
06	01	01	1	23	-14.5	0.296	-9.000	-9.000	-999.	371.	138.0	0.07	0.28	1.00	4.00	134.	10.0	277.2	10.0
06	01	01	1	24	-18.2	0.372	-9.000	-9.000	-999.	522.	218.0	0.07	0.28	1.00	4.90	133.	10.0	277.8	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
06	01	01	01	10.0	1	185.	3.20	276.1	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	27.27137	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	25.06320	AT (424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	24.65035	AT (424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	23.37801	AT (424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	20.18223	AT (424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	18.79562	AT (424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	18.77398	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	18.63192	AT (424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	18.60493	AT (424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	18.37945	AT (423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	6.76233	AT (424050.00, 4527450.00, 1300.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	6.74059	AT (424050.00, 4527500.00, 1299.51, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	6.71468	AT (424600.00, 4526250.00, 1320.90, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	6.69121	AT (424650.00, 4526200.00, 1322.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	6.68390	AT (424100.00, 4527550.00, 1299.58, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	6.67412	AT (424050.00, 4527400.00, 1301.17, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	6.66230	AT (424550.00, 4526250.00, 1319.79, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	6.64901	AT (424050.00, 4527550.00, 1299.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	6.64688	AT (424100.00, 4527600.00, 1299.04, 2912.70, 0.00)	DC	
	10TH HIGHEST VALUE IS	6.64357	AT (424700.00, 4526200.00, 1322.65, 2867.37, 0.00)	DC	
4H1	1ST HIGHEST VALUE IS	3.63717	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.52329	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.44976	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.41649	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.39599	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.36611	AT (423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.35008	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	

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          8TH HIGHEST VALUE IS       3.31742 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.31426 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.30390 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC

4K1A      1ST HIGHEST VALUE IS       0.04478 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.04383 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.03877 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.03838 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.03833 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.03665 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.03374 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.03262 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.03257 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.03251 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
```


*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                     AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

4K1B      1ST HIGHEST VALUE IS       0.03626 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.03603 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.03600 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.03439 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.03394 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.03068 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.03058 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.03050 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.02934 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.02627 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC

4V82      1ST HIGHEST VALUE IS      22.57085 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      20.21181 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      20.17138 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      19.97140 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      15.40089 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      15.08339 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS      13.55790 AT (  424206.50,  4526802.70,  1307.25,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      13.47921 AT (  424198.40,  4526780.00,  1307.25,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS      13.34725 AT (  423933.50,  4526984.90,  1300.98,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS      13.29919 AT (  423910.20,  4526985.50,  1300.67,  2867.37,    0.00)  DC

6H1       1ST HIGHEST VALUE IS       0.64230 AT (  423971.90,  4526311.70,  1306.95,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.63635 AT (  423976.40,  4526296.50,  1307.98,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.62701 AT (  424000.90,  4526759.50,  1304.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.62408 AT (  423962.20,  4526296.80,  1306.98,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.61901 AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.61498 AT (  424002.50,  4526908.70,  1303.27,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.61167 AT (  423962.60,  4526277.20,  1306.96,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.61138 AT (  423990.60,  4526296.30,  1308.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.60982 AT (  424200.00,  4526400.00,  1311.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.60609 AT (  424002.20,  4526883.90,  1303.43,  2867.37,    0.00)  DC

6H3       1ST HIGHEST VALUE IS       5.12629 AT (  424150.00,  4526200.00,  1311.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       4.78112 AT (  424100.00,  4526250.00,  1310.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       4.67465 AT (  424150.00,  4526250.00,  1311.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       4.44542 AT (  424150.00,  4526150.00,  1311.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       4.42263 AT (  424100.00,  4526300.00,  1310.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       4.41480 AT (  424200.00,  4526200.00,  1312.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       4.38539 AT (  424200.00,  4526150.00,  1312.08,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       4.26463 AT (  424200.00,  4526100.00,  1312.11,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.89395 AT (  424050.00,  4526200.00,  1309.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.82429 AT (  424250.00,  4526100.00,  1313.86,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                     AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

6H2       1ST HIGHEST VALUE IS       0.75089 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.68905 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.67240 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.58826 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.58422 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.58060 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
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          7TH HIGHEST VALUE IS       0.53237 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.53237 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.52696 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.52462 AT (  424000.00,  4526300.00,  1308.00,  2867.37,    0.00)  DC

6K1       1ST HIGHEST VALUE IS       0.01208 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01200 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01183 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01168 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01147 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01115 AT (  423768.50,  4526277.50,  1303.49,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01107 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01094 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01090 AT (  423771.40,  4526280.90,  1303.56,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01038 AT (  423713.10,  4526253.70,  1303.00,  2867.37,    0.00)  DC

6K2       1ST HIGHEST VALUE IS       0.01208 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01192 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01189 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01145 AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01137 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01123 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01112 AT (  423700.00,  4526300.00,  1302.93,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01093 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01043 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01033 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC

7H3       1ST HIGHEST VALUE IS       0.33902 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.33413 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.33361 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.33206 AT (  424250.00,  4527300.00,  1303.51,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.33183 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.32968 AT (  424300.00,  4527400.00,  1306.41,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.32941 AT (  424250.00,  4527350.00,  1303.48,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.32886 AT (  423800.00,  4526300.00,  1304.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.32867 AT (  424300.00,  4527350.00,  1305.53,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.32859 AT (  424200.00,  4527250.00,  1303.25,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   1ST-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                   NETWORK
GROUP ID                     AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

7H1       1ST HIGHEST VALUE IS       0.47509 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.44783 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.44769 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.44704 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.44699 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.44120 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.43643 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.41823 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.39944 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.37194 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC

8H1       1ST HIGHEST VALUE IS       0.70444 AT (  423900.00,  4526250.00,  1305.93,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.68051 AT (  423900.00,  4526300.00,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.66078 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.65509 AT (  423963.50,  4526218.50,  1307.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.65396 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.65157 AT (  423795.90,  4526280.90,  1304.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.65098 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.65064 AT (  423963.20,  4526238.10,  1307.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.64590 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.64579 AT (  423972.40,  4526218.80,  1307.00,  2867.37,    0.00)  DC

9H1       1ST HIGHEST VALUE IS       0.87552 AT (  424100.00,  4526500.00,  1308.69,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.87038 AT (  424092.30,  4526485.40,  1308.49,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.85893 AT (  424116.80,  4526553.40,  1308.40,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.82808 AT (  424100.50,  4526508.10,  1308.47,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.81519 AT (  424108.60,  4526530.70,  1308.63,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.80871 AT (  424124.90,  4526576.10,  1308.06,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.75837 AT (  424150.00,  4526550.00,  1308.55,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.74255 AT (  424150.00,  4526500.00,  1310.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.65902 AT (  424200.00,  4526550.00,  1310.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.64133 AT (  424200.00,  4526500.00,  1310.00,  2867.37,    0.00)  DC

9H2       1ST HIGHEST VALUE IS       1.07464 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.02567 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.95390 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.90496 AT (  424100.00,  4526400.00,  1309.66,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.90427 AT (  424073.10,  4526413.90,  1308.34,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.87927 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.82519 AT (  424084.20,  4526462.80,  1308.52,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.79264 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.74190 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.73459 AT (  424100.00,  4526450.00,  1308.97,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
10H1	1ST HIGHEST VALUE IS	0.39181 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.39158 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.39130 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.38775 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.38648 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.38413 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.38333 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.38176 AT	(423997.60, 4526436.10, 1307.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.37929 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.36688 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
10H2	1ST HIGHEST VALUE IS	0.76521 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.71128 AT	(423822.00, 4526230.30, 1304.69, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.71080 AT	(423900.00, 4526250.00, 1305.93, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.70441 AT	(423822.10, 4526206.20, 1304.94, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.70157 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.69613 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.68479 AT	(423850.00, 4526150.00, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.67551 AT	(423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.66784 AT	(423963.50, 4526218.50, 1307.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.66627 AT	(423972.40, 4526218.80, 1307.00, 2867.37, 0.00)	DC	
11H1	1ST HIGHEST VALUE IS	0.39687 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.39523 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.39507 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.39418 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.39276 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.38751 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.38635 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.38550 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.38479 AT	(424018.60, 4526512.50, 1306.56, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.38000 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
12H1	1ST HIGHEST VALUE IS	0.29339 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.29151 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.27256 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.27253 AT	(423850.00, 4526150.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.27226 AT	(423768.50, 4526277.50, 1303.49, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.27126 AT	(423771.40, 4526280.90, 1303.56, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.27066 AT	(423900.00, 4526100.00, 1306.02, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.26820 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.26729 AT	(423713.20, 4526205.50, 1303.04, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.26625 AT	(424020.30, 4526683.90, 1305.00, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
13H1	1ST HIGHEST VALUE IS	0.51304 AT	(423997.30, 4526411.20, 1307.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.50628 AT	(424017.80, 4526439.00, 1307.01, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.50381 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.50225 AT	(423997.10, 4526386.30, 1307.42, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.50213 AT	(424000.00, 4526400.00, 1307.79, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.49847 AT	(424018.10, 4526463.50, 1307.12, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.49790 AT	(423997.60, 4526436.10, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.49621 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.49084 AT	(424017.60, 4526414.50, 1307.94, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.48965 AT	(424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC	
19H1	1ST HIGHEST VALUE IS	0.32197 AT	(423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.31775 AT	(423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.31698 AT	(423900.00, 4526300.00, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.31571 AT	(423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.31257 AT	(423820.50, 4526280.80, 1304.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.31218 AT	(423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.31114 AT	(423800.00, 4526300.00, 1304.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.31079 AT	(423900.00, 4526250.00, 1305.93, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.30724 AT	(423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.30595 AT	(423874.10, 4526311.60, 1305.39, 2867.37, 0.00)	DC	

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20H1      1ST HIGHEST VALUE IS       0.29854 AT (  423900.00,  4526250.00,  1305.93,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.29152 AT (  423795.90,  4526280.90,  1304.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.28675 AT (  423821.00,  4526264.00,  1304.01,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.28598 AT (  423820.50,  4526280.80,  1304.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.28500 AT (  423800.00,  4526300.00,  1304.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.28177 AT (  423950.00,  4526250.00,  1307.01,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.28126 AT (  424076.00,  4526440.10,  1308.42,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.27897 AT (  423821.50,  4526247.10,  1304.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.27828 AT (  424079.80,  4526430.90,  1308.90,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.27532 AT (  423850.00,  4526300.00,  1305.00,  2867.37,    0.00)  DC

20H2      1ST HIGHEST VALUE IS       0.50297 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.50037 AT (  423822.00,  4526230.30,  1304.69,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.48845 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.47756 AT (  423821.50,  4526247.10,  1304.09,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.47753 AT (  423822.10,  4526206.20,  1304.94,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.47586 AT (  423850.00,  4526200.00,  1305.72,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.47263 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.47230 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.46778 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.46717 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

20H3      1ST HIGHEST VALUE IS       0.50196 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.49347 AT (  423821.50,  4526247.10,  1304.09,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.49306 AT (  423822.00,  4526230.30,  1304.69,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.48636 AT (  423795.90,  4526280.90,  1304.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.46980 AT (  423821.00,  4526264.00,  1304.01,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.46882 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.46793 AT (  423822.10,  4526206.20,  1304.94,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.46751 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.46750 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.46194 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC

23H1      1ST HIGHEST VALUE IS       0.35759 AT (  423898.60,  4526311.60,  1305.71,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.35049 AT (  423900.00,  4526300.00,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.34824 AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.33669 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.33636 AT (  423825.30,  4526311.60,  1304.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.33185 AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.33175 AT (  423850.00,  4526300.00,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.33004 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.32951 AT (  423947.40,  4526311.70,  1306.11,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.32795 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC

24H1      1ST HIGHEST VALUE IS       0.41945 AT (  423841.00,  4527079.80,  1298.99,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.41786 AT (  423841.20,  4527102.90,  1298.97,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.41358 AT (  423840.90,  4527056.60,  1299.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.41033 AT (  423900.00,  4527100.00,  1300.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.40718 AT (  423886.40,  4527102.10,  1299.37,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.40452 AT (  423950.00,  4527100.00,  1300.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.40205 AT (  423886.60,  4527121.40,  1299.87,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.39817 AT (  423850.00,  4527100.00,  1299.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.39334 AT (  423900.00,  4527150.00,  1299.97,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.39124 AT (  423863.80,  4527102.50,  1299.00,  2867.37,    0.00)  DC

25H1      1ST HIGHEST VALUE IS       0.38988 AT (  423840.40,  4526987.00,  1299.47,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.38390 AT (  423840.60,  4527010.20,  1299.06,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.38363 AT (  423910.20,  4526985.50,  1300.67,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.38116 AT (  423933.50,  4526984.90,  1300.98,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.37792 AT (  423886.90,  4526986.00,  1299.62,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.37558 AT (  423863.70,  4526986.50,  1300.17,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.37273 AT (  423840.70,  4527033.40,  1299.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.36967 AT (  423900.00,  4527000.00,  1300.24,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.36875 AT (  423850.00,  4527000.00,  1299.20,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.36740 AT (  423956.70,  4526984.40,  1302.00,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
SCRUBBER	1ST HIGHEST VALUE IS	4.56275 AT	(424450.00, 4526350.00, 1322.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	4.54814 AT	(424500.00, 4526300.00, 1316.04, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	4.53694 AT	(424400.00, 4526350.00, 1315.35, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	4.52682 AT	(424000.00, 4527350.00, 1300.74, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	4.50012 AT	(424550.00, 4526250.00, 1319.79, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	4.49651 AT	(424450.00, 4526300.00, 1315.71, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	4.48521 AT	(424000.00, 4527400.00, 1300.03, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	4.48470 AT	(424050.00, 4527450.00, 1300.25, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	4.46442 AT	(424600.00, 4526250.00, 1320.90, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	4.46286 AT	(424050.00, 4527400.00, 1301.17, 2867.37, 0.00)	DC	
26H1	1ST HIGHEST VALUE IS	0.38574 AT	(423585.50, 4527067.50, 1295.96, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.38092 AT	(423589.10, 4527089.50, 1296.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.35742 AT	(423592.60, 4527111.60, 1296.03, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.33743 AT	(423550.00, 4527100.00, 1294.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.32621 AT	(423596.20, 4527133.60, 1295.94, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.32089 AT	(423562.10, 4527067.70, 1294.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.32032 AT	(423550.00, 4527150.00, 1294.01, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.31753 AT	(423603.30, 4527177.70, 1295.64, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.31660 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.31471 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
27H1	1ST HIGHEST VALUE IS	0.47903 AT	(423863.80, 4527102.50, 1299.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.47541 AT	(423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.47525 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.47164 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.47123 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.47029 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.46775 AT	(423886.40, 4527102.10, 1299.37, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.46133 AT	(423886.60, 4527121.40, 1299.87, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.44863 AT	(423840.70, 4527033.40, 1299.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.44621 AT	(424000.00, 4527100.00, 1301.89, 2867.37, 0.00)	DC	
30H1	1ST HIGHEST VALUE IS	0.74073 AT	(423839.70, 4527180.00, 1297.98, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.73098 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.71966 AT	(423800.00, 4527200.00, 1297.31, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.71156 AT	(423900.00, 4527200.00, 1298.93, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.71067 AT	(423792.50, 4527200.10, 1296.99, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.71012 AT	(423792.10, 4527180.50, 1297.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.70616 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.70494 AT	(423815.90, 4527180.20, 1297.21, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.69778 AT	(424150.00, 4527150.00, 1303.96, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.69699 AT	(424239.20, 4526893.30, 1307.25, 2867.37, 0.00)	DC	

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
30H2	1ST HIGHEST VALUE IS	0.74456 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.73570 AT	(423839.70, 4527180.00, 1297.98, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.71968 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.71802 AT	(423800.00, 4527200.00, 1297.31, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.71251 AT	(423792.10, 4527180.50, 1297.01, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.71040 AT	(423792.50, 4527200.10, 1296.99, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.70954 AT	(423900.00, 4527200.00, 1298.93, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.70333 AT	(423815.90, 4527180.20, 1297.21, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.69285 AT	(424150.00, 4527150.00, 1303.96, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.69209 AT	(423900.00, 4527150.00, 1299.97, 2867.37, 0.00)	DC	
33H1	1ST HIGHEST VALUE IS	0.53755 AT	(423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.53053 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.52793 AT	(423822.20, 4526085.60, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.52461 AT	(423850.00, 4526150.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.52156 AT	(423900.00, 4526100.00, 1306.02, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.51995 AT	(423950.00, 4526050.00, 1308.90, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.51641 AT	(423822.20, 4526109.70, 1304.38, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.51415 AT	(423850.00, 4526100.00, 1305.14, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.51038 AT	(424700.00, 4525950.00, 1323.98, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.50925 AT	(424750.00, 4525900.00, 1323.99, 2867.37, 0.00)	DC	

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BOILER4   1ST HIGHEST VALUE IS       2.49695 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.47649 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.41064 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.33388 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.20542 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.16636 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       2.10269 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.09077 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.07895 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.06169 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC

BOILER5   1ST HIGHEST VALUE IS       2.33456 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.32464 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.17011 AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.15479 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.11959 AT (  424002.00,  4526859.00,  1303.58,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.06555 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       2.06115 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.01585 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.92714 AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.89874 AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   1ST-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                  ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BOILER8   1ST HIGHEST VALUE IS       3.36488 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.30358 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.23258 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.22436 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.21586 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.19368 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.07321 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.04670 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.03559 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.98763 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC

BOILER9   1ST HIGHEST VALUE IS       3.83153 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.83092 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.73574 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.70193 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.69980 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.64997 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.63731 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.62904 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.61276 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.60710 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC

BOILER10  1ST HIGHEST VALUE IS       3.71748 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.56991 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.53949 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.41386 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.41086 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.36237 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.25439 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.13382 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.04619 AT (  424000.90,  4526759.50,  1304.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.00268 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC

BOILER11  1ST HIGHEST VALUE IS       1.73300 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.71886 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.69318 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.66516 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.64773 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.62543 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.56109 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.51731 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.46727 AT (  424076.00,  4526440.10,  1308.42,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.46628 AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H2	1ST HIGHEST VALUE IS	0.62227 AT	(424198.40, 4526780.00, 1307.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.62119 AT	(424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.59905 AT	(424242.70, 4526812.50, 1308.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.59425 AT	(424234.70, 4526790.30, 1308.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.56607 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.55958 AT	(424214.70, 4526825.30, 1307.63, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.51339 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.51167 AT	(424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.50745 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.50456 AT	(424258.70, 4526856.90, 1307.60, 2867.37, 0.00)	DC	
68H3	1ST HIGHEST VALUE IS	0.80704 AT	(424255.60, 4526656.80, 1310.07, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.79984 AT	(424250.00, 4526650.00, 1309.85, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.79421 AT	(424301.70, 4526656.70, 1310.60, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.78979 AT	(424232.60, 4526656.80, 1309.65, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.78303 AT	(424202.60, 4526701.30, 1308.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.77038 AT	(424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.76553 AT	(424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.76510 AT	(424209.60, 4526656.90, 1309.24, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.75507 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.74934 AT	(424300.00, 4526650.00, 1311.00, 2867.37, 0.00)	DC	
68H4	1ST HIGHEST VALUE IS	0.84805 AT	(424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.84378 AT	(424182.00, 4526734.70, 1308.06, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.81344 AT	(424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.80935 AT	(424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.80825 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.80479 AT	(424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.79784 AT	(424202.60, 4526701.30, 1308.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.77972 AT	(424194.60, 4526679.10, 1308.34, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.77822 AT	(424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.77150 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
68H5	1ST HIGHEST VALUE IS	0.69469 AT	(424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.67310 AT	(424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.66058 AT	(424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.63716 AT	(424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.63286 AT	(424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.62828 AT	(424002.00, 4526859.00, 1303.58, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.61015 AT	(424141.30, 4526621.40, 1308.11, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.58355 AT	(424150.00, 4526600.00, 1308.93, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.57709 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.56615 AT	(424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC	

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H6	1ST HIGHEST VALUE IS	0.74503 AT	(424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.68281 AT	(424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.65765 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.64749 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.63325 AT	(424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.55908 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.53033 AT	(424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.52109 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.48535 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.47731 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
68H7	1ST HIGHEST VALUE IS	0.79826 AT	(424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.77504 AT	(424239.20, 4526893.30, 1307.25, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.75989 AT	(424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.75480 AT	(424250.00, 4526900.00, 1307.92, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.73100 AT	(424266.70, 4526879.20, 1307.75, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.72475 AT	(424206.50, 4526802.70, 1307.25, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.71861 AT	(424214.70, 4526825.30, 1307.63, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.70541 AT	(424222.80, 4526848.00, 1307.57, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.70350 AT	(424250.70, 4526834.70, 1307.89, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.70151 AT	(424282.70, 4526923.60, 1306.90, 2867.37, 0.00)	DC	

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68H10     1ST HIGHEST VALUE IS       0.07246 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.07106 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.07065 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.07019 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06996 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06977 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06743 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06719 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06700 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.06684 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC

68H11     1ST HIGHEST VALUE IS       0.06843 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.06425 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06324 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06301 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06300 AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06285 AT (  423997.60,  4526436.10,  1307.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06142 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06097 AT (  424017.80,  4526439.00,  1307.01,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06016 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.05996 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   1ST-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

68H12     1ST HIGHEST VALUE IS       0.06908 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.06707 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06693 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06624 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06580 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06560 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06273 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06271 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06236 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.06092 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC

68H13     1ST HIGHEST VALUE IS       0.06507 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.06463 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06457 AT (  423605.30,  4526311.40,  1301.42,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06282 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06240 AT (  423997.30,  4526411.20,  1307.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06215 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06190 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06167 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06081 AT (  423600.00,  4526300.00,  1301.95,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.06080 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

FLARES    1ST HIGHEST VALUE IS       0.01412 AT (  424400.00,  4525800.00,  1320.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01411 AT (  424350.00,  4525900.00,  1318.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01408 AT (  424400.00,  4525850.00,  1319.92,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01407 AT (  424350.00,  4525850.00,  1318.28,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01402 AT (  424450.00,  4525750.00,  1322.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01396 AT (  424300.00,  4525950.00,  1316.22,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01390 AT (  424450.00,  4525800.00,  1321.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01384 AT (  424300.00,  4525900.00,  1317.47,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01382 AT (  424450.00,  4525700.00,  1322.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01381 AT (  424400.00,  4525750.00,  1320.00,  2867.37,    0.00)  DC

FLAREN    1ST HIGHEST VALUE IS       0.01400 AT (  424400.00,  4525800.00,  1320.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01399 AT (  424350.00,  4525900.00,  1318.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01396 AT (  424400.00,  4525850.00,  1319.92,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01395 AT (  424350.00,  4525850.00,  1318.28,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01390 AT (  424450.00,  4525750.00,  1322.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01385 AT (  424300.00,  4525950.00,  1316.22,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01379 AT (  424450.00,  4525800.00,  1321.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01373 AT (  424300.00,  4525900.00,  1317.47,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01370 AT (  424450.00,  4525700.00,  1322.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01370 AT (  424400.00,  4525750.00,  1320.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	23.49925 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	22.83480 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	22.73816 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	21.99177 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	18.28065 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	17.88265 AT	(423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	17.74921 AT	(423900.00, 4527000.00, 1300.24, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	17.47753 AT	(423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	17.28693 AT	(424198.40, 4526780.00, 1307.25, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	17.20485 AT	(424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	5.64024 AT	(423900.00, 4527050.00, 1300.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	5.55654 AT	(423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	5.50985 AT	(423886.40, 4527102.10, 1299.37, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	5.50871 AT	(423900.00, 4527100.00, 1300.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	5.50115 AT	(423863.80, 4527102.50, 1299.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	5.44572 AT	(423886.60, 4527121.40, 1299.87, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	5.44092 AT	(423850.00, 4527000.00, 1299.20, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	5.42761 AT	(423840.70, 4527033.40, 1299.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	5.40457 AT	(423900.00, 4527000.00, 1300.24, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	5.38070 AT	(423886.90, 4526986.00, 1299.62, 2867.37, 0.00)	DC	
4H1	1ST HIGHEST VALUE IS	3.29412 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.29396 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.26129 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.20081 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.09888 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.07046 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.02961 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	3.00562 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	2.99938 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	2.94062 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
4K1A	1ST HIGHEST VALUE IS	0.03998 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.03907 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.03518 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.03403 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.03343 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.03283 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.03031 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.02968 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.02883 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.02869 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
4K1B	1ST HIGHEST VALUE IS	0.03547 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.03292 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.03250 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.03248 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.03209 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.02856 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.02808 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.02797 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.02640 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.02416 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
4V82	1ST HIGHEST VALUE IS	20.02035 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	18.70052 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	18.67932 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	17.56333 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	14.10318 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	12.61235 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	11.62699 AT	(423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	11.45192 AT	(424198.40, 4526780.00, 1307.25, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	11.38438 AT	(424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	11.28245 AT	(423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC	

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6H1       1ST HIGHEST VALUE IS       0.52362 AT (  423971.90,  4526311.70,  1306.95,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.50696 AT (  423976.40,  4526296.50,  1307.98,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.50238 AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.50192 AT (  423947.40,  4526311.70,  1306.11,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.48929 AT (  423990.60,  4526296.30,  1308.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.48856 AT (  423898.60,  4526311.60,  1305.71,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.48526 AT (  423900.00,  4526300.00,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.48483 AT (  423996.60,  4526336.60,  1307.76,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.48468 AT (  423962.20,  4526296.80,  1306.98,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.48370 AT (  423950.00,  4526300.00,  1306.66,  2867.37,    0.00)  DC

6H3       1ST HIGHEST VALUE IS       3.39054 AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.36562 AT (  423898.60,  4526311.60,  1305.71,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.34941 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.33748 AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.32676 AT (  423900.00,  4526300.00,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.30300 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.24676 AT (  423947.40,  4526311.70,  1306.11,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.23242 AT (  424021.60,  4526806.30,  1304.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.22382 AT (  424050.00,  4526200.00,  1309.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.20518 AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

6H2       1ST HIGHEST VALUE IS       0.47248 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.46497 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.45497 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.45467 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.45409 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.43881 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.43714 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.43329 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.43245 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.43124 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC

6K1       1ST HIGHEST VALUE IS       0.01118 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01098 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01094 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01058 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01050 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01029 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.00997 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.00933 AT (  423700.00,  4526250.00,  1303.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00926 AT (  423713.20,  4526229.60,  1303.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.00915 AT (  423768.50,  4526277.50,  1303.49,  2867.37,    0.00)  DC

6K2       1ST HIGHEST VALUE IS       0.01097 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01085 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01085 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01037 AT (  423700.00,  4526300.00,  1302.93,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01033 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01030 AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.00998 AT (  423713.10,  4526253.70,  1303.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.00998 AT (  423654.20,  4526311.40,  1302.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00986 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.00966 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC

7H3       1ST HIGHEST VALUE IS       0.32451 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.32067 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.31966 AT (  423800.00,  4526300.00,  1304.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.31898 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.31592 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.31389 AT (  423771.40,  4526280.90,  1303.56,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.31324 AT (  423795.90,  4526280.90,  1304.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.31142 AT (  423768.50,  4526277.50,  1303.49,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.30733 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.30633 AT (  423825.30,  4526311.60,  1304.00,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
7H1	1ST HIGHEST VALUE IS	0.38200 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.35598 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.34954 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.34062 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.33745 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.33660 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.32225 AT	(424020.30, 4526683.90, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.31882 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.30834 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.30433 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
8H1	1ST HIGHEST VALUE IS	0.61168 AT	(423900.00, 4526250.00, 1305.93, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.60034 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.59890 AT	(423750.00, 4526300.00, 1303.46, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.59551 AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.58483 AT	(423850.00, 4526200.00, 1305.72, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.58269 AT	(423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.58251 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.57915 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.57165 AT	(423750.00, 4526277.60, 1303.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.57023 AT	(423731.50, 4526277.70, 1303.00, 2867.37, 0.00)	DC	
9H1	1ST HIGHEST VALUE IS	0.72906 AT	(424124.90, 4526576.10, 1308.06, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.72007 AT	(424108.60, 4526530.70, 1308.63, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.71853 AT	(424100.50, 4526508.10, 1308.47, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.71132 AT	(424116.80, 4526553.40, 1308.40, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.70971 AT	(424100.00, 4526500.00, 1308.69, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.70501 AT	(424092.30, 4526485.40, 1308.49, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.63959 AT	(424150.00, 4526550.00, 1308.55, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.62019 AT	(424150.00, 4526500.00, 1310.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.55476 AT	(424084.20, 4526462.80, 1308.52, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.54596 AT	(424150.00, 4526450.00, 1310.00, 2867.37, 0.00)	DC	
9H2	1ST HIGHEST VALUE IS	0.92484 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.90640 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.90455 AT	(424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.75075 AT	(424084.20, 4526462.80, 1308.52, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.74273 AT	(424018.10, 4526463.50, 1307.12, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.70849 AT	(424100.00, 4526450.00, 1308.97, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.70653 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.67672 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.63172 AT	(424150.00, 4526450.00, 1310.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.61612 AT	(424092.30, 4526485.40, 1308.49, 2867.37, 0.00)	DC	

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
10H1	1ST HIGHEST VALUE IS	0.37559 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.37066 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.36729 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.36704 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.36180 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.36159 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.35981 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.35858 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.35752 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.35385 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
10H2	1ST HIGHEST VALUE IS	0.64208 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.64062 AT	(423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.62948 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.61883 AT	(423900.00, 4526100.00, 1306.02, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.61057 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.60356 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.59848 AT	(423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.59514 AT	(424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.58654 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.58643 AT	(423963.50, 4526218.50, 1307.00, 2867.37, 0.00)	DC	

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11H1      1ST HIGHEST VALUE IS       0.37506 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.36901 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.36805 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.36450 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.36156 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.35832 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.35801 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.35742 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.35709 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.35470 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC

12H1      1ST HIGHEST VALUE IS       0.26463 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.24968 AT (  423950.00,  4526100.00,  1307.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.24820 AT (  423950.00,  4526150.00,  1307.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.24772 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.24696 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.24257 AT (  423850.00,  4526100.00,  1305.14,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.24170 AT (  423713.30,  4526181.40,  1303.11,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.24067 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.23879 AT (  423713.20,  4526205.50,  1303.04,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.23619 AT (  423900.00,  4526050.00,  1306.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

13H1      1ST HIGHEST VALUE IS       0.48493 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.47723 AT (  424017.80,  4526439.00,  1307.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.47443 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.47341 AT (  424017.60,  4526414.50,  1307.94,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.46978 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.46932 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.46737 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.46717 AT (  424000.00,  4526400.00,  1307.79,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.46617 AT (  424017.30,  4526390.10,  1308.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.45748 AT (  423997.60,  4526436.10,  1307.00,  2867.37,    0.00)  DC

19H1      1ST HIGHEST VALUE IS       0.30242 AT (  423900.00,  4526250.00,  1305.93,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.29834 AT (  423900.00,  4526300.00,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.29670 AT (  423800.00,  4526300.00,  1304.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.29534 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.29013 AT (  423821.00,  4526264.00,  1304.01,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.28800 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.28793 AT (  423820.50,  4526280.80,  1304.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.28751 AT (  423771.40,  4526280.90,  1303.56,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.28739 AT (  423850.00,  4526250.00,  1305.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.28715 AT (  424066.40,  4526397.00,  1308.57,  2867.37,    0.00)  DC

20H1      1ST HIGHEST VALUE IS       0.28509 AT (  423900.00,  4526250.00,  1305.93,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.27207 AT (  423950.00,  4526250.00,  1307.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.27084 AT (  423795.90,  4526280.90,  1304.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.26768 AT (  423820.50,  4526280.80,  1304.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.26707 AT (  423821.00,  4526264.00,  1304.01,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.26685 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.26583 AT (  423850.00,  4526250.00,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.26519 AT (  423821.50,  4526247.10,  1304.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.26462 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.26424 AT (  423822.00,  4526230.30,  1304.69,  2867.37,    0.00)  DC

20H2      1ST HIGHEST VALUE IS       0.46580 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.46112 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.44342 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.42702 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.42686 AT (  423850.00,  4526200.00,  1305.72,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.42595 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.42492 AT (  423822.10,  4526206.20,  1304.94,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.42408 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.42373 AT (  423822.10,  4526182.10,  1304.50,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.42288 AT (  423950.00,  4526150.00,  1307.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
20H3	1ST HIGHEST VALUE IS	0.47589 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.45436 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.43826 AT	(423850.00, 4526150.00, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.43758 AT	(423850.00, 4526200.00, 1305.72, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.43707 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.43291 AT	(423822.00, 4526230.30, 1304.69, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.43147 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.42907 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.42694 AT	(423822.10, 4526206.20, 1304.94, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.42574 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
23H1	1ST HIGHEST VALUE IS	0.32903 AT	(423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.32748 AT	(423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.32486 AT	(423900.00, 4526300.00, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.32252 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.31960 AT	(423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.31552 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.31452 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.31343 AT	(423947.40, 4526311.70, 1306.11, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.31305 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.31286 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
24H1	1ST HIGHEST VALUE IS	0.38348 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.37932 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.37705 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.37176 AT	(423900.00, 4527100.00, 1300.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.37113 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.37091 AT	(423900.00, 4527150.00, 1299.97, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.36958 AT	(423886.80, 4527140.70, 1299.36, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.36510 AT	(423887.10, 4527160.10, 1299.28, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.36399 AT	(423886.60, 4527121.40, 1299.87, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.36102 AT	(423863.80, 4527102.50, 1299.00, 2867.37, 0.00)	DC	
25H1	1ST HIGHEST VALUE IS	0.35793 AT	(423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.35488 AT	(423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.35378 AT	(423840.60, 4527010.20, 1299.06, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.34947 AT	(423850.00, 4527000.00, 1299.20, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.34794 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.34610 AT	(423840.70, 4527033.40, 1299.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.34606 AT	(423900.00, 4527000.00, 1300.24, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.34561 AT	(423886.90, 4526986.00, 1299.62, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.34018 AT	(423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.34010 AT	(423956.70, 4526984.40, 1302.00, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
SCRUBBER	1ST HIGHEST VALUE IS	3.46526 AT	(424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.40848 AT	(423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.39367 AT	(424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.39320 AT	(423886.90, 4526986.00, 1299.62, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.37449 AT	(424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.35387 AT	(423840.60, 4527010.20, 1299.06, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.31976 AT	(423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	3.29854 AT	(423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	3.29536 AT	(424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	3.29182 AT	(424002.00, 4526859.00, 1303.58, 2867.37, 0.00)	DC	
26H1	1ST HIGHEST VALUE IS	0.30720 AT	(424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.30052 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.29845 AT	(423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.29761 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.29613 AT	(424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.29579 AT	(423592.60, 4527111.60, 1296.03, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.29476 AT	(424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.29389 AT	(424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.29221 AT	(423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.29197 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	

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27H1      1ST HIGHEST VALUE IS       0.44168 AT (  423850.00,  4527100.00,  1299.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.43859 AT (  423841.20,  4527102.90,  1298.97,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.43791 AT (  423863.80,  4527102.50,  1299.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.42500 AT (  423886.60,  4527121.40,  1299.87,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.42324 AT (  423841.00,  4527079.80,  1298.99,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.41783 AT (  423886.80,  4527140.70,  1299.36,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.41624 AT (  423840.90,  4527056.60,  1299.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.41114 AT (  423887.10,  4527160.10,  1299.28,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.41075 AT (  423839.70,  4527180.00,  1297.98,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.40948 AT (  423863.50,  4527179.70,  1298.36,  2867.37,    0.00)  DC

30H1      1ST HIGHEST VALUE IS       0.68580 AT (  423815.90,  4527180.20,  1297.21,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.67859 AT (  423792.10,  4527180.50,  1297.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.66917 AT (  423792.50,  4527200.10,  1296.99,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.66624 AT (  423839.70,  4527180.00,  1297.98,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.66096 AT (  423800.00,  4527200.00,  1297.31,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.65078 AT (  423770.10,  4527220.00,  1296.87,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.64383 AT (  423792.90,  4527219.80,  1296.88,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.64343 AT (  423900.00,  4527200.00,  1298.93,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.64171 AT (  423747.30,  4527220.30,  1295.92,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.62946 AT (  423800.00,  4527250.00,  1296.81,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

30H2      1ST HIGHEST VALUE IS       0.68202 AT (  423792.10,  4527180.50,  1297.01,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.68190 AT (  423815.90,  4527180.20,  1297.21,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.66534 AT (  423792.50,  4527200.10,  1296.99,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.66432 AT (  423839.70,  4527180.00,  1297.98,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.66275 AT (  423800.00,  4527200.00,  1297.31,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.65027 AT (  423770.10,  4527220.00,  1296.87,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.64633 AT (  423900.00,  4527200.00,  1298.93,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.64106 AT (  423747.30,  4527220.30,  1295.92,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.63876 AT (  423792.90,  4527219.80,  1296.88,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.62769 AT (  423800.00,  4527250.00,  1296.81,  2867.37,    0.00)  DC

33H1      1ST HIGHEST VALUE IS       0.46224 AT (  423850.00,  4526050.00,  1305.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.45941 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.45550 AT (  423850.00,  4526100.00,  1305.14,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.45188 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.44724 AT (  423850.00,  4526000.00,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.44657 AT (  423900.00,  4526050.00,  1306.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.44526 AT (  423713.30,  4526181.40,  1303.11,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.44503 AT (  423950.00,  4526050.00,  1308.90,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.43965 AT (  423950.00,  4526100.00,  1307.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.43644 AT (  424000.00,  4526000.00,  1310.67,  2867.37,    0.00)  DC

BOILER4   1ST HIGHEST VALUE IS       2.30323 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.24610 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.24035 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.02766 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.96085 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.96017 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.93148 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.91468 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.90770 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.81980 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC

BOILER5   1ST HIGHEST VALUE IS       1.97578 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.81682 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.79843 AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.72930 AT (  424002.00,  4526859.00,  1303.58,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.72341 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.67268 AT (  424002.20,  4526883.90,  1303.43,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.62909 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.61089 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.58609 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.54916 AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
BOILER8	1ST HIGHEST VALUE IS	2.56423 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	2.46841 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	2.46257 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	2.44606 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	2.38263 AT	(424020.30, 4526683.90, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	2.37463 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	2.31675 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	2.28180 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	2.27222 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	2.24848 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
BOILER9	1ST HIGHEST VALUE IS	3.46612 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.44937 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.41296 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.40607 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.34832 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.34469 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.30682 AT	(424020.30, 4526683.90, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	3.21464 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	3.16663 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	3.16018 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
BOILER10	1ST HIGHEST VALUE IS	3.29125 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.24347 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.16832 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.14432 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.01523 AT	(424020.30, 4526683.90, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	2.88826 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	2.87863 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	2.74888 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	2.72787 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	2.24291 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
BOILER11	1ST HIGHEST VALUE IS	1.53198 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.43380 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.40888 AT	(424018.60, 4526512.50, 1306.56, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	1.37568 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	1.35800 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	1.31151 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	1.28573 AT	(423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	1.27567 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	1.24750 AT	(423850.00, 4526300.00, 1305.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	1.23362 AT	(423874.10, 4526311.60, 1305.39, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H2	1ST HIGHEST VALUE IS	0.47997 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.45571 AT	(424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.45449 AT	(424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.44778 AT	(424258.70, 4526856.90, 1307.60, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.44139 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.43878 AT	(424198.40, 4526780.00, 1307.25, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.43373 AT	(424234.70, 4526790.30, 1308.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.43045 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.42192 AT	(424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.41931 AT	(424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC	
68H3	1ST HIGHEST VALUE IS	0.77197 AT	(424202.60, 4526701.30, 1308.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.75449 AT	(424255.60, 4526656.80, 1310.07, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.73577 AT	(424250.00, 4526650.00, 1309.85, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.73024 AT	(424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.71695 AT	(424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.71548 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.69718 AT	(424232.60, 4526656.80, 1309.65, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.69535 AT	(424200.00, 4526650.00, 1309.02, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.69384 AT	(424194.60, 4526679.10, 1308.34, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.68844 AT	(424250.00, 4526600.00, 1310.00, 2867.37, 0.00)	DC	

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68H4      1ST HIGHEST VALUE IS       0.80066 AT (  424173.90,  4526712.00,  1308.32,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.74733 AT (  424157.60,  4526666.70,  1308.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.74234 AT (  424182.00,  4526734.70,  1308.06,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.74140 AT (  424194.60,  4526679.10,  1308.34,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.71950 AT (  424190.20,  4526757.30,  1307.52,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.71925 AT (  424165.70,  4526689.40,  1308.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.71664 AT (  424198.40,  4526780.00,  1307.25,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.70256 AT (  424200.00,  4526750.00,  1308.90,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.69437 AT (  424218.60,  4526745.80,  1308.03,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.69401 AT (  424202.60,  4526701.30,  1308.00,  2867.37,    0.00)  DC

68H5      1ST HIGHEST VALUE IS       0.67338 AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.66004 AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.63288 AT (  424022.10,  4526855.30,  1304.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.59417 AT (  424002.00,  4526859.00,  1303.58,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.57892 AT (  424149.40,  4526644.00,  1308.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.57306 AT (  424141.30,  4526621.40,  1308.11,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.56731 AT (  424157.60,  4526666.70,  1308.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.55360 AT (  424150.00,  4526600.00,  1308.93,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.54802 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.54483 AT (  424021.60,  4526806.30,  1304.09,  2867.37,    0.00)  DC
```


*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

```
                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

68H6      1ST HIGHEST VALUE IS       0.67276 AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.66843 AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.62581 AT (  424000.90,  4526759.50,  1304.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.61484 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.56657 AT (  424021.60,  4526806.30,  1304.09,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.53617 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.52346 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.51132 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.46731 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.46264 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC

68H7      1ST HIGHEST VALUE IS       0.70333 AT (  424231.00,  4526870.60,  1306.99,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.64527 AT (  424214.70,  4526825.30,  1307.63,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.62790 AT (  424242.70,  4526812.50,  1308.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.62250 AT (  424022.30,  4526879.70,  1303.97,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.62016 AT (  424234.70,  4526790.30,  1308.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.61720 AT (  424274.70,  4526901.40,  1307.68,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.60282 AT (  424022.60,  4526904.20,  1303.05,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.59697 AT (  424206.50,  4526802.70,  1307.25,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.59589 AT (  424002.50,  4526908.70,  1303.27,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.59533 AT (  424222.80,  4526848.00,  1307.57,  2867.37,    0.00)  DC

68H10     1ST HIGHEST VALUE IS       0.06412 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.06304 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06235 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06228 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06191 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06155 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.05953 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.05887 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.05864 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.05745 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC

68H11     1ST HIGHEST VALUE IS       0.05723 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.05664 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.05572 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.05431 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.05415 AT (  423800.00,  4526300.00,  1304.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.05409 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.05401 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.05388 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.05379 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.05378 AT (  423997.60,  4526436.10,  1307.00,  2867.37,    0.00)  DC
```

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H12	1ST HIGHEST VALUE IS	0.06334 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.05991 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.05939 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.05775 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.05669 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.05539 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.05485 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.05468 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.05461 AT	(423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.05458 AT	(423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC	
68H13	1ST HIGHEST VALUE IS	0.05966 AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.05669 AT	(423997.60, 4526436.10, 1307.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.05597 AT	(423750.00, 4526300.00, 1303.46, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.05537 AT	(423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.05469 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.05415 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.05335 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.05294 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.05261 AT	(424017.80, 4526439.00, 1307.01, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.05258 AT	(423997.30, 4526411.20, 1307.00, 2867.37, 0.00)	DC	
FLARES	1ST HIGHEST VALUE IS	0.01078 AT	(424600.00, 4525500.00, 1323.98, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.01076 AT	(424550.00, 4525600.00, 1323.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.01076 AT	(424550.00, 4525550.00, 1323.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.01074 AT	(424500.00, 4525650.00, 1321.24, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.01069 AT	(424600.00, 4525550.00, 1323.08, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.01066 AT	(424500.00, 4525600.00, 1322.94, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.01064 AT	(424450.00, 4525700.00, 1322.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.01057 AT	(424700.00, 4525400.00, 1327.01, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.01055 AT	(424500.00, 4525700.00, 1322.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.01051 AT	(424450.00, 4525750.00, 1322.00, 2867.37, 0.00)	DC	
FLAREN	1ST HIGHEST VALUE IS	0.01069 AT	(424600.00, 4525500.00, 1323.98, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.01067 AT	(424550.00, 4525600.00, 1323.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.01067 AT	(424550.00, 4525550.00, 1323.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.01065 AT	(424500.00, 4525650.00, 1321.24, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.01060 AT	(424600.00, 4525550.00, 1323.08, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.01057 AT	(424500.00, 4525600.00, 1322.94, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.01055 AT	(424450.00, 4525700.00, 1322.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.01048 AT	(424700.00, 4525400.00, 1327.01, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.01046 AT	(424500.00, 4525700.00, 1322.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.01043 AT	(424450.00, 4525750.00, 1322.00, 2867.37, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 10 Warning Message(s)
A Total of 525 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 525 Missing Hours Identified (5.99 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
CN W305 1 WAKFLG:Stack height > or = EPA formula height for SRCID: 4H1
CN W305 1 WAKFLG:Stack height > or = EPA formula height for SRCID: 9H1
CN W305 1 WAKFLG:Stack height > or = EPA formula height for SRCID: 9H2
CN W305 1 WAKFLG:Stack height > or = EPA formula height for SRCID: 12H1

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CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLAREN
CN W305      13 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
CN W305      72 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
```

*** MODEL SETUP OPTIONS SUMMARY ***

- -

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses URBAN Dispersion Algorithm for the SBL for 50 Source(s),
for Total of 1 Urban Area(s):
Urban Population = 306479.0 ; Urban Roughness Length = 1.000 m

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. Half-life of 4 hrs for URBAN SO2.
6. Urban Roughness Length of 1.0 Meter Assumed.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 1 Short Term Average(s) of: 1-HR

**This Run Includes: 50 Source(s); 52 Source Group(s); and 10025 Receptor(s)

**The Model Assumes A Pollutant Type of: SO2

**Note that special processing requirements apply for the 1-hour SO2 NAAQS - check available guidance.
Model will process user-specified ranks of daily maximum
1-hour values averaged across the number of years modeled.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs External File(s) of Maximum Daily 1-hr Values by Year (MXDYBYYR Keyword)
Model Outputs External File(s) of Contributions to Maximum Daily Values Paired in Time & Space (MAXDCONT Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1288.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 149.6 MB of RAM.

**Input Runstream File: Holly_V17_2007_SO2.DTA
**Output Print File: Holly_V17_2007_SO2.LST

**File for Summary of Results: C:\beast\Holly\Holly_V17_2007_SO2.SUM

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2007.SFC Met Version: 11059
Profile file: SY2007.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2007 Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-2.0	0.051	-9.000	-9.000	-999.	27.	5.4	0.01	0.28	1.00	1.80	267.	10.0	270.4	10.0
07	01	01	1	02	-1.2	0.042	-9.000	-9.000	-999.	20.	4.6	0.02	0.28	1.00	1.30	295.	10.0	270.9	10.0
07	01	01	1	03	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	93.	10.0	270.6	10.0
07	01	01	1	04	-0.8	0.036	-9.000	-9.000	-999.	16.	4.4	0.07	0.28	1.00	0.90	141.	10.0	270.6	10.0
07	01	01	1	05	-2.4	0.063	-9.000	-9.000	-999.	37.	8.4	0.12	0.28	1.00	1.40	172.	10.0	270.4	10.0
07	01	01	1	06	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	114.	10.0	270.4	10.0
07	01	01	1	07	-0.5	0.029	-9.000	-9.000	-999.	11.	3.3	0.04	0.28	1.00	0.80	87.	10.0	270.0	10.0
07	01	01	1	08	-0.5	0.026	-9.000	-9.000	-999.	9.	2.7	0.01	0.28	1.00	0.90	262.	10.0	269.5	10.0
07	01	01	1	09	-4.5	0.099	-9.000	-9.000	-999.	71.	16.8	0.09	0.28	0.51	1.90	347.	10.0	269.0	10.0
07	01	01	1	10	9.0	0.139	0.572	0.017	655.	119.	-23.4	0.04	0.28	0.30	1.70	315.	10.0	271.0	10.0
07	01	01	1	11	22.7	0.145	0.787	0.018	677.	128.	-10.7	0.06	0.28	0.22	1.50	14.	10.0	272.8	10.0
07	01	01	1	12	31.5	0.186	0.891	0.018	707.	184.	-16.0	0.06	0.28	0.19	2.00	13.	10.0	272.9	10.0
07	01	01	1	13	34.6	0.222	0.934	0.018	740.	241.	-25.0	0.06	0.28	0.19	2.50	5.	10.0	273.4	10.0
07	01	01	1	14	38.8	0.298	0.985	0.018	777.	374.	-53.6	0.09	0.28	0.19	3.20	359.	10.0	273.9	10.0
07	01	01	1	15	28.3	0.138	0.898	0.018	805.	136.	-7.3	0.04	0.28	0.22	1.50	64.	10.0	275.4	10.0
07	01	01	1	16	11.6	0.177	0.671	0.018	816.	171.	-37.4	0.05	0.28	0.29	2.10	111.	10.0	275.1	10.0
07	01	01	1	17	-7.2	0.120	-9.000	-9.000	-999.	96.	18.8	0.07	0.28	0.49	2.30	134.	10.0	273.6	10.0
07	01	01	1	18	-4.8	0.077	-9.000	-9.000	-999.	49.	7.5	0.12	0.28	1.00	1.70	152.	10.0	272.0	10.0
07	01	01	1	19	-2.1	0.045	-9.000	-9.000	-999.	22.	3.4	0.01	0.28	1.00	1.50	221.	10.0	271.0	10.0
07	01	01	1	20	-0.8	0.029	-9.000	-9.000	-999.	11.	2.4	0.01	0.28	1.00	1.00	242.	10.0	270.4	10.0
07	01	01	1	21	-6.2	0.083	-9.000	-9.000	-999.	55.	7.3	0.07	0.28	1.00	2.10	128.	10.0	269.8	10.0
07	01	01	1	22	-8.2	0.095	-9.000	-9.000	-999.	68.	8.4	0.07	0.28	1.00	2.40	136.	10.0	269.4	10.0
07	01	01	1	23	-9.6	0.103	-9.000	-9.000	-999.	76.	9.1	0.07	0.28	1.00	2.60	142.	10.0	268.8	10.0
07	01	01	1	24	-5.1	0.075	-9.000	-9.000	-999.	48.	6.6	0.07	0.28	1.00	1.90	148.	10.0	269.0	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	10.0	1	267.	1.80	270.5	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	26.83614	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	25.64410	AT (424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	24.86168	AT (424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	22.63557	AT (424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	22.54806	AT (424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	20.56284	AT (424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	18.36637	AT (424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	18.36381	AT (423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	17.92522	AT (424198.40, 4526780.00, 1307.25, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	17.79521	AT (423886.90, 4526986.00, 1299.62, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	7.50727	AT (424650.00, 4527300.00, 1309.11, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	7.50621	AT (424800.00, 4526750.00, 1319.15, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	7.49225	AT (424850.00, 4526750.00, 1319.27, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	7.48666	AT (424750.00, 4526750.00, 1317.76, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	7.47195	AT (424600.00, 4527250.00, 1308.89, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	7.45869	AT (424900.00, 4526750.00, 1320.27, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	7.45178	AT (424700.00, 4527350.00, 1309.57, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	7.43508	AT (424700.00, 4526750.00, 1317.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	7.43199	AT (424750.00, 4527350.00, 1310.47, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	7.42522	AT (424550.00, 4527250.00, 1308.60, 2867.37, 0.00)	DC	
4H1	1ST HIGHEST VALUE IS	4.40239	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.80281	AT (424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.59442	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.54487	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.54099	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.44630	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.39433	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	

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         8TH HIGHEST VALUE IS       3.35134 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
         9TH HIGHEST VALUE IS       3.31113 AT (  424100.50,  4526508.10,  1308.47,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS       3.27169 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC

4K1A     1ST HIGHEST VALUE IS       0.04404 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
         2ND HIGHEST VALUE IS       0.04010 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
         3RD HIGHEST VALUE IS       0.03903 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS       0.03828 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
         5TH HIGHEST VALUE IS       0.03410 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
         6TH HIGHEST VALUE IS       0.03311 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
         7TH HIGHEST VALUE IS       0.03302 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
         8TH HIGHEST VALUE IS       0.03184 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
         9TH HIGHEST VALUE IS       0.03162 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS       0.03130 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                    AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

4K1B     1ST HIGHEST VALUE IS       0.03850 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
         2ND HIGHEST VALUE IS       0.03688 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
         3RD HIGHEST VALUE IS       0.03647 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS       0.03393 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
         5TH HIGHEST VALUE IS       0.03287 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
         6TH HIGHEST VALUE IS       0.03112 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
         7TH HIGHEST VALUE IS       0.03059 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
         8TH HIGHEST VALUE IS       0.02881 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC
         9TH HIGHEST VALUE IS       0.02651 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS       0.02577 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC

4V82     1ST HIGHEST VALUE IS      22.01307 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
         2ND HIGHEST VALUE IS      20.85330 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
         3RD HIGHEST VALUE IS      20.06772 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS      18.74801 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
         5TH HIGHEST VALUE IS      15.28678 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
         6TH HIGHEST VALUE IS      13.95723 AT (  424190.20,  4526757.30,  1307.52,  2867.37,    0.00)  DC
         7TH HIGHEST VALUE IS      13.28763 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
         8TH HIGHEST VALUE IS      12.96606 AT (  424206.50,  4526802.70,  1307.25,  2867.37,    0.00)  DC
         9TH HIGHEST VALUE IS      12.96415 AT (  424198.40,  4526780.00,  1307.25,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS      12.75181 AT (  424200.00,  4526750.00,  1308.90,  2867.37,    0.00)  DC

6H1      1ST HIGHEST VALUE IS       1.29582 AT (  424073.10,  4526413.90,  1308.34,  2867.37,    0.00)  DC
         2ND HIGHEST VALUE IS       1.16037 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC
         3RD HIGHEST VALUE IS       1.12135 AT (  424100.00,  4526400.00,  1309.66,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS       1.11324 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
         5TH HIGHEST VALUE IS       1.10745 AT (  424066.40,  4526397.00,  1308.57,  2867.37,    0.00)  DC
         6TH HIGHEST VALUE IS       1.06192 AT (  424079.80,  4526430.90,  1308.90,  2867.37,    0.00)  DC
         7TH HIGHEST VALUE IS       0.99304 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
         8TH HIGHEST VALUE IS       0.98239 AT (  424100.00,  4526350.00,  1310.00,  2867.37,    0.00)  DC
         9TH HIGHEST VALUE IS       0.96012 AT (  424076.00,  4526440.10,  1308.42,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS       0.93514 AT (  424058.90,  4526395.20,  1308.59,  2867.37,    0.00)  DC

6H3      1ST HIGHEST VALUE IS       3.56278 AT (  424050.00,  4526150.00,  1310.00,  2867.37,    0.00)  DC
         2ND HIGHEST VALUE IS       3.46869 AT (  424000.90,  4526759.50,  1304.00,  2867.37,    0.00)  DC
         3RD HIGHEST VALUE IS       3.44079 AT (  423971.90,  4526311.70,  1306.95,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS       3.43942 AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC
         5TH HIGHEST VALUE IS       3.43604 AT (  424050.00,  4526350.00,  1309.00,  2867.37,    0.00)  DC
         6TH HIGHEST VALUE IS       3.42992 AT (  424043.50,  4526355.80,  1309.00,  2867.37,    0.00)  DC
         7TH HIGHEST VALUE IS       3.42539 AT (  424200.00,  4526550.00,  1310.00,  2867.37,    0.00)  DC
         8TH HIGHEST VALUE IS       3.41890 AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC
         9TH HIGHEST VALUE IS       3.40089 AT (  424050.00,  4526200.00,  1309.00,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS       3.39755 AT (  424051.20,  4526375.50,  1309.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

```
                                                                                                  NETWORK
GROUP ID                    AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

6H2      1ST HIGHEST VALUE IS       0.72523 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
         2ND HIGHEST VALUE IS       0.72022 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
         3RD HIGHEST VALUE IS       0.71577 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS       0.70056 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
         5TH HIGHEST VALUE IS       0.62553 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
         6TH HIGHEST VALUE IS       0.56866 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
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          7TH HIGHEST VALUE IS       0.55509 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.50595 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.49858 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.49811 AT (  423996.80,  4526361.50,  1307.70,  2867.37,    0.00)  DC

6K1       1ST HIGHEST VALUE IS       0.01172 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01162 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01152 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01120 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01100 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01059 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01038 AT (  423713.10,  4526253.70,  1303.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.00974 AT (  423713.20,  4526229.60,  1303.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00962 AT (  423700.00,  4526250.00,  1303.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.00898 AT (  423713.20,  4526205.50,  1303.04,  2867.37,    0.00)  DC

6K2       1ST HIGHEST VALUE IS       0.01192 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01172 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01142 AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01137 AT (  423700.00,  4526300.00,  1302.93,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01135 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01100 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01096 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01091 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01027 AT (  423713.10,  4526253.70,  1303.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01010 AT (  423700.00,  4526250.00,  1303.00,  2867.37,    0.00)  DC

7H3       1ST HIGHEST VALUE IS       0.33385 AT (  424350.00,  4527200.00,  1305.73,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.33229 AT (  424400.00,  4527250.00,  1305.39,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.33062 AT (  424300.00,  4527150.00,  1305.92,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.33033 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.32967 AT (  424700.00,  4526800.00,  1314.93,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.32932 AT (  424350.00,  4527250.00,  1304.12,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.32907 AT (  424650.00,  4526800.00,  1314.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.32903 AT (  424600.00,  4526750.00,  1315.58,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.32885 AT (  424400.00,  4527300.00,  1304.17,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.32770 AT (  424450.00,  4527300.00,  1306.15,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   1ST-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                              ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                   NETWORK
GROUP ID                     AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

7H1       1ST HIGHEST VALUE IS       0.54486 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.48125 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.46356 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.46318 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.43424 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.43163 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.42117 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.32270 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.31857 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.31566 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC

8H1       1ST HIGHEST VALUE IS       0.63311 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.62445 AT (  423850.00,  4526200.00,  1305.72,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.62429 AT (  423900.00,  4526250.00,  1305.93,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.61676 AT (  424209.60,  4526656.90,  1309.24,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.61229 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.61114 AT (  424186.60,  4526656.90,  1308.44,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.61036 AT (  424050.00,  4526250.00,  1309.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.61028 AT (  424200.00,  4526650.00,  1309.02,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.60717 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.60450 AT (  423822.10,  4526206.20,  1304.94,  2867.37,    0.00)  DC

9H1       1ST HIGHEST VALUE IS       0.86253 AT (  424092.30,  4526485.40,  1308.49,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.83074 AT (  424116.80,  4526553.40,  1308.40,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.81661 AT (  424124.90,  4526576.10,  1308.06,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.79453 AT (  424100.00,  4526500.00,  1308.69,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.79269 AT (  424150.00,  4526550.00,  1308.55,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.74638 AT (  424100.50,  4526508.10,  1308.47,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.71775 AT (  424133.10,  4526598.70,  1307.86,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.70426 AT (  424108.60,  4526530.70,  1308.63,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.68735 AT (  424150.00,  4526500.00,  1310.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.66103 AT (  424150.00,  4526600.00,  1308.93,  2867.37,    0.00)  DC

9H2       1ST HIGHEST VALUE IS       1.18979 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.14706 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.13110 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.78015 AT (  424084.20,  4526462.80,  1308.52,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.77958 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.75780 AT (  424100.00,  4526400.00,  1309.66,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.75064 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.73734 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.72725 AT (  424073.10,  4526413.90,  1308.34,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.72600 AT (  424079.80,  4526430.90,  1308.90,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
10H1	1ST HIGHEST VALUE IS	0.40417 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.39809 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.39528 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.39180 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.38702 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.38671 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.38618 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.38154 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.38114 AT	(423997.60, 4526436.10, 1307.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.38070 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
10H2	1ST HIGHEST VALUE IS	0.67429 AT	(423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.66805 AT	(424200.00, 4526600.00, 1309.10, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.66084 AT	(423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.65938 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.64940 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.64657 AT	(423822.10, 4526206.20, 1304.94, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.64459 AT	(424250.00, 4526600.00, 1310.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.64403 AT	(423822.00, 4526230.30, 1304.69, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.64138 AT	(424050.00, 4526200.00, 1309.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.63999 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
11H1	1ST HIGHEST VALUE IS	0.43061 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.41695 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.41348 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.41048 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.40597 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.40306 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.40191 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.39978 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.39646 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.39557 AT	(423997.60, 4526436.10, 1307.00, 2867.37, 0.00)	DC	
12H1	1ST HIGHEST VALUE IS	0.26357 AT	(423850.00, 4526100.00, 1305.14, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.26330 AT	(423900.00, 4526100.00, 1306.02, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.26045 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.25983 AT	(424050.00, 4526200.00, 1309.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.25541 AT	(423900.00, 4526050.00, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.25393 AT	(423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.25277 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.25263 AT	(423850.00, 4526050.00, 1305.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.25160 AT	(423850.00, 4526150.00, 1305.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.24888 AT	(424200.00, 4526300.00, 1311.18, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
13H1	1ST HIGHEST VALUE IS	0.50952 AT	(423997.30, 4526411.20, 1307.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.50914 AT	(424017.60, 4526414.50, 1307.94, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.50719 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.50318 AT	(423997.10, 4526386.30, 1307.42, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.50185 AT	(424000.00, 4526400.00, 1307.79, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.49886 AT	(424017.80, 4526439.00, 1307.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.49786 AT	(424018.10, 4526463.50, 1307.12, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.49133 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.48857 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.48743 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
19H1	1ST HIGHEST VALUE IS	0.31156 AT	(424079.80, 4526430.90, 1308.90, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.30088 AT	(424073.10, 4526413.90, 1308.34, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.29892 AT	(424084.20, 4526462.80, 1308.52, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.29858 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.29825 AT	(423800.00, 4526300.00, 1304.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.29764 AT	(424076.00, 4526440.10, 1308.42, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.29759 AT	(423850.00, 4526300.00, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.29695 AT	(424100.00, 4526350.00, 1310.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.29629 AT	(423971.90, 4526311.70, 1306.95, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.29622 AT	(423850.00, 4526250.00, 1305.00, 2867.37, 0.00)	DC	

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20H1      1ST HIGHEST VALUE IS       0.28251 AT (  423962.20,  4526296.80,  1306.98,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.27962 AT (  424100.00,  4526400.00,  1309.66,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.27954 AT (  424050.00,  4526350.00,  1309.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.27940 AT (  424066.40,  4526397.00,  1308.57,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.27907 AT (  424043.50,  4526355.80,  1309.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.27813 AT (  423962.60,  4526277.20,  1306.96,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.27717 AT (  424051.20,  4526375.50,  1309.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.27672 AT (  424076.00,  4526440.10,  1308.42,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.27581 AT (  424079.80,  4526430.90,  1308.90,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.27553 AT (  423850.00,  4526250.00,  1305.00,  2867.37,    0.00)  DC

20H2      1ST HIGHEST VALUE IS       0.48498 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.47724 AT (  424000.00,  4526200.00,  1308.82,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.47547 AT (  424002.20,  4526211.60,  1308.79,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.47206 AT (  423993.60,  4526211.00,  1307.37,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.46588 AT (  423950.00,  4526150.00,  1307.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.45917 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.45322 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.45303 AT (  423822.10,  4526133.80,  1304.69,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.44794 AT (  424100.00,  4526300.00,  1310.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.44741 AT (  424100.00,  4526250.00,  1310.00,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   1ST-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

20H3      1ST HIGHEST VALUE IS       0.47330 AT (  423950.00,  4526200.00,  1307.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.47063 AT (  424002.40,  4526232.10,  1308.24,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.46349 AT (  424002.20,  4526211.60,  1308.79,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.46281 AT (  424150.00,  4526400.00,  1310.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.46159 AT (  423950.00,  4526150.00,  1307.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.46146 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.45709 AT (  424100.00,  4526400.00,  1309.66,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.45463 AT (  423850.00,  4526200.00,  1305.72,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.45095 AT (  424150.00,  4526300.00,  1311.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.45050 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC

23H1      1ST HIGHEST VALUE IS       0.33062 AT (  424016.60,  4526316.60,  1308.01,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.32997 AT (  423950.00,  4526300.00,  1306.66,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.32683 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.32555 AT (  423962.20,  4526296.80,  1306.98,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.32508 AT (  424100.00,  4526450.00,  1308.97,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.32476 AT (  423947.40,  4526311.70,  1306.11,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.32469 AT (  424100.00,  4526400.00,  1309.66,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.32449 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.32448 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.32434 AT (  423962.60,  4526277.20,  1306.96,  2867.37,    0.00)  DC

24H1      1ST HIGHEST VALUE IS       0.42172 AT (  423841.00,  4527079.80,  1298.99,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.42095 AT (  423840.90,  4527056.60,  1299.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.41293 AT (  423841.20,  4527102.90,  1298.97,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.40417 AT (  423886.40,  4527102.10,  1299.37,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.40328 AT (  423886.60,  4527121.40,  1299.87,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.40141 AT (  423840.70,  4527033.40,  1299.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.39882 AT (  423850.00,  4527100.00,  1299.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.39742 AT (  423850.00,  4527050.00,  1298.99,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.39496 AT (  423900.00,  4527100.00,  1300.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.39113 AT (  423886.80,  4527140.70,  1299.36,  2867.37,    0.00)  DC

25H1      1ST HIGHEST VALUE IS       0.38908 AT (  423840.40,  4526987.00,  1299.47,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.38030 AT (  423840.60,  4527010.20,  1299.06,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.37533 AT (  423863.70,  4526986.50,  1300.17,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.36708 AT (  423840.70,  4527033.40,  1299.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.36314 AT (  423886.90,  4526986.00,  1299.62,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.36216 AT (  423850.00,  4527000.00,  1299.20,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.36122 AT (  423900.00,  4527000.00,  1300.24,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.35653 AT (  423900.00,  4527050.00,  1300.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.35083 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.35014 AT (  423840.90,  4527056.60,  1299.00,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
SCRUBBER	1ST HIGHEST VALUE IS	5.10497 AT	(424700.00, 4526750.00, 1317.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	5.09859 AT	(424750.00, 4526750.00, 1317.76, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	5.08360 AT	(424650.00, 4526750.00, 1316.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	5.07312 AT	(424800.00, 4526750.00, 1319.15, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	5.03318 AT	(424600.00, 4526750.00, 1315.58, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	5.02641 AT	(424850.00, 4526750.00, 1319.27, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	4.98731 AT	(424750.00, 4526700.00, 1318.19, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	4.98552 AT	(424700.00, 4526700.00, 1317.02, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	4.96924 AT	(424900.00, 4526750.00, 1320.27, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	4.96625 AT	(424800.00, 4526700.00, 1319.12, 2867.37, 0.00)	DC	
26H1	1ST HIGHEST VALUE IS	0.39655 AT	(423538.80, 4527067.90, 1294.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.37235 AT	(423515.40, 4527068.10, 1293.78, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.36860 AT	(423500.00, 4527100.00, 1293.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.35647 AT	(423562.10, 4527067.70, 1294.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.33289 AT	(423585.50, 4527067.50, 1295.96, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.33280 AT	(423550.00, 4527100.00, 1294.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.32809 AT	(424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.32391 AT	(424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.32372 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.32283 AT	(423450.00, 4527150.00, 1293.04, 2867.37, 0.00)	DC	
27H1	1ST HIGHEST VALUE IS	0.47269 AT	(423863.80, 4527102.50, 1299.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.46456 AT	(423886.40, 4527102.10, 1299.37, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.46084 AT	(423886.60, 4527121.40, 1299.87, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.45021 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.44738 AT	(423886.80, 4527140.70, 1299.36, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.43932 AT	(424900.00, 4526800.00, 1319.64, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.43892 AT	(424850.00, 4526800.00, 1319.09, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.43826 AT	(424950.00, 4526800.00, 1320.50, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.43651 AT	(424800.00, 4526800.00, 1317.74, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.43598 AT	(425000.00, 4526800.00, 1321.34, 2867.37, 0.00)	DC	
30H1	1ST HIGHEST VALUE IS	0.75366 AT	(424000.00, 4527150.00, 1301.96, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.75346 AT	(423839.70, 4527180.00, 1297.98, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.71269 AT	(423850.00, 4527200.00, 1297.98, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.70692 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.69703 AT	(424206.50, 4526802.70, 1307.25, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.69398 AT	(423815.90, 4527180.20, 1297.21, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.69075 AT	(423863.50, 4527179.70, 1298.36, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.69002 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.68578 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.68408 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
30H2	1ST HIGHEST VALUE IS	0.75219 AT	(424000.00, 4527150.00, 1301.96, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.74903 AT	(423839.70, 4527180.00, 1297.98, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.72134 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.70740 AT	(423850.00, 4527200.00, 1297.98, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.69869 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.69748 AT	(424206.50, 4526802.70, 1307.25, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.69262 AT	(423815.90, 4527180.20, 1297.21, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.68979 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.68742 AT	(423863.50, 4527179.70, 1298.36, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.68516 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
33H1	1ST HIGHEST VALUE IS	0.57766 AT	(424900.00, 4526450.00, 1323.39, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.57728 AT	(424950.00, 4526450.00, 1324.14, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.57585 AT	(424850.00, 4526450.00, 1322.76, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.57145 AT	(424800.00, 4526450.00, 1322.66, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.56938 AT	(424750.00, 4527000.00, 1314.18, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.56904 AT	(424700.00, 4526950.00, 1314.84, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.56870 AT	(424950.00, 4526400.00, 1324.55, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.56867 AT	(424900.00, 4526400.00, 1323.64, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.56693 AT	(425000.00, 4526400.00, 1325.46, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.56652 AT	(424850.00, 4526400.00, 1323.21, 2867.37, 0.00)	DC	

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BOILER4   1ST HIGHEST VALUE IS       2.47906 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.47598 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.42984 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.42768 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.40585 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.22819 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       2.18743 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.14119 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.12297 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.12040 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC

BOILER5   1ST HIGHEST VALUE IS       2.33490 AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.23556 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.22004 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.13701 AT (  424021.60,  4526806.30,  1304.09,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.10218 AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.04130 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.97733 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.92944 AT (  424002.00,  4526859.00,  1303.58,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.92653 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.92166 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   1ST-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BOILER8   1ST HIGHEST VALUE IS       3.48585 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.39926 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.34113 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.27993 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.26603 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.26336 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.22903 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.20325 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.06759 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.03612 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC

BOILER9   1ST HIGHEST VALUE IS       3.85507 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.79875 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.78460 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.76177 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.70533 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.66893 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.61588 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.60250 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.58136 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.54218 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC

BOILER10  1ST HIGHEST VALUE IS       3.51564 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.47806 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.35783 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.22377 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.22377 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.13470 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.12575 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.07029 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.01178 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.89273 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC

BOILER11  1ST HIGHEST VALUE IS       1.64512 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.61546 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.61436 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.59672 AT (  424116.80,  4526553.40,  1308.40,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.59007 AT (  424141.30,  4526621.40,  1308.11,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.57162 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.55827 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.54987 AT (  424133.10,  4526598.70,  1307.86,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.54442 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.54431 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H2	1ST HIGHEST VALUE IS	0.61970 AT	(424226.70, 4526768.00, 1308.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.60377 AT	(424206.50, 4526802.70, 1307.25, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.55340 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.54738 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.54722 AT	(424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.53169 AT	(424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.52458 AT	(424258.70, 4526856.90, 1307.60, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.50269 AT	(424214.70, 4526825.30, 1307.63, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.50103 AT	(424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.48089 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
68H3	1ST HIGHEST VALUE IS	0.81370 AT	(424278.70, 4526656.80, 1308.99, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.80772 AT	(424255.60, 4526656.80, 1310.07, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.79037 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.77974 AT	(424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.77958 AT	(424300.00, 4526650.00, 1311.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.77301 AT	(424232.60, 4526656.80, 1309.65, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.77266 AT	(424250.00, 4526650.00, 1309.85, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.77167 AT	(424202.60, 4526701.30, 1308.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.75597 AT	(424301.70, 4526656.70, 1310.60, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.74366 AT	(424194.60, 4526679.10, 1308.34, 2867.37, 0.00)	DC	
68H4	1ST HIGHEST VALUE IS	0.85358 AT	(424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.84912 AT	(424182.00, 4526734.70, 1308.06, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.82525 AT	(424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.81817 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.81727 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.79380 AT	(424194.60, 4526679.10, 1308.34, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.78767 AT	(424202.60, 4526701.30, 1308.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.77781 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.76916 AT	(424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.76172 AT	(424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC	
68H5	1ST HIGHEST VALUE IS	0.73002 AT	(424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.70798 AT	(424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.65912 AT	(424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.63994 AT	(424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.63586 AT	(424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.61907 AT	(424002.00, 4526859.00, 1303.58, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.61654 AT	(424141.30, 4526621.40, 1308.11, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.59321 AT	(424133.10, 4526598.70, 1307.86, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.58892 AT	(424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.58855 AT	(424150.00, 4526600.00, 1308.93, 2867.37, 0.00)	DC	

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H6	1ST HIGHEST VALUE IS	0.74376 AT	(424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.73107 AT	(424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.67300 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.66237 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.62244 AT	(424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.55700 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.53924 AT	(424105.60, 4527054.50, 1304.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.53614 AT	(424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.52071 AT	(424085.20, 4527053.70, 1304.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.51713 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
68H7	1ST HIGHEST VALUE IS	0.76417 AT	(424214.70, 4526825.30, 1307.63, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.76074 AT	(424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.75720 AT	(424239.20, 4526893.30, 1307.25, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.74246 AT	(424250.70, 4526834.70, 1307.89, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.73603 AT	(424250.00, 4526900.00, 1307.92, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.72769 AT	(424274.70, 4526901.40, 1307.68, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.72472 AT	(424206.50, 4526802.70, 1307.25, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.72451 AT	(424266.70, 4526879.20, 1307.75, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.70276 AT	(424222.80, 4526848.00, 1307.57, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.70022 AT	(424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC	

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68H10     1ST HIGHEST VALUE IS       0.08025 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.07970 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.07217 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.07095 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.07034 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06916 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06849 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06637 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06595 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.06386 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC

68H11     1ST HIGHEST VALUE IS       0.07163 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.06679 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06126 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.05941 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.05830 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.05774 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.05759 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.05740 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.05536 AT (  423898.60,  4526311.60,  1305.71,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.05520 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

68H12     1ST HIGHEST VALUE IS       0.07887 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.07125 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.07021 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06944 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06894 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06801 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06719 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06434 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06321 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.06210 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC

68H13     1ST HIGHEST VALUE IS       0.07107 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.07041 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06982 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06749 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06727 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06679 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06666 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06568 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.05791 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.05779 AT (  423900.00,  4526300.00,  1306.00,  2867.37,    0.00)  DC

FLARES    1ST HIGHEST VALUE IS       0.01436 AT (  424550.00,  4526050.00,  1320.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01433 AT (  424400.00,  4525900.00,  1319.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01432 AT (  424600.00,  4526000.00,  1322.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01431 AT (  424450.00,  4525850.00,  1321.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01428 AT (  424500.00,  4526100.00,  1319.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01426 AT (  424550.00,  4526000.00,  1321.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01425 AT (  424400.00,  4525950.00,  1318.04,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01422 AT (  424500.00,  4526050.00,  1319.27,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01421 AT (  424450.00,  4525900.00,  1320.98,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01419 AT (  424350.00,  4525950.00,  1317.00,  2867.37,    0.00)  DC

FLAREN    1ST HIGHEST VALUE IS       0.01424 AT (  424550.00,  4526050.00,  1320.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01421 AT (  424400.00,  4525900.00,  1319.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01420 AT (  424600.00,  4526000.00,  1322.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01420 AT (  424450.00,  4525850.00,  1321.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01416 AT (  424500.00,  4526100.00,  1319.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01414 AT (  424550.00,  4526000.00,  1321.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01413 AT (  424400.00,  4525950.00,  1318.04,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01410 AT (  424500.00,  4526050.00,  1319.27,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01409 AT (  424450.00,  4525900.00,  1320.98,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01407 AT (  424350.00,  4525950.00,  1317.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	24.22676 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	22.72026 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	22.34715 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	22.02132 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	18.98002 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	17.50970 AT	(424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	17.24085 AT	(423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	16.69975 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	16.60059 AT	(423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	16.59324 AT	(424198.40, 4526780.00, 1307.25, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	5.35473 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	5.29712 AT	(423886.60, 4527121.40, 1299.87, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	5.29231 AT	(423840.70, 4527033.40, 1299.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	5.27039 AT	(423840.60, 4527010.20, 1299.06, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	5.24832 AT	(423886.40, 4527102.10, 1299.37, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	5.24472 AT	(423900.00, 4527100.00, 1300.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	5.23201 AT	(423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	5.21063 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	5.18950 AT	(423900.00, 4527000.00, 1300.24, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	5.17189 AT	(423950.00, 4527000.00, 1301.90, 2867.37, 0.00)	DC	
4H1	1ST HIGHEST VALUE IS	3.27749 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.25983 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.22605 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.17517 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.17005 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.13553 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.04683 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	2.97603 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	2.93635 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	2.92108 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
4K1A	1ST HIGHEST VALUE IS	0.03767 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.03315 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.03250 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.03204 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.03008 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.02966 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.02899 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.02860 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.02837 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.02618 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
4K1B	1ST HIGHEST VALUE IS	0.03500 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.03134 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.03107 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.03092 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.03003 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.02918 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.02720 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.02459 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.02367 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.01941 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
4V82	1ST HIGHEST VALUE IS	20.63202 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	18.83551 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	18.35054 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	17.78832 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	13.60115 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	11.94760 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	11.52033 AT	(423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	11.30804 AT	(424198.40, 4526780.00, 1307.25, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	11.22414 AT	(423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	11.05175 AT	(424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	

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6H1       1ST HIGHEST VALUE IS       0.51728 AT (  423898.60,  4526311.60,  1305.71,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.50920 AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.49996 AT (  423900.00,  4526300.00,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.49070 AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.48819 AT (  424100.50,  4526508.10,  1308.47,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.48341 AT (  423947.40,  4526311.70,  1306.11,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.48206 AT (  423850.00,  4526300.00,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.48094 AT (  424100.00,  4526500.00,  1308.69,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.47420 AT (  423950.00,  4526300.00,  1306.66,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.47217 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC

6H3       1ST HIGHEST VALUE IS       3.21694 AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.13049 AT (  424141.30,  4526621.40,  1308.11,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.12594 AT (  424000.90,  4526759.50,  1304.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.12482 AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.11184 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.09954 AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.09679 AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.09031 AT (  424021.60,  4526806.30,  1304.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.08369 AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.08314 AT (  423900.00,  4526300.00,  1306.00,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   4TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                  ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

6H2       1ST HIGHEST VALUE IS       0.49835 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.44960 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.44884 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.44733 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.43400 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.43331 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.43114 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.42703 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.42695 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.42662 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC

6K1       1ST HIGHEST VALUE IS       0.01134 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01096 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01025 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.00951 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.00931 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.00930 AT (  423713.10,  4526253.70,  1303.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.00907 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.00895 AT (  423713.20,  4526229.60,  1303.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00852 AT (  423713.20,  4526205.50,  1303.04,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.00841 AT (  423700.00,  4526250.00,  1303.00,  2867.37,    0.00)  DC

6K2       1ST HIGHEST VALUE IS       0.01051 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01035 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.00996 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.00994 AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.00991 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.00979 AT (  423700.00,  4526300.00,  1302.93,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.00955 AT (  423713.10,  4526253.70,  1303.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.00952 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00949 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.00906 AT (  423650.00,  4526300.00,  1302.00,  2867.37,    0.00)  DC

7H3       1ST HIGHEST VALUE IS       0.30136 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.29676 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.29663 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.29553 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.29500 AT (  424017.80,  4526439.00,  1307.01,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.29483 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.29423 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.29369 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.29322 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.29101 AT (  423795.90,  4526280.90,  1304.00,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
7H1	1ST HIGHEST VALUE IS	0.41230 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.35764 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.32634 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.30286 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.30223 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.29937 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.29805 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.29801 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.29392 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.28873 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
8H1	1ST HIGHEST VALUE IS	0.59468 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.59340 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.57178 AT	(423822.10, 4526158.00, 1304.41, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.56786 AT	(423822.10, 4526182.10, 1304.50, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.56407 AT	(423822.10, 4526206.20, 1304.94, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.56133 AT	(423850.00, 4526200.00, 1305.72, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.55743 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.55616 AT	(423822.10, 4526133.80, 1304.69, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.55422 AT	(423900.00, 4526250.00, 1305.93, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.55264 AT	(423900.00, 4526100.00, 1306.02, 2867.37, 0.00)	DC	
9H1	1ST HIGHEST VALUE IS	0.68798 AT	(424116.80, 4526553.40, 1308.40, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.67566 AT	(424108.60, 4526530.70, 1308.63, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.65816 AT	(424100.00, 4526500.00, 1308.69, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.65576 AT	(424100.50, 4526508.10, 1308.47, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.64169 AT	(424092.30, 4526485.40, 1308.49, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.63457 AT	(424150.00, 4526550.00, 1308.55, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.61315 AT	(424124.90, 4526576.10, 1308.06, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.56987 AT	(424150.00, 4526500.00, 1310.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.54294 AT	(424084.20, 4526462.80, 1308.52, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.53831 AT	(424150.00, 4526600.00, 1308.93, 2867.37, 0.00)	DC	
9H2	1ST HIGHEST VALUE IS	0.95941 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.93025 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.92489 AT	(424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.70671 AT	(424084.20, 4526462.80, 1308.52, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.68973 AT	(424018.10, 4526463.50, 1307.12, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.65950 AT	(424100.00, 4526450.00, 1308.97, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.63154 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.58678 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.58611 AT	(424073.10, 4526413.90, 1308.34, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.55878 AT	(424076.00, 4526440.10, 1308.42, 2867.37, 0.00)	DC	

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
10H1	1ST HIGHEST VALUE IS	0.38346 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.38300 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.37532 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.37113 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.37071 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.36950 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.35871 AT	(423997.60, 4526436.10, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.35556 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.35244 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.35002 AT	(424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC	
10H2	1ST HIGHEST VALUE IS	0.63616 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.61343 AT	(423850.00, 4526150.00, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.61152 AT	(423900.00, 4526100.00, 1306.02, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.60915 AT	(423850.00, 4526100.00, 1305.14, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.60228 AT	(423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.59720 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.59168 AT	(423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.56962 AT	(423900.00, 4526050.00, 1306.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.56082 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.55575 AT	(423950.00, 4526050.00, 1308.90, 2867.37, 0.00)	DC	

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11H1      1ST HIGHEST VALUE IS       0.38268 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.37066 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.36626 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.36584 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.36427 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.36340 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.36168 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.36102 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.35936 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.35892 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC

12H1      1ST HIGHEST VALUE IS       0.24289 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.23887 AT (  423900.00,  4526050.00,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.23764 AT (  423950.00,  4526100.00,  1307.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.23737 AT (  423822.20,  4526085.60,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.23514 AT (  423822.20,  4526109.70,  1304.38,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.23290 AT (  423822.10,  4526133.80,  1304.69,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.22994 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.22856 AT (  423850.00,  4526100.00,  1305.14,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.22832 AT (  423900.00,  4526000.00,  1308.26,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.22657 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   4TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

13H1      1ST HIGHEST VALUE IS       0.48261 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.48034 AT (  424017.80,  4526439.00,  1307.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.47087 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.46982 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.46682 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.46051 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.45949 AT (  424017.60,  4526414.50,  1307.94,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.44193 AT (  423997.60,  4526436.10,  1307.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.43816 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.42593 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC

19H1      1ST HIGHEST VALUE IS       0.28731 AT (  423850.00,  4526250.00,  1305.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.28470 AT (  424084.20,  4526462.80,  1308.52,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.28035 AT (  424092.30,  4526485.40,  1308.49,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.28007 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.27907 AT (  424073.10,  4526413.90,  1308.34,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.27885 AT (  424076.00,  4526440.10,  1308.42,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.27829 AT (  424079.80,  4526430.90,  1308.90,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.27515 AT (  423990.60,  4526296.30,  1308.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.27408 AT (  423850.00,  4526300.00,  1305.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.27061 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC

20H1      1ST HIGHEST VALUE IS       0.26953 AT (  424079.80,  4526430.90,  1308.90,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.26891 AT (  424076.00,  4526440.10,  1308.42,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.26349 AT (  424100.00,  4526450.00,  1308.97,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.26208 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.26055 AT (  424066.40,  4526397.00,  1308.57,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.26024 AT (  424058.90,  4526395.20,  1308.59,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.25810 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.25709 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.25671 AT (  424073.10,  4526413.90,  1308.34,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.25361 AT (  424100.00,  4526400.00,  1309.66,  2867.37,    0.00)  DC

20H2      1ST HIGHEST VALUE IS       0.43134 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.42456 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.42297 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.42219 AT (  423822.20,  4526109.70,  1304.38,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.42158 AT (  423822.10,  4526133.80,  1304.69,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.41130 AT (  423850.00,  4526100.00,  1305.14,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.40808 AT (  423822.10,  4526158.00,  1304.41,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.40786 AT (  423822.20,  4526085.60,  1305.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.40352 AT (  423850.00,  4526200.00,  1305.72,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.40261 AT (  423900.00,  4526050.00,  1306.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
20H3	1ST HIGHEST VALUE IS	0.43081 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.42070 AT	(423850.00, 4526150.00, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.41986 AT	(423850.00, 4526200.00, 1305.72, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.41679 AT	(423822.10, 4526133.80, 1304.69, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.41492 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.41427 AT	(423822.10, 4526158.00, 1304.41, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.40619 AT	(423900.00, 4526100.00, 1306.02, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.40600 AT	(423822.20, 4526109.70, 1304.38, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.39613 AT	(423822.20, 4526085.60, 1305.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.39426 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
23H1	1ST HIGHEST VALUE IS	0.30516 AT	(423874.10, 4526311.60, 1305.39, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.30511 AT	(424100.50, 4526508.10, 1308.47, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.30475 AT	(423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.30268 AT	(424084.20, 4526462.80, 1308.52, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.30051 AT	(423900.00, 4526300.00, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.29930 AT	(424100.00, 4526400.00, 1309.66, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.29876 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.29856 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.29786 AT	(424100.00, 4526450.00, 1308.97, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.29745 AT	(424100.00, 4526500.00, 1308.69, 2867.37, 0.00)	DC	
24H1	1ST HIGHEST VALUE IS	0.35435 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.35243 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.35081 AT	(423839.70, 4527180.00, 1297.98, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.34841 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.34671 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.34487 AT	(423815.90, 4527180.20, 1297.21, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.34401 AT	(423863.80, 4527102.50, 1299.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.34310 AT	(423886.40, 4527102.10, 1299.37, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.34078 AT	(423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.33996 AT	(423886.60, 4527121.40, 1299.87, 2867.37, 0.00)	DC	
25H1	1ST HIGHEST VALUE IS	0.34065 AT	(423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.33768 AT	(423840.60, 4527010.20, 1299.06, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.33220 AT	(423840.70, 4527033.40, 1299.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.32644 AT	(423850.00, 4527000.00, 1299.20, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.32469 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.32384 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.32202 AT	(423886.90, 4526986.00, 1299.62, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.31752 AT	(423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.31604 AT	(423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.31479 AT	(423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
SCRUBBER	1ST HIGHEST VALUE IS	3.40976 AT	(424022.80, 4526928.70, 1303.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.40683 AT	(424650.00, 4526450.00, 1319.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.37468 AT	(424002.50, 4526908.70, 1303.27, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.35136 AT	(424800.00, 4526400.00, 1322.76, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.31211 AT	(424350.00, 4525750.00, 1319.03, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.30864 AT	(424550.00, 4526400.00, 1319.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.30782 AT	(424300.00, 4525850.00, 1318.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	3.30732 AT	(424022.60, 4526904.20, 1303.05, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	3.30588 AT	(424002.70, 4526933.60, 1302.97, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	3.30259 AT	(423956.70, 4526984.40, 1302.00, 2867.37, 0.00)	DC	
26H1	1ST HIGHEST VALUE IS	0.30390 AT	(424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.30388 AT	(424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.29822 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.29444 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.29058 AT	(423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.28951 AT	(424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.28893 AT	(424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.28548 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.28514 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.28325 AT	(424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC	

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27H1      1ST HIGHEST VALUE IS       0.40200 AT (  423792.10,  4527180.50,  1297.01,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.40113 AT (  423841.00,  4527079.80,  1298.99,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.39817 AT (  423840.90,  4527056.60,  1299.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.39443 AT (  423792.50,  4527200.10,  1296.99,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.39314 AT (  423841.20,  4527102.90,  1298.97,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.39084 AT (  423800.00,  4527200.00,  1297.31,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.38891 AT (  423863.50,  4527179.70,  1298.36,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.38447 AT (  423815.90,  4527180.20,  1297.21,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.38374 AT (  423850.00,  4527050.00,  1298.99,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.38300 AT (  423839.70,  4527180.00,  1297.98,  2867.37,    0.00)  DC

30H1      1ST HIGHEST VALUE IS       0.64744 AT (  423792.50,  4527200.10,  1296.99,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.64346 AT (  423839.70,  4527180.00,  1297.98,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.64255 AT (  423792.10,  4527180.50,  1297.01,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.63771 AT (  423815.90,  4527180.20,  1297.21,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.63677 AT (  423800.00,  4527200.00,  1297.31,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.63285 AT (  423850.00,  4527200.00,  1297.98,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.63223 AT (  423792.90,  4527219.80,  1296.88,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.63161 AT (  423770.10,  4527220.00,  1296.87,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.63109 AT (  423850.00,  4527250.00,  1297.74,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.63046 AT (  423701.70,  4527220.80,  1295.89,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   4TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

30H2      1ST HIGHEST VALUE IS       0.65020 AT (  423792.10,  4527180.50,  1297.01,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.64799 AT (  423839.70,  4527180.00,  1297.98,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.64643 AT (  423815.90,  4527180.20,  1297.21,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.64600 AT (  423792.50,  4527200.10,  1296.99,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.63864 AT (  423800.00,  4527200.00,  1297.31,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.63213 AT (  423770.10,  4527220.00,  1296.87,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.63173 AT (  423850.00,  4527200.00,  1297.98,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.62917 AT (  423792.90,  4527219.80,  1296.88,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.62852 AT (  423850.00,  4527250.00,  1297.74,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.62773 AT (  423701.70,  4527220.80,  1295.89,  2867.37,    0.00)  DC

33H1      1ST HIGHEST VALUE IS       0.44781 AT (  423900.00,  4526050.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.44241 AT (  423900.00,  4526000.00,  1308.26,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.43527 AT (  423822.20,  4526085.60,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.42812 AT (  423800.00,  4526050.00,  1304.66,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.42739 AT (  423900.00,  4525950.00,  1307.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.42709 AT (  423822.20,  4526109.70,  1304.38,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.42530 AT (  423950.00,  4526050.00,  1308.90,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.42389 AT (  423950.00,  4526000.00,  1308.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.42310 AT (  423800.00,  4526000.00,  1305.04,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.42126 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC

BOILER4   1ST HIGHEST VALUE IS       2.27113 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.25683 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.20733 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.14546 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.06737 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.04100 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.99206 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.98778 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.92442 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.92230 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC

BOILER5   1ST HIGHEST VALUE IS       1.76934 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.66905 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.65967 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.55993 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.52444 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.42435 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.41732 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.38387 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.38299 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.29895 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
BOILER8	1ST HIGHEST VALUE IS	2.60589 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	2.52826 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	2.51872 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	2.47338 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	2.46106 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	2.41644 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	2.40981 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	2.39894 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	2.33085 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	2.30259 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
BOILER9	1ST HIGHEST VALUE IS	3.43915 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.30098 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.29963 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.24916 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.22033 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.17498 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.15153 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	3.11963 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	3.03469 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	3.01616 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
BOILER10	1ST HIGHEST VALUE IS	2.93955 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	2.77037 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	2.54864 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	2.51178 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	2.38207 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	1.93767 AT	(424141.30, 4526621.40, 1308.11, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	1.87415 AT	(424020.30, 4526683.90, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	1.74098 AT	(424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	1.72751 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	1.68649 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
BOILER11	1ST HIGHEST VALUE IS	1.35848 AT	(423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.33375 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.30779 AT	(423886.90, 4526986.00, 1299.62, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	1.30618 AT	(423900.00, 4527000.00, 1300.24, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	1.30063 AT	(423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	1.29631 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	1.28361 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	1.27614 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	1.27135 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	1.26368 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H2	1ST HIGHEST VALUE IS	0.51508 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.48379 AT	(424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.47827 AT	(424226.70, 4526768.00, 1308.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.46488 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.43796 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.42095 AT	(424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.41136 AT	(424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.41129 AT	(424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.39802 AT	(424150.00, 4526600.00, 1308.93, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.39443 AT	(424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	
68H3	1ST HIGHEST VALUE IS	0.75917 AT	(424255.60, 4526656.80, 1310.07, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.74206 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.73982 AT	(424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.72863 AT	(424278.70, 4526656.80, 1308.99, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.72669 AT	(424209.60, 4526656.90, 1309.24, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.72568 AT	(424202.60, 4526701.30, 1308.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.72101 AT	(424232.60, 4526656.80, 1309.65, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.71831 AT	(424250.00, 4526650.00, 1309.85, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.71342 AT	(424194.60, 4526679.10, 1308.34, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.70350 AT	(424200.00, 4526650.00, 1309.02, 2867.37, 0.00)	DC	

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68H4      1ST HIGHEST VALUE IS       0.81167 AT (  424182.00,  4526734.70,  1308.06,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.77614 AT (  424173.90,  4526712.00,  1308.32,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.77521 AT (  424165.70,  4526689.40,  1308.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.75917 AT (  424210.60,  4526723.60,  1308.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.73473 AT (  424190.20,  4526757.30,  1307.52,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.71600 AT (  424198.40,  4526780.00,  1307.25,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.71388 AT (  424202.60,  4526701.30,  1308.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.71301 AT (  424218.60,  4526745.80,  1308.03,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.70260 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.70231 AT (  424194.60,  4526679.10,  1308.34,  2867.37,    0.00)  DC

68H5      1ST HIGHEST VALUE IS       0.68820 AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.67080 AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.62749 AT (  424022.10,  4526855.30,  1304.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.60820 AT (  424149.40,  4526644.00,  1308.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.60670 AT (  424002.00,  4526859.00,  1303.58,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.59121 AT (  424141.30,  4526621.40,  1308.11,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.58837 AT (  424133.10,  4526598.70,  1307.86,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.58731 AT (  424157.60,  4526666.70,  1308.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.57203 AT (  424165.70,  4526689.40,  1308.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.55619 AT (  424124.90,  4526576.10,  1308.06,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

68H6      1ST HIGHEST VALUE IS       0.72491 AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.70675 AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.66345 AT (  424000.90,  4526759.50,  1304.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.61539 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.57171 AT (  424021.60,  4526806.30,  1304.09,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.54248 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.52364 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.50923 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.48739 AT (  424085.20,  4527053.70,  1304.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.48017 AT (  424105.60,  4527054.50,  1304.00,  2867.37,    0.00)  DC

68H7      1ST HIGHEST VALUE IS       0.71718 AT (  424239.20,  4526893.30,  1307.25,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.69908 AT (  424250.00,  4526900.00,  1307.92,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.69259 AT (  424231.00,  4526870.60,  1306.99,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.69154 AT (  424214.70,  4526825.30,  1307.63,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.67888 AT (  424206.50,  4526802.70,  1307.25,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.64241 AT (  424282.70,  4526923.60,  1306.90,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.64236 AT (  424234.70,  4526790.30,  1308.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.63793 AT (  424250.70,  4526834.70,  1307.89,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.63057 AT (  424242.70,  4526812.50,  1308.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.62815 AT (  424022.60,  4526904.20,  1303.05,  2867.37,    0.00)  DC

68H10     1ST HIGHEST VALUE IS       0.05900 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.05874 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.05860 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.05818 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.05771 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.05557 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.05483 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.05262 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.05245 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.05245 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC

68H11     1ST HIGHEST VALUE IS       0.04996 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.04945 AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.04933 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.04876 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.04876 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.04845 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.04785 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.04781 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.04750 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.04742 AT (  423997.60,  4526436.10,  1307.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H12	1ST HIGHEST VALUE IS	0.06080 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.05861 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.05821 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.05773 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.05745 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.05451 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.05414 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.05328 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.05167 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.05146 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
68H13	1ST HIGHEST VALUE IS	0.05869 AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.05670 AT	(423750.00, 4526300.00, 1303.46, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.05563 AT	(423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.05099 AT	(423731.50, 4526277.70, 1303.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.05075 AT	(423750.00, 4526277.60, 1303.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.04977 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.04844 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.04795 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.04789 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.04766 AT	(423997.60, 4526436.10, 1307.00, 2867.37, 0.00)	DC	
FLARES	1ST HIGHEST VALUE IS	0.01203 AT	(424500.00, 4525950.00, 1320.12, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.01200 AT	(424450.00, 4526000.00, 1320.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.01198 AT	(424550.00, 4525900.00, 1321.02, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.01186 AT	(424600.00, 4525850.00, 1322.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.01182 AT	(424400.00, 4526050.00, 1317.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.01170 AT	(424650.00, 4525800.00, 1322.94, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.01149 AT	(424350.00, 4526100.00, 1314.13, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.01144 AT	(424700.00, 4525750.00, 1323.92, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.01122 AT	(424450.00, 4526050.00, 1319.93, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.01118 AT	(422700.00, 4525950.00, 1293.00, 2867.37, 0.00)	DC	
FLAREN	1ST HIGHEST VALUE IS	0.01193 AT	(424500.00, 4525950.00, 1320.12, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.01190 AT	(424450.00, 4526000.00, 1320.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.01188 AT	(424550.00, 4525900.00, 1321.02, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.01176 AT	(424600.00, 4525850.00, 1322.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.01173 AT	(424400.00, 4526050.00, 1317.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.01160 AT	(424650.00, 4525800.00, 1322.94, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.01140 AT	(424350.00, 4526100.00, 1314.13, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.01135 AT	(424700.00, 4525750.00, 1323.92, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.01113 AT	(424450.00, 4526050.00, 1319.93, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.01109 AT	(422700.00, 4525950.00, 1293.00, 2867.37, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 10 Warning Message(s)
A Total of 2026 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 2026 Missing Hours Identified (23.13 Percent)

CAUTION!: Number of Missing Hours Exceeds 10 Percent of Total!
Data May Not Be Acceptable for Regulatory Applications.
See Section 5.3.2 of "Meteorological Monitoring Guidance
for Regulatory Modeling Applications" (EPA-454/R-99-005).

******** FATAL ERROR MESSAGES ********
*** NONE ***

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   ********   WARNING MESSAGES   ********
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          12H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLAREN
CN W305       4 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H2
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:           4H1
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
CN W305      15 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
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                                            ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for    50 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. Half-life of 4 hrs for URBAN SO2.
        6. Urban Roughness Length of 1.0 Meter Assumed.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR

**This Run Includes:     50 Source(s);      52 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  SO2

**Note that special processing requirements apply for the 1-hour SO2 NAAQS - check available guidance.
  Model will process user-specified ranks of daily maximum
1-hour values averaged across the number of years modeled.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs External File(s) of Maximum Daily 1-hr Values by Year (MXDYBYYR Keyword)
         Model Outputs External File(s) of Contributions to Maximum Daily Values Paired in Time & Space (MAXDCONT Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =    149.6 MB of RAM.

**Input Runstream File:          Holly_V17_2008_SO2.DTA
**Output Print File:             Holly_V17_2008_SO2.LST

**File for Summary of Results:   C:\beast\Holly\Holly_V17_2008_SO2.SUM
```



```
                                            *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                               (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                  *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                           (METERS/SEC)

                                                 1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2008.SFC Met Version: 11059
Profile file: SY2008.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2008 Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-24.3	0.228	-9.000	-9.000	-999.	250.	38.8	0.07	0.28	1.00	3.60	144.	10.0	264.2	10.0
08	01	01	1	02	-9.9	0.103	-9.000	-9.000	-999.	85.	8.9	0.07	0.28	1.00	2.60	130.	10.0	263.6	10.0
08	01	01	1	03	-3.8	0.064	-9.000	-9.000	-999.	37.	5.5	0.07	0.28	1.00	1.60	127.	10.0	263.0	10.0
08	01	01	1	04	-10.3	0.109	-9.000	-9.000	-999.	82.	10.0	0.12	0.28	1.00	2.40	153.	10.0	263.6	10.0
08	01	01	1	05	-8.5	0.095	-9.000	-9.000	-999.	68.	8.2	0.07	0.28	1.00	2.40	123.	10.0	263.1	10.0
08	01	01	1	06	-7.9	0.091	-9.000	-9.000	-999.	63.	7.6	0.05	0.28	1.00	2.40	93.	10.0	262.9	10.0
08	01	01	1	07	-7.2	0.086	-9.000	-9.000	-999.	58.	7.0	0.04	0.28	1.00	2.40	63.	10.0	262.6	10.0
08	01	01	1	08	-11.6	0.116	-9.000	-9.000	-999.	91.	10.9	0.05	0.28	1.00	2.90	30.	10.0	261.4	10.0
08	01	01	1	09	-13.2	0.185	-9.000	-9.000	-999.	184.	38.9	0.06	0.28	0.51	3.00	24.	10.0	262.9	10.0
08	01	01	1	10	10.3	0.229	0.258	0.005	54.	252.	-94.0	0.06	0.28	0.30	2.80	26.	10.0	264.2	10.0
08	01	01	1	11	27.2	0.247	0.447	0.005	105.	283.	-44.5	0.06	0.28	0.22	2.90	23.	10.0	265.8	10.0
08	01	01	1	12	31.4	0.256	0.518	0.005	142.	298.	-43.0	0.06	0.28	0.19	3.00	24.	10.0	267.2	10.0
08	01	01	1	13	34.5	0.201	0.582	0.007	183.	208.	-18.9	0.05	0.28	0.19	2.30	54.	10.0	268.6	10.0
08	01	01	1	14	31.7	0.255	0.602	0.005	220.	296.	-41.7	0.05	0.28	0.19	3.10	37.	10.0	267.6	10.0
08	01	01	1	15	23.3	0.252	0.565	0.005	247.	291.	-55.2	0.06	0.28	0.22	3.00	3.	10.0	267.8	10.0
08	01	01	1	16	-0.3	0.246	-9.000	-9.000	-999.	281.	4710.6	0.06	0.28	0.29	3.20	17.	10.0	267.4	10.0
08	01	01	1	17	-8.9	0.196	-9.000	-9.000	-999.	200.	68.0	0.06	0.28	0.49	2.90	13.	10.0	266.1	10.0
08	01	01	1	18	-13.0	0.244	-9.000	-9.000	-999.	277.	88.9	0.06	0.28	1.00	3.50	8.	10.0	264.5	10.0
08	01	01	1	19	-5.5	0.104	-9.000	-9.000	-999.	90.	16.1	0.05	0.28	1.00	2.20	35.	10.0	264.2	10.0
08	01	01	1	20	-2.6	0.056	-9.000	-9.000	-999.	31.	5.3	0.05	0.28	1.00	1.50	48.	10.0	264.2	10.0
08	01	01	1	21	-2.5	0.062	-9.000	-9.000	-999.	35.	7.4	0.06	0.28	1.00	1.60	17.	10.0	263.4	10.0
08	01	01	1	22	-2.9	0.066	-9.000	-9.000	-999.	39.	7.9	0.06	0.28	1.00	1.70	26.	10.0	263.9	10.0
08	01	01	1	23	-8.6	0.160	-9.000	-9.000	-999.	147.	38.2	0.06	0.28	1.00	2.60	24.	10.0	263.0	10.0
08	01	01	1	24	-26.9	0.273	-9.000	-9.000	-999.	327.	60.1	0.06	0.28	1.00	4.10	15.	10.0	262.9	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	10.0	1	144.	3.60	264.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
NEW	1ST HIGHEST VALUE IS	7.44164	AT (424800.00, 4526900.00, 1316.60, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	7.43537	AT (424750.00, 4526900.00, 1315.26, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	7.40932	AT (424850.00, 4526900.00, 1317.94, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	7.38789	AT (424700.00, 4526900.00, 1314.59, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	7.35011	AT (424900.00, 4526950.00, 1318.01, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	7.34335	AT (424900.00, 4526900.00, 1318.63, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	7.33987	AT (424950.00, 4526950.00, 1318.72, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	7.32425	AT (424850.00, 4526950.00, 1317.37, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	7.28207	AT (424650.00, 4526900.00, 1314.19, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	7.25382	AT (424800.00, 4526950.00, 1316.50, 2867.37, 0.00)	DC	
ALL	1ST HIGHEST VALUE IS	23.85773	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	22.59409	AT (424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	22.36630	AT (424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	21.56602	AT (424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	18.47970	AT (423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	18.44579	AT (424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	17.96517	AT (423886.90, 4526986.00, 1299.62, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	17.85653	AT (423900.00, 4527000.00, 1300.24, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	17.78256	AT (423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	17.67977	AT (424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
4H1	1ST HIGHEST VALUE IS	3.63282	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.43311	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.40677	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.35454	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.29424	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.28348	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.26776	AT (424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	

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         8TH HIGHEST VALUE IS       3.20290 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
         9TH HIGHEST VALUE IS       3.10785 AT (  424100.50,  4526508.10,  1308.47,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS       3.08940 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC

4K1A     1ST HIGHEST VALUE IS       0.11548 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
         2ND HIGHEST VALUE IS       0.10507 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
         3RD HIGHEST VALUE IS       0.09523 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS       0.07312 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
         5TH HIGHEST VALUE IS       0.06360 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
         6TH HIGHEST VALUE IS       0.06359 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
         7TH HIGHEST VALUE IS       0.06278 AT (  424100.00,  4526500.00,  1308.69,  2867.37,    0.00)  DC
         8TH HIGHEST VALUE IS       0.05783 AT (  424092.30,  4526485.40,  1308.49,  2867.37,    0.00)  DC
         9TH HIGHEST VALUE IS       0.05583 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS       0.05427 AT (  424100.50,  4526508.10,  1308.47,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

4K1B     1ST HIGHEST VALUE IS       0.03758 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
         2ND HIGHEST VALUE IS       0.03511 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
         3RD HIGHEST VALUE IS       0.03427 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS       0.03379 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
         5TH HIGHEST VALUE IS       0.03170 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
         6TH HIGHEST VALUE IS       0.03076 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC
         7TH HIGHEST VALUE IS       0.02939 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
         8TH HIGHEST VALUE IS       0.02932 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
         9TH HIGHEST VALUE IS       0.02860 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS       0.02766 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC

4V82     1ST HIGHEST VALUE IS      20.73856 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
         2ND HIGHEST VALUE IS      18.83121 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
         3RD HIGHEST VALUE IS      18.13904 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS      17.32537 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
         5TH HIGHEST VALUE IS      15.14285 AT (  424198.40,  4526780.00,  1307.25,  2867.37,    0.00)  DC
         6TH HIGHEST VALUE IS      14.54911 AT (  424234.70,  4526790.30,  1308.00,  2867.37,    0.00)  DC
         7TH HIGHEST VALUE IS      13.99764 AT (  424206.50,  4526802.70,  1307.25,  2867.37,    0.00)  DC
         8TH HIGHEST VALUE IS      13.42463 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
         9TH HIGHEST VALUE IS      13.30933 AT (  423910.20,  4526985.50,  1300.67,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS      13.11915 AT (  424242.70,  4526812.50,  1308.00,  2867.37,    0.00)  DC

6H1      1ST HIGHEST VALUE IS       1.19540 AT (  424066.40,  4526397.00,  1308.57,  2867.37,    0.00)  DC
         2ND HIGHEST VALUE IS       1.19020 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
         3RD HIGHEST VALUE IS       1.13671 AT (  424058.90,  4526395.20,  1308.59,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS       1.08870 AT (  424100.00,  4526350.00,  1310.00,  2867.37,    0.00)  DC
         5TH HIGHEST VALUE IS       1.07292 AT (  424073.10,  4526413.90,  1308.34,  2867.37,    0.00)  DC
         6TH HIGHEST VALUE IS       1.03981 AT (  424076.00,  4526440.10,  1308.42,  2867.37,    0.00)  DC
         7TH HIGHEST VALUE IS       0.98569 AT (  424079.80,  4526430.90,  1308.90,  2867.37,    0.00)  DC
         8TH HIGHEST VALUE IS       0.94745 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
         9TH HIGHEST VALUE IS       0.91295 AT (  424150.00,  4526300.00,  1311.00,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS       0.87619 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC

6H3      1ST HIGHEST VALUE IS       5.11173 AT (  424150.00,  4526250.00,  1311.00,  2867.37,    0.00)  DC
         2ND HIGHEST VALUE IS       4.91101 AT (  424150.00,  4526200.00,  1311.00,  2867.37,    0.00)  DC
         3RD HIGHEST VALUE IS       4.62252 AT (  424200.00,  4526150.00,  1312.08,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS       4.61231 AT (  424100.00,  4526300.00,  1310.00,  2867.37,    0.00)  DC
         5TH HIGHEST VALUE IS       4.33433 AT (  424200.00,  4526200.00,  1312.00,  2867.37,    0.00)  DC
         6TH HIGHEST VALUE IS       4.18118 AT (  424150.00,  4526150.00,  1311.00,  2867.37,    0.00)  DC
         7TH HIGHEST VALUE IS       3.98737 AT (  424100.00,  4526250.00,  1310.00,  2867.37,    0.00)  DC
         8TH HIGHEST VALUE IS       3.98436 AT (  424200.00,  4526100.00,  1312.11,  2867.37,    0.00)  DC
         9TH HIGHEST VALUE IS       3.88983 AT (  424250.00,  4526100.00,  1313.86,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS       3.86386 AT (  424050.00,  4526200.00,  1309.00,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

```
                                                                                                NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

6H2      1ST HIGHEST VALUE IS       0.65075 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
         2ND HIGHEST VALUE IS       0.61485 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
         3RD HIGHEST VALUE IS       0.61278 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS       0.56106 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
         5TH HIGHEST VALUE IS       0.54514 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
         6TH HIGHEST VALUE IS       0.54514 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
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          7TH HIGHEST VALUE IS       0.53190 AT (  423996.60,  4526336.60,  1307.76,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.52758 AT (  423997.70,  4526295.60,  1308.04,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.52754 AT (  423990.60,  4526296.30,  1308.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.52748 AT (  424000.00,  4526300.00,  1308.00,  2867.37,    0.00)  DC

6K1       1ST HIGHEST VALUE IS       0.01217 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01187 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01182 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01160 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01125 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01122 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01089 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01074 AT (  423768.50,  4526277.50,  1303.49,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01053 AT (  423771.40,  4526280.90,  1303.56,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01004 AT (  423700.00,  4526250.00,  1303.00,  2867.37,    0.00)  DC

6K2       1ST HIGHEST VALUE IS       0.01195 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01162 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01153 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01130 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01107 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01088 AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01081 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01075 AT (  423700.00,  4526300.00,  1302.93,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01071 AT (  423654.20,  4526311.40,  1302.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01037 AT (  423650.00,  4526300.00,  1302.00,  2867.37,    0.00)  DC

7H3       1ST HIGHEST VALUE IS       0.34077 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.33690 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.33514 AT (  423825.30,  4526311.60,  1304.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.33348 AT (  423800.00,  4526300.00,  1304.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.32941 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.32886 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.32879 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.32869 AT (  423898.60,  4526311.60,  1305.71,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.32794 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.32619 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   1ST-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC                RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

7H1       1ST HIGHEST VALUE IS       0.49759 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.47753 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.47195 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.46010 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.44919 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.43016 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.42687 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.39934 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.39413 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.34747 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC

8H1       1ST HIGHEST VALUE IS       0.70289 AT (  423900.00,  4526300.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.70230 AT (  423950.00,  4526250.00,  1307.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.69842 AT (  423900.00,  4526250.00,  1305.93,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.69232 AT (  423962.90,  4526257.70,  1307.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.69014 AT (  423963.20,  4526238.10,  1307.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.68785 AT (  423898.60,  4526311.60,  1305.71,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.67765 AT (  423963.50,  4526218.50,  1307.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.67072 AT (  423962.60,  4526277.20,  1306.96,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.66607 AT (  423997.70,  4526295.60,  1308.04,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.66479 AT (  423990.60,  4526296.30,  1308.00,  2867.37,    0.00)  DC

9H1       1ST HIGHEST VALUE IS       0.91230 AT (  424124.90,  4526576.10,  1308.06,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.82453 AT (  424100.50,  4526508.10,  1308.47,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.81185 AT (  424100.00,  4526500.00,  1308.69,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.76571 AT (  424092.30,  4526485.40,  1308.49,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.76300 AT (  424150.00,  4526600.00,  1308.93,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.74097 AT (  424133.10,  4526598.70,  1307.86,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.73255 AT (  424150.00,  4526500.00,  1310.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.70960 AT (  424108.60,  4526530.70,  1308.63,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.68801 AT (  424200.00,  4526600.00,  1309.10,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.68049 AT (  424116.80,  4526553.40,  1308.40,  2867.37,    0.00)  DC

9H2       1ST HIGHEST VALUE IS       1.21290 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.16782 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.12972 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.00767 AT (  424084.20,  4526462.80,  1308.52,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.90439 AT (  424100.00,  4526450.00,  1308.97,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.81295 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.74512 AT (  424079.80,  4526430.90,  1308.90,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.74160 AT (  424092.30,  4526485.40,  1308.49,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.74016 AT (  424150.00,  4526450.00,  1310.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.72160 AT (  424076.00,  4526440.10,  1308.42,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
10H1	1ST HIGHEST VALUE IS	0.39629 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.39604 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.39395 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.39092 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.38425 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.38075 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.37717 AT	(423997.60, 4526436.10, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.37351 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.37041 AT	(424018.60, 4526512.50, 1306.56, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.36947 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
10H2	1ST HIGHEST VALUE IS	0.77263 AT	(423900.00, 4526250.00, 1305.93, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.76279 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.74754 AT	(423963.50, 4526218.50, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.74428 AT	(423972.40, 4526218.80, 1307.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.73522 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.73520 AT	(423963.20, 4526238.10, 1307.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.72305 AT	(423950.00, 4526250.00, 1307.01, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.70641 AT	(423962.90, 4526257.70, 1307.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.69425 AT	(423850.00, 4526150.00, 1305.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.69161 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
11H1	1ST HIGHEST VALUE IS	0.41242 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.40905 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.40140 AT	(424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.40097 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.40022 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.39673 AT	(424018.60, 4526512.50, 1306.56, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.39662 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.39576 AT	(423997.60, 4526436.10, 1307.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.39223 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.38660 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
12H1	1ST HIGHEST VALUE IS	0.30079 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.29218 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.29007 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.28984 AT	(424002.20, 4526211.60, 1308.79, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.28784 AT	(424002.40, 4526232.10, 1308.24, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.28691 AT	(423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.28529 AT	(424000.00, 4526200.00, 1308.82, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.28271 AT	(423993.60, 4526211.00, 1307.37, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.27337 AT	(424002.60, 4526252.70, 1308.08, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.26949 AT	(423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC	

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
13H1	1ST HIGHEST VALUE IS	0.53923 AT	(424000.00, 4526400.00, 1307.79, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.52971 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.51850 AT	(423997.30, 4526411.20, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.50785 AT	(424018.10, 4526463.50, 1307.12, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.50765 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.50445 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.50286 AT	(424017.80, 4526439.00, 1307.01, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.50231 AT	(423997.10, 4526386.30, 1307.42, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.50208 AT	(424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.50063 AT	(424017.60, 4526414.50, 1307.94, 2867.37, 0.00)	DC	
19H1	1ST HIGHEST VALUE IS	0.32502 AT	(423850.00, 4526300.00, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.32465 AT	(423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.32429 AT	(423962.60, 4526277.20, 1306.96, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.32243 AT	(423950.00, 4526300.00, 1306.66, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.31614 AT	(423962.20, 4526296.80, 1306.98, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.31509 AT	(424058.90, 4526395.20, 1308.59, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.31419 AT	(424066.40, 4526397.00, 1308.57, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.31355 AT	(423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.31314 AT	(423962.90, 4526257.70, 1307.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.30934 AT	(423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC	

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20H1      1ST HIGHEST VALUE IS       0.29420 AT (  423962.90,  4526257.70,  1307.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.29385 AT (  423900.00,  4526250.00,  1305.93,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.29026 AT (  423850.00,  4526300.00,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.28710 AT (  423963.20,  4526238.10,  1307.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.28580 AT (  423850.00,  4526250.00,  1305.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.28572 AT (  424051.20,  4526375.50,  1309.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.28433 AT (  423800.00,  4526300.00,  1304.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.28372 AT (  423825.30,  4526311.60,  1304.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.28331 AT (  423962.60,  4526277.20,  1306.96,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.28283 AT (  423950.00,  4526250.00,  1307.01,  2867.37,    0.00)  DC

20H2      1ST HIGHEST VALUE IS       0.52760 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.52736 AT (  423963.50,  4526218.50,  1307.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.52444 AT (  423972.40,  4526218.80,  1307.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.50984 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.50750 AT (  423963.20,  4526238.10,  1307.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.48918 AT (  423850.00,  4526200.00,  1305.72,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.48095 AT (  423950.00,  4526150.00,  1307.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.48087 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.47672 AT (  423950.00,  4526200.00,  1307.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.47057 AT (  423993.60,  4526211.00,  1307.37,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

20H3      1ST HIGHEST VALUE IS       0.51510 AT (  423972.40,  4526218.80,  1307.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.50665 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.50606 AT (  423963.20,  4526238.10,  1307.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.50174 AT (  423993.60,  4526211.00,  1307.37,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.49536 AT (  423963.50,  4526218.50,  1307.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.48836 AT (  424000.00,  4526200.00,  1308.82,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.48802 AT (  423962.90,  4526257.70,  1307.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.48475 AT (  423850.00,  4526200.00,  1305.72,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.48332 AT (  424002.20,  4526211.60,  1308.79,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.47433 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC

23H1      1ST HIGHEST VALUE IS       0.34621 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.34621 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.34491 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.34258 AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.33999 AT (  423990.60,  4526296.30,  1308.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.33888 AT (  423996.60,  4526336.60,  1307.76,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.33813 AT (  424000.00,  4526300.00,  1308.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.33774 AT (  423997.70,  4526295.60,  1308.04,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.33761 AT (  423898.60,  4526311.60,  1305.71,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.33759 AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC

24H1      1ST HIGHEST VALUE IS       0.43173 AT (  423841.00,  4527079.80,  1298.99,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.42368 AT (  423841.20,  4527102.90,  1298.97,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.42148 AT (  423840.90,  4527056.60,  1299.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.41226 AT (  423886.60,  4527121.40,  1299.87,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.41051 AT (  423886.40,  4527102.10,  1299.37,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.40686 AT (  423900.00,  4527100.00,  1300.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.40520 AT (  423900.00,  4527150.00,  1299.97,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.40052 AT (  423850.00,  4527100.00,  1299.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.40047 AT (  423886.80,  4527140.70,  1299.36,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.39331 AT (  423950.00,  4527050.00,  1300.21,  2867.37,    0.00)  DC

25H1      1ST HIGHEST VALUE IS       0.38053 AT (  423933.50,  4526984.90,  1300.98,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.37420 AT (  423863.70,  4526986.50,  1300.17,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.37398 AT (  423950.00,  4527000.00,  1301.90,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.37192 AT (  423956.70,  4526984.40,  1302.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.37090 AT (  423840.60,  4527010.20,  1299.06,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.37055 AT (  423840.40,  4526987.00,  1299.47,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.36803 AT (  423900.00,  4527050.00,  1300.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.36792 AT (  423886.90,  4526986.00,  1299.62,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.36739 AT (  423850.00,  4527000.00,  1299.20,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.36608 AT (  423900.00,  4527000.00,  1300.24,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
SCRUBBER	1ST HIGHEST VALUE IS	4.97635 AT	(424750.00, 4526900.00, 1315.26, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	4.96599 AT	(424800.00, 4526900.00, 1316.60, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	4.95519 AT	(424700.00, 4526900.00, 1314.59, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	4.92666 AT	(424850.00, 4526900.00, 1317.94, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	4.90227 AT	(424600.00, 4526850.00, 1314.48, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	4.89857 AT	(424650.00, 4526850.00, 1314.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	4.89410 AT	(424650.00, 4526900.00, 1314.19, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	4.86813 AT	(424700.00, 4526850.00, 1314.80, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	4.86194 AT	(424900.00, 4526900.00, 1318.63, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	4.85479 AT	(424550.00, 4526850.00, 1314.00, 2867.37, 0.00)	DC	
26H1	1ST HIGHEST VALUE IS	0.40447 AT	(423585.50, 4527067.50, 1295.96, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.38424 AT	(423562.10, 4527067.70, 1294.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.38138 AT	(423550.00, 4527100.00, 1294.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.37773 AT	(423592.60, 4527111.60, 1296.03, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.35788 AT	(423538.80, 4527067.90, 1294.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.35732 AT	(423596.20, 4527133.60, 1295.94, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.35680 AT	(423589.10, 4527089.50, 1296.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.33220 AT	(423550.00, 4527150.00, 1294.01, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.32772 AT	(423500.00, 4527150.00, 1293.68, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.32664 AT	(423515.40, 4527068.10, 1293.78, 2867.37, 0.00)	DC	
27H1	1ST HIGHEST VALUE IS	0.48957 AT	(423863.80, 4527102.50, 1299.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.47977 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.47534 AT	(423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.47251 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.47068 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.47011 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.46854 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.46566 AT	(423886.40, 4527102.10, 1299.37, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.46553 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.46329 AT	(423840.70, 4527033.40, 1299.00, 2867.37, 0.00)	DC	
30H1	1ST HIGHEST VALUE IS	0.80400 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.76725 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.76473 AT	(423839.70, 4527180.00, 1297.98, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.76204 AT	(423815.90, 4527180.20, 1297.21, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.74678 AT	(423900.00, 4527150.00, 1299.97, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.73662 AT	(424198.40, 4526780.00, 1307.25, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.72704 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.72466 AT	(423850.00, 4527200.00, 1297.98, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.72443 AT	(423800.00, 4527200.00, 1297.31, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.72365 AT	(423792.10, 4527180.50, 1297.01, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
30H2	1ST HIGHEST VALUE IS	0.81189 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.77935 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.76867 AT	(423839.70, 4527180.00, 1297.98, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.76802 AT	(423815.90, 4527180.20, 1297.21, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.74826 AT	(423900.00, 4527150.00, 1299.97, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.74544 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.72976 AT	(423800.00, 4527200.00, 1297.31, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.72914 AT	(424198.40, 4526780.00, 1307.25, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.72679 AT	(424182.00, 4526734.70, 1308.06, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.72604 AT	(423850.00, 4527200.00, 1297.98, 2867.37, 0.00)	DC	
33H1	1ST HIGHEST VALUE IS	0.57753 AT	(424900.00, 4526600.00, 1321.71, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.57671 AT	(424950.00, 4526600.00, 1322.48, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.57519 AT	(424850.00, 4526600.00, 1321.19, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.57329 AT	(425000.00, 4526600.00, 1323.41, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.56893 AT	(424800.00, 4526600.00, 1320.51, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.56295 AT	(424950.00, 4526650.00, 1322.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.56260 AT	(424850.00, 4526550.00, 1321.77, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.56238 AT	(424800.00, 4526550.00, 1320.72, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.56050 AT	(425100.00, 4526600.00, 1325.53, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.55949 AT	(424900.00, 4526550.00, 1322.26, 2867.37, 0.00)	DC	

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BOILER4   1ST HIGHEST VALUE IS       2.49326 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.46434 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.42196 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.33742 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.27299 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.16744 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       2.10128 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.09486 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.07920 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.02912 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC

BOILER5   1ST HIGHEST VALUE IS       2.36005 AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.35021 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.20528 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.17097 AT (  424021.60,  4526806.30,  1304.09,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.14855 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.02841 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.98884 AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.96232 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.87228 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.86920 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BOILER8   1ST HIGHEST VALUE IS       3.34556 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.25287 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.24762 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.09131 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.05861 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.03996 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       2.94923 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.88039 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.85989 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.77642 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC

BOILER9   1ST HIGHEST VALUE IS       3.91934 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.83643 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.77051 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.71326 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.60445 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.56580 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.51533 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.51476 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.46374 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.45081 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC

BOILER10  1ST HIGHEST VALUE IS       3.30631 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.22260 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.21623 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.11044 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.07362 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.06765 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.02844 AT (  424000.90,  4526759.50,  1304.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.87446 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.58040 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.55219 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC

BOILER11  1ST HIGHEST VALUE IS       1.71671 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.66919 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.60527 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.54193 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.51405 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.48898 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.47919 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.47723 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.44840 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.44736 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H2	1ST HIGHEST VALUE IS	0.62091 AT	(424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.60349 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.59942 AT	(424198.40, 4526780.00, 1307.25, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.57254 AT	(424222.80, 4526848.00, 1307.57, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.53752 AT	(424242.70, 4526812.50, 1308.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.51278 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.51176 AT	(424214.70, 4526825.30, 1307.63, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.51029 AT	(424239.20, 4526893.30, 1307.25, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.51000 AT	(424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.50064 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
68H3	1ST HIGHEST VALUE IS	0.80671 AT	(424232.60, 4526656.80, 1309.65, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.80429 AT	(424250.00, 4526650.00, 1309.85, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.80306 AT	(424278.70, 4526656.80, 1308.99, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.78217 AT	(424202.60, 4526701.30, 1308.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.77313 AT	(424301.70, 4526656.70, 1310.60, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.76809 AT	(424300.00, 4526650.00, 1311.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.75402 AT	(424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.73980 AT	(424255.60, 4526656.80, 1310.07, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.73185 AT	(424209.60, 4526656.90, 1309.24, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.72794 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
68H4	1ST HIGHEST VALUE IS	0.83219 AT	(424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.82896 AT	(424182.00, 4526734.70, 1308.06, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.82413 AT	(424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.81201 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.80018 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.78766 AT	(424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.78628 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.78554 AT	(424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.78066 AT	(424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.77835 AT	(424198.40, 4526780.00, 1307.25, 2867.37, 0.00)	DC	
68H5	1ST HIGHEST VALUE IS	0.72394 AT	(424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.70827 AT	(424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.63699 AT	(424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.63222 AT	(424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.62942 AT	(424002.00, 4526859.00, 1303.58, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.61802 AT	(424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.60651 AT	(424141.30, 4526621.40, 1308.11, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.59908 AT	(424133.10, 4526598.70, 1307.86, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.58850 AT	(424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.58709 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H6	1ST HIGHEST VALUE IS	0.72324 AT	(424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.69313 AT	(424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.66836 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.66213 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.63207 AT	(424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.55703 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.55125 AT	(424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.52151 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.52009 AT	(424105.60, 4527054.50, 1304.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.48707 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
68H7	1ST HIGHEST VALUE IS	0.78160 AT	(424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.76551 AT	(424222.80, 4526848.00, 1307.57, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.73103 AT	(424266.70, 4526879.20, 1307.75, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.71935 AT	(424239.20, 4526893.30, 1307.25, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.70778 AT	(424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.70357 AT	(424206.50, 4526802.70, 1307.25, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.69811 AT	(424247.30, 4526916.00, 1307.11, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.69611 AT	(424250.00, 4526900.00, 1307.92, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.67526 AT	(424234.70, 4526790.30, 1308.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.67426 AT	(424265.50, 4526962.20, 1306.99, 2867.37, 0.00)	DC	

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68H10     1ST HIGHEST VALUE IS       0.07776 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.07574 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.07021 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06833 AT (  423997.60,  4526436.10,  1307.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06588 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06580 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06488 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06479 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06409 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.06401 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC

68H11     1ST HIGHEST VALUE IS       0.06565 AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.06457 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06457 AT (  423654.20,  4526311.40,  1302.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06391 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06389 AT (  423997.30,  4526411.20,  1307.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06222 AT (  423700.00,  4526300.00,  1302.93,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06206 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06172 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06091 AT (  423650.00,  4526300.00,  1302.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.06014 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   1ST-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

68H12     1ST HIGHEST VALUE IS       0.07394 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.06853 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06827 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06378 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06291 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06200 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06114 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06043 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.05952 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.05925 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC

68H13     1ST HIGHEST VALUE IS       0.07132 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.06912 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06466 AT (  423605.30,  4526311.40,  1301.42,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06385 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06353 AT (  423997.10,  4526386.30,  1307.42,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06303 AT (  423580.90,  4526311.40,  1301.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06269 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06198 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06196 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.06144 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

FLARES    1ST HIGHEST VALUE IS       0.01439 AT (  424850.00,  4527350.00,  1312.08,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01437 AT (  424800.00,  4526300.00,  1322.66,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01434 AT (  424650.00,  4526100.00,  1322.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01432 AT (  424500.00,  4525950.00,  1320.12,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01432 AT (  424600.00,  4526050.00,  1320.98,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01430 AT (  424750.00,  4527300.00,  1310.19,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01430 AT (  424900.00,  4527350.00,  1312.76,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01429 AT (  424800.00,  4527300.00,  1311.72,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01429 AT (  424600.00,  4526150.00,  1321.85,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01429 AT (  424450.00,  4526000.00,  1320.00,  2867.37,    0.00)  DC

FLAREN    1ST HIGHEST VALUE IS       0.01427 AT (  424850.00,  4527350.00,  1312.08,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01425 AT (  424800.00,  4526300.00,  1322.66,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01422 AT (  424650.00,  4526100.00,  1322.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01420 AT (  424500.00,  4525950.00,  1320.12,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01420 AT (  424600.00,  4526050.00,  1320.98,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01419 AT (  424750.00,  4527300.00,  1310.19,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01418 AT (  424900.00,  4527350.00,  1312.76,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01417 AT (  424800.00,  4527300.00,  1311.72,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01417 AT (  424600.00,  4526150.00,  1321.85,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01417 AT (  424450.00,  4526000.00,  1320.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
NEW	1ST HIGHEST VALUE IS	5.59626 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	5.55500 AT	(423840.70, 4527033.40, 1299.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	5.53875 AT	(423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	5.53565 AT	(423900.00, 4527050.00, 1300.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	5.52713 AT	(423840.60, 4527010.20, 1299.06, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	5.48263 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	5.39645 AT	(423850.00, 4527000.00, 1299.20, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	5.38505 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	5.38237 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	5.33407 AT	(423863.80, 4527102.50, 1299.00, 2867.37, 0.00)	DC	
ALL	1ST HIGHEST VALUE IS	22.70945 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	21.55333 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	21.13066 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	20.61734 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	17.52281 AT	(423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	17.29937 AT	(423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	17.24758 AT	(423900.00, 4527000.00, 1300.24, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	16.53438 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	16.38571 AT	(423956.70, 4526984.40, 1302.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	16.35566 AT	(423950.00, 4527000.00, 1301.90, 2867.37, 0.00)	DC	
4H1	1ST HIGHEST VALUE IS	3.27508 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.18172 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.18153 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.17218 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.07687 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.01857 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	2.93294 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	2.90273 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	2.84215 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	2.78346 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
4K1A	1ST HIGHEST VALUE IS	0.03953 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.03785 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.03420 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.03136 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.03106 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.03035 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.02948 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.02931 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.02859 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.02800 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
4K1B	1ST HIGHEST VALUE IS	0.03074 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.03043 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.03009 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.02980 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.02898 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.02581 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.02531 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.02457 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.02452 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.02382 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
4V82	1ST HIGHEST VALUE IS	19.50294 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	17.46201 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	17.30444 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	16.61410 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	12.84468 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	11.45882 AT	(423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	11.36105 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	11.33391 AT	(423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	10.67806 AT	(423950.00, 4527000.00, 1301.90, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	10.54868 AT	(424206.50, 4526802.70, 1307.25, 2867.37, 0.00)	DC	

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6H1       1ST HIGHEST VALUE IS       0.63030 AT (  423990.60,  4526296.30,  1308.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.61790 AT (  423976.40,  4526296.50,  1307.98,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.61716 AT (  423997.70,  4526295.60,  1308.04,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.61292 AT (  424002.70,  4526273.30,  1307.72,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.61135 AT (  423971.90,  4526311.70,  1306.95,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.60742 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.60742 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.60670 AT (  424000.00,  4526300.00,  1308.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.60100 AT (  424002.90,  4526293.90,  1308.27,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.60081 AT (  423962.20,  4526296.80,  1306.98,  2867.37,    0.00)  DC

6H3       1ST HIGHEST VALUE IS       3.62376 AT (  424150.00,  4526150.00,  1311.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.56694 AT (  424150.00,  4526200.00,  1311.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.54111 AT (  424100.00,  4526250.00,  1310.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.45905 AT (  424100.00,  4526200.00,  1310.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.45391 AT (  424150.00,  4526250.00,  1311.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.36934 AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.35303 AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.33614 AT (  424200.00,  4526100.00,  1312.11,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.31066 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.30578 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

6H2       1ST HIGHEST VALUE IS       0.46270 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.45558 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.45247 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.45022 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.44690 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.44064 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.43989 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.43987 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.42895 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.42875 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC

6K1       1ST HIGHEST VALUE IS       0.01166 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01134 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01133 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01067 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01063 AT (  423768.50,  4526277.50,  1303.49,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01038 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01034 AT (  423771.40,  4526280.90,  1303.56,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01004 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00944 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.00924 AT (  423713.10,  4526253.70,  1303.00,  2867.37,    0.00)  DC

6K2       1ST HIGHEST VALUE IS       0.01119 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01112 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01079 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01076 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01048 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01024 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01014 AT (  423700.00,  4526300.00,  1302.93,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01014 AT (  423654.20,  4526311.40,  1302.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01001 AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.00971 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC

7H3       1ST HIGHEST VALUE IS       0.32116 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.32104 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.31934 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.31799 AT (  423800.00,  4526300.00,  1304.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.31775 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.31431 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.31221 AT (  423795.90,  4526280.90,  1304.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.30947 AT (  423768.50,  4526277.50,  1303.49,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.30938 AT (  423771.40,  4526280.90,  1303.56,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.30870 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
7H1	1ST HIGHEST VALUE IS	0.35140 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.33568 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.30141 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.29862 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.29859 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.29686 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.29587 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.29467 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.28939 AT	(424020.30, 4526683.90, 1305.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.28849 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
8H1	1ST HIGHEST VALUE IS	0.63293 AT	(423900.00, 4526250.00, 1305.93, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.62491 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.60034 AT	(423850.00, 4526200.00, 1305.72, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.59700 AT	(423972.40, 4526218.80, 1307.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.59457 AT	(423962.90, 4526257.70, 1307.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.58933 AT	(423962.60, 4526277.20, 1306.96, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.58763 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.58654 AT	(423963.20, 4526238.10, 1307.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.58458 AT	(423850.00, 4526250.00, 1305.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.58247 AT	(423963.50, 4526218.50, 1307.00, 2867.37, 0.00)	DC	
9H1	1ST HIGHEST VALUE IS	0.72098 AT	(424100.00, 4526500.00, 1308.69, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.71906 AT	(424092.30, 4526485.40, 1308.49, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.71689 AT	(424100.50, 4526508.10, 1308.47, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.65533 AT	(424108.60, 4526530.70, 1308.63, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.64706 AT	(424116.80, 4526553.40, 1308.40, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.61662 AT	(424150.00, 4526500.00, 1310.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.57428 AT	(424084.20, 4526462.80, 1308.52, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.56710 AT	(424124.90, 4526576.10, 1308.06, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.56381 AT	(424150.00, 4526550.00, 1308.55, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.55330 AT	(424100.00, 4526450.00, 1308.97, 2867.37, 0.00)	DC	
9H2	1ST HIGHEST VALUE IS	1.10019 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.04198 AT	(424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.92770 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.77438 AT	(424018.10, 4526463.50, 1307.12, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.76886 AT	(424084.20, 4526462.80, 1308.52, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.69940 AT	(424100.00, 4526450.00, 1308.97, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.67925 AT	(424076.00, 4526440.10, 1308.42, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.60173 AT	(424079.80, 4526430.90, 1308.90, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.59967 AT	(424092.30, 4526485.40, 1308.49, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.58828 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
10H1	1ST HIGHEST VALUE IS	0.37295 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.36822 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.36637 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.36234 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.36194 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.36096 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.36062 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.34993 AT	(424018.60, 4526512.50, 1306.56, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.34780 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.34731 AT	(423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC	
10H2	1ST HIGHEST VALUE IS	0.65813 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.64660 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.64517 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.63643 AT	(423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.61872 AT	(424000.00, 4526150.00, 1308.53, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.61678 AT	(423900.00, 4526100.00, 1306.02, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.60822 AT	(423950.00, 4526250.00, 1307.01, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.60037 AT	(423993.60, 4526211.00, 1307.37, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.60014 AT	(423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.59915 AT	(423972.40, 4526218.80, 1307.00, 2867.37, 0.00)	DC	

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11H1      1ST HIGHEST VALUE IS       0.38384 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.37250 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.36976 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.36850 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.36560 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.36491 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.36090 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.35893 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.35633 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.35198 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC

12H1      1ST HIGHEST VALUE IS       0.26416 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.25890 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.25498 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.25123 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.24879 AT (  423950.00,  4526100.00,  1307.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.24811 AT (  423822.10,  4526133.80,  1304.69,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.24723 AT (  423850.00,  4526100.00,  1305.14,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.24530 AT (  423822.10,  4526158.00,  1304.41,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.24379 AT (  423950.00,  4526150.00,  1307.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.24293 AT (  423900.00,  4526050.00,  1306.00,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

13H1      1ST HIGHEST VALUE IS       0.50314 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.49852 AT (  424000.00,  4526400.00,  1307.79,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.49800 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.49344 AT (  424017.80,  4526439.00,  1307.01,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.48197 AT (  423997.10,  4526386.30,  1307.42,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.47643 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.47350 AT (  423997.30,  4526411.20,  1307.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.47131 AT (  423997.60,  4526436.10,  1307.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.46978 AT (  424017.30,  4526390.10,  1308.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.46857 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC

19H1      1ST HIGHEST VALUE IS       0.30860 AT (  423850.00,  4526300.00,  1305.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.30027 AT (  423850.00,  4526250.00,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.29643 AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.29542 AT (  423900.00,  4526250.00,  1305.93,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.29194 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.28722 AT (  424100.00,  4526400.00,  1309.66,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.28595 AT (  423962.60,  4526277.20,  1306.96,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.28409 AT (  424073.10,  4526413.90,  1308.34,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.28268 AT (  423950.00,  4526250.00,  1307.01,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.28163 AT (  424076.00,  4526440.10,  1308.42,  2867.37,    0.00)  DC

20H1      1ST HIGHEST VALUE IS       0.28388 AT (  423850.00,  4526250.00,  1305.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.27355 AT (  423900.00,  4526250.00,  1305.93,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.26859 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.26524 AT (  424073.10,  4526413.90,  1308.34,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.26408 AT (  424058.90,  4526395.20,  1308.59,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.26367 AT (  424066.40,  4526397.00,  1308.57,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.26276 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.26120 AT (  423962.60,  4526277.20,  1306.96,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.26104 AT (  423850.00,  4526300.00,  1305.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.26088 AT (  424028.00,  4526316.30,  1308.64,  2867.37,    0.00)  DC

20H2      1ST HIGHEST VALUE IS       0.49270 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.48630 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.46012 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.46001 AT (  423950.00,  4526150.00,  1307.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.45382 AT (  423850.00,  4526200.00,  1305.72,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.44719 AT (  423993.60,  4526211.00,  1307.37,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.44507 AT (  423822.10,  4526182.10,  1304.50,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.44370 AT (  424000.00,  4526200.00,  1308.82,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.44210 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.43757 AT (  423850.00,  4526100.00,  1305.14,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
20H3	1ST HIGHEST VALUE IS	0.48876 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.46361 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.46352 AT	(423850.00, 4526200.00, 1305.72, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.44711 AT	(424002.40, 4526232.10, 1308.24, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.44621 AT	(424002.20, 4526211.60, 1308.79, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.44431 AT	(423850.00, 4526150.00, 1305.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.43949 AT	(423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.43914 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.43589 AT	(423822.10, 4526182.10, 1304.50, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.43019 AT	(423850.00, 4526250.00, 1305.00, 2867.37, 0.00)	DC	
23H1	1ST HIGHEST VALUE IS	0.33064 AT	(423874.10, 4526311.60, 1305.39, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.32351 AT	(423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.32235 AT	(423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.31385 AT	(423850.00, 4526300.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.31345 AT	(423947.40, 4526311.70, 1306.11, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.31338 AT	(423900.00, 4526300.00, 1306.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.31274 AT	(423950.00, 4526300.00, 1306.66, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.31202 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.31113 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.31018 AT	(423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC	
24H1	1ST HIGHEST VALUE IS	0.37338 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.37138 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.36797 AT	(423886.40, 4527102.10, 1299.37, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.36672 AT	(423886.60, 4527121.40, 1299.87, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.36510 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.36282 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.35743 AT	(423863.80, 4527102.50, 1299.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.35542 AT	(423792.10, 4527180.50, 1297.01, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.35486 AT	(423886.80, 4527140.70, 1299.36, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.35439 AT	(423900.00, 4527100.00, 1300.00, 2867.37, 0.00)	DC	
25H1	1ST HIGHEST VALUE IS	0.35241 AT	(423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.35224 AT	(423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.35192 AT	(423840.60, 4527010.20, 1299.06, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.34582 AT	(423900.00, 4527000.00, 1300.24, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.34500 AT	(423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.34288 AT	(423886.90, 4526986.00, 1299.62, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.34086 AT	(423840.70, 4527033.40, 1299.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.34046 AT	(423850.00, 4527000.00, 1299.20, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.33686 AT	(423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.33269 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
SCRUBBER	1ST HIGHEST VALUE IS	3.46456 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.41225 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.39916 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.38148 AT	(424020.30, 4526683.90, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.37943 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.37813 AT	(424002.50, 4526908.70, 1303.27, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.37162 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	3.35531 AT	(424002.70, 4526933.60, 1302.97, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	3.35201 AT	(424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	3.33203 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
26H1	1ST HIGHEST VALUE IS	0.30762 AT	(424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.29557 AT	(424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.29510 AT	(424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.29436 AT	(423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.29375 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.29355 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.29302 AT	(423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.29252 AT	(424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.28429 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.28129 AT	(424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC	

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27H1      1ST HIGHEST VALUE IS       0.44443 AT (  423841.20,  4527102.90,  1298.97,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.44214 AT (  423841.00,  4527079.80,  1298.99,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.43922 AT (  423850.00,  4527100.00,  1299.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.43777 AT (  423850.00,  4527050.00,  1298.99,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.42931 AT (  423840.90,  4527056.60,  1299.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.42503 AT (  423863.80,  4527102.50,  1299.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.40843 AT (  423840.70,  4527033.40,  1299.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.40790 AT (  423839.70,  4527180.00,  1297.98,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.40741 AT (  423792.10,  4527180.50,  1297.01,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.40345 AT (  423815.90,  4527180.20,  1297.21,  2867.37,    0.00)  DC

30H1      1ST HIGHEST VALUE IS       0.68662 AT (  423815.90,  4527180.20,  1297.21,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.67703 AT (  423792.10,  4527180.50,  1297.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.67532 AT (  423792.50,  4527200.10,  1296.99,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.67125 AT (  423800.00,  4527200.00,  1297.31,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.66977 AT (  423850.00,  4527200.00,  1297.98,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.65965 AT (  423839.70,  4527180.00,  1297.98,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.65786 AT (  423770.10,  4527220.00,  1296.87,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.65723 AT (  423792.90,  4527219.80,  1296.88,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.64693 AT (  423724.50,  4527220.50,  1296.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.64183 AT (  423747.30,  4527220.30,  1295.92,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   4TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

30H2      1ST HIGHEST VALUE IS       0.68574 AT (  423815.90,  4527180.20,  1297.21,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.67511 AT (  423792.10,  4527180.50,  1297.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.67160 AT (  423792.50,  4527200.10,  1296.99,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.67114 AT (  423800.00,  4527200.00,  1297.31,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.66729 AT (  423850.00,  4527200.00,  1297.98,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.65770 AT (  423839.70,  4527180.00,  1297.98,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.65525 AT (  423770.10,  4527220.00,  1296.87,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.65455 AT (  423792.90,  4527219.80,  1296.88,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.64066 AT (  423724.50,  4527220.50,  1296.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.64053 AT (  423747.30,  4527220.30,  1295.92,  2867.37,    0.00)  DC

33H1      1ST HIGHEST VALUE IS       0.49097 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.47810 AT (  423900.00,  4526050.00,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.47482 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.46935 AT (  423850.00,  4526100.00,  1305.14,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.46660 AT (  423850.00,  4526050.00,  1305.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.45472 AT (  423950.00,  4526050.00,  1308.90,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.45454 AT (  423850.00,  4526000.00,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.45310 AT (  423900.00,  4526000.00,  1308.26,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.44637 AT (  423950.00,  4526000.00,  1308.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.43366 AT (  423822.20,  4526109.70,  1304.38,  2867.37,    0.00)  DC

BOILER4   1ST HIGHEST VALUE IS       2.32111 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.27934 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.26055 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.13595 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.08541 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.06539 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.97677 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.97004 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.92353 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.88327 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC

BOILER5   1ST HIGHEST VALUE IS       1.89172 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.85601 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.82090 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.81298 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.80214 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.61395 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.61076 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.48446 AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.38441 AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.33289 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
BOILER8	1ST HIGHEST VALUE IS	2.78322 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	2.53547 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	2.43206 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	2.39074 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	2.36575 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	2.36309 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	2.34055 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	2.31647 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	2.25025 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	2.19469 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
BOILER9	1ST HIGHEST VALUE IS	3.50656 AT	(423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.43176 AT	(424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.33255 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.26491 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.25484 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.19670 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.07417 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	3.03336 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	3.01469 AT	(424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	2.98382 AT	(424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
BOILER10	1ST HIGHEST VALUE IS	2.41287 AT	(424020.30, 4526683.90, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	2.33315 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	2.32638 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	2.22673 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	2.17416 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	2.12160 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	2.07965 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	1.83713 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	1.76837 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	1.73119 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
BOILER11	1ST HIGHEST VALUE IS	1.41344 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.39710 AT	(424018.60, 4526512.50, 1306.56, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.38136 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	1.30862 AT	(424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	1.30648 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	1.29445 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	1.28841 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	1.28765 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	1.27112 AT	(423956.70, 4526984.40, 1302.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	1.26384 AT	(423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H2	1ST HIGHEST VALUE IS	0.50605 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.50593 AT	(424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.48409 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.47035 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.45870 AT	(424226.70, 4526768.00, 1308.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.43739 AT	(424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.43626 AT	(424222.80, 4526848.00, 1307.57, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.43005 AT	(424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.42586 AT	(424214.70, 4526825.30, 1307.63, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.42521 AT	(424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC	
68H3	1ST HIGHEST VALUE IS	0.72968 AT	(424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.71441 AT	(424232.60, 4526656.80, 1309.65, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.71440 AT	(424250.00, 4526650.00, 1309.85, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.70361 AT	(424202.60, 4526701.30, 1308.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.70111 AT	(424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.69902 AT	(424209.60, 4526656.90, 1309.24, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.69520 AT	(424194.60, 4526679.10, 1308.34, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.68077 AT	(424278.70, 4526656.80, 1308.99, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.67678 AT	(424186.60, 4526656.90, 1308.44, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.67103 AT	(424255.60, 4526656.80, 1310.07, 2867.37, 0.00)	DC	

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68H4      1ST HIGHEST VALUE IS       0.80080 AT (  424173.90,  4526712.00,  1308.32,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.79926 AT (  424190.20,  4526757.30,  1307.52,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.79407 AT (  424200.00,  4526750.00,  1308.90,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.77368 AT (  424165.70,  4526689.40,  1308.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.74924 AT (  424182.00,  4526734.70,  1308.06,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.73560 AT (  424194.60,  4526679.10,  1308.34,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.72790 AT (  424202.60,  4526701.30,  1308.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.72182 AT (  424210.60,  4526723.60,  1308.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.72081 AT (  424200.00,  4526700.00,  1308.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.70971 AT (  424198.40,  4526780.00,  1307.25,  2867.37,    0.00)  DC

68H5      1ST HIGHEST VALUE IS       0.70996 AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.68443 AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.61936 AT (  424002.00,  4526859.00,  1303.58,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.61484 AT (  424022.10,  4526855.30,  1304.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.58848 AT (  424149.40,  4526644.00,  1308.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.57351 AT (  424157.60,  4526666.70,  1308.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.56880 AT (  424133.10,  4526598.70,  1307.86,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.56693 AT (  424141.30,  4526621.40,  1308.11,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.56028 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.55389 AT (  424165.70,  4526689.40,  1308.00,  2867.37,    0.00)  DC
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**MODELOPTs:  RegDFAULT CONC                                          ELEV

                    *** THE SUMMARY OF MAXIMUM   4TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

68H6      1ST HIGHEST VALUE IS       0.70578 AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.67714 AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.64586 AT (  424000.90,  4526759.50,  1304.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.60474 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.57878 AT (  424021.60,  4526806.30,  1304.09,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.55243 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.51613 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.51368 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.48175 AT (  424105.60,  4527054.50,  1304.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.46530 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC

68H7      1ST HIGHEST VALUE IS       0.72458 AT (  424231.00,  4526870.60,  1306.99,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.66559 AT (  424222.80,  4526848.00,  1307.57,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.66029 AT (  424266.70,  4526879.20,  1307.75,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.62742 AT (  424256.40,  4526939.10,  1307.42,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.62605 AT (  424239.20,  4526893.30,  1307.25,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.62338 AT (  424022.30,  4526879.70,  1303.97,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.62290 AT (  424002.50,  4526908.70,  1303.27,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.61199 AT (  424022.80,  4526928.70,  1303.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.60275 AT (  424250.00,  4526900.00,  1307.92,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.60253 AT (  424022.60,  4526904.20,  1303.05,  2867.37,    0.00)  DC

68H10     1ST HIGHEST VALUE IS       0.05969 AT (  423997.60,  4526436.10,  1307.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.05868 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.05753 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.05732 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.05664 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.05558 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.05532 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.05486 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.05486 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.05411 AT (  424017.80,  4526439.00,  1307.01,  2867.37,    0.00)  DC

68H11     1ST HIGHEST VALUE IS       0.05783 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.05544 AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.05492 AT (  423997.60,  4526436.10,  1307.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.05185 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.05176 AT (  423700.00,  4526300.00,  1302.93,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.05151 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.05149 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.05120 AT (  423997.30,  4526411.20,  1307.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.05062 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.05056 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
```

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H12	1ST HIGHEST VALUE IS	0.05750 AT	(423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.05489 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.05350 AT	(423997.30, 4526411.20, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.05280 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.05227 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.05214 AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.05162 AT	(423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.05155 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.05132 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.05098 AT	(423731.50, 4526277.70, 1303.00, 2867.37, 0.00)	DC	
68H13	1ST HIGHEST VALUE IS	0.06204 AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.05961 AT	(423750.00, 4526300.00, 1303.46, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.05603 AT	(423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.05535 AT	(423874.10, 4526311.60, 1305.39, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.05474 AT	(423750.00, 4526277.60, 1303.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.05410 AT	(424000.00, 4526400.00, 1307.79, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.05297 AT	(423731.50, 4526277.70, 1303.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.05286 AT	(423997.30, 4526411.20, 1307.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.05091 AT	(423997.10, 4526386.30, 1307.42, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.05085 AT	(423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC	
FLARES	1ST HIGHEST VALUE IS	0.01239 AT	(424600.00, 4526000.00, 1322.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.01238 AT	(424550.00, 4526050.00, 1320.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.01219 AT	(424500.00, 4526100.00, 1319.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.01209 AT	(424650.00, 4525950.00, 1322.99, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.01194 AT	(424700.00, 4526100.00, 1322.97, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.01189 AT	(424450.00, 4526150.00, 1320.90, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.01175 AT	(424750.00, 4526050.00, 1323.01, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.01174 AT	(424700.00, 4525900.00, 1323.05, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.01174 AT	(424600.00, 4526150.00, 1321.85, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.01168 AT	(424550.00, 4526200.00, 1320.00, 2867.37, 0.00)	DC	
FLAREN	1ST HIGHEST VALUE IS	0.01228 AT	(424600.00, 4526000.00, 1322.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.01228 AT	(424550.00, 4526050.00, 1320.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.01209 AT	(424500.00, 4526100.00, 1319.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.01199 AT	(424650.00, 4525950.00, 1322.99, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.01184 AT	(424700.00, 4526100.00, 1322.97, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.01179 AT	(424450.00, 4526150.00, 1320.90, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.01165 AT	(424750.00, 4526050.00, 1323.01, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.01164 AT	(424700.00, 4525900.00, 1323.05, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.01164 AT	(424600.00, 4526150.00, 1321.85, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.01159 AT	(424550.00, 4526200.00, 1320.00, 2867.37, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 10 Warning Message(s)
A Total of 146 Informational Message(s)

A Total of 8784 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 146 Missing Hours Identified (1.66 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
CN W305 1 WAKFLG:Stack height > or = EPA formula height for SRCID: 9H2
CN W305 1 WAKFLG:Stack height > or = EPA formula height for SRCID: 12H1
CN W305 5 WAKFLG:Stack height > or = EPA formula height for SRCID: FLARES
CN W305 5 WAKFLG:Stack height > or = EPA formula height for SRCID: FLAREN

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CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
CN W305       8 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H1
CN W305       9 WAKFLG:Stack height > or = EPA formula height for SRCID:           4H1
CN W305      44 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
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*** MODEL SETUP OPTIONS SUMMARY ***

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- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for    50 Source(s),
  for Total of    1 Urban Area(s):
  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. Half-life of 4 hrs for URBAN SO2.
        6. Urban Roughness Length of 1.0 Meter Assumed.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR

**This Run Includes:     50 Source(s);      52 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  SO2

**Note that special processing requirements apply for the 1-hour SO2 NAAQS - check available guidance.
  Model will process user-specified ranks of daily maximum
1-hour values averaged across the number of years modeled.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs External File(s) of Maximum Daily 1-hr Values by Year (MXDYBYYR Keyword)
         Model Outputs External File(s) of Contributions to Maximum Daily Values Paired in Time & Space (MAXDCONT Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =    149.6 MB of RAM.

**Input Runstream File:          Holly_V17_2009_SO2.DTA
**Output Print File:             Holly_V17_2009_SO2.LST

**File for Summary of Results:   C:\beast\Holly\Holly_V17_2009_SO2.SUM
```


*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

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1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2009.SFC Met Version: 11059
Profile file: SY2009.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 72572
Name: SALT_LAKE_CITY,UT Name: UNKNOWN
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.00	127.	10.0	267.9	10.0
09	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	1.80	120.	10.0	268.0	10.0
09	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	3.00	106.	10.0	269.1	10.0
09	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.10	132.	10.0	270.2	10.0
09	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.80	141.	10.0	269.8	10.0
09	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.50	148.	10.0	269.4	10.0
09	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	1.90	96.	10.0	269.2	10.0
09	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.12	0.28	1.00	0.80	178.	10.0	269.6	10.0
09	01	01	1	09	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	0.51	2.70	149.	10.0	270.9	10.0
09	01	01	1	10	9.0	0.274	0.144	0.005	10.	330.	-177.5	0.12	0.28	0.30	2.90	154.	10.0	271.9	10.0
09	01	01	1	11	22.7	0.173	0.298	0.012	36.	169.	-17.8	0.09	0.28	0.22	1.70	190.	10.0	273.9	10.0
09	01	01	1	12	31.6	0.109	0.420	0.018	73.	84.	-3.2	0.05	0.28	0.19	1.00	46.	10.0	275.6	10.0
09	01	01	1	13	34.8	0.258	0.504	0.005	114.	301.	-38.1	0.12	0.28	0.19	2.50	163.	10.0	277.0	10.0
09	01	01	1	14	32.1	0.113	0.539	0.013	151.	102.	-3.5	0.12	0.28	0.19	0.80	154.	10.0	277.9	10.0
09	01	01	1	15	4.7	0.155	0.288	0.013	157.	141.	-62.0	0.07	0.28	0.22	1.80	124.	10.0	278.8	10.0
09	01	01	1	16	0.4	0.334	0.124	0.005	158.	444.	-7805.0	0.07	0.28	0.29	4.20	143.	10.0	278.6	10.0
09	01	01	1	17	-14.1	0.342	-9.000	-9.000	-999.	460.	219.8	0.07	0.28	0.49	4.50	146.	10.0	277.9	10.0
09	01	01	1	18	-26.4	0.354	-9.000	-9.000	-999.	485.	130.6	0.07	0.28	1.00	4.80	146.	10.0	277.4	10.0
09	01	01	1	19	-35.5	0.392	-9.000	-9.000	-999.	564.	131.3	0.12	0.28	1.00	4.70	169.	10.0	277.4	10.0
09	01	01	1	20	-28.1	0.311	-9.000	-9.000	-999.	402.	82.5	0.12	0.28	1.00	3.90	150.	10.0	277.6	10.0
09	01	01	1	21	-29.8	0.330	-9.000	-9.000	-999.	437.	93.6	0.07	0.28	1.00	4.60	129.	10.0	278.5	10.0
09	01	01	1	22	-14.1	0.288	-9.000	-9.000	-999.	356.	130.9	0.07	0.28	1.00	3.90	131.	10.0	278.8	10.0
09	01	01	1	23	-23.6	0.320	-9.000	-9.000	-999.	416.	107.0	0.07	0.28	1.00	4.40	122.	10.0	278.9	10.0
09	01	01	1	24	-24.9	0.337	-9.000	-9.000	-999.	450.	118.7	0.07	0.28	1.00	4.60	130.	10.0	278.4	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	127.	3.00	267.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	26.27244	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	25.29503	AT (424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	22.68249	AT (424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	22.14716	AT (424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	18.66278	AT (423886.90, 4526986.00, 1299.62, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	18.64535	AT (424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	18.43892	AT (424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	18.37827	AT (423900.00, 4527000.00, 1300.24, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	18.19649	AT (423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	17.90706	AT (424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	7.53043	AT (424600.00, 4527400.00, 1307.94, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	7.52388	AT (424550.00, 4527400.00, 1307.21, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	7.51185	AT (424500.00, 4527350.00, 1306.98, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	7.50452	AT (424650.00, 4527450.00, 1308.10, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	7.49892	AT (424550.00, 4527350.00, 1307.22, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	7.47726	AT (424600.00, 4527450.00, 1307.37, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	7.43107	AT (424700.00, 4527500.00, 1308.04, 2912.70, 0.00)	DC	
	8TH HIGHEST VALUE IS	7.40268	AT (424450.00, 4527300.00, 1306.15, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	7.38881	AT (424650.00, 4527500.00, 1307.43, 2912.70, 0.00)	DC	
	10TH HIGHEST VALUE IS	7.38503	AT (424500.00, 4527300.00, 1306.86, 2867.37, 0.00)	DC	
4H1	1ST HIGHEST VALUE IS	3.84063	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.62338	AT (424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.51736	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.40449	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.39267	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.29887	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.27352	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	

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          8TH HIGHEST VALUE IS       3.25539 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.16513 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.13787 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC

4K1A      1ST HIGHEST VALUE IS       0.04139 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.04133 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.04118 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.03859 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.03809 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.03704 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.03683 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.03355 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.03348 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.03339 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   1ST-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                      NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

4K1B      1ST HIGHEST VALUE IS       0.03812 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.03635 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.03553 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.03533 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.03392 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.03048 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.03048 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.03029 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.02974 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.02974 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC

4V82      1ST HIGHEST VALUE IS      21.88284 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      20.90478 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      18.94367 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      18.93298 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      15.03240 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      14.30063 AT (  424190.20,  4526757.30,  1307.52,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS      14.08726 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      13.49244 AT (  424200.00,  4526750.00,  1308.90,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS      12.99741 AT (  424226.70,  4526768.00,  1308.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS      12.53858 AT (  424182.00,  4526734.70,  1308.06,  2867.37,    0.00)  DC

6H1       1ST HIGHEST VALUE IS       0.73574 AT (  423996.60,  4526336.60,  1307.76,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.72359 AT (  423996.80,  4526361.50,  1307.70,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.71907 AT (  424000.00,  4526350.00,  1307.88,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.71451 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.71451 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.70934 AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.69893 AT (  424022.10,  4526855.30,  1304.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.69655 AT (  424000.00,  4526300.00,  1308.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.69520 AT (  423947.40,  4526311.70,  1306.11,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.69084 AT (  423997.70,  4526295.60,  1308.04,  2867.37,    0.00)  DC

6H3       1ST HIGHEST VALUE IS       4.15975 AT (  424200.00,  4526150.00,  1312.08,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       4.12299 AT (  424050.00,  4526150.00,  1310.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       4.07164 AT (  424150.00,  4526200.00,  1311.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       4.04209 AT (  424150.00,  4526250.00,  1311.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.89322 AT (  424050.00,  4526200.00,  1309.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.88905 AT (  424200.00,  4526200.00,  1312.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.88828 AT (  424050.00,  4526100.00,  1310.10,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.75542 AT (  424100.00,  4526150.00,  1311.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.72897 AT (  424250.00,  4526100.00,  1313.86,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.69475 AT (  424100.00,  4526200.00,  1310.00,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   1ST-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                      NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

6H2       1ST HIGHEST VALUE IS       0.73020 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.71463 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.67132 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.66331 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.65260 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.63353 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
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          7TH HIGHEST VALUE IS       0.60467 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.57015 AT (  423990.60,  4526296.30,  1308.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.55457 AT (  423971.90,  4526311.70,  1306.95,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.55037 AT (  424000.90,  4526759.50,  1304.00,  2867.37,    0.00)  DC

6K1       1ST HIGHEST VALUE IS       0.01204 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01179 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01151 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01147 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01140 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01136 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01110 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01101 AT (  423768.50,  4526277.50,  1303.49,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01079 AT (  423771.40,  4526280.90,  1303.56,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01047 AT (  423713.10,  4526253.70,  1303.00,  2867.37,    0.00)  DC

6K2       1ST HIGHEST VALUE IS       0.01215 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01196 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01193 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01122 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01105 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01081 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01072 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01058 AT (  423654.20,  4526311.40,  1302.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01046 AT (  423713.10,  4526253.70,  1303.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01040 AT (  423650.00,  4526300.00,  1302.00,  2867.37,    0.00)  DC

7H3       1ST HIGHEST VALUE IS       0.35000 AT (  424650.00,  4526600.00,  1317.99,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.34904 AT (  424700.00,  4526600.00,  1318.06,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.34822 AT (  424600.00,  4526600.00,  1317.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.34740 AT (  424700.00,  4526650.00,  1317.56,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.34738 AT (  424750.00,  4526650.00,  1318.26,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.34637 AT (  424750.00,  4526600.00,  1318.90,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.34571 AT (  424800.00,  4526650.00,  1320.09,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.34513 AT (  424650.00,  4526650.00,  1317.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.34330 AT (  424550.00,  4526600.00,  1316.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.34232 AT (  424800.00,  4526600.00,  1320.51,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   1ST-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
7H1       1ST HIGHEST VALUE IS       0.50895 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.48643 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.48208 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.44662 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.43639 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.42926 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.42257 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.41673 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.40954 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.40113 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC

8H1       1ST HIGHEST VALUE IS       0.70791 AT (  423850.00,  4526300.00,  1305.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.69466 AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.67984 AT (  423850.00,  4526250.00,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.67251 AT (  424200.00,  4526350.00,  1310.99,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.67211 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.67139 AT (  423771.40,  4526280.90,  1303.56,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.66915 AT (  423768.50,  4526277.50,  1303.49,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.66754 AT (  423821.50,  4526247.10,  1304.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.66448 AT (  423821.00,  4526264.00,  1304.01,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.66369 AT (  423900.00,  4526250.00,  1305.93,  2867.37,    0.00)  DC

9H1       1ST HIGHEST VALUE IS       0.90076 AT (  424100.50,  4526508.10,  1308.47,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.89622 AT (  424108.60,  4526530.70,  1308.63,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.87323 AT (  424116.80,  4526553.40,  1308.40,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.87248 AT (  424124.90,  4526576.10,  1308.06,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.84429 AT (  424092.30,  4526485.40,  1308.49,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.83442 AT (  424100.00,  4526500.00,  1308.69,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.83366 AT (  424150.00,  4526500.00,  1310.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.77478 AT (  424150.00,  4526550.00,  1308.55,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.71375 AT (  424200.00,  4526500.00,  1310.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.70441 AT (  424141.30,  4526621.40,  1308.11,  2867.37,    0.00)  DC

9H2       1ST HIGHEST VALUE IS       1.23072 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.07295 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.04039 AT (  424100.00,  4526450.00,  1308.97,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.02821 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.98170 AT (  424076.00,  4526440.10,  1308.42,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.87817 AT (  424084.20,  4526462.80,  1308.52,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.86821 AT (  424079.80,  4526430.90,  1308.90,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.84590 AT (  424018.10,  4526463.50,  1307.12,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.84025 AT (  424150.00,  4526400.00,  1310.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.81032 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
10H1	1ST HIGHEST VALUE IS	0.38997 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.38956 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.38738 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.38457 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.38313 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.38087 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.38054 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.37679 AT	(424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.37492 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.36654 AT	(424018.60, 4526512.50, 1306.56, 2867.37, 0.00)	DC	
10H2	1ST HIGHEST VALUE IS	0.70970 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.70884 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.70048 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.69768 AT	(423850.00, 4526200.00, 1305.72, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.67769 AT	(423821.00, 4526264.00, 1304.01, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.67317 AT	(423820.50, 4526280.80, 1304.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.66878 AT	(423850.00, 4526250.00, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.66869 AT	(423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.66069 AT	(424000.00, 4526150.00, 1308.53, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.65526 AT	(423972.40, 4526218.80, 1307.00, 2867.37, 0.00)	DC	
11H1	1ST HIGHEST VALUE IS	0.42805 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.41975 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.41312 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.41260 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.41113 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.40861 AT	(424018.60, 4526512.50, 1306.56, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.40798 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.40691 AT	(424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.40145 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.40086 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
12H1	1ST HIGHEST VALUE IS	0.30268 AT	(423850.00, 4526200.00, 1305.72, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.28373 AT	(423822.10, 4526182.10, 1304.50, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.28366 AT	(423822.10, 4526158.00, 1304.41, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.28204 AT	(423850.00, 4526150.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.27779 AT	(423822.10, 4526133.80, 1304.69, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.27518 AT	(423822.10, 4526206.20, 1304.94, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.27364 AT	(423850.00, 4526250.00, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.27055 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.26772 AT	(423900.00, 4526100.00, 1306.02, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.26551 AT	(423822.20, 4526109.70, 1304.38, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
13H1	1ST HIGHEST VALUE IS	0.51653 AT	(423997.10, 4526386.30, 1307.42, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.51158 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.50860 AT	(423997.30, 4526411.20, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.50825 AT	(424017.80, 4526439.00, 1307.01, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.50478 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.50052 AT	(423997.60, 4526436.10, 1307.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.50010 AT	(424018.10, 4526463.50, 1307.12, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.49469 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.49188 AT	(424017.60, 4526414.50, 1307.94, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.48963 AT	(424000.00, 4526400.00, 1307.79, 2867.37, 0.00)	DC	
19H1	1ST HIGHEST VALUE IS	0.32115 AT	(423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.31990 AT	(423800.00, 4526300.00, 1304.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.31347 AT	(423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.31233 AT	(423850.00, 4526300.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.31206 AT	(423795.90, 4526280.90, 1304.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.31021 AT	(423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.30580 AT	(423850.00, 4526250.00, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.30270 AT	(423820.50, 4526280.80, 1304.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.30190 AT	(423874.10, 4526311.60, 1305.39, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.30164 AT	(424000.00, 4526350.00, 1307.88, 2867.37, 0.00)	DC	

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20H1      1ST HIGHEST VALUE IS       0.28970 AT (  423820.50,  4526280.80,  1304.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.28820 AT (  423850.00,  4526250.00,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.28255 AT (  423950.00,  4526250.00,  1307.01,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.28215 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.28215 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.28167 AT (  423821.00,  4526264.00,  1304.01,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.28038 AT (  424051.20,  4526375.50,  1309.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.27925 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.27908 AT (  424016.60,  4526316.60,  1308.01,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.27559 AT (  424035.70,  4526336.00,  1308.43,  2867.37,    0.00)  DC

20H2      1ST HIGHEST VALUE IS       0.54733 AT (  423850.00,  4526200.00,  1305.72,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.48594 AT (  423821.50,  4526247.10,  1304.09,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.48507 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.48026 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.48012 AT (  423822.10,  4526158.00,  1304.41,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.47970 AT (  423822.10,  4526182.10,  1304.50,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.47537 AT (  423822.00,  4526230.30,  1304.69,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.47180 AT (  423950.00,  4526150.00,  1307.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.46937 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.46827 AT (  424150.00,  4526300.00,  1311.00,  2867.37,    0.00)  DC
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**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

20H3      1ST HIGHEST VALUE IS       0.52273 AT (  423850.00,  4526200.00,  1305.72,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.48742 AT (  423821.00,  4526264.00,  1304.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.47956 AT (  423821.50,  4526247.10,  1304.09,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.47513 AT (  423850.00,  4526250.00,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.47004 AT (  423950.00,  4526200.00,  1307.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.46313 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.45888 AT (  423820.50,  4526280.80,  1304.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.45783 AT (  423822.10,  4526182.10,  1304.50,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.45383 AT (  423822.00,  4526230.30,  1304.69,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.45370 AT (  423822.10,  4526206.20,  1304.94,  2867.37,    0.00)  DC

23H1      1ST HIGHEST VALUE IS       0.35116 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.34227 AT (  423947.40,  4526311.70,  1306.11,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.33831 AT (  423950.00,  4526300.00,  1306.66,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.33559 AT (  423898.60,  4526311.60,  1305.71,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.33335 AT (  423962.20,  4526296.80,  1306.98,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.33257 AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.33033 AT (  424100.00,  4526200.00,  1310.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.32863 AT (  423971.90,  4526311.70,  1306.95,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.32835 AT (  423825.30,  4526311.60,  1304.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.32731 AT (  423900.00,  4526300.00,  1306.00,  2867.37,    0.00)  DC

24H1      1ST HIGHEST VALUE IS       0.44254 AT (  423840.90,  4527056.60,  1299.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.43821 AT (  423841.00,  4527079.80,  1298.99,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.43284 AT (  423840.70,  4527033.40,  1299.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.42503 AT (  423841.20,  4527102.90,  1298.97,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.42144 AT (  423850.00,  4527050.00,  1298.99,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.41251 AT (  423850.00,  4527100.00,  1299.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.40514 AT (  423886.60,  4527121.40,  1299.87,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.40109 AT (  423886.40,  4527102.10,  1299.37,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.39798 AT (  423863.80,  4527102.50,  1299.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.39641 AT (  423886.80,  4527140.70,  1299.36,  2867.37,    0.00)  DC

25H1      1ST HIGHEST VALUE IS       0.40668 AT (  423840.40,  4526987.00,  1299.47,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.39268 AT (  423840.60,  4527010.20,  1299.06,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.37787 AT (  423850.00,  4527000.00,  1299.20,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.37522 AT (  423840.70,  4527033.40,  1299.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.37418 AT (  423863.70,  4526986.50,  1300.17,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.36177 AT (  423850.00,  4527050.00,  1298.99,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.35994 AT (  423900.00,  4527000.00,  1300.24,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.35856 AT (  423840.90,  4527056.60,  1299.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.35553 AT (  424157.60,  4526666.70,  1308.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.35280 AT (  424141.30,  4526621.40,  1308.11,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
SCRUBBER	1ST HIGHEST VALUE IS	4.91184 AT	(424500.00, 4527350.00, 1306.98, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	4.90508 AT	(424450.00, 4527300.00, 1306.15, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	4.87894 AT	(424550.00, 4527350.00, 1307.22, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	4.86946 AT	(424550.00, 4527400.00, 1307.21, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	4.85773 AT	(424600.00, 4527400.00, 1307.94, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	4.85707 AT	(424500.00, 4527300.00, 1306.86, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	4.83833 AT	(424400.00, 4527250.00, 1305.39, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	4.79926 AT	(424650.00, 4527450.00, 1308.10, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	4.79493 AT	(424600.00, 4527450.00, 1307.37, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	4.76784 AT	(424450.00, 4527250.00, 1305.72, 2867.37, 0.00)	DC	
26H1	1ST HIGHEST VALUE IS	0.39410 AT	(423589.10, 4527089.50, 1296.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.36933 AT	(423585.50, 4527067.50, 1295.96, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.36748 AT	(423592.60, 4527111.60, 1296.03, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.36092 AT	(423550.00, 4527100.00, 1294.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.35124 AT	(423562.10, 4527067.70, 1294.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.33932 AT	(423550.00, 4527150.00, 1294.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.33139 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.32811 AT	(423599.80, 4527155.70, 1295.47, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.32453 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.32437 AT	(423500.00, 4527150.00, 1293.68, 2867.37, 0.00)	DC	
27H1	1ST HIGHEST VALUE IS	0.47047 AT	(423863.80, 4527102.50, 1299.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.46739 AT	(423886.40, 4527102.10, 1299.37, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.46071 AT	(423840.70, 4527033.40, 1299.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.45773 AT	(423900.00, 4527050.00, 1300.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.45738 AT	(423886.60, 4527121.40, 1299.87, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.45469 AT	(423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.45427 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.45411 AT	(423840.60, 4527010.20, 1299.06, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.45408 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.45207 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
30H1	1ST HIGHEST VALUE IS	0.75537 AT	(424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.73767 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.73007 AT	(424000.00, 4527200.00, 1301.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.72633 AT	(423839.70, 4527180.00, 1297.98, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.72548 AT	(424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.72526 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.72238 AT	(424222.80, 4526848.00, 1307.57, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.71706 AT	(424258.70, 4526856.90, 1307.60, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.70972 AT	(424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.70861 AT	(424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
30H2	1ST HIGHEST VALUE IS	0.74835 AT	(424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.74094 AT	(424222.80, 4526848.00, 1307.57, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.74022 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.73166 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.72866 AT	(424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.72787 AT	(424000.00, 4527200.00, 1301.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.72678 AT	(423839.70, 4527180.00, 1297.98, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.72216 AT	(424258.70, 4526856.90, 1307.60, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.72214 AT	(424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.71099 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
33H1	1ST HIGHEST VALUE IS	0.56946 AT	(424700.00, 4527100.00, 1314.35, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.56805 AT	(424650.00, 4527050.00, 1312.97, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.56553 AT	(424650.00, 4527100.00, 1313.10, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.56547 AT	(424750.00, 4527150.00, 1312.17, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.56426 AT	(424600.00, 4527050.00, 1312.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.56228 AT	(424600.00, 4527000.00, 1313.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.56126 AT	(424700.00, 4527150.00, 1311.35, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.56073 AT	(424550.00, 4527000.00, 1311.49, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.55940 AT	(424800.00, 4527200.00, 1312.21, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.55660 AT	(424750.00, 4527100.00, 1314.99, 2867.37, 0.00)	DC	

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BOILER4   1ST HIGHEST VALUE IS       2.47562 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.43729 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.39168 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.39076 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.16726 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.14453 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       2.06541 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.02555 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.02232 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.01910 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC

BOILER5   1ST HIGHEST VALUE IS       2.35333 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.34238 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.32879 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.29062 AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.18138 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.13131 AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       2.11243 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.09917 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.04484 AT (  424021.60,  4526806.30,  1304.09,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.03727 AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

BOILER8   1ST HIGHEST VALUE IS       3.32718 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.31916 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.27842 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.24128 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.20317 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.15964 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.11680 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.10473 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.03473 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.02554 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC

BOILER9   1ST HIGHEST VALUE IS       3.94795 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.92811 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.85313 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.72507 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.70888 AT (  424020.10,  4526659.40,  1305.14,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.70722 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.67909 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.66309 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.64527 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.62685 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC

BOILER10  1ST HIGHEST VALUE IS       3.64501 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.60203 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.42484 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.34979 AT (  424020.30,  4526683.90,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.29360 AT (  423999.90,  4526660.00,  1304.88,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.24153 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.23563 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.21707 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.17510 AT (  424000.90,  4526759.50,  1304.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.07750 AT (  424019.80,  4526634.90,  1305.01,  2867.37,    0.00)  DC

BOILER11  1ST HIGHEST VALUE IS       1.73265 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.59090 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.55268 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.54254 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.54043 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.53981 AT (  423997.90,  4526461.00,  1306.61,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.53948 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.53214 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.51699 AT (  424108.60,  4526530.70,  1308.63,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.50868 AT (  423898.60,  4526311.60,  1305.71,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H2	1ST HIGHEST VALUE IS	0.60523 AT	(424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.60029 AT	(424206.50, 4526802.70, 1307.25, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.56926 AT	(424214.70, 4526825.30, 1307.63, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.56665 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.56101 AT	(424226.70, 4526768.00, 1308.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.55873 AT	(424222.80, 4526848.00, 1307.57, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.55490 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.55158 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.52912 AT	(424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.52206 AT	(424250.70, 4526834.70, 1307.89, 2867.37, 0.00)	DC	
68H3	1ST HIGHEST VALUE IS	0.80476 AT	(424278.70, 4526656.80, 1308.99, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.78584 AT	(424202.60, 4526701.30, 1308.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.78423 AT	(424301.70, 4526656.70, 1310.60, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.78305 AT	(424250.00, 4526650.00, 1309.85, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.77904 AT	(424255.60, 4526656.80, 1310.07, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.77862 AT	(424232.60, 4526656.80, 1309.65, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.77844 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.77396 AT	(424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.75959 AT	(424300.00, 4526650.00, 1311.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.73617 AT	(424324.70, 4526656.70, 1311.00, 2867.37, 0.00)	DC	
68H4	1ST HIGHEST VALUE IS	0.85525 AT	(424182.00, 4526734.70, 1308.06, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.85344 AT	(424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.84265 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.83522 AT	(424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.80955 AT	(424198.40, 4526780.00, 1307.25, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.79004 AT	(424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.78629 AT	(424226.70, 4526768.00, 1308.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.78553 AT	(424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.77861 AT	(424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.77413 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
68H5	1ST HIGHEST VALUE IS	0.73658 AT	(424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.72082 AT	(424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.64472 AT	(424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.64085 AT	(424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.63020 AT	(424002.00, 4526859.00, 1303.58, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.61245 AT	(424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.60849 AT	(424133.10, 4526598.70, 1307.86, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.59033 AT	(424141.30, 4526621.40, 1308.11, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.58610 AT	(424124.90, 4526576.10, 1308.06, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.58174 AT	(424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H6	1ST HIGHEST VALUE IS	0.73325 AT	(424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.72121 AT	(424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.66441 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.65779 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.59561 AT	(424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.56430 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.55392 AT	(424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.54543 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.53209 AT	(424105.60, 4527054.50, 1304.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.50144 AT	(424085.20, 4527053.70, 1304.00, 2867.37, 0.00)	DC	
68H7	1ST HIGHEST VALUE IS	0.78203 AT	(424222.80, 4526848.00, 1307.57, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.76916 AT	(424239.20, 4526893.30, 1307.25, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.76056 AT	(424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.75917 AT	(424214.70, 4526825.30, 1307.63, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.74577 AT	(424250.00, 4526900.00, 1307.92, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.73248 AT	(424250.70, 4526834.70, 1307.89, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.72764 AT	(424258.70, 4526856.90, 1307.60, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.72304 AT	(424247.30, 4526916.00, 1307.11, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.70380 AT	(424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.70022 AT	(424206.50, 4526802.70, 1307.25, 2867.37, 0.00)	DC	

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68H10     1ST HIGHEST VALUE IS       0.07316 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.07282 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.07231 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.07033 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06917 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06900 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06877 AT (  424018.60,  4526512.50,  1306.56,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06864 AT (  424000.00,  4526650.00,  1305.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06778 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.06712 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC

68H11     1ST HIGHEST VALUE IS       0.07024 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.06425 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06371 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06353 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06234 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06229 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06146 AT (  423997.30,  4526411.20,  1307.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06065 AT (  423800.00,  4526300.00,  1304.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06051 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.06047 AT (  424000.00,  4526400.00,  1307.79,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 1ST-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

68H12     1ST HIGHEST VALUE IS       0.07009 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.06941 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06814 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06677 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06566 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06498 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06469 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06447 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06363 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.06289 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC

68H13     1ST HIGHEST VALUE IS       0.07492 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.07240 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06896 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06604 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.06602 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.06496 AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.06320 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.06249 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.06141 AT (  423629.70,  4526311.40,  1301.93,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.06137 AT (  423825.30,  4526311.60,  1304.00,  2867.37,    0.00)  DC

FLARES    1ST HIGHEST VALUE IS       0.01445 AT (  424850.00,  4526550.00,  1321.77,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01442 AT (  424800.00,  4526550.00,  1320.72,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01438 AT (  424900.00,  4526550.00,  1322.26,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01431 AT (  424950.00,  4526500.00,  1323.89,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01427 AT (  425000.00,  4526500.00,  1324.45,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01427 AT (  424750.00,  4526550.00,  1319.51,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01426 AT (  424900.00,  4526500.00,  1322.86,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01424 AT (  424900.00,  4527150.00,  1315.29,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01423 AT (  424950.00,  4526550.00,  1323.09,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01419 AT (  424950.00,  4527150.00,  1316.57,  2867.37,    0.00)  DC

FLAREN    1ST HIGHEST VALUE IS       0.01433 AT (  424850.00,  4526550.00,  1321.77,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01430 AT (  424800.00,  4526550.00,  1320.72,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01426 AT (  424900.00,  4526550.00,  1322.26,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01419 AT (  424950.00,  4526500.00,  1323.89,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01416 AT (  425000.00,  4526500.00,  1324.45,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01415 AT (  424750.00,  4526550.00,  1319.51,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.01414 AT (  424900.00,  4526500.00,  1322.86,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.01412 AT (  424900.00,  4527150.00,  1315.29,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.01412 AT (  424950.00,  4526550.00,  1323.09,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.01407 AT (  424950.00,  4527150.00,  1316.57,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	22.97535	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	21.67763	AT (424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	21.35439	AT (424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	20.72478	AT (424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	17.59978	AT (423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	17.51095	AT (423900.00, 4527000.00, 1300.24, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	17.22479	AT (424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	17.15297	AT (423886.90, 4526986.00, 1299.62, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	16.69656	AT (423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	16.59580	AT (424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
NEW	1ST HIGHEST VALUE IS	5.54074	AT (424850.00, 4526750.00, 1319.27, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	5.53949	AT (424800.00, 4526750.00, 1319.15, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	5.53009	AT (424900.00, 4526750.00, 1320.27, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	5.51211	AT (424750.00, 4526750.00, 1317.76, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	5.50518	AT (424950.00, 4526750.00, 1321.17, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	5.49147	AT (424800.00, 4526800.00, 1317.74, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	5.48845	AT (423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	5.48426	AT (424750.00, 4526800.00, 1315.81, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	5.47520	AT (424850.00, 4526800.00, 1319.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	5.46296	AT (424700.00, 4526750.00, 1317.00, 2867.37, 0.00)	DC	
4H1	1ST HIGHEST VALUE IS	3.30193	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.28758	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.22275	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.21674	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.19602	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.11594	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.07540	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	2.98078	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	2.93361	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	2.93332	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
4K1A	1ST HIGHEST VALUE IS	0.03671	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.03466	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.03405	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.03254	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.03223	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.02914	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.02888	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.02850	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.02780	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.02612	AT (424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
4K1B	1ST HIGHEST VALUE IS	0.03421	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.03370	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.03360	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.03097	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.02974	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.02930	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.02637	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.02546	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.02459	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.02424	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
4V82	1ST HIGHEST VALUE IS	19.71503	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	17.64894	AT (424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	17.35062	AT (424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	17.11810	AT (424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	13.51839	AT (424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	11.41503	AT (424190.20, 4526757.30, 1307.52, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	10.94103	AT (423910.20, 4526985.50, 1300.67, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	10.58460	AT (423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	10.51613	AT (423900.00, 4527000.00, 1300.24, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	10.49603	AT (424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	

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6H1       1ST HIGHEST VALUE IS       0.54697 AT (  423962.20,  4526296.80,  1306.98,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.54023 AT (  423950.00,  4526250.00,  1307.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.52497 AT (  423950.00,  4526200.00,  1307.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.52387 AT (  423950.00,  4526300.00,  1306.66,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.52361 AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.52242 AT (  423898.60,  4526311.60,  1305.71,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.52168 AT (  423947.40,  4526311.70,  1306.11,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.51678 AT (  423962.60,  4526277.20,  1306.96,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.51353 AT (  423963.20,  4526238.10,  1307.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.51156 AT (  423962.90,  4526257.70,  1307.00,  2867.37,    0.00)  DC

6H3       1ST HIGHEST VALUE IS       3.34423 AT (  423996.80,  4526361.50,  1307.70,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.33402 AT (  423996.60,  4526336.60,  1307.76,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.32522 AT (  424000.00,  4526350.00,  1307.88,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.29291 AT (  423898.60,  4526311.60,  1305.71,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.28378 AT (  423900.00,  4526300.00,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.25494 AT (  424100.00,  4526150.00,  1311.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.21077 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.21077 AT (  423996.30,  4526311.70,  1308.14,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.20536 AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.20484 AT (  424050.00,  4526200.00,  1309.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

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                                                                                                  NETWORK
GROUP ID                      AVERAGE CONC              RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

6H2       1ST HIGHEST VALUE IS       0.62384 AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.60605 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.55385 AT (  424000.20,  4526684.90,  1304.50,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.52661 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.52485 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.48425 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.44820 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.44518 AT (  424000.90,  4526759.50,  1304.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.44284 AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.42961 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC

6K1       1ST HIGHEST VALUE IS       0.01111 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01109 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01089 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01054 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01051 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.00994 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.00993 AT (  423713.10,  4526253.70,  1303.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.00968 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00949 AT (  423768.50,  4526277.50,  1303.49,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.00928 AT (  423771.40,  4526280.90,  1303.56,  2867.37,    0.00)  DC

6K2       1ST HIGHEST VALUE IS       0.01167 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.01157 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.01113 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.01102 AT (  423750.00,  4526277.60,  1303.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.01030 AT (  423713.00,  4526277.80,  1302.99,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.01017 AT (  423731.50,  4526277.70,  1303.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.00999 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.00977 AT (  423713.10,  4526253.70,  1303.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00958 AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.00948 AT (  423654.20,  4526311.40,  1302.00,  2867.37,    0.00)  DC

7H3       1ST HIGHEST VALUE IS       0.31060 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.30823 AT (  423771.40,  4526280.90,  1303.56,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.30813 AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.30718 AT (  423874.10,  4526311.60,  1305.39,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.30613 AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.30511 AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.30510 AT (  423768.50,  4526277.50,  1303.49,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.30457 AT (  423850.00,  4526300.00,  1305.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.30400 AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.30003 AT (  423825.30,  4526311.60,  1304.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
7H1	1ST HIGHEST VALUE IS	0.42359 AT	(423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.39720 AT	(424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.37471 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.37357 AT	(424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.36622 AT	(424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.36319 AT	(423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.33953 AT	(424020.30, 4526683.90, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.32861 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.31017 AT	(424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.30147 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
8H1	1ST HIGHEST VALUE IS	0.61678 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.60689 AT	(423900.00, 4526250.00, 1305.93, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.58205 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.57163 AT	(423993.60, 4526211.00, 1307.37, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.56952 AT	(423963.50, 4526218.50, 1307.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.56759 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.56112 AT	(423850.00, 4526250.00, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.55693 AT	(423822.10, 4526206.20, 1304.94, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.55664 AT	(423963.20, 4526238.10, 1307.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.55621 AT	(423850.00, 4526200.00, 1305.72, 2867.37, 0.00)	DC	
9H1	1ST HIGHEST VALUE IS	0.80275 AT	(424100.00, 4526500.00, 1308.69, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.77208 AT	(424100.50, 4526508.10, 1308.47, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.74035 AT	(424116.80, 4526553.40, 1308.40, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.73303 AT	(424092.30, 4526485.40, 1308.49, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.71699 AT	(424124.90, 4526576.10, 1308.06, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.70363 AT	(424108.60, 4526530.70, 1308.63, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.70254 AT	(424150.00, 4526500.00, 1310.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.68650 AT	(424150.00, 4526550.00, 1308.55, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.56712 AT	(424200.00, 4526500.00, 1310.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.55695 AT	(424084.20, 4526462.80, 1308.52, 2867.37, 0.00)	DC	
9H2	1ST HIGHEST VALUE IS	0.94000 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.92747 AT	(424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.90730 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.81064 AT	(424018.10, 4526463.50, 1307.12, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.73782 AT	(424084.20, 4526462.80, 1308.52, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.70038 AT	(424076.00, 4526440.10, 1308.42, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.65492 AT	(424100.00, 4526450.00, 1308.97, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.60425 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.60154 AT	(424092.30, 4526485.40, 1308.49, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.59932 AT	(424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
10H1	1ST HIGHEST VALUE IS	0.38206 AT	(423998.10, 4526485.90, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.36821 AT	(424018.30, 4526488.00, 1307.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.36683 AT	(424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.36532 AT	(424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.36359 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.35385 AT	(423997.90, 4526461.00, 1306.61, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.35099 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.35041 AT	(424018.60, 4526512.50, 1306.56, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.34654 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.34652 AT	(423997.60, 4526436.10, 1307.00, 2867.37, 0.00)	DC	
10H2	1ST HIGHEST VALUE IS	0.65807 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.64689 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.62135 AT	(423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.61831 AT	(423900.00, 4526100.00, 1306.02, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.61779 AT	(424000.00, 4526150.00, 1308.53, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.60623 AT	(424000.00, 4526200.00, 1308.82, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.60575 AT	(423993.60, 4526211.00, 1307.37, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.60244 AT	(424000.00, 4526100.00, 1308.53, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.59784 AT	(423950.00, 4526100.00, 1307.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.57605 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	

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11H1      1ST HIGHEST VALUE IS       0.39026 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.38695 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.37987 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.37933 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.37354 AT (  424018.80,  4526537.00,  1306.25,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.37266 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.37057 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.36586 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.36580 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.35535 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC

12H1      1ST HIGHEST VALUE IS       0.25531 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.25303 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.24157 AT (  423900.00,  4526050.00,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.23629 AT (  424000.00,  4526100.00,  1308.53,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.23541 AT (  423850.00,  4526100.00,  1305.14,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.23259 AT (  423900.00,  4526200.00,  1306.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.23098 AT (  423822.10,  4526158.00,  1304.41,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.23000 AT (  423822.10,  4526133.80,  1304.69,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.22989 AT (  424000.00,  4526150.00,  1308.53,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.22972 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   4TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

13H1      1ST HIGHEST VALUE IS       0.48862 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.48580 AT (  423997.60,  4526436.10,  1307.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.47816 AT (  423997.10,  4526386.30,  1307.42,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.47763 AT (  424000.00,  4526400.00,  1307.79,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.47579 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.47493 AT (  424017.80,  4526439.00,  1307.01,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.47442 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.47105 AT (  424018.30,  4526488.00,  1307.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.47017 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.46158 AT (  424017.60,  4526414.50,  1307.94,  2867.37,    0.00)  DC

19H1      1ST HIGHEST VALUE IS       0.29614 AT (  423950.00,  4526250.00,  1307.01,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.29311 AT (  423850.00,  4526300.00,  1305.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.28796 AT (  423850.00,  4526250.00,  1305.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.28603 AT (  423962.90,  4526257.70,  1307.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.28399 AT (  423820.50,  4526280.80,  1304.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.28388 AT (  423800.00,  4526300.00,  1304.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.28323 AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.28273 AT (  424100.00,  4526400.00,  1309.66,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.28226 AT (  424066.40,  4526397.00,  1308.57,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.28208 AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC

20H1      1ST HIGHEST VALUE IS       0.27435 AT (  423850.00,  4526250.00,  1305.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.27178 AT (  423950.00,  4526250.00,  1307.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.26504 AT (  423900.00,  4526250.00,  1305.93,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.26485 AT (  423820.50,  4526280.80,  1304.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.26469 AT (  424073.10,  4526413.90,  1308.34,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.26458 AT (  423821.00,  4526264.00,  1304.01,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.26446 AT (  424051.20,  4526375.50,  1309.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.26317 AT (  423963.50,  4526218.50,  1307.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.26282 AT (  423963.20,  4526238.10,  1307.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.26136 AT (  423962.90,  4526257.70,  1307.00,  2867.37,    0.00)  DC

20H2      1ST HIGHEST VALUE IS       0.44574 AT (  423900.00,  4526150.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.44378 AT (  423950.00,  4526150.00,  1307.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.43551 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.43012 AT (  423850.00,  4526150.00,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.42745 AT (  423950.00,  4526200.00,  1307.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.42458 AT (  423822.10,  4526133.80,  1304.69,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.42268 AT (  423822.10,  4526206.20,  1304.94,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.41984 AT (  423822.10,  4526182.10,  1304.50,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.41927 AT (  423850.00,  4526100.00,  1305.14,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.41454 AT (  423950.00,  4526100.00,  1307.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
20H3	1ST HIGHEST VALUE IS	0.44033 AT	(423900.00, 4526150.00, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.43583 AT	(423963.50, 4526218.50, 1307.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.43570 AT	(423950.00, 4526200.00, 1307.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.43269 AT	(423950.00, 4526150.00, 1307.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.43016 AT	(423900.00, 4526200.00, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.42732 AT	(423850.00, 4526150.00, 1305.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.42274 AT	(423972.40, 4526218.80, 1307.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.42121 AT	(423850.00, 4526200.00, 1305.72, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.41855 AT	(423822.10, 4526182.10, 1304.50, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.41511 AT	(424000.00, 4526200.00, 1308.82, 2867.37, 0.00)	DC	
23H1	1ST HIGHEST VALUE IS	0.32235 AT	(423947.40, 4526311.70, 1306.11, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.32073 AT	(423976.40, 4526296.50, 1307.98, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.31897 AT	(423950.00, 4526300.00, 1306.66, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.31881 AT	(423874.10, 4526311.60, 1305.39, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.31738 AT	(423900.00, 4526300.00, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.31692 AT	(423962.20, 4526296.80, 1306.98, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.31690 AT	(423971.90, 4526311.70, 1306.95, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.31156 AT	(423898.60, 4526311.60, 1305.71, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.30655 AT	(423990.60, 4526296.30, 1308.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.30431 AT	(423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC	
24H1	1ST HIGHEST VALUE IS	0.37942 AT	(423850.00, 4527100.00, 1299.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.37456 AT	(423863.80, 4527102.50, 1299.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.37345 AT	(423841.20, 4527102.90, 1298.97, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.37022 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.36005 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.35721 AT	(423839.70, 4527180.00, 1297.98, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.34954 AT	(423886.60, 4527121.40, 1299.87, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.34858 AT	(423863.50, 4527179.70, 1298.36, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.34634 AT	(423886.40, 4527102.10, 1299.37, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.34399 AT	(423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
25H1	1ST HIGHEST VALUE IS	0.35477 AT	(423840.60, 4527010.20, 1299.06, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.35349 AT	(423840.70, 4527033.40, 1299.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.34613 AT	(423850.00, 4527050.00, 1298.99, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.34549 AT	(423850.00, 4527000.00, 1299.20, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.34405 AT	(423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.34313 AT	(423840.90, 4527056.60, 1299.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.34249 AT	(423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.32938 AT	(423841.00, 4527079.80, 1298.99, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.32542 AT	(423863.80, 4527102.50, 1299.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.31306 AT	(424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
SCRUBBER	1ST HIGHEST VALUE IS	3.81606 AT	(424650.00, 4526750.00, 1316.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.81451 AT	(424700.00, 4526750.00, 1317.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.80111 AT	(424600.00, 4526750.00, 1315.58, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.79581 AT	(424750.00, 4526750.00, 1317.76, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.76730 AT	(424800.00, 4526750.00, 1319.15, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.76003 AT	(424550.00, 4526750.00, 1315.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.72409 AT	(424850.00, 4526750.00, 1319.27, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	3.68179 AT	(424500.00, 4526750.00, 1313.87, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	3.67670 AT	(424900.00, 4526750.00, 1320.27, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	3.62309 AT	(424950.00, 4526750.00, 1321.17, 2867.37, 0.00)	DC	
26H1	1ST HIGHEST VALUE IS	0.31699 AT	(424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.30594 AT	(424000.70, 4526734.60, 1304.28, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.30040 AT	(423550.00, 4527100.00, 1294.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.29982 AT	(424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.29756 AT	(424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.29471 AT	(424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.29294 AT	(424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.28904 AT	(423585.50, 4527067.50, 1295.96, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.28695 AT	(423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.28527 AT	(424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	

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27H1      1ST HIGHEST VALUE IS       0.43301 AT (  423841.00,  4527079.80,  1298.99,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.43166 AT (  423840.90,  4527056.60,  1299.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.43108 AT (  423850.00,  4527050.00,  1298.99,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.42836 AT (  423850.00,  4527100.00,  1299.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.42492 AT (  423841.20,  4527102.90,  1298.97,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.41925 AT (  423863.80,  4527102.50,  1299.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.41414 AT (  423900.00,  4527150.00,  1299.97,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.41115 AT (  423840.70,  4527033.40,  1299.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.40586 AT (  423886.80,  4527140.70,  1299.36,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.40548 AT (  423886.60,  4527121.40,  1299.87,  2867.37,    0.00)  DC

30H1      1ST HIGHEST VALUE IS       0.65504 AT (  423792.10,  4527180.50,  1297.01,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.65262 AT (  424231.00,  4526870.60,  1306.99,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.64989 AT (  423815.90,  4527180.20,  1297.21,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.64562 AT (  423800.00,  4527200.00,  1297.31,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.64107 AT (  423792.50,  4527200.10,  1296.99,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.63634 AT (  423863.50,  4527179.70,  1298.36,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.63535 AT (  423770.10,  4527220.00,  1296.87,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.63003 AT (  424266.70,  4526879.20,  1307.75,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.62799 AT (  423792.90,  4527219.80,  1296.88,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.61887 AT (  423850.00,  4527200.00,  1297.98,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   4TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                  ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

30H2      1ST HIGHEST VALUE IS       0.65436 AT (  424231.00,  4526870.60,  1306.99,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.65344 AT (  423815.90,  4527180.20,  1297.21,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.64946 AT (  423792.10,  4527180.50,  1297.01,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.64572 AT (  423800.00,  4527200.00,  1297.31,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.63912 AT (  423792.50,  4527200.10,  1296.99,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.63351 AT (  423770.10,  4527220.00,  1296.87,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.63304 AT (  424258.70,  4526856.90,  1307.60,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.63218 AT (  423863.50,  4527179.70,  1298.36,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.62502 AT (  423792.90,  4527219.80,  1296.88,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.62191 AT (  423839.70,  4527180.00,  1297.98,  2867.37,    0.00)  DC

33H1      1ST HIGHEST VALUE IS       0.45539 AT (  423900.00,  4526050.00,  1306.00,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.45392 AT (  424950.00,  4526450.00,  1324.14,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.45383 AT (  423900.00,  4526100.00,  1306.02,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.45353 AT (  424900.00,  4526450.00,  1323.39,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.45119 AT (  424850.00,  4526450.00,  1322.76,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.44833 AT (  423850.00,  4526050.00,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.44626 AT (  424800.00,  4526450.00,  1322.66,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.43997 AT (  423850.00,  4526000.00,  1306.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.43800 AT (  423850.00,  4526100.00,  1305.14,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.43722 AT (  424750.00,  4526450.00,  1321.29,  2867.37,    0.00)  DC

BOILER4   1ST HIGHEST VALUE IS       2.27544 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.17405 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.15885 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.07295 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.98495 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.94061 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.91344 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.88686 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.86925 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.79639 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC

BOILER5   1ST HIGHEST VALUE IS       1.95314 AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.79507 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.68171 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.64980 AT (  424002.00,  4526859.00,  1303.58,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.60344 AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.60274 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.60261 AT (  424022.10,  4526855.30,  1304.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.57456 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.54172 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.52973 AT (  424019.10,  4526561.40,  1306.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
BOILER8	1ST HIGHEST VALUE IS	2.96704	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	2.88413	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	2.55183	AT (424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	2.54551	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	2.53477	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	2.41459	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	2.40580	AT (423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	2.38526	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	2.33381	AT (424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	2.32980	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
BOILER9	1ST HIGHEST VALUE IS	3.57865	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.37485	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.30183	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.27011	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.25853	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.25088	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.18538	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	3.16225	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	3.15649	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	3.14976	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
BOILER10	1ST HIGHEST VALUE IS	2.96714	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	2.95053	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	2.87100	AT (424020.60, 4526708.40, 1305.02, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	2.76683	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	2.75618	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	2.74032	AT (424000.20, 4526684.90, 1304.50, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	2.66038	AT (424020.30, 4526683.90, 1305.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	2.55615	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	2.51104	AT (424000.40, 4526709.70, 1304.25, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	2.14836	AT (424020.80, 4526732.80, 1305.09, 2867.37, 0.00)	DC	
BOILER11	1ST HIGHEST VALUE IS	1.44603	AT (423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.39842	AT (424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.39463	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	1.39400	AT (424000.00, 4526500.00, 1306.05, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	1.36364	AT (423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	1.35829	AT (423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	1.35455	AT (424018.60, 4526512.50, 1306.56, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	1.34626	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	1.32844	AT (424018.80, 4526537.00, 1306.25, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	1.32130	AT (423933.50, 4526984.90, 1300.98, 2867.37, 0.00)	DC	

*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H2	1ST HIGHEST VALUE IS	0.50763	AT (424218.60, 4526745.80, 1308.03, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.50678	AT (424210.60, 4526723.60, 1308.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.48903	AT (424165.70, 4526689.40, 1308.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.45320	AT (424200.00, 4526750.00, 1308.90, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.45112	AT (424214.70, 4526825.30, 1307.63, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.44036	AT (424157.60, 4526666.70, 1308.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.43477	AT (424226.70, 4526768.00, 1308.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.42603	AT (424149.40, 4526644.00, 1308.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.42177	AT (424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.42035	AT (424206.50, 4526802.70, 1307.25, 2867.37, 0.00)	DC	
68H3	1ST HIGHEST VALUE IS	0.76198	AT (424200.00, 4526700.00, 1308.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.76075	AT (424278.70, 4526656.80, 1308.99, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.74863	AT (424301.70, 4526656.70, 1310.60, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.74762	AT (424250.00, 4526650.00, 1309.85, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.74600	AT (424300.00, 4526650.00, 1311.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.73131	AT (424202.60, 4526701.30, 1308.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.72024	AT (424232.60, 4526656.80, 1309.65, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.71443	AT (424255.60, 4526656.80, 1310.07, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.70827	AT (424173.90, 4526712.00, 1308.32, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.70054	AT (424324.70, 4526656.70, 1311.00, 2867.37, 0.00)	DC	

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68H4      1ST HIGHEST VALUE IS       0.78123 AT (  424190.20,  4526757.30,  1307.52,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.77076 AT (  424200.00,  4526750.00,  1308.90,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.76244 AT (  424173.90,  4526712.00,  1308.32,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.74964 AT (  424210.60,  4526723.60,  1308.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.74800 AT (  424198.40,  4526780.00,  1307.25,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.73632 AT (  424157.60,  4526666.70,  1308.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.72717 AT (  424226.70,  4526768.00,  1308.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.72119 AT (  424165.70,  4526689.40,  1308.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.71217 AT (  424218.60,  4526745.80,  1308.03,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.71144 AT (  424149.40,  4526644.00,  1308.00,  2867.37,    0.00)  DC

68H5      1ST HIGHEST VALUE IS       0.72135 AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.70356 AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.62340 AT (  424149.40,  4526644.00,  1308.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.61492 AT (  424022.10,  4526855.30,  1304.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.61138 AT (  424002.00,  4526859.00,  1303.58,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.58229 AT (  424133.10,  4526598.70,  1307.86,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.57023 AT (  424157.60,  4526666.70,  1308.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.56040 AT (  424141.30,  4526621.40,  1308.11,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.55923 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.55711 AT (  424165.70,  4526689.40,  1308.00,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   4TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF SO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

68H6      1ST HIGHEST VALUE IS       0.71689 AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.68428 AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.65479 AT (  424000.90,  4526759.50,  1304.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.60587 AT (  424021.10,  4526757.30,  1305.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.55760 AT (  424021.60,  4526806.30,  1304.09,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.54709 AT (  424000.70,  4526734.60,  1304.28,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.53631 AT (  424001.40,  4526809.20,  1303.38,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.51634 AT (  424020.80,  4526732.80,  1305.09,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.49600 AT (  424105.60,  4527054.50,  1304.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.47101 AT (  424000.40,  4526709.70,  1304.25,  2867.37,    0.00)  DC

68H7      1ST HIGHEST VALUE IS       0.71694 AT (  424214.70,  4526825.30,  1307.63,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.69341 AT (  424222.80,  4526848.00,  1307.57,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.69019 AT (  424258.70,  4526856.90,  1307.60,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.68438 AT (  424250.00,  4526850.00,  1307.99,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.66093 AT (  424250.70,  4526834.70,  1307.89,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.65480 AT (  424239.20,  4526893.30,  1307.25,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.64807 AT (  424242.70,  4526812.50,  1308.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.64068 AT (  424206.50,  4526802.70,  1307.25,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.63469 AT (  424231.00,  4526870.60,  1306.99,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.63217 AT (  424250.00,  4526900.00,  1307.92,  2867.37,    0.00)  DC

68H10     1ST HIGHEST VALUE IS       0.06399 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.06290 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.06150 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.06108 AT (  424000.00,  4526600.00,  1304.70,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.05999 AT (  424019.30,  4526585.90,  1306.09,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.05892 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.05803 AT (  424000.00,  4526500.00,  1306.05,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.05755 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.05754 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.05750 AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC

68H11     1ST HIGHEST VALUE IS       0.05469 AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       0.05460 AT (  423998.60,  4526535.60,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       0.05452 AT (  424000.00,  4526550.00,  1305.81,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       0.05342 AT (  423998.90,  4526560.50,  1305.38,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       0.05309 AT (  423999.10,  4526585.40,  1305.28,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       0.05272 AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       0.05271 AT (  423998.40,  4526510.70,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.05255 AT (  423997.60,  4526436.10,  1307.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.05166 AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.05129 AT (  423998.10,  4526485.90,  1306.00,  2867.37,    0.00)  DC
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*** THE SUMMARY OF MAXIMUM 4TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF SO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
68H12	1ST HIGHEST VALUE IS	0.06290 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.06091 AT	(424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.05937 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.05908 AT	(424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.05786 AT	(423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.05720 AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.05598 AT	(423750.00, 4526300.00, 1303.46, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.05595 AT	(423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.05502 AT	(423800.00, 4526300.00, 1304.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.05463 AT	(423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC	
68H13	1ST HIGHEST VALUE IS	0.06998 AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.06795 AT	(423750.00, 4526300.00, 1303.46, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.06522 AT	(423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.06279 AT	(423750.00, 4526277.60, 1303.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.06054 AT	(423731.50, 4526277.70, 1303.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.05370 AT	(423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.05340 AT	(423998.40, 4526510.70, 1306.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.05298 AT	(423998.60, 4526535.60, 1306.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.05185 AT	(423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.05167 AT	(423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC	
FLARES	1ST HIGHEST VALUE IS	0.01164 AT	(422750.00, 4526100.00, 1292.76, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.01154 AT	(422950.00, 4525750.00, 1294.52, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.01153 AT	(422750.00, 4526050.00, 1292.16, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.01149 AT	(423150.00, 4525850.00, 1296.19, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.01148 AT	(423000.00, 4525600.00, 1295.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.01147 AT	(422800.00, 4526100.00, 1293.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.01147 AT	(423050.00, 4525700.00, 1294.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.01139 AT	(422550.00, 4525900.00, 1293.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.01138 AT	(422700.00, 4526050.00, 1293.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.01136 AT	(422600.00, 4526000.00, 1292.91, 2867.37, 0.00)	DC	
FLAREN	1ST HIGHEST VALUE IS	0.01154 AT	(422750.00, 4526100.00, 1292.76, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.01144 AT	(422950.00, 4525750.00, 1294.52, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.01144 AT	(422750.00, 4526050.00, 1292.16, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.01139 AT	(423150.00, 4525850.00, 1296.19, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.01138 AT	(423000.00, 4525600.00, 1295.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.01137 AT	(422800.00, 4526100.00, 1293.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.01137 AT	(423050.00, 4525700.00, 1294.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.01129 AT	(422550.00, 4525900.00, 1293.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.01128 AT	(422700.00, 4526050.00, 1293.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.01127 AT	(422600.00, 4526000.00, 1292.91, 2867.37, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 10 Warning Message(s)
A Total of 802 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 9 Calm Hours Identified

A Total of 793 Missing Hours Identified (9.05 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

```
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:          9H2
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         12H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          4H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          9H1
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CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLAREN
CN W305     233 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
CN W305     252 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
CN W305     253 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
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Appendix I
Full Impact Source Parameters and Emissions Information

Full Impact Point Sources in AERMOD

Source ID	Source Description	Easting (X)	Northing (Y)	Base Elevation	Stack Height	Temperature	Exit Velocity	Stack Diameter	NOX
		(m)	(m)	(m)	(m)	(K)	(m/s)	(m)	(g/s)
TURBINE	Bountiful City Light and Power: Power Plant	425421.2	4526575.0	1330.0	15.5	745.9	52.97	1.07	0.7005
BOUGT2	Bountiful City Light and Power: Power Plant	425412.0	4526560.0	1330.0	15.2	619.3	13.23	0.88	0.9450
BOUGT3	Bountiful City Light and Power: Power Plant	425412.0	4526554.5	1330.0	15.2	620.4	13.23	0.88	0.9450
ENGINE8	Bountiful City Light and Power: Power Plant	425420.4	4526530.5	1330.0	16.8	718.2	37.43	0.99	2.0160
BOILER1	PacifiCorp Energy: Gadsby Power Plant	421680.6	4513524.6	1289.0	76.2	398.7	17.68	3.35	22.5535
BOILER2	PacifiCorp Energy: Gadsby Power Plant	421679.8	4513499.8	1289.0	76.2	390.9	19.20	3.35	25.7034
BOILER3	PacifiCorp Energy: Gadsby Power Plant	421679.6	4513468.2	1289.0	76.2	398.7	21.03	3.35	17.8916
TURB1	PacifiCorp Energy: Gadsby Power Plant	421210.8	4513439.4	1290.0	24.7	715.4	26.55	3.66	0.9324
TURB2	PacifiCorp Energy: Gadsby Power Plant	421210.6	4513412.6	1290.0	24.7	715.4	26.55	3.66	0.9324
TURB3	PacifiCorp Energy: Gadsby Power Plant	421210.1	4513385.3	1290.0	24.7	715.4	26.55	3.66	0.9324
TE101	Tesoro Refinery	423596.9	4516067.5	1292.0	30.5	478.0	4.80	2.40	1.5195
TE102	Tesoro Refinery	423603.9	4516171.5	1292.0	30.5	478.0	10.50	1.50	2.1659
TE103	Tesoro Refinery	423603.9	4516119.5	1292.0	12.2	755.0	7.00	0.60	0.1121
TE104	Tesoro Refinery	423509.9	4516299.5	1292.0	60.3	672.0	15.50	2.90	11.9282
TE105	Tesoro Refinery	423740.9	4516216.5	1299.0	15.2	533.0	14.00	1.32	2.3259
TE106	Tesoro Refinery	423750.9	4516221.5	1299.0	15.2	533.0	14.00	1.32	2.0286
TE107	Tesoro Refinery	423572.9	4516150.5	1292.0	14.6	644.0	6.30	1.32	0.7711
TE108	Tesoro Refinery	423693.9	4516194.5	1295.0	48.0	1090.0	15.20	0.60	0.0227
CH201	Chevron Products Co - Salt Lake Refinery	422246.9	4519542.5	1286.0	48.8	433.2	6.51	1.96	0.7300
CH202	Chevron Products Co - Salt Lake Refinery	422247.9	4519525.5	1286.0	48.8	433.2	0.81	1.96	0.3700
CH203	Chevron Products Co - Salt Lake Refinery	422246.9	4519654.5	1286.0	53.9	613.7	8.63	2.42	0.8800
CH204	Chevron Products Co - Salt Lake Refinery	422248.9	4519910.5	1286.0	48.8	755.4	6.10	1.35	0.3100
CH205	Chevron Products Co - Salt Lake Refinery	422248.9	4519924.5	1286.0	48.3	583.2	2.61	1.52	0.2700
CH206	Chevron Products Co - Salt Lake Refinery	422249.9	4519946.5	1286.0	48.8	488.7	19.04	1.83	9.2100
CH207	Chevron Products Co - Salt Lake Refinery	422241.9	4519513.5	1286.0	15.2	608.0	21.30	0.91	0.4900
CH208	Chevron Products Co - Salt Lake Refinery	421941.9	4519527.5	1286.0	11.4	755.4	6.08	1.05	0.3700
CH209	Chevron Products Co - Salt Lake Refinery	421941.9	4519519.5	1286.0	13.3	999.8	4.87	0.91	0.5400
CH210	Chevron Products Co - Salt Lake Refinery	421941.9	4519512.5	1286.0	13.3	949.8	4.76	0.76	0.2200
CH211	Chevron Products Co - Salt Lake Refinery	422062.9	4519660.5	1286.0	35.1	888.7	9.55	1.24	0.0800
CH212	Chevron Products Co - Salt Lake Refinery	422075.9	4519717.5	1286.0	52.0	494.3	3.47	2.29	0.6900
CH213	Chevron Products Co - Salt Lake Refinery	422232.9	4519700.5	1286.0	33.5	744.3	4.68	1.71	0.3500
CH214	Chevron Products Co - Salt Lake Refinery	422247.9	4519694.5	1286.0	50.3	900.0	19.79	0.67	5.9000
CH215	Chevron Products Co - Salt Lake Refinery	422177.9	4519968.5	1286.0	48.8	1273.0	20.00	0.76	1.8900
CH216	Chevron Products Co - Salt Lake Refinery	421797.9	4519482.5	1286.0	61.0	1273.0	20.00	0.61	2.2600
CH217	Chevron Products Co - Salt Lake Refinery	421993.9	4519696.5	1286.0	45.7	1273.0	20.00	0.76	1.8900
FJ301	Big West Oil, LLC: Big West Oil, LLC Refinery	422537.9	4521256.5	1297.0	24.4	722.0	12.47	0.91	0.6325
FJ304	Big West Oil, LLC: Big West Oil, LLC Refinery	422549.9	4521233.5	1295.0	17.4	644.0	4.34	1.07	0.1840
FJ305	Big West Oil, LLC: Big West Oil, LLC Refinery	422533.9	4521303.5	1293.0	15.2	700.0	4.52	1.01	0.1575
FJ306	Big West Oil, LLC: Big West Oil, LLC Refinery	422540.9	4521387.5	1293.0	9.9	755.0	9.33	0.52	0.0794
FJ307	Big West Oil, LLC: Big West Oil, LLC Refinery	422546.9	4521336.5	1294.0	22.9	644.0	6.06	1.07	0.2507
FJ308	Big West Oil, LLC: Big West Oil, LLC Refinery	422530.9	4521336.5	1293.0	34.0	533.0	3.24	1.98	0.3427
FJ309	Big West Oil, LLC: Big West Oil, LLC Refinery	422550.9	4521311.5	1294.0	10.0	561.0	23.18	0.98	0.7509
FJ310	Big West Oil, LLC: Big West Oil, LLC Refinery	422548.9	4521305.5	1294.0	11.2	589.0	17.39	1.07	0.2507
FJ311	Big West Oil, LLC: Big West Oil, LLC Refinery	422553.9	4521043.5	1295.0	14.0	683.0	7.49	1.52	0.5922
FJ313	Big West Oil, LLC: Big West Oil, LLC Refinery	422481.9	4521033.5	1293.0	12.2	811.0	5.74	1.07	0.1840
FJ314	Big West Oil, LLC: Big West Oil, LLC Refinery	422545.9	4521084.5	1294.0	9.1	616.0	13.60	1.07	0.0126
FJ315	Big West Oil, LLC: Big West Oil, LLC Refinery	422535.9	4521084.5	1295.0	11.6	616.0	8.25	1.22	0.4611
FJ316	Big West Oil, LLC: Big West Oil, LLC Refinery	422535.9	4521052.5	1294.0	73.2	561.0	49.03	0.91	4.9643
FJ317	Big West Oil, LLC: Big West Oil, LLC Refinery	422480.9	4521115.5	1293.0	18.6	728.0	6.03	0.61	0.0126
FJ318	Big West Oil, LLC: Big West Oil, LLC Refinery	422468.9	4521115.5	1292.0	18.9	728.0	2.04	0.61	0.0126
FJ319	Big West Oil, LLC: Big West Oil, LLC Refinery	422485.9	4521115.5	1293.0	20.7	728.0	3.92	0.76	0.0391
FJ320	Big West Oil, LLC: Big West Oil, LLC Refinery	422468.9	4521104.5	1293.0	29.6	1005.0	53.01	0.25	0.0126
FJ321	Big West Oil, LLC: Big West Oil, LLC Refinery	422241.9	4520926.5	1290.0	25.3	811.0	1.50	0.24	1.5409
FJ322	Big West Oil, LLC: Big West Oil, LLC Refinery	422280.9	4521275.5	1291.0	36.6	811.0	0.90	0.46	1.5409
SE401	Silver Eagle Refining - Woods Cross Inc.: Petrol	423303.9	4524440.5	1299.0	14.5	1273.0	20.00	0.76	0.0176
SE402	Silver Eagle Refining - Woods Cross Inc.: Petrol	423213.9	4524414.5	1299.0	13.7	505.0	7.45	1.22	0.3011
SE403	Silver Eagle Refining - Woods Cross Inc.: Petrol	423253.9	4524401.5	1299.0	13.7	477.0	19.70	1.07	0.3011
SE404	Silver Eagle Refining - Woods Cross Inc.: Petrol	423255.9	4524410.5	1299.0	21.3	866.0	24.58	0.61	1.4338
SE405	Silver Eagle Refining - Woods Cross Inc.: Petrol	423259.9	4524414.5	1299.0	9.1	984.0	12.27	0.46	0.1411
SE406	Silver Eagle Refining - Woods Cross Inc.: Petrol	423303.9	4524440.5	1299.0	7.6	491.0	25.00	0.50	3.8946

Appendix J
Full Impact Analysis AERMOD Results

```
                                           ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for   109 Source(s),
  for Total of    2 Urban Area(s):
  Urban ID = DAVIS_CO ;  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m
  Urban ID = SLCOUNTY ;  Urban Population =   1029655.0 ;  Urban Roughness Length =  1.000 m

**Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
           with an Equilibrium NO2/NOx Ratio of  0.900
           and with a Default In-stack Ratio of  0.250
        7. Urban Roughness Length of 1.0 Meter Used.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR

**This Run Includes:    110 Source(s);       9 Source Group(s); and   10025 Receptor(s)

**This Run Includes BACKGRND Concentrations Varying by HOURLY   for      2 Source Group(s);
     Missing HOURLY BACKGRND Concentrations are Filled Based on ANNUAL   BACKGRND Values

**The Model Assumes A Pollutant Type of:  NO2

**Note that special processing requirements apply for the 1-hour NO2 NAAQS - check available guidance.
  Model will process user-specified ranks of daily maximum 1-hour values averaged across the number of years modeled.
  For annual NO2 NAAQS modeling, the multi-year maximum of PERIOD values can be simulated using the MULTYEAR keyword.
  Multi-year PERIOD and 1-hour values should only be done in a single model run using the MULTYEAR option with a
  single multi-year meteorological data file using STARTEND keyword.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs External File(s) of Maximum Daily 1-hr Values by Year (MXDYBYYR Keyword)
         Model Outputs External File(s) of Contributions to Maximum Daily Values Paired in Time & Space (MAXDCONT Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                               ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =    193.5 MB of RAM.

**Input Runstream File:          Holly_FI11_NO2_bkgd_2006_NO2.DTA
**Output Print File:             Holly_FI11_NO2_bkgd_2006_NO2.LST

**File for Summary of Results:   C:\beast\Holly\Holly_FI11_NO2_bkgd_2006_NO2.SUM
```



```
                                           *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                            (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.
```

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2006.SFC Met Version: 11059
Profile file: SY2006.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2006 Year: 2006

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
06	01	01	1	01	-11.8	0.241	-9.000	-9.000	-999.	273.	91.0	0.09	0.28	1.00	3.20	185.	10.0	276.0	10.0
06	01	01	1	02	-11.9	0.244	-9.000	-9.000	-999.	277.	93.0	0.01	0.28	1.00	4.60	248.	10.0	276.5	10.0
06	01	01	1	03	-24.7	0.504	-9.000	-9.000	-999.	824.	399.2	0.01	0.28	1.00	9.00	269.	10.0	277.0	10.0
06	01	01	1	04	-40.4	0.427	-9.000	-9.000	-999.	646.	146.0	0.02	0.28	1.00	7.00	290.	10.0	276.9	10.0
06	01	01	1	05	-15.9	0.324	-9.000	-9.000	-999.	430.	164.1	0.04	0.28	1.00	4.80	301.	10.0	276.4	10.0
06	01	01	1	06	-18.0	0.366	-9.000	-9.000	-999.	508.	209.4	0.02	0.28	1.00	5.90	298.	10.0	276.4	10.0
06	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.02	0.28	1.00	6.30	289.	10.0	275.9	10.0
06	01	01	1	08	-34.7	0.381	-9.000	-9.000	-999.	540.	122.8	0.02	0.28	1.00	6.30	282.	10.0	275.4	10.0
06	01	01	1	09	-21.0	0.324	-9.000	-9.000	-999.	425.	124.8	0.01	0.28	0.51	6.00	268.	10.0	275.1	10.0
06	01	01	1	10	10.5	0.195	0.315	0.005	92.	206.	-54.3	0.01	0.28	0.30	3.20	249.	10.0	276.1	10.0
06	01	01	1	11	27.6	0.203	0.649	0.005	307.	211.	-23.6	0.01	0.28	0.22	3.20	248.	10.0	277.5	10.0
06	01	01	1	12	38.6	0.170	0.825	0.005	450.	161.	-9.8	0.01	0.28	0.19	2.50	249.	10.0	278.4	10.0
06	01	01	1	13	42.5	0.283	0.942	0.005	608.	346.	-41.1	0.09	0.28	0.19	3.00	207.	10.0	279.2	10.0
06	01	01	1	14	32.3	0.382	0.913	0.005	729.	543.	-133.3	0.12	0.28	0.19	4.00	168.	10.0	279.9	10.0
06	01	01	1	15	4.8	0.338	0.487	0.005	746.	452.	-623.1	0.07	0.28	0.22	4.20	148.	10.0	279.8	10.0
06	01	01	1	16	0.4	0.444	0.218	0.005	747.	681.	-8888.0	0.12	0.28	0.29	4.90	155.	10.0	279.4	10.0
06	01	01	1	17	-17.9	0.410	-9.000	-9.000	-999.	605.	298.0	0.12	0.28	0.49	4.70	161.	10.0	278.4	10.0
06	01	01	1	18	-25.2	0.339	-9.000	-9.000	-999.	457.	119.9	0.12	0.28	1.00	4.10	163.	10.0	277.4	10.0
06	01	01	1	19	-21.1	0.284	-9.000	-9.000	-999.	349.	83.7	0.07	0.28	1.00	4.00	149.	10.0	276.6	10.0
06	01	01	1	20	-9.3	0.189	-9.000	-9.000	-999.	192.	55.7	0.07	0.28	1.00	2.80	124.	10.0	276.0	10.0
06	01	01	1	21	-18.7	0.381	-9.000	-9.000	-999.	540.	227.2	0.07	0.28	1.00	5.00	140.	10.0	276.9	10.0
06	01	01	1	22	-12.9	0.262	-9.000	-9.000	-999.	316.	108.2	0.12	0.28	1.00	3.20	165.	10.0	277.1	10.0
06	01	01	1	23	-14.5	0.296	-9.000	-9.000	-999.	371.	138.0	0.07	0.28	1.00	4.00	134.	10.0	277.2	10.0
06	01	01	1	24	-18.2	0.372	-9.000	-9.000	-999.	522.	218.0	0.07	0.28	1.00	4.90	133.	10.0	277.8	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
06	01	01	01	10.0	1	185.	3.20	276.1	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
HOLLY	1ST HIGHEST VALUE IS	99.50253	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	92.62387	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	89.81328	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	87.22499	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	84.61885	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	82.87268	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	80.80679	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	75.84344	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	70.72668	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	67.70910	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
BTFLPWR	1ST HIGHEST VALUE IS	54.47148	AT (426400.00, 4525000.00, 1388.52, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	53.85143	AT (427000.00, 4526000.00, 1397.29, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	52.27401	AT (427000.00, 4525600.00, 1404.54, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	51.89610	AT (426600.00, 4525000.00, 1398.46, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	51.63784	AT (426600.00, 4525200.00, 1392.02, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	50.36027	AT (426600.00, 4524800.00, 1408.35, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	48.53949	AT (427200.00, 4526600.00, 1399.61, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	47.21975	AT (427200.00, 4526400.00, 1404.52, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	46.77043	AT (427000.00, 4526400.00, 1388.10, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	43.93576	AT (426400.00, 4524600.00, 1402.43, 2867.37, 0.00)	DC	
GADSBY	1ST HIGHEST VALUE IS	41.02352	AT (418000.00, 4512000.00, 1290.05, 1290.05, 0.00)	DC	
	2ND HIGHEST VALUE IS	40.87584	AT (420000.00, 4510000.00, 1291.00, 1291.00, 0.00)	DC	

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          3RD HIGHEST VALUE IS      40.42601 AT (  418000.00,  4514000.00,  1286.52,  1286.52,    0.00)  DC
          4TH HIGHEST VALUE IS      38.83163 AT (  418000.00,  4513000.00,  1288.00,  1288.00,    0.00)  DC
          5TH HIGHEST VALUE IS      38.62269 AT (  419000.00,  4514000.00,  1287.72,  1287.72,    0.00)  DC
          6TH HIGHEST VALUE IS      38.33722 AT (  421000.00,  4511000.00,  1288.42,  1288.42,    0.00)  DC
          7TH HIGHEST VALUE IS      37.68751 AT (  420000.00,  4512000.00,  1293.92,  1293.92,    0.00)  DC
          8TH HIGHEST VALUE IS      37.51249 AT (  417000.00,  4514000.00,  1285.44,  1285.44,    0.00)  DC
          9TH HIGHEST VALUE IS      36.57601 AT (  419000.00,  4512000.00,  1289.90,  1289.90,    0.00)  DC
         10TH HIGHEST VALUE IS      36.03424 AT (  417000.00,  4513000.00,  1289.07,  1295.00,    0.00)  DC

TESORO    1ST HIGHEST VALUE IS      50.08990 AT (  424000.00,  4516500.00,  1348.58,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      42.55964 AT (  424000.00,  4516000.00,  1305.59,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      38.75486 AT (  423500.00,  4516000.00,  1289.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      36.67193 AT (  424500.00,  4516000.00,  1482.12,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      30.35358 AT (  424000.00,  4517000.00,  1475.67,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      29.51312 AT (  424500.00,  4517000.00,  1651.83,  2725.66,    0.00)  DC
          7TH HIGHEST VALUE IS      29.06486 AT (  423500.00,  4516500.00,  1293.01,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      27.98893 AT (  424000.00,  4517500.00,  1590.64,  2725.66,    0.00)  DC
          9TH HIGHEST VALUE IS      27.72451 AT (  425000.00,  4515000.00,  1398.35,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS      27.56134 AT (  423500.00,  4517500.00,  1412.73,  2867.37,    0.00)  DC

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Short Term Averages            ***        05/01/12
                                   *** 4-years Met Data - Syracuse 2006-2009                                ***        15:54:37
                                                                                                                       PAGE   5
 **MODELOPTs:  NonDFAULT CONC                                          ELEV
                                                                              PVMRM

                     *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                  ** CONC OF NO2      IN MICROGRAMS/M**3                        **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

CHEVRON   1ST HIGHEST VALUE IS      41.96856 AT (  423500.00,  4519500.00,  1558.04,  2764.40,    0.00)  DC
          2ND HIGHEST VALUE IS      41.17303 AT (  421000.00,  4518000.00,  1286.01,  2764.40,    0.00)  DC
          3RD HIGHEST VALUE IS      38.30789 AT (  421500.00,  4518500.00,  1286.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      38.05129 AT (  421000.00,  4517500.00,  1284.00,  2764.39,    0.00)  DC
          5TH HIGHEST VALUE IS      37.76153 AT (  420500.00,  4518000.00,  1285.72,  2725.66,    0.00)  DC
          6TH HIGHEST VALUE IS      37.74154 AT (  420000.00,  4519000.00,  1285.01,  2725.66,    0.00)  DC
          7TH HIGHEST VALUE IS      37.67278 AT (  419500.00,  4519000.00,  1285.73,  1285.73,    0.00)  DC
          8TH HIGHEST VALUE IS      36.82969 AT (  420500.00,  4517500.00,  1284.98,  2725.66,    0.00)  DC
          9TH HIGHEST VALUE IS      36.54712 AT (  420000.00,  4517500.00,  1283.17,  1893.29,    0.00)  DC
         10TH HIGHEST VALUE IS      36.53631 AT (  424000.00,  4519500.00,  1590.05,  2807.02,    0.00)  DC

BIGWEST   1ST HIGHEST VALUE IS      77.00242 AT (  422600.00,  4521000.00,  1297.53,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      65.97170 AT (  422600.00,  4521200.00,  1297.70,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      56.86200 AT (  422400.00,  4521000.00,  1292.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      55.29760 AT (  421500.00,  4519500.00,  1285.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      55.12176 AT (  421500.00,  4520000.00,  1286.96,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      54.71140 AT (  422400.00,  4521200.00,  1291.48,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS      51.94092 AT (  422600.00,  4521400.00,  1297.07,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      51.66945 AT (  422000.00,  4520000.00,  1286.43,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS      51.51892 AT (  422000.00,  4519500.00,  1286.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS      48.39565 AT (  421000.00,  4519500.00,  1284.95,  2820.07,    0.00)  DC

SI_EAGLE  1ST HIGHEST VALUE IS      99.00668 AT (  423400.00,  4524400.00,  1305.77,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      65.52903 AT (  423200.00,  4524600.00,  1303.27,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      64.41267 AT (  423400.00,  4524600.00,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      64.21751 AT (  423200.00,  4524400.00,  1303.02,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      56.64017 AT (  423400.00,  4524200.00,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      54.73776 AT (  423600.00,  4524600.00,  1308.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS      53.24177 AT (  423600.00,  4524400.00,  1308.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      49.29091 AT (  423600.00,  4524200.00,  1308.16,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS      47.70307 AT (  423200.00,  4524200.00,  1303.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS      46.31677 AT (  423400.00,  4524800.00,  1305.00,  2867.37,    0.00)  DC

BACKGRND  1ST HIGHEST VALUE IS     110.92311 AT (  425503.00,  4528150.00,  1309.00,  2912.70,    0.00)  DC
          2ND HIGHEST VALUE IS     110.92311 AT (  422934.80,  4526766.30,  1291.14,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS     110.92311 AT (  422934.70,  4526749.30,  1291.06,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS     110.92311 AT (  422934.60,  4526732.20,  1291.29,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS     110.92311 AT (  422934.40,  4526715.20,  1291.56,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS     110.92311 AT (  422958.90,  4526715.00,  1292.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS     110.92311 AT (  422983.50,  4526714.80,  1292.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS     110.92311 AT (  423008.00,  4526714.60,  1292.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS     110.92311 AT (  423032.50,  4526714.40,  1292.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS     110.92311 AT (  423057.10,  4526714.20,  1292.00,  2867.37,    0.00)  DC

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Short Term Averages            ***        05/01/12
                                   *** 4-years Met Data - Syracuse 2006-2009                                ***        15:54:37
                                                                                                                       PAGE   6
 **MODELOPTs:  NonDFAULT CONC                                          ELEV
                                                                              PVMRM

                     *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                  ** CONC OF NO2      IN MICROGRAMS/M**3                        **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

ALL       1ST HIGHEST VALUE IS     155.72164 AT (  421500.00,  4518000.00,  1284.00,  2867.37,    0.00)  DC
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         2ND HIGHEST VALUE IS     154.66502 AT (  421500.00,  4517500.00,  1285.00,  2807.02,    0.00)  DC
         3RD HIGHEST VALUE IS     151.52302 AT (  421500.00,  4518500.00,  1286.00,  2867.37,    0.00)  DC
         4TH HIGHEST VALUE IS     149.93502 AT (  421000.00,  4517000.00,  1285.26,  2725.66,    0.00)  DC
         5TH HIGHEST VALUE IS     148.38487 AT (  421500.00,  4517000.00,  1284.03,  2795.96,    0.00)  DC
         6TH HIGHEST VALUE IS     146.52637 AT (  421000.00,  4516500.00,  1286.03,  2725.66,    0.00)  DC
         7TH HIGHEST VALUE IS     146.43532 AT (  421000.00,  4516000.00,  1286.00,  2725.66,    0.00)  DC
         8TH HIGHEST VALUE IS     145.57787 AT (  421000.00,  4517500.00,  1284.00,  2764.39,    0.00)  DC
         9TH HIGHEST VALUE IS     144.65135 AT (  422600.00,  4522400.00,  1293.03,  2867.37,    0.00)  DC
        10TH HIGHEST VALUE IS     143.16143 AT (  421500.00,  4516500.00,  1286.00,  2764.40,    0.00)  DC


*** RECEPTOR TYPES:  GC = GRIDCART
                     GP = GRIDPOLR
                     DC = DISCCART
                     DP = DISCPOLR

*** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Short Term Averages            ***        05/01/12
                                  *** 4-years Met Data - Syracuse 2006-2009                                ***        15:54:37
                                                                                                                      PAGE   7
**MODELOPTs:  NonDFAULT CONC                                                    ELEV
                                                                                          PVMRM

*** Message Summary : AERMOD Model Execution ***

 --------- Summary of Total Messages --------

A Total of            0 Fatal Error Message(s)
A Total of          308 Warning Message(s)
A Total of          525 Informational Message(s)

A Total of         8760 Hours Were Processed

A Total of            0 Calm Hours Identified

A Total of          525 Missing Hours Identified (  5.99 Percent)


   ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


   ********   WARNING MESSAGES   ********
SO W320    1673  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
SO W320    2705  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           4H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H2
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          12H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE102
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE108
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ307
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ308
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ316
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ319
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ320
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLAREN
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE105
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE106
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ301
CN W305      13 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
CN W305      21 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE104
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CN W305      64 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ322
CN W305      72 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
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                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for   109 Source(s),
  for Total of    2 Urban Area(s):
  Urban ID = DAVIS_CO ;  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m
  Urban ID = SLCOUNTY ;  Urban Population =   1029655.0 ;  Urban Roughness Length =  1.000 m

**Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
           with an Equilibrium NO2/NOx Ratio of  0.900
           and with a Default In-stack Ratio of  0.250
        7. Urban Roughness Length of 1.0 Meter Used.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR

**This Run Includes:    110 Source(s);       9 Source Group(s); and   10025 Receptor(s)

**This Run Includes BACKGRND Concentrations Varying by HOURLY   for      2 Source Group(s);
     Missing HOURLY BACKGRND Concentrations are Filled Based on ANNUAL   BACKGRND Values

**The Model Assumes A Pollutant Type of:  NO2

**Note that special processing requirements apply for the 1-hour NO2 NAAQS - check available guidance.
  Model will process user-specified ranks of daily maximum 1-hour values averaged across the number of years modeled.
  For annual NO2 NAAQS modeling, the multi-year maximum of PERIOD values can be simulated using the MULTYEAR keyword.
  Multi-year PERIOD and 1-hour values should only be done in a single model run using the MULTYEAR option with a
  single multi-year meteorological data file using STARTEND keyword.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs External File(s) of Maximum Daily 1-hr Values by Year (MXDYBYYR Keyword)
         Model Outputs External File(s) of Contributions to Maximum Daily Values Paired in Time & Space (MAXDCONT Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                  ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =    193.5 MB of RAM.

**Input Runstream File:          Holly_FI11_NO2_bkgd_2007_NO2.DTA
**Output Print File:             Holly_FI11_NO2_bkgd_2007_NO2.LST

**File for Summary of Results:   C:\beast\Holly\Holly_FI11_NO2_bkgd_2007_NO2.SUM
```



```
                                          *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.
```

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2007.SFC Met Version: 11059
Profile file: SY2007.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2007 Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-2.0	0.051	-9.000	-9.000	-999.	27.	5.4	0.01	0.28	1.00	1.80	267.	10.0	270.4	10.0
07	01	01	1	02	-1.2	0.042	-9.000	-9.000	-999.	20.	4.6	0.02	0.28	1.00	1.30	295.	10.0	270.9	10.0
07	01	01	1	03	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	93.	10.0	270.6	10.0
07	01	01	1	04	-0.8	0.036	-9.000	-9.000	-999.	16.	4.4	0.07	0.28	1.00	0.90	141.	10.0	270.6	10.0
07	01	01	1	05	-2.4	0.063	-9.000	-9.000	-999.	37.	8.4	0.12	0.28	1.00	1.40	172.	10.0	270.4	10.0
07	01	01	1	06	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	114.	10.0	270.4	10.0
07	01	01	1	07	-0.5	0.029	-9.000	-9.000	-999.	11.	3.3	0.04	0.28	1.00	0.80	87.	10.0	270.0	10.0
07	01	01	1	08	-0.5	0.026	-9.000	-9.000	-999.	9.	2.7	0.01	0.28	1.00	0.90	262.	10.0	269.5	10.0
07	01	01	1	09	-4.5	0.099	-9.000	-9.000	-999.	71.	16.8	0.09	0.28	0.51	1.90	347.	10.0	269.0	10.0
07	01	01	1	10	9.0	0.139	0.572	0.017	655.	119.	-23.4	0.04	0.28	0.30	1.70	315.	10.0	271.0	10.0
07	01	01	1	11	22.7	0.145	0.787	0.018	677.	128.	-10.7	0.06	0.28	0.22	1.50	14.	10.0	272.8	10.0
07	01	01	1	12	31.5	0.186	0.891	0.018	707.	184.	-16.0	0.06	0.28	0.19	2.00	13.	10.0	272.9	10.0
07	01	01	1	13	34.6	0.222	0.934	0.018	740.	241.	-25.0	0.06	0.28	0.19	2.50	5.	10.0	273.4	10.0
07	01	01	1	14	38.8	0.298	0.985	0.018	777.	374.	-53.6	0.09	0.28	0.19	3.20	359.	10.0	273.9	10.0
07	01	01	1	15	28.3	0.138	0.898	0.018	805.	136.	-7.3	0.04	0.28	0.22	1.50	64.	10.0	275.4	10.0
07	01	01	1	16	11.6	0.177	0.671	0.018	816.	171.	-37.4	0.05	0.28	0.29	2.10	111.	10.0	275.1	10.0
07	01	01	1	17	-7.2	0.120	-9.000	-9.000	-999.	96.	18.8	0.07	0.28	0.49	2.30	134.	10.0	273.6	10.0
07	01	01	1	18	-4.8	0.077	-9.000	-9.000	-999.	49.	7.5	0.12	0.28	1.00	1.70	152.	10.0	272.0	10.0
07	01	01	1	19	-2.1	0.045	-9.000	-9.000	-999.	22.	3.4	0.01	0.28	1.00	1.50	221.	10.0	271.0	10.0
07	01	01	1	20	-0.8	0.029	-9.000	-9.000	-999.	11.	2.4	0.01	0.28	1.00	1.00	242.	10.0	270.4	10.0
07	01	01	1	21	-6.2	0.083	-9.000	-9.000	-999.	55.	7.3	0.07	0.28	1.00	2.10	128.	10.0	269.8	10.0
07	01	01	1	22	-8.2	0.095	-9.000	-9.000	-999.	68.	8.4	0.07	0.28	1.00	2.40	136.	10.0	269.4	10.0
07	01	01	1	23	-9.6	0.103	-9.000	-9.000	-999.	76.	9.1	0.07	0.28	1.00	2.60	142.	10.0	268.8	10.0
07	01	01	1	24	-5.1	0.075	-9.000	-9.000	-999.	48.	6.6	0.07	0.28	1.00	1.90	148.	10.0	269.0	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	10.0	1	267.	1.80	270.5	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
HOLLY	1ST HIGHEST VALUE IS	81.94362	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	76.66178	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	76.18509	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	71.85127	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	70.37087	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	68.59674	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	65.49137	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	61.63881	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	61.42872	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	57.29076	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
BTFLPWR	1ST HIGHEST VALUE IS	66.52663	AT (427200.00, 4526600.00, 1399.61, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	54.58233	AT (427200.00, 4526400.00, 1404.52, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	53.71178	AT (427000.00, 4525800.00, 1404.56, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	51.18779	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	50.17373	AT (426800.00, 4525200.00, 1408.04, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	48.70478	AT (427000.00, 4526400.00, 1388.10, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	48.25017	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	48.13710	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	47.08894	AT (427000.00, 4526000.00, 1397.29, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	46.80948	AT (426600.00, 4525200.00, 1392.02, 2867.37, 0.00)	DC	
GADSBY	1ST HIGHEST VALUE IS	38.71022	AT (419000.00, 4514000.00, 1287.72, 1287.72, 0.00)	DC	

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          2ND HIGHEST VALUE IS      37.17759 AT (  420000.00,  4512000.00,  1293.92,  1293.92,    0.00)  DC
          3RD HIGHEST VALUE IS      36.83725 AT (  419000.00,  4512000.00,  1289.90,  1289.90,    0.00)  DC
          4TH HIGHEST VALUE IS      36.79455 AT (  419000.00,  4516000.00,  1286.00,  1286.00,    0.00)  DC
          5TH HIGHEST VALUE IS      36.78245 AT (  418000.00,  4515000.00,  1286.00,  1286.00,    0.00)  DC
          6TH HIGHEST VALUE IS      36.15292 AT (  419000.00,  4515000.00,  1286.00,  1286.00,    0.00)  DC
          7TH HIGHEST VALUE IS      36.09199 AT (  419500.00,  4516000.00,  1284.48,  1285.00,    0.00)  DC
          8TH HIGHEST VALUE IS      35.74059 AT (  420000.00,  4515000.00,  1287.00,  1287.00,    0.00)  DC
          9TH HIGHEST VALUE IS      35.73509 AT (  418000.00,  4514000.00,  1286.52,  1286.52,    0.00)  DC
         10TH HIGHEST VALUE IS      35.49445 AT (  418000.00,  4512000.00,  1290.05,  1290.05,    0.00)  DC

TESORO    1ST HIGHEST VALUE IS      46.95253 AT (  424500.00,  4516500.00,  1526.47,  2795.96,    0.00)  DC
          2ND HIGHEST VALUE IS      44.58941 AT (  424000.00,  4516500.00,  1348.58,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      38.85148 AT (  424000.00,  4516000.00,  1305.59,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      35.84351 AT (  424500.00,  4516000.00,  1482.12,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      33.89644 AT (  425000.00,  4516500.00,  1628.25,  2725.66,    0.00)  DC
          6TH HIGHEST VALUE IS      30.97916 AT (  424500.00,  4517000.00,  1651.83,  2725.66,    0.00)  DC
          7TH HIGHEST VALUE IS      30.50368 AT (  425000.00,  4516000.00,  1521.64,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      28.88917 AT (  424000.00,  4517500.00,  1590.64,  2725.66,    0.00)  DC
          9TH HIGHEST VALUE IS      28.48031 AT (  425000.00,  4515000.00,  1398.35,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS      28.40606 AT (  423500.00,  4516500.00,  1293.01,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF NO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                     AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

CHEVRON   1ST HIGHEST VALUE IS      54.80247 AT (  423500.00,  4520000.00,  1512.12,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      47.84634 AT (  423500.00,  4519500.00,  1558.04,  2764.40,    0.00)  DC
          3RD HIGHEST VALUE IS      46.37276 AT (  424000.00,  4520000.00,  1541.80,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      45.39636 AT (  423500.00,  4519000.00,  1581.44,  2725.66,    0.00)  DC
          5TH HIGHEST VALUE IS      44.53856 AT (  423500.00,  4520500.00,  1450.38,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      42.98464 AT (  421000.00,  4518000.00,  1286.01,  2764.40,    0.00)  DC
          7TH HIGHEST VALUE IS      42.66832 AT (  421000.00,  4518500.00,  1286.00,  2807.02,    0.00)  DC
          8TH HIGHEST VALUE IS      42.40708 AT (  423400.00,  4521200.00,  1352.14,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS      41.25031 AT (  423600.00,  4521200.00,  1368.32,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS      40.82535 AT (  420500.00,  4518000.00,  1285.72,  2725.66,    0.00)  DC

BIGWEST   1ST HIGHEST VALUE IS      79.12070 AT (  422600.00,  4521000.00,  1297.53,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      67.01904 AT (  422600.00,  4521200.00,  1297.70,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      59.34104 AT (  421500.00,  4520000.00,  1286.96,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      53.17153 AT (  422000.00,  4519500.00,  1286.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      53.14530 AT (  422400.00,  4521000.00,  1292.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      51.03142 AT (  422400.00,  4521200.00,  1291.48,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS      50.82636 AT (  422600.00,  4522600.00,  1293.03,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      50.42233 AT (  421000.00,  4520000.00,  1284.52,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS      50.11748 AT (  422600.00,  4522800.00,  1293.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS      49.53743 AT (  422600.00,  4523000.00,  1293.00,  2867.37,    0.00)  DC

SI_EAGLE  1ST HIGHEST VALUE IS      80.25645 AT (  423400.00,  4524400.00,  1305.77,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      59.75452 AT (  423400.00,  4524600.00,  1306.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      58.18703 AT (  423200.00,  4524600.00,  1303.27,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      49.70523 AT (  423400.00,  4524200.00,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      49.59263 AT (  423600.00,  4524400.00,  1308.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      48.78865 AT (  423200.00,  4524400.00,  1303.02,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS      48.55770 AT (  423600.00,  4524600.00,  1308.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      45.47532 AT (  423600.00,  4524200.00,  1308.16,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS      44.23250 AT (  423400.00,  4524800.00,  1305.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS      40.71133 AT (  423200.00,  4524200.00,  1303.00,  2867.37,    0.00)  DC

BACKGRND  1ST HIGHEST VALUE IS     124.08347 AT (  425503.00,  4528150.00,  1309.00,  2912.70,    0.00)  DC
          2ND HIGHEST VALUE IS     124.08347 AT (  422934.80,  4526766.30,  1291.14,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS     124.08347 AT (  422934.70,  4526749.30,  1291.06,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS     124.08347 AT (  422934.60,  4526732.20,  1291.29,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS     124.08347 AT (  422934.40,  4526715.20,  1291.56,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS     124.08347 AT (  422958.90,  4526715.00,  1292.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS     124.08347 AT (  422983.50,  4526714.80,  1292.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS     124.08347 AT (  423008.00,  4526714.60,  1292.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS     124.08347 AT (  423032.50,  4526714.40,  1292.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS     124.08347 AT (  423057.10,  4526714.20,  1292.00,  2867.37,    0.00)  DC
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**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	179.62938 AT	(424000.00, 4527400.00, 1300.03, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	179.20962 AT	(424000.00, 4527350.00, 1300.74, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	179.12326 AT	(424000.00, 4527450.00, 1299.71, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	177.65410 AT	(424050.00, 4527600.00, 1298.75, 2912.70, 0.00)	DC	
	5TH HIGHEST VALUE IS	177.54055 AT	(424000.00, 4527500.00, 1299.14, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	177.48605 AT	(424000.00, 4527300.00, 1301.13, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	177.48021 AT	(424050.00, 4527650.00, 1298.24, 2912.70, 0.00)	DC	
	8TH HIGHEST VALUE IS	177.21939 AT	(424050.00, 4527700.00, 1297.74, 2912.70, 0.00)	DC	
	9TH HIGHEST VALUE IS	177.19182 AT	(424000.00, 4527550.00, 1298.75, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	176.80779 AT	(424050.00, 4527750.00, 1297.30, 2912.70, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 310 Warning Message(s)
A Total of 2026 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 2026 Missing Hours Identified (23.13 Percent)

CAUTION!: Number of Missing Hours Exceeds 10 Percent of Total!
Data May Not Be Acceptable for Regulatory Applications.
See Section 5.3.2 of "Meteorological Monitoring Guidance
for Regulatory Modeling Applications" (EPA-454/R-99-005).

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

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SO W320    1673  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
SO W320    2705  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          12H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLAREN
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE105
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE106
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE108
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ301
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ308
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ320
CN W305       3 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ319
CN W305       4 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H2
CN W305       4 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE104
CN W305       4 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ307
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:           4H1
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H1
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE102
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ316
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ322
CN W305      15 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
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```
**MODELOPTs:  NonDFAULT CONC                                          ELEV
                                                                          PVMRM

                                        ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for   109 Source(s),
  for Total of    2 Urban Area(s):
  Urban ID = DAVIS_CO ;  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m
  Urban ID = SLCOUNTY ;  Urban Population =   1029655.0 ;  Urban Roughness Length =  1.000 m

**Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
           with an Equilibrium NO2/NOx Ratio of  0.900
           and with a Default In-stack Ratio of  0.250
        7. Urban Roughness Length of 1.0 Meter Used.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR

**This Run Includes:    110 Source(s);       9 Source Group(s); and   10025 Receptor(s)

**This Run Includes BACKGRND Concentrations Varying by HOURLY   for      2 Source Group(s);
     Missing HOURLY BACKGRND Concentrations are Filled Based on ANNUAL   BACKGRND Values

**The Model Assumes A Pollutant Type of:  NO2

**Note that special processing requirements apply for the 1-hour NO2 NAAQS - check available guidance.
  Model will process user-specified ranks of daily maximum 1-hour values averaged across the number of years modeled.
  For annual NO2 NAAQS modeling, the multi-year maximum of PERIOD values can be simulated using the MULTYEAR keyword.
  Multi-year PERIOD and 1-hour values should only be done in a single model run using the MULTYEAR option with a
  single multi-year meteorological data file using STARTEND keyword.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs External File(s) of Maximum Daily 1-hr Values by Year (MXDYBYYR Keyword)
         Model Outputs External File(s) of Contributions to Maximum Daily Values Paired in Time & Space (MAXDCONT Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =    193.5 MB of RAM.

**Input Runstream File:          Holly_FI11_NO2_bkgd_2008_NO2.DTA
**Output Print File:             Holly_FI11_NO2_bkgd_2008_NO2.LST

**File for Summary of Results:   C:\beast\Holly\Holly_FI11_NO2_bkgd_2008_NO2.SUM
```



```
**MODELOPTs:  NonDFAULT CONC                                          ELEV
                                                                          PVMRM

                                        *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                          (1=YES; 0=NO)

          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
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          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1

              NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.
```

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2008.SFC Met Version: 11059
Profile file: SY2008.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2008 Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-24.3	0.228	-9.000	-9.000	-999.	250.	38.8	0.07	0.28	1.00	3.60	144.	10.0	264.2	10.0
08	01	01	1	02	-9.9	0.103	-9.000	-9.000	-999.	85.	8.9	0.07	0.28	1.00	2.60	130.	10.0	263.6	10.0
08	01	01	1	03	-3.8	0.064	-9.000	-9.000	-999.	37.	5.5	0.07	0.28	1.00	1.60	127.	10.0	263.0	10.0
08	01	01	1	04	-10.3	0.109	-9.000	-9.000	-999.	82.	10.0	0.12	0.28	1.00	2.40	153.	10.0	263.6	10.0
08	01	01	1	05	-8.5	0.095	-9.000	-9.000	-999.	68.	8.2	0.07	0.28	1.00	2.40	123.	10.0	263.1	10.0
08	01	01	1	06	-7.9	0.091	-9.000	-9.000	-999.	63.	7.6	0.05	0.28	1.00	2.40	93.	10.0	262.9	10.0
08	01	01	1	07	-7.2	0.086	-9.000	-9.000	-999.	58.	7.0	0.04	0.28	1.00	2.40	63.	10.0	262.6	10.0
08	01	01	1	08	-11.6	0.116	-9.000	-9.000	-999.	91.	10.9	0.05	0.28	1.00	2.90	30.	10.0	261.4	10.0
08	01	01	1	09	-13.2	0.185	-9.000	-9.000	-999.	184.	38.9	0.06	0.28	0.51	3.00	24.	10.0	262.9	10.0
08	01	01	1	10	10.3	0.229	0.258	0.005	54.	252.	-94.0	0.06	0.28	0.30	2.80	26.	10.0	264.2	10.0
08	01	01	1	11	27.2	0.247	0.447	0.005	105.	283.	-44.5	0.06	0.28	0.22	2.90	23.	10.0	265.8	10.0
08	01	01	1	12	31.4	0.256	0.518	0.005	142.	298.	-43.0	0.06	0.28	0.19	3.00	24.	10.0	267.2	10.0
08	01	01	1	13	34.5	0.201	0.582	0.007	183.	208.	-18.9	0.05	0.28	0.19	2.30	54.	10.0	268.6	10.0
08	01	01	1	14	31.7	0.255	0.602	0.005	220.	296.	-41.7	0.05	0.28	0.19	3.10	37.	10.0	267.6	10.0
08	01	01	1	15	23.3	0.252	0.565	0.005	247.	291.	-55.2	0.06	0.28	0.22	3.00	3.	10.0	267.8	10.0
08	01	01	1	16	-0.3	0.246	-9.000	-9.000	-999.	281.	4710.6	0.06	0.28	0.29	3.20	17.	10.0	267.4	10.0
08	01	01	1	17	-8.9	0.196	-9.000	-9.000	-999.	200.	68.0	0.06	0.28	0.49	2.90	13.	10.0	266.1	10.0
08	01	01	1	18	-13.0	0.244	-9.000	-9.000	-999.	277.	88.9	0.06	0.28	1.00	3.50	8.	10.0	264.5	10.0
08	01	01	1	19	-5.5	0.104	-9.000	-9.000	-999.	90.	16.1	0.05	0.28	1.00	2.20	35.	10.0	264.2	10.0
08	01	01	1	20	-2.6	0.056	-9.000	-9.000	-999.	31.	5.3	0.05	0.28	1.00	1.50	48.	10.0	264.2	10.0
08	01	01	1	21	-2.5	0.062	-9.000	-9.000	-999.	35.	7.4	0.06	0.28	1.00	1.60	17.	10.0	263.4	10.0
08	01	01	1	22	-2.9	0.066	-9.000	-9.000	-999.	39.	7.9	0.06	0.28	1.00	1.70	26.	10.0	263.9	10.0
08	01	01	1	23	-8.6	0.160	-9.000	-9.000	-999.	147.	38.2	0.06	0.28	1.00	2.60	24.	10.0	263.0	10.0
08	01	01	1	24	-26.9	0.273	-9.000	-9.000	-999.	327.	60.1	0.06	0.28	1.00	4.10	15.	10.0	262.9	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	10.0	1	144.	3.60	264.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
HOLLY	1ST HIGHEST VALUE IS	85.96856	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	85.58879	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	83.43506	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	79.04383	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	76.69409	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	76.09277	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	74.68234	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	73.82353	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	70.64288	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	69.67107	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
BTFLPWR	1ST HIGHEST VALUE IS	60.55314	AT (427000.00, 4525800.00, 1404.56, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	58.95680	AT (427000.00, 4526000.00, 1397.29, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	57.79700	AT (426600.00, 4525000.00, 1398.46, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	56.73581	AT (426400.00, 4525000.00, 1388.52, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	55.51340	AT (426600.00, 4524800.00, 1408.35, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	53.27114	AT (426400.00, 4524600.00, 1402.43, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	51.12542	AT (426400.00, 4524800.00, 1394.52, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	50.51386	AT (427200.00, 4527400.00, 1391.25, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	49.90883	AT (427400.00, 4527400.00, 1408.36, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	49.29821	AT (426400.00, 4525200.00, 1383.38, 2867.37, 0.00)	DC	
GADSBY	1ST HIGHEST VALUE IS	43.85151	AT (419000.00, 4513000.00, 1289.00, 1289.00, 0.00)	DC	

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          2ND HIGHEST VALUE IS      41.48023 AT (  419000.00,  4511000.00,  1291.00,  1291.00,    0.00)  DC
          3RD HIGHEST VALUE IS      40.65236 AT (  420000.00,  4512000.00,  1293.92,  1293.92,    0.00)  DC
          4TH HIGHEST VALUE IS      40.57721 AT (  420000.00,  4511000.00,  1288.89,  1288.89,    0.00)  DC
          5TH HIGHEST VALUE IS      40.11924 AT (  419500.00,  4516000.00,  1284.48,  1285.00,    0.00)  DC
          6TH HIGHEST VALUE IS      39.82455 AT (  420500.00,  4517000.00,  1284.00,  2725.66,    0.00)  DC
          7TH HIGHEST VALUE IS      39.23148 AT (  419000.00,  4515000.00,  1286.00,  1286.00,    0.00)  DC
          8TH HIGHEST VALUE IS      38.91143 AT (  420500.00,  4516500.00,  1285.02,  1893.29,    0.00)  DC
          9TH HIGHEST VALUE IS      38.07679 AT (  420000.00,  4513000.00,  1290.24,  1293.92,    0.00)  DC
         10TH HIGHEST VALUE IS      37.76403 AT (  419000.00,  4516500.00,  1285.45,  1285.45,    0.00)  DC

TESORO    1ST HIGHEST VALUE IS      43.04633 AT (  424500.00,  4516500.00,  1526.47,  2795.96,    0.00)  DC
          2ND HIGHEST VALUE IS      42.43897 AT (  424000.00,  4516000.00,  1305.59,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      41.30573 AT (  424000.00,  4516500.00,  1348.58,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      37.55455 AT (  423500.00,  4516000.00,  1289.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      37.44181 AT (  424500.00,  4516000.00,  1482.12,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      29.41932 AT (  423500.00,  4516500.00,  1293.01,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS      29.03265 AT (  424000.00,  4517000.00,  1475.67,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      27.04416 AT (  425000.00,  4515000.00,  1398.35,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS      27.03847 AT (  422000.00,  4516000.00,  1286.00,  2795.96,    0.00)  DC
         10TH HIGHEST VALUE IS      26.62265 AT (  424500.00,  4517000.00,  1651.83,  2725.66,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF NO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

CHEVRON   1ST HIGHEST VALUE IS      52.96379 AT (  423500.00,  4519000.00,  1581.44,  2725.66,    0.00)  DC
          2ND HIGHEST VALUE IS      46.46491 AT (  423500.00,  4519500.00,  1558.04,  2764.40,    0.00)  DC
          3RD HIGHEST VALUE IS      46.36838 AT (  421000.00,  4518500.00,  1286.00,  2807.02,    0.00)  DC
          4TH HIGHEST VALUE IS      43.91081 AT (  424000.00,  4520500.00,  1495.53,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      43.67347 AT (  420500.00,  4518000.00,  1285.72,  2725.66,    0.00)  DC
          6TH HIGHEST VALUE IS      43.42033 AT (  421000.00,  4519000.00,  1284.95,  2807.02,    0.00)  DC
          7TH HIGHEST VALUE IS      43.30404 AT (  423500.00,  4520500.00,  1450.38,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      41.88990 AT (  421000.00,  4518000.00,  1286.01,  2764.40,    0.00)  DC
          9TH HIGHEST VALUE IS      41.70727 AT (  420500.00,  4519000.00,  1284.66,  2725.66,    0.00)  DC
         10TH HIGHEST VALUE IS      41.47798 AT (  420000.00,  4519500.00,  1285.15,  2725.66,    0.00)  DC

BIGWEST   1ST HIGHEST VALUE IS      81.13758 AT (  422600.00,  4521000.00,  1297.53,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      68.71462 AT (  422600.00,  4521200.00,  1297.70,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      60.54574 AT (  421500.00,  4520000.00,  1286.96,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      56.69025 AT (  421500.00,  4519500.00,  1285.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      52.46649 AT (  422400.00,  4521000.00,  1292.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      52.10983 AT (  421000.00,  4519500.00,  1284.95,  2820.07,    0.00)  DC
          7TH HIGHEST VALUE IS      51.15502 AT (  422500.00,  4519500.00,  1289.88,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      50.84822 AT (  421000.00,  4520000.00,  1284.52,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS      50.56771 AT (  422000.00,  4519500.00,  1286.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS      50.07969 AT (  422400.00,  4521200.00,  1291.48,  2867.37,    0.00)  DC

SI_EAGLE  1ST HIGHEST VALUE IS      91.42683 AT (  423400.00,  4524400.00,  1305.77,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      66.90442 AT (  423200.00,  4524600.00,  1303.27,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      62.50675 AT (  423400.00,  4524600.00,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      58.42588 AT (  423200.00,  4524400.00,  1303.02,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      54.06532 AT (  423600.00,  4524600.00,  1308.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      52.82816 AT (  423600.00,  4524400.00,  1308.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS      50.22192 AT (  423200.00,  4524200.00,  1303.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      49.05865 AT (  423400.00,  4524200.00,  1306.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS      48.29396 AT (  423600.00,  4524200.00,  1308.16,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS      47.70874 AT (  423600.00,  4524800.00,  1307.76,  2867.37,    0.00)  DC

BACKGRND  1ST HIGHEST VALUE IS     118.44332 AT (  425503.00,  4528150.00,  1309.00,  2912.70,    0.00)  DC
          2ND HIGHEST VALUE IS     118.44332 AT (  422934.80,  4526766.30,  1291.14,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS     118.44332 AT (  422934.70,  4526749.30,  1291.06,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS     118.44332 AT (  422934.60,  4526732.20,  1291.29,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS     118.44332 AT (  422934.40,  4526715.20,  1291.56,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS     118.44332 AT (  422958.90,  4526715.00,  1292.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS     118.44332 AT (  422983.50,  4526714.80,  1292.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS     118.44332 AT (  423008.00,  4526714.60,  1292.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS     118.44332 AT (  423032.50,  4526714.40,  1292.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS     118.44332 AT (  423057.10,  4526714.20,  1292.00,  2867.37,    0.00)  DC
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**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	169.72669 AT	(421500.00, 4518000.00, 1284.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	168.75119 AT	(421500.00, 4517500.00, 1285.00, 2807.02, 0.00)	DC	
	3RD HIGHEST VALUE IS	166.35068 AT	(421500.00, 4517000.00, 1284.03, 2795.96, 0.00)	DC	
	4TH HIGHEST VALUE IS	162.20275 AT	(421000.00, 4516500.00, 1286.03, 2725.66, 0.00)	DC	
	5TH HIGHEST VALUE IS	161.94436 AT	(421500.00, 4516500.00, 1286.00, 2764.40, 0.00)	DC	
	6TH HIGHEST VALUE IS	161.27107 AT	(422000.00, 4519500.00, 1286.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	161.26040 AT	(421000.00, 4516000.00, 1286.00, 2725.66, 0.00)	DC	
	8TH HIGHEST VALUE IS	158.18156 AT	(421500.00, 4518500.00, 1286.00, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	157.92167 AT	(423950.00, 4527100.00, 1300.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	157.83716 AT	(423950.00, 4527150.00, 1299.98, 2867.37, 0.00)	DC	

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 425 Warning Message(s)
A Total of 146 Informational Message(s)

A Total of 8784 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 146 Missing Hours Identified (1.66 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

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SO W320    1673  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
SO W320    2705  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H2
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          12H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE104
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE108
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ301
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ307
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ308
CN W305       4 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ316
CN W305       4 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ320
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLAREN
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE106
CN W305       6 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE105
CN W305       6 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ319
CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE102
CN W305       8 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H1
CN W305       8 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ322
CN W305       9 WAKFLG:Stack height > or = EPA formula height for SRCID:           4H1
MX W453      38  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008010214
CN W305      44 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
MX W453      64  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008010316
MX W453      88  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008010416
MX W453     179  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008010811
MX W453     233  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011017
MX W453     309  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011321
MX W453     323  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011411
MX W453     347  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011511
MX W453     371  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011611
MX W453     372  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011612
MX W453     373  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011613
MX W453     374  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011614
MX W453     375  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011615
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MX W453     376  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011616
MX W453     377  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011617
MX W453     378  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011618
MX W453     379  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011619
MX W453     380  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011620
MX W453     381  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011621
MX W453     382  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011622
MX W453     383  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011623
MX W453     384  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011624
MX W453     385  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011701
MX W453     386  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011702
MX W453     387  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011703
MX W453     388  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011704
MX W453     389  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011705
MX W453     390  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011706
MX W453     391  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011707
MX W453     392  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011708
MX W453     393  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011709
MX W453     394  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011710
MX W453     395  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011711
MX W453     396  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011712
MX W453     397  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008011713
MX W453     465  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008012009
MX W453     539  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008012311
MX W453     682  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008012910
MX W453     707  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008013011
MX W453     786  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008020218
MX W453     827  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008020411
MX W453     857  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008020517
MX W453     905  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008020717
MX W453     928  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008020816
MX W453     995  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008021111
MX W453    1047  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008021315
MX W453    1072  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008021416
MX W453    1172  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008021820
MX W453    1190  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008021914
MX W453    1191  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008021915
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MX W453    7238  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102814
MX W453    7239  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102815
MX W453    7240  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102816
MX W453    7241  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102817
MX W453    7242  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102818
MX W453    7243  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102819
MX W453    7244  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102820
MX W453    7245  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102821
MX W453    7246  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102822
MX W453    7247  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102823
MX W453    7248  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102824
MX W453    7249  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102901
MX W453    7250  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102902
MX W453    7251  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102903
MX W453    7252  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102904
MX W453    7253  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102905
MX W453    7254  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102906
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MX W453    7256  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102908
MX W453    7257  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102909
MX W453    7258  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102910
MX W453    7259  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102911
MX W453    7260  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102912
MX W453    7261  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102913
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MX W453    7263  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102915
MX W453    7264  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102916
MX W453    7265  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102917
MX W453    7266  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102918
MX W453    7267  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102919
MX W453    7268  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102920
MX W453    7269  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102921
MX W453    7270  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008102922
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MX W453    7274  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008103002
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MX W453    7277  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008103005
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MX W453    7283  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008103011
MX W453    7284  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008103012
MX W453    7285  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008103013
MX W453    7286  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008103014
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MX W453    7403  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008110411
MX W453    7521  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008110909
MX W453    7547  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008111011
MX W453    7667  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008111511
MX W453    7740  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008111812
MX W453    7741  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008111813
MX W453    7768  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008111916
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MX W453    7912  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008112516
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MX W453    8242  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008120910
MX W453    8345  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008121317
MX W453    8387  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008121511
MX W453    8388  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008121512
MX W453    8483  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008121911
MX W453    8533  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008122113
MX W453    8772  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2008123112
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                                     ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for   109 Source(s),
  for Total of    2 Urban Area(s):
  Urban ID = DAVIS_CO ;  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m
  Urban ID = SLCOUNTY ;  Urban Population =   1029655.0 ;  Urban Roughness Length =  1.000 m

**Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
           with an Equilibrium NO2/NOx Ratio of  0.900
           and with a Default In-stack Ratio of  0.250
        7. Urban Roughness Length of 1.0 Meter Used.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  1 Short Term Average(s) of:   1-HR

**This Run Includes:    110 Source(s);       9 Source Group(s); and   10025 Receptor(s)

**This Run Includes BACKGRND Concentrations Varying by HOURLY   for      2 Source Group(s);
     Missing HOURLY BACKGRND Concentrations are Filled Based on ANNUAL   BACKGRND Values

**The Model Assumes A Pollutant Type of:  NO2

**Note that special processing requirements apply for the 1-hour NO2 NAAQS - check available guidance.
  Model will process user-specified ranks of daily maximum 1-hour values averaged across the number of years modeled.
  For annual NO2 NAAQS modeling, the multi-year maximum of PERIOD values can be simulated using the MULTYEAR keyword.
  Multi-year PERIOD and 1-hour values should only be done in a single model run using the MULTYEAR option with a
  single multi-year meteorological data file using STARTEND keyword.

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs External File(s) of Maximum Daily 1-hr Values by Year (MXDYBYYR Keyword)
         Model Outputs External File(s) of Contributions to Maximum Daily Values Paired in Time & Space (MAXDCONT Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                  ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =    193.5 MB of RAM.

**Input Runstream File:          Holly_FI11_NO2_bkgd_2009_NO2.DTA
**Output Print File:             Holly_FI11_NO2_bkgd_2009_NO2.LST

**File for Summary of Results:   C:\beast\Holly\Holly_FI11_NO2_bkgd_2009_NO2.SUM
```



```
                                     *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                       (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.
```

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2009.SFC Met Version: 11059
Profile file: SY2009.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 72572
Name: SALT_LAKE_CITY,UT Name: UNKNOWN
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.00	127.	10.0	267.9	10.0
09	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	1.80	120.	10.0	268.0	10.0
09	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	3.00	106.	10.0	269.1	10.0
09	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.10	132.	10.0	270.2	10.0
09	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.80	141.	10.0	269.8	10.0
09	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.50	148.	10.0	269.4	10.0
09	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	1.90	96.	10.0	269.2	10.0
09	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.12	0.28	1.00	0.80	178.	10.0	269.6	10.0
09	01	01	1	09	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	0.51	2.70	149.	10.0	270.9	10.0
09	01	01	1	10	9.0	0.274	0.144	0.005	10.	330.	-177.5	0.12	0.28	0.30	2.90	154.	10.0	271.9	10.0
09	01	01	1	11	22.7	0.173	0.298	0.012	36.	169.	-17.8	0.09	0.28	0.22	1.70	190.	10.0	273.9	10.0
09	01	01	1	12	31.6	0.109	0.420	0.018	73.	84.	-3.2	0.05	0.28	0.19	1.00	46.	10.0	275.6	10.0
09	01	01	1	13	34.8	0.258	0.504	0.005	114.	301.	-38.1	0.12	0.28	0.19	2.50	163.	10.0	277.0	10.0
09	01	01	1	14	32.1	0.113	0.539	0.013	151.	102.	-3.5	0.12	0.28	0.19	0.80	154.	10.0	277.9	10.0
09	01	01	1	15	4.7	0.155	0.288	0.013	157.	141.	-62.0	0.07	0.28	0.22	1.80	124.	10.0	278.8	10.0
09	01	01	1	16	0.4	0.334	0.124	0.005	158.	444.	-7805.0	0.07	0.28	0.29	4.20	143.	10.0	278.6	10.0
09	01	01	1	17	-14.1	0.342	-9.000	-9.000	-999.	460.	219.8	0.07	0.28	0.49	4.50	146.	10.0	277.9	10.0
09	01	01	1	18	-26.4	0.354	-9.000	-9.000	-999.	485.	130.6	0.07	0.28	1.00	4.80	146.	10.0	277.4	10.0
09	01	01	1	19	-35.5	0.392	-9.000	-9.000	-999.	564.	131.3	0.12	0.28	1.00	4.70	169.	10.0	277.4	10.0
09	01	01	1	20	-28.1	0.311	-9.000	-9.000	-999.	402.	82.5	0.12	0.28	1.00	3.90	150.	10.0	277.6	10.0
09	01	01	1	21	-29.8	0.330	-9.000	-9.000	-999.	437.	93.6	0.07	0.28	1.00	4.60	129.	10.0	278.5	10.0
09	01	01	1	22	-14.1	0.288	-9.000	-9.000	-999.	356.	130.9	0.07	0.28	1.00	3.90	131.	10.0	278.8	10.0
09	01	01	1	23	-23.6	0.320	-9.000	-9.000	-999.	416.	107.0	0.07	0.28	1.00	4.40	122.	10.0	278.9	10.0
09	01	01	1	24	-24.9	0.337	-9.000	-9.000	-999.	450.	118.7	0.07	0.28	1.00	4.60	130.	10.0	278.4	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	127.	3.00	267.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM 8TH-HIGHEST MAX DAILY 1-HR RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
HOLLY	1ST HIGHEST VALUE IS	93.07340	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	92.32604	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	84.09953	AT (423999.90, 4526660.00, 1304.88, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	82.44135	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	75.57887	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	75.25486	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	75.04403	AT (424020.10, 4526659.40, 1305.14, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	74.29407	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	68.96016	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	66.60330	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
BTFLPWR	1ST HIGHEST VALUE IS	55.69472	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	55.67826	AT (427000.00, 4525800.00, 1404.56, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	53.61004	AT (426800.00, 4525400.00, 1399.31, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	52.34451	AT (427200.00, 4526200.00, 1406.81, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	51.46730	AT (427000.00, 4526000.00, 1397.29, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	51.06999	AT (427200.00, 4526600.00, 1399.61, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	49.40310	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	48.94198	AT (426400.00, 4525000.00, 1388.52, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	48.74939	AT (427000.00, 4525600.00, 1404.54, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	48.53390	AT (426400.00, 4524800.00, 1394.52, 2867.37, 0.00)	DC	
GADSBY	1ST HIGHEST VALUE IS	40.80315	AT (421000.00, 4510000.00, 1290.68, 1290.68, 0.00)	DC	

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          2ND HIGHEST VALUE IS      39.41206 AT (  419000.00,  4514000.00,  1287.72,  1287.72,    0.00)  DC
          3RD HIGHEST VALUE IS      38.56703 AT (  418000.00,  4514000.00,  1286.52,  1286.52,    0.00)  DC
          4TH HIGHEST VALUE IS      38.37260 AT (  420000.00,  4511000.00,  1288.89,  1288.89,    0.00)  DC
          5TH HIGHEST VALUE IS      37.77469 AT (  421000.00,  4511000.00,  1288.42,  1288.42,    0.00)  DC
          6TH HIGHEST VALUE IS      37.71868 AT (  419000.00,  4512000.00,  1289.90,  1289.90,    0.00)  DC
          7TH HIGHEST VALUE IS      36.90560 AT (  420000.00,  4512000.00,  1293.92,  1293.92,    0.00)  DC
          8TH HIGHEST VALUE IS      36.61214 AT (  421000.00,  4509000.00,  1291.42,  1291.42,    0.00)  DC
          9TH HIGHEST VALUE IS      36.60077 AT (  421000.00,  4512000.00,  1291.00,  1291.00,    0.00)  DC
         10TH HIGHEST VALUE IS      36.24448 AT (  420000.00,  4513000.00,  1290.24,  1293.92,    0.00)  DC

TESORO    1ST HIGHEST VALUE IS      45.21030 AT (  424000.00,  4516500.00,  1348.58,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      42.42234 AT (  424500.00,  4516000.00,  1482.12,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      41.28739 AT (  424500.00,  4516500.00,  1526.47,  2795.96,    0.00)  DC
          4TH HIGHEST VALUE IS      39.78512 AT (  424000.00,  4516000.00,  1305.59,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      37.06734 AT (  423500.00,  4516000.00,  1289.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      35.41634 AT (  425000.00,  4516000.00,  1521.64,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS      34.42462 AT (  424000.00,  4517500.00,  1590.64,  2725.66,    0.00)  DC
          8TH HIGHEST VALUE IS      33.21048 AT (  425000.00,  4516500.00,  1628.25,  2725.66,    0.00)  DC
          9TH HIGHEST VALUE IS      32.99775 AT (  424500.00,  4517000.00,  1651.83,  2725.66,    0.00)  DC
         10TH HIGHEST VALUE IS      30.67714 AT (  424000.00,  4517000.00,  1475.67,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF NO2      IN MICROGRAMS/M**3                          **

                                                                                                      NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

CHEVRON   1ST HIGHEST VALUE IS      51.67591 AT (  423500.00,  4519500.00,  1558.04,  2764.40,    0.00)  DC
          2ND HIGHEST VALUE IS      44.64787 AT (  423500.00,  4520500.00,  1450.38,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      43.91753 AT (  421000.00,  4518500.00,  1286.00,  2807.02,    0.00)  DC
          4TH HIGHEST VALUE IS      43.18188 AT (  420500.00,  4519000.00,  1284.66,  2725.66,    0.00)  DC
          5TH HIGHEST VALUE IS      43.15912 AT (  423500.00,  4520000.00,  1512.12,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      42.65841 AT (  420500.00,  4518500.00,  1284.78,  2725.66,    0.00)  DC
          7TH HIGHEST VALUE IS      42.01475 AT (  420000.00,  4519000.00,  1285.01,  2725.66,    0.00)  DC
          8TH HIGHEST VALUE IS      41.54910 AT (  420000.00,  4518500.00,  1286.67,  2725.66,    0.00)  DC
          9TH HIGHEST VALUE IS      41.45598 AT (  421000.00,  4519000.00,  1284.95,  2807.02,    0.00)  DC
         10TH HIGHEST VALUE IS      41.25333 AT (  421500.00,  4517500.00,  1285.00,  2807.02,    0.00)  DC

BIGWEST   1ST HIGHEST VALUE IS      78.38374 AT (  422600.00,  4521000.00,  1297.53,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      58.10745 AT (  422600.00,  4521200.00,  1297.70,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      56.52898 AT (  422400.00,  4521000.00,  1292.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      56.03503 AT (  421500.00,  4520000.00,  1286.96,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      55.50371 AT (  421500.00,  4519500.00,  1285.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      54.40133 AT (  422000.00,  4519500.00,  1286.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS      53.67147 AT (  422400.00,  4521200.00,  1291.48,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      53.50271 AT (  422600.00,  4521400.00,  1297.07,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS      51.38456 AT (  421000.00,  4519500.00,  1284.95,  2820.07,    0.00)  DC
         10TH HIGHEST VALUE IS      50.72806 AT (  421000.00,  4520500.00,  1287.00,  2867.37,    0.00)  DC

SI_EAGLE  1ST HIGHEST VALUE IS      85.37015 AT (  423400.00,  4524400.00,  1305.77,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS      71.04527 AT (  423200.00,  4524600.00,  1303.27,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS      67.62937 AT (  423400.00,  4524600.00,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS      54.72252 AT (  423400.00,  4524200.00,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS      52.09178 AT (  423600.00,  4524600.00,  1308.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS      51.43880 AT (  423600.00,  4524400.00,  1308.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS      51.33580 AT (  423200.00,  4524400.00,  1303.02,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS      50.53054 AT (  423200.00,  4524200.00,  1303.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS      47.57020 AT (  423000.00,  4524600.00,  1300.02,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS      44.18409 AT (  423600.00,  4524200.00,  1308.16,  2867.37,    0.00)  DC

BACKGRND  1ST HIGHEST VALUE IS     112.80316 AT (  425503.00,  4528150.00,  1309.00,  2912.70,    0.00)  DC
          2ND HIGHEST VALUE IS     112.80316 AT (  422934.80,  4526766.30,  1291.14,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS     112.80316 AT (  422934.70,  4526749.30,  1291.06,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS     112.80316 AT (  422934.60,  4526732.20,  1291.29,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS     112.80316 AT (  422934.40,  4526715.20,  1291.56,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS     112.80316 AT (  422958.90,  4526715.00,  1292.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS     112.80316 AT (  422983.50,  4526714.80,  1292.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS     112.80316 AT (  423008.00,  4526714.60,  1292.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS     112.80316 AT (  423032.50,  4526714.40,  1292.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS     112.80316 AT (  423057.10,  4526714.20,  1292.00,  2867.37,    0.00)  DC
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                    *** THE SUMMARY OF MAXIMUM   8TH-HIGHEST MAX DAILY  1-HR RESULTS AVERAGED OVER   1 YEARS ***

                                 ** CONC OF NO2      IN MICROGRAMS/M**3                          **

                                                                                                      NETWORK
GROUP ID                      AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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ALL       1ST HIGHEST VALUE IS     168.98040 AT (  421500.00,  4518000.00,  1284.00,  2867.37,     0.00)  DC
          2ND HIGHEST VALUE IS     166.31622 AT (  421500.00,  4517500.00,  1285.00,  2807.02,     0.00)  DC
          3RD HIGHEST VALUE IS     165.22912 AT (  421500.00,  4518500.00,  1286.00,  2867.37,     0.00)  DC
          4TH HIGHEST VALUE IS     160.50295 AT (  421000.00,  4517000.00,  1285.26,  2725.66,     0.00)  DC
          5TH HIGHEST VALUE IS     160.31806 AT (  422000.00,  4518000.00,  1284.01,  2867.37,     0.00)  DC
          6TH HIGHEST VALUE IS     159.60936 AT (  422000.00,  4519000.00,  1287.16,  2867.37,     0.00)  DC
          7TH HIGHEST VALUE IS     158.89846 AT (  422000.00,  4517500.00,  1286.00,  2867.37,     0.00)  DC
          8TH HIGHEST VALUE IS     158.52347 AT (  421500.00,  4517000.00,  1284.03,  2795.96,     0.00)  DC
          9TH HIGHEST VALUE IS     157.09813 AT (  422000.00,  4518500.00,  1283.42,  2867.37,     0.00)  DC
         10TH HIGHEST VALUE IS     157.02272 AT (  421500.00,  4516000.00,  1286.68,  2725.66,     0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
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 **MODELOPTs:  NonDFAULT CONC                                                ELEV
                                                                                   PVMRM

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of           0 Fatal Error Message(s)
 A Total of         299 Warning Message(s)
 A Total of         802 Informational Message(s)

 A Total of        8760 Hours Were Processed

 A Total of           9 Calm Hours Identified

 A Total of         793 Missing Hours Identified (  9.05 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 SO W320    1673  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
 SO W320    2705  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
 CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H2
 CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:          12H1
 CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE108
 CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ301
 CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ307
 CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ308
 CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ316
 CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ320
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:           4H1
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H1
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLAREN
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE105
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ319
 CN W305      12 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE102
 CN W305      12 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE106
 CN W305      16 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE104
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 MX W453     184  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2009010816
 MX W453     208  BGEXT:Substitution for missing hrly BACKGRND data. Date=   2009010916
 CN W305     233 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
 CN W305     252 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
 CN W305     253 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
 CN W305     256 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ322
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**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** MODEL SETUP OPTIONS SUMMARY ***

- -

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses URBAN Dispersion Algorithm for the SBL for 109 Source(s),
for Total of 2 Urban Area(s):
Urban ID = DAVIS_CO ; Urban Population = 306479.0 ; Urban Roughness Length = 1.000 m
Urban ID = SLCOUNTY ; Urban Population = 1029655.0 ; Urban Roughness Length = 1.000 m

**Model Allows User-Specified Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.
6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
with an Equilibrium NO2/NOx Ratio of 0.900
and with a Default In-stack Ratio of 0.250
7. Urban Roughness Length of 1.0 Meter Used.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates ANNUAL Averages Only

**This Run Includes: 110 Source(s); 8 Source Group(s); and 10025 Receptor(s)

**The Model Assumes A Pollutant Type of: NO2

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of ANNUAL Averages by Receptor
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1288.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 57.3 MB of RAM.

**Input Runstream File: Holly_FI11_NO2_lt_2006_NO2.DTA
**Output Print File: Holly_FI11_NO2_lt_2006_NO2.LST

**File for Summary of Results: C:\beast\Holly\Holly_FI11_NO2_lt_2006_NO2.SUM

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
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1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2006.SFC Met Version: 11059
Profile file: SY2006.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2006 Year: 2006

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
06	01	01	1	01	-11.8	0.241	-9.000	-9.000	-999.	273.	91.0	0.09	0.28	1.00	3.20	185.	10.0	276.0	10.0
06	01	01	1	02	-11.9	0.244	-9.000	-9.000	-999.	277.	93.0	0.01	0.28	1.00	4.60	248.	10.0	276.5	10.0
06	01	01	1	03	-24.7	0.504	-9.000	-9.000	-999.	824.	399.2	0.01	0.28	1.00	9.00	269.	10.0	277.0	10.0
06	01	01	1	04	-40.4	0.427	-9.000	-9.000	-999.	646.	146.0	0.02	0.28	1.00	7.00	290.	10.0	276.9	10.0
06	01	01	1	05	-15.9	0.324	-9.000	-9.000	-999.	430.	164.1	0.04	0.28	1.00	4.80	301.	10.0	276.4	10.0
06	01	01	1	06	-18.0	0.366	-9.000	-9.000	-999.	508.	209.4	0.02	0.28	1.00	5.90	298.	10.0	276.4	10.0
06	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.02	0.28	1.00	6.30	289.	10.0	275.9	10.0
06	01	01	1	08	-34.7	0.381	-9.000	-9.000	-999.	540.	122.8	0.02	0.28	1.00	6.30	282.	10.0	275.4	10.0
06	01	01	1	09	-21.0	0.324	-9.000	-9.000	-999.	425.	124.8	0.01	0.28	0.51	6.00	268.	10.0	275.1	10.0
06	01	01	1	10	10.5	0.195	0.315	0.005	92.	206.	-54.3	0.01	0.28	0.30	3.20	249.	10.0	276.1	10.0
06	01	01	1	11	27.6	0.203	0.649	0.005	307.	211.	-23.6	0.01	0.28	0.22	3.20	248.	10.0	277.5	10.0
06	01	01	1	12	38.6	0.170	0.825	0.005	450.	161.	-9.8	0.01	0.28	0.19	2.50	249.	10.0	278.4	10.0
06	01	01	1	13	42.5	0.283	0.942	0.005	608.	346.	-41.1	0.09	0.28	0.19	3.00	207.	10.0	279.2	10.0
06	01	01	1	14	32.3	0.382	0.913	0.005	729.	543.	-133.3	0.12	0.28	0.19	4.00	168.	10.0	279.9	10.0
06	01	01	1	15	4.8	0.338	0.487	0.005	746.	452.	-623.1	0.07	0.28	0.22	4.20	148.	10.0	279.8	10.0
06	01	01	1	16	0.4	0.444	0.218	0.005	747.	681.	-8888.0	0.12	0.28	0.29	4.90	155.	10.0	279.4	10.0
06	01	01	1	17	-17.9	0.410	-9.000	-9.000	-999.	605.	298.0	0.12	0.28	0.49	4.70	161.	10.0	278.4	10.0
06	01	01	1	18	-25.2	0.339	-9.000	-9.000	-999.	457.	119.9	0.12	0.28	1.00	4.10	163.	10.0	277.4	10.0
06	01	01	1	19	-21.1	0.284	-9.000	-9.000	-999.	349.	83.7	0.07	0.28	1.00	4.00	149.	10.0	276.6	10.0
06	01	01	1	20	-9.3	0.189	-9.000	-9.000	-999.	192.	55.7	0.07	0.28	1.00	2.80	124.	10.0	276.0	10.0
06	01	01	1	21	-18.7	0.381	-9.000	-9.000	-999.	540.	227.2	0.07	0.28	1.00	5.00	140.	10.0	276.9	10.0
06	01	01	1	22	-12.9	0.262	-9.000	-9.000	-999.	316.	108.2	0.12	0.28	1.00	3.20	165.	10.0	277.1	10.0
06	01	01	1	23	-14.5	0.296	-9.000	-9.000	-999.	371.	138.0	0.07	0.28	1.00	4.00	134.	10.0	277.2	10.0
06	01	01	1	24	-18.2	0.372	-9.000	-9.000	-999.	522.	218.0	0.07	0.28	1.00	4.90	133.	10.0	277.8	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
06	01	01	01	10.0	1	185.	3.20	276.1	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
HOLLY	1ST HIGHEST VALUE IS	5.39545	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	5.32254	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	5.30204	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	5.08617	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	5.02015	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	4.98984	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	4.73850	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	4.73574	AT (424124.90, 4526576.10, 1308.06, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	4.72600	AT (424000.00, 4526650.00, 1305.00, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	4.72572	AT (424116.80, 4526553.40, 1308.40, 2867.37, 0.00)	DC	
BTFLPWR	1ST HIGHEST VALUE IS	1.40614	AT (425800.00, 4526400.00, 1339.56, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.03529	AT (425600.00, 4526400.00, 1335.51, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.01421	AT (426000.00, 4526400.00, 1346.13, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.95743	AT (425400.00, 4526900.00, 1325.75, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.95556	AT (425800.00, 4526600.00, 1336.65, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.95295	AT (425400.00, 4526200.00, 1334.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.94601	AT (425400.00, 4526800.00, 1326.86, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.94086	AT (425500.00, 4526200.00, 1335.95, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.93761	AT (425400.00, 4526300.00, 1332.82, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.91906	AT (425300.00, 4526900.00, 1324.95, 2867.37, 0.00)	DC	
GADSBY	1ST HIGHEST VALUE IS	1.66780	AT (423000.00, 4513000.00, 1289.00, 2725.66, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.15991	AT (421000.00, 4510000.00, 1290.68, 1290.68, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.15185	AT (424000.00, 4513000.00, 1296.00, 2795.96, 0.00)	DC	
	4TH HIGHEST VALUE IS	1.10764	AT (417500.00, 4517000.00, 1286.99, 1286.99, 0.00)	DC	
	5TH HIGHEST VALUE IS	1.10653	AT (421000.00, 4509000.00, 1291.42, 1291.42, 0.00)	DC	
	6TH HIGHEST VALUE IS	1.10540	AT (421000.00, 4511000.00, 1288.42, 1288.42, 0.00)	DC	
	7TH HIGHEST VALUE IS	1.10540	AT (418000.00, 4516500.00, 1285.00, 1285.00, 0.00)	DC	

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          8TH HIGHEST VALUE IS       1.09940 AT (  417500.00,  4516500.00,  1286.00,  1286.00,    0.00)  DC
          9TH HIGHEST VALUE IS       1.09748 AT (  418000.00,  4517000.00,  1288.00,  1288.00,    0.00)  DC
         10TH HIGHEST VALUE IS       1.08748 AT (  418000.00,  4516000.00,  1286.00,  1286.00,    0.00)  DC

TESORO    1ST HIGHEST VALUE IS       2.85112 AT (  424000.00,  4516000.00,  1305.59,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.77919 AT (  423500.00,  4516500.00,  1293.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.70626 AT (  424500.00,  4516000.00,  1482.12,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.66855 AT (  423500.00,  4517000.00,  1340.85,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.53326 AT (  424000.00,  4516500.00,  1348.58,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.07133 AT (  423500.00,  4516000.00,  1289.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.01171 AT (  423000.00,  4517000.00,  1292.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       0.99582 AT (  423000.00,  4517500.00,  1300.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       0.97097 AT (  422500.00,  4517500.00,  1289.60,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       0.96437 AT (  423500.00,  4517500.00,  1412.73,  2867.37,    0.00)  DC
```



```
 **MODELOPTs:  NonDFAULT CONC                                          ELEV
                                                                            PVMRM

                                   *** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER   1 YEARS ***


                                    ** CONC OF NO2      IN MICROGRAMS/M**3                        **

                                                                                                   NETWORK
GROUP ID                       AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

CHEVRON   1ST HIGHEST VALUE IS       2.76144 AT (  422500.00,  4519500.00,  1289.88,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.63978 AT (  423000.00,  4519500.00,  1322.98,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.01597 AT (  422000.00,  4519000.00,  1287.16,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.86867 AT (  422500.00,  4519000.00,  1288.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.82982 AT (  423000.00,  4520000.00,  1361.35,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.77005 AT (  423000.00,  4519000.00,  1369.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.71813 AT (  422000.00,  4520000.00,  1286.43,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.71061 AT (  422000.00,  4520500.00,  1287.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.62144 AT (  422000.00,  4518500.00,  1283.42,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.60383 AT (  420000.00,  4521600.00,  1284.32,  2807.02,    0.00)  DC

BIGWEST   1ST HIGHEST VALUE IS       5.64488 AT (  422600.00,  4521000.00,  1297.53,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       5.27438 AT (  422400.00,  4521200.00,  1291.48,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       4.61521 AT (  422600.00,  4521200.00,  1297.70,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       4.11065 AT (  422400.00,  4521000.00,  1292.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.76730 AT (  422800.00,  4521200.00,  1304.99,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.48969 AT (  422800.00,  4521000.00,  1306.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.22667 AT (  422400.00,  4521400.00,  1291.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.75139 AT (  422200.00,  4521400.00,  1289.03,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.72869 AT (  422400.00,  4521600.00,  1290.31,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.64406 AT (  423000.00,  4521000.00,  1326.00,  2867.37,    0.00)  DC

SI_EAGLE  1ST HIGHEST VALUE IS       4.07479 AT (  423400.00,  4524400.00,  1305.77,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.14808 AT (  423200.00,  4524600.00,  1303.27,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.93161 AT (  423600.00,  4524400.00,  1308.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.43524 AT (  423400.00,  4524200.00,  1306.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.36100 AT (  423200.00,  4524800.00,  1303.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.33422 AT (  423600.00,  4524200.00,  1308.16,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       2.26698 AT (  423800.00,  4524200.00,  1311.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.13864 AT (  422500.00,  4525200.00,  1295.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.12149 AT (  423400.00,  4524000.00,  1306.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.10620 AT (  422500.00,  4525300.00,  1294.37,  2867.37,    0.00)  DC

ALL       1ST HIGHEST VALUE IS       8.80283 AT (  422600.00,  4521000.00,  1297.53,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       8.26833 AT (  422400.00,  4521200.00,  1291.48,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       7.68747 AT (  422600.00,  4521200.00,  1297.70,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       7.28655 AT (  422400.00,  4521000.00,  1292.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       6.79277 AT (  422800.00,  4521200.00,  1304.99,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       6.60492 AT (  423999.60,  4526635.10,  1305.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       6.59589 AT (  422500.00,  4519500.00,  1289.88,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       6.53997 AT (  424019.60,  4526610.40,  1306.04,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       6.51724 AT (  423999.40,  4526610.20,  1304.83,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       6.49671 AT (  422800.00,  4521000.00,  1306.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 24 Warning Message(s)
A Total of 525 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 525 Missing Hours Identified (5.99 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

```
SO W320    1673  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
SO W320    2705  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           4H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H2
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          12H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE102
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE108
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ307
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ308
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ316
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ319
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ320
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLAREN
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE105
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE106
CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ301
CN W305      13 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
CN W305      21 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE104
CN W305      64 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ322
CN W305      72 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
```

```
                                           ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for   109 Source(s),
  for Total of    2 Urban Area(s):
  Urban ID = DAVIS_CO ;  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m
  Urban ID = SLCOUNTY ;  Urban Population =   1029655.0 ;  Urban Roughness Length =  1.000 m

**Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
           with an Equilibrium NO2/NOx Ratio of  0.900
           and with a Default In-stack Ratio of  0.250
        7. Urban Roughness Length of 1.0 Meter Used.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates ANNUAL Averages Only

**This Run Includes:    110 Source(s);       8 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  NO2

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of ANNUAL Averages by Receptor
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                               m for Missing Hours
                                                               b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     57.3 MB of RAM.

**Input Runstream File:          Holly_FI11_NO2_lt_2007_NO2.DTA
**Output Print File:             Holly_FI11_NO2_lt_2007_NO2.LST

**File for Summary of Results:   C:\beast\Holly\Holly_FI11_NO2_lt_2007_NO2.SUM
```



```
                                           *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                              (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                 *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                          (METERS/SEC)

                                              1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2007.SFC Met Version: 11059
Profile file: SY2007.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2007 Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-2.0	0.051	-9.000	-9.000	-999.	27.	5.4	0.01	0.28	1.00	1.80	267.	10.0	270.4	10.0
07	01	01	1	02	-1.2	0.042	-9.000	-9.000	-999.	20.	4.6	0.02	0.28	1.00	1.30	295.	10.0	270.9	10.0
07	01	01	1	03	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	93.	10.0	270.6	10.0
07	01	01	1	04	-0.8	0.036	-9.000	-9.000	-999.	16.	4.4	0.07	0.28	1.00	0.90	141.	10.0	270.6	10.0
07	01	01	1	05	-2.4	0.063	-9.000	-9.000	-999.	37.	8.4	0.12	0.28	1.00	1.40	172.	10.0	270.4	10.0
07	01	01	1	06	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	114.	10.0	270.4	10.0
07	01	01	1	07	-0.5	0.029	-9.000	-9.000	-999.	11.	3.3	0.04	0.28	1.00	0.80	87.	10.0	270.0	10.0
07	01	01	1	08	-0.5	0.026	-9.000	-9.000	-999.	9.	2.7	0.01	0.28	1.00	0.90	262.	10.0	269.5	10.0
07	01	01	1	09	-4.5	0.099	-9.000	-9.000	-999.	71.	16.8	0.09	0.28	0.51	1.90	347.	10.0	269.0	10.0
07	01	01	1	10	9.0	0.139	0.572	0.017	655.	119.	-23.4	0.04	0.28	0.30	1.70	315.	10.0	271.0	10.0
07	01	01	1	11	22.7	0.145	0.787	0.018	677.	128.	-10.7	0.06	0.28	0.22	1.50	14.	10.0	272.8	10.0
07	01	01	1	12	31.5	0.186	0.891	0.018	707.	184.	-16.0	0.06	0.28	0.19	2.00	13.	10.0	272.9	10.0
07	01	01	1	13	34.6	0.222	0.934	0.018	740.	241.	-25.0	0.06	0.28	0.19	2.50	5.	10.0	273.4	10.0
07	01	01	1	14	38.8	0.298	0.985	0.018	777.	374.	-53.6	0.09	0.28	0.19	3.20	359.	10.0	273.9	10.0
07	01	01	1	15	28.3	0.138	0.898	0.018	805.	136.	-7.3	0.04	0.28	0.22	1.50	64.	10.0	275.4	10.0
07	01	01	1	16	11.6	0.177	0.671	0.018	816.	171.	-37.4	0.05	0.28	0.29	2.10	111.	10.0	275.1	10.0
07	01	01	1	17	-7.2	0.120	-9.000	-9.000	-999.	96.	18.8	0.07	0.28	0.49	2.30	134.	10.0	273.6	10.0
07	01	01	1	18	-4.8	0.077	-9.000	-9.000	-999.	49.	7.5	0.12	0.28	1.00	1.70	152.	10.0	272.0	10.0
07	01	01	1	19	-2.1	0.045	-9.000	-9.000	-999.	22.	3.4	0.01	0.28	1.00	1.50	221.	10.0	271.0	10.0
07	01	01	1	20	-0.8	0.029	-9.000	-9.000	-999.	11.	2.4	0.01	0.28	1.00	1.00	242.	10.0	270.4	10.0
07	01	01	1	21	-6.2	0.083	-9.000	-9.000	-999.	55.	7.3	0.07	0.28	1.00	2.10	128.	10.0	269.8	10.0
07	01	01	1	22	-8.2	0.095	-9.000	-9.000	-999.	68.	8.4	0.07	0.28	1.00	2.40	136.	10.0	269.4	10.0
07	01	01	1	23	-9.6	0.103	-9.000	-9.000	-999.	76.	9.1	0.07	0.28	1.00	2.60	142.	10.0	268.8	10.0
07	01	01	1	24	-5.1	0.075	-9.000	-9.000	-999.	48.	6.6	0.07	0.28	1.00	1.90	148.	10.0	269.0	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	10.0	1	267.	1.80	270.5	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
HOLLY	1ST HIGHEST VALUE IS	3.98789	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	3.93281	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	3.88847	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	3.84582	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	3.84534	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	3.72281	AT (424124.90, 4526576.10, 1308.06, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	3.69640	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	3.68052	AT (424116.80, 4526553.40, 1308.40, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	3.61620	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	3.59357	AT (424133.10, 4526598.70, 1307.86, 2867.37, 0.00)	DC	
BTFLPWR	1ST HIGHEST VALUE IS	0.91862	AT (425800.00, 4526400.00, 1339.56, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	0.81251	AT (425800.00, 4526600.00, 1336.65, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	0.76941	AT (426000.00, 4526400.00, 1346.13, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	0.75500	AT (425400.00, 4526100.00, 1335.08, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	0.73137	AT (425400.00, 4526000.00, 1336.08, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	0.72418	AT (425400.00, 4526200.00, 1334.01, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	0.71283	AT (425400.00, 4525900.00, 1337.65, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	0.70127	AT (425400.00, 4525800.00, 1338.80, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	0.69565	AT (425400.00, 4525700.00, 1339.79, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	0.68771	AT (425400.00, 4525600.00, 1340.35, 2867.37, 0.00)	DC	
GADSBY	1ST HIGHEST VALUE IS	1.42069	AT (418000.00, 4517000.00, 1288.00, 1288.00, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.40679	AT (417500.00, 4517500.00, 1287.70, 1287.70, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.40158	AT (417500.00, 4517000.00, 1286.99, 1286.99, 0.00)	DC	
	4TH HIGHEST VALUE IS	1.38137	AT (418000.00, 4517500.00, 1288.00, 1288.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	1.37942	AT (418000.00, 4516500.00, 1285.00, 1285.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	1.37800	AT (418500.00, 4516500.00, 1285.00, 1285.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	1.37001	AT (417000.00, 4517500.00, 1287.00, 1287.00, 0.00)	DC	

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          8TH HIGHEST VALUE IS       1.35367 AT (  418500.00,  4517000.00,  1287.00,  1287.00,    0.00)  DC
          9TH HIGHEST VALUE IS       1.34722 AT (  417500.00,  4518000.00,  1286.90,  1286.90,    0.00)  DC
         10TH HIGHEST VALUE IS       1.34684 AT (  417000.00,  4518000.00,  1286.01,  1286.01,    0.00)  DC

TESORO    1ST HIGHEST VALUE IS       1.67637 AT (  424000.00,  4516000.00,  1305.59,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.40441 AT (  424500.00,  4516000.00,  1482.12,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.30546 AT (  423500.00,  4517000.00,  1340.85,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.24433 AT (  421500.00,  4518000.00,  1284.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.23229 AT (  422000.00,  4518000.00,  1284.01,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.22610 AT (  421500.00,  4518500.00,  1286.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.21756 AT (  422000.00,  4517500.00,  1286.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.20913 AT (  421000.00,  4518500.00,  1286.00,  2807.02,    0.00)  DC
          9TH HIGHEST VALUE IS       1.19453 AT (  422500.00,  4517500.00,  1289.60,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.14417 AT (  421000.00,  4518000.00,  1286.01,  2764.40,    0.00)  DC

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Short Term Averages            ***        05/10/12
                                   *** 4-years Met Data - Syracuse 2006-2009                                ***        04:35:13
                                                                                                                       PAGE   5
 **MODELOPTs:  NonDFAULT CONC                                                   ELEV
                                                                                         PVMRM

                                   *** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER   1 YEARS ***


                                    ** CONC OF NO2      IN MICROGRAMS/M**3                        **

                                                                                                          NETWORK
GROUP ID                       AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

CHEVRON   1ST HIGHEST VALUE IS       2.12504 AT (  419800.00,  4521800.00,  1284.35,  2725.66,    0.00)  DC
          2ND HIGHEST VALUE IS       2.12082 AT (  420000.00,  4521800.00,  1284.13,  2807.02,    0.00)  DC
          3RD HIGHEST VALUE IS       2.11904 AT (  420000.00,  4521600.00,  1284.32,  2807.02,    0.00)  DC
          4TH HIGHEST VALUE IS       2.11298 AT (  420200.00,  4521600.00,  1284.72,  2807.02,    0.00)  DC
          5TH HIGHEST VALUE IS       2.11015 AT (  419800.00,  4522000.00,  1284.15,  2725.66,    0.00)  DC
          6TH HIGHEST VALUE IS       2.09303 AT (  419800.00,  4521600.00,  1284.13,  2725.66,    0.00)  DC
          7TH HIGHEST VALUE IS       2.09174 AT (  419600.00,  4522000.00,  1284.01,  1284.01,    0.00)  DC
          8TH HIGHEST VALUE IS       2.08384 AT (  419600.00,  4521800.00,  1284.13,  1284.13,    0.00)  DC
          9TH HIGHEST VALUE IS       2.07981 AT (  420200.00,  4521800.00,  1284.74,  2820.07,    0.00)  DC
         10TH HIGHEST VALUE IS       2.07518 AT (  420000.00,  4522000.00,  1284.13,  2807.02,    0.00)  DC

BIGWEST   1ST HIGHEST VALUE IS       5.32994 AT (  422400.00,  4521200.00,  1291.48,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       4.03429 AT (  422600.00,  4521000.00,  1297.53,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       3.55833 AT (  422400.00,  4521000.00,  1292.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       3.34401 AT (  422600.00,  4521200.00,  1297.70,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.12425 AT (  421200.00,  4522000.00,  1287.08,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.10127 AT (  421400.00,  4521800.00,  1288.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.06808 AT (  421200.00,  4522200.00,  1287.99,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.05106 AT (  421200.00,  4521800.00,  1287.97,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       3.03796 AT (  421000.00,  4522200.00,  1287.85,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       3.03203 AT (  421400.00,  4522000.00,  1287.48,  2867.37,    0.00)  DC

SI_EAGLE  1ST HIGHEST VALUE IS       3.10681 AT (  423400.00,  4524400.00,  1305.77,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.65405 AT (  422400.00,  4525300.00,  1294.00,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.64756 AT (  422500.00,  4525300.00,  1294.37,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.64636 AT (  422500.00,  4525200.00,  1295.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.62440 AT (  422400.00,  4525400.00,  1293.76,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.59083 AT (  422300.00,  4525400.00,  1293.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       2.56889 AT (  422400.00,  4525200.00,  1294.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.55726 AT (  422500.00,  4525400.00,  1294.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.55617 AT (  422300.00,  4525300.00,  1293.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.55394 AT (  422600.00,  4525300.00,  1295.00,  2867.37,    0.00)  DC

ALL       1ST HIGHEST VALUE IS       8.45934 AT (  422400.00,  4521200.00,  1291.48,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       7.28947 AT (  422600.00,  4521000.00,  1297.53,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       6.78249 AT (  422400.00,  4521000.00,  1292.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       6.63548 AT (  421000.00,  4522000.00,  1287.96,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       6.62798 AT (  421200.00,  4522000.00,  1287.08,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       6.58589 AT (  421000.00,  4522200.00,  1287.85,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       6.57834 AT (  421200.00,  4521800.00,  1287.97,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       6.57579 AT (  422600.00,  4521200.00,  1297.70,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       6.55320 AT (  421200.00,  4522200.00,  1287.99,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       6.52764 AT (  421400.00,  4521800.00,  1288.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 24 Warning Message(s)
A Total of 2026 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 2026 Missing Hours Identified (23.13 Percent)

CAUTION!: Number of Missing Hours Exceeds 10 Percent of Total!
Data May Not Be Acceptable for Regulatory Applications.
See Section 5.3.2 of "Meteorological Monitoring Guidance
for Regulatory Modeling Applications" (EPA-454/R-99-005).

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

```
SO W320    1673  PPARM:Input Parameter May Be Out-of-Range for Parameter          VS
SO W320    2705  PPARM:Input Parameter May Be Out-of-Range for Parameter          VS
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         7H3
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:        10H2
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:        12H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:      FLARES
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:      FLAREN
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:       TE105
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:       TE106
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:       TE108
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:       FJ301
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:       FJ308
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:       FJ320
CN W305       3 WAKFLG:Stack height > or = EPA formula height for SRCID:       FJ319
CN W305       4 WAKFLG:Stack height > or = EPA formula height for SRCID:         9H2
CN W305       4 WAKFLG:Stack height > or = EPA formula height for SRCID:       TE104
CN W305       4 WAKFLG:Stack height > or = EPA formula height for SRCID:       FJ307
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:         4H1
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:         9H1
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:       TE102
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:       FJ316
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:        33H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:       FJ322
CN W305      15 WAKFLG:Stack height > or = EPA formula height for SRCID:        19H1
```

```
 *** AERMOD - VERSION  12060 ***    *** Holly Refinery Source Modifications - Short
Term Averages           ***       05/10/12
                                   *** 4-years Met Data - Syracuse 2006-2009                                         ***        09:22:10
                                                                                                                             PAGE   1
 **MODELOPTs:  NonDFAULT CONC                                                 ELEV
                                                                                        PVMRM

                                         ***     MODEL SETUP OPTIONS SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses URBAN Dispersion Algorithm for the SBL for   109 Source(s),
   for Total of    2 Urban Area(s):
   Urban ID = DAVIS_CO ;  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m
   Urban ID = SLCOUNTY ;  Urban Population =   1029655.0 ;  Urban Roughness Length =  1.000 m

 **Model Allows User-Specified Options:
         1. Stack-tip Downwash.
         2. Model Accounts for ELEVated Terrain Effects.
         3. Use Calms Processing Routine.
         4. Use Missing Data Processing Routine.
         5. No Exponential Decay.
         6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
            with an Equilibrium NO2/NOx Ratio of  0.900
            and with a Default In-stack Ratio of  0.250
         7. Urban Roughness Length of 1.0 Meter Used.

 **Model Assumes No FLAGPOLE Receptor Heights.

 **Model Calculates ANNUAL Averages Only

 **This Run Includes:    110 Source(s);       8 Source Group(s); and   10025 Receptor(s)

 **The Model Assumes A Pollutant Type of:  NO2

 **Model Set To Continue RUNning After the Setup Testing.

 **Output Options Selected:
          Model Outputs Tables of ANNUAL Averages by Receptor
          Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
          Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                  Emission Units = GRAMS/SEC                               ;  Emission Rate Unit Factor =   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =     57.3 MB of RAM.

 **Input Runstream File:          Holly_FI11_NO2_lt_2008_NO2.DTA
 **Output Print File:             Holly_FI11_NO2_lt_2008_NO2.LST

 **File for Summary of Results:   C:\beast\Holly\Holly_FI11_NO2_lt_2008_NO2.SUM
```

```
                                         *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                  *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                        (METERS/SEC)

                                                 1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2008.SFC Met Version: 11059
Profile file: SY2008.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2008 Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-24.3	0.228	-9.000	-9.000	-999.	250.	38.8	0.07	0.28	1.00	3.60	144.	10.0	264.2	10.0
08	01	01	1	02	-9.9	0.103	-9.000	-9.000	-999.	85.	8.9	0.07	0.28	1.00	2.60	130.	10.0	263.6	10.0
08	01	01	1	03	-3.8	0.064	-9.000	-9.000	-999.	37.	5.5	0.07	0.28	1.00	1.60	127.	10.0	263.0	10.0
08	01	01	1	04	-10.3	0.109	-9.000	-9.000	-999.	82.	10.0	0.12	0.28	1.00	2.40	153.	10.0	263.6	10.0
08	01	01	1	05	-8.5	0.095	-9.000	-9.000	-999.	68.	8.2	0.07	0.28	1.00	2.40	123.	10.0	263.1	10.0
08	01	01	1	06	-7.9	0.091	-9.000	-9.000	-999.	63.	7.6	0.05	0.28	1.00	2.40	93.	10.0	262.9	10.0
08	01	01	1	07	-7.2	0.086	-9.000	-9.000	-999.	58.	7.0	0.04	0.28	1.00	2.40	63.	10.0	262.6	10.0
08	01	01	1	08	-11.6	0.116	-9.000	-9.000	-999.	91.	10.9	0.05	0.28	1.00	2.90	30.	10.0	261.4	10.0
08	01	01	1	09	-13.2	0.185	-9.000	-9.000	-999.	184.	38.9	0.06	0.28	0.51	3.00	24.	10.0	262.9	10.0
08	01	01	1	10	10.3	0.229	0.258	0.005	54.	252.	-94.0	0.06	0.28	0.30	2.80	26.	10.0	264.2	10.0
08	01	01	1	11	27.2	0.247	0.447	0.005	105.	283.	-44.5	0.06	0.28	0.22	2.90	23.	10.0	265.8	10.0
08	01	01	1	12	31.4	0.256	0.518	0.005	142.	298.	-43.0	0.06	0.28	0.19	3.00	24.	10.0	267.2	10.0
08	01	01	1	13	34.5	0.201	0.582	0.007	183.	208.	-18.9	0.05	0.28	0.19	2.30	54.	10.0	268.6	10.0
08	01	01	1	14	31.7	0.255	0.602	0.005	220.	296.	-41.7	0.05	0.28	0.19	3.10	37.	10.0	267.6	10.0
08	01	01	1	15	23.3	0.252	0.565	0.005	247.	291.	-55.2	0.06	0.28	0.22	3.00	3.	10.0	267.8	10.0
08	01	01	1	16	-0.3	0.246	-9.000	-9.000	-999.	281.	4710.6	0.06	0.28	0.29	3.20	17.	10.0	267.4	10.0
08	01	01	1	17	-8.9	0.196	-9.000	-9.000	-999.	200.	68.0	0.06	0.28	0.49	2.90	13.	10.0	266.1	10.0
08	01	01	1	18	-13.0	0.244	-9.000	-9.000	-999.	277.	88.9	0.06	0.28	1.00	3.50	8.	10.0	264.5	10.0
08	01	01	1	19	-5.5	0.104	-9.000	-9.000	-999.	90.	16.1	0.05	0.28	1.00	2.20	35.	10.0	264.2	10.0
08	01	01	1	20	-2.6	0.056	-9.000	-9.000	-999.	31.	5.3	0.05	0.28	1.00	1.50	48.	10.0	264.2	10.0
08	01	01	1	21	-2.5	0.062	-9.000	-9.000	-999.	35.	7.4	0.06	0.28	1.00	1.60	17.	10.0	263.4	10.0
08	01	01	1	22	-2.9	0.066	-9.000	-9.000	-999.	39.	7.9	0.06	0.28	1.00	1.70	26.	10.0	263.9	10.0
08	01	01	1	23	-8.6	0.160	-9.000	-9.000	-999.	147.	38.2	0.06	0.28	1.00	2.60	24.	10.0	263.0	10.0
08	01	01	1	24	-26.9	0.273	-9.000	-9.000	-999.	327.	60.1	0.06	0.28	1.00	4.10	15.	10.0	262.9	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	10.0	1	144.	3.60	264.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
HOLLY	1ST HIGHEST VALUE IS	4.72599	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	4.70618	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	4.65174	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	4.63952	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	4.49429	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	4.40500	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	4.37946	AT (424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	4.22301	AT (424116.80, 4526553.40, 1308.40, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	4.21906	AT (424019.80, 4526634.90, 1305.01, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	4.17906	AT (423998.90, 4526560.50, 1305.38, 2867.37, 0.00)	DC	
BTFLPWR	1ST HIGHEST VALUE IS	1.38316	AT (425400.00, 4526200.00, 1334.01, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.36254	AT (425400.00, 4526300.00, 1332.82, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.28733	AT (425400.00, 4526100.00, 1335.08, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	1.24438	AT (425500.00, 4526200.00, 1335.95, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	1.17055	AT (425500.00, 4526100.00, 1337.26, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	1.14566	AT (425400.00, 4526000.00, 1336.08, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	1.12282	AT (425500.00, 4526300.00, 1334.69, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	1.09744	AT (425800.00, 4526400.00, 1339.56, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	1.05884	AT (425500.00, 4526000.00, 1338.62, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	1.02710	AT (425400.00, 4525900.00, 1337.65, 2867.37, 0.00)	DC	
GADSBY	1ST HIGHEST VALUE IS	1.34487	AT (421000.00, 4510000.00, 1290.68, 1290.68, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.33776	AT (423000.00, 4513000.00, 1289.00, 2725.66, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.32893	AT (421000.00, 4511000.00, 1288.42, 1288.42, 0.00)	DC	
	4TH HIGHEST VALUE IS	1.29404	AT (422000.00, 4512000.00, 1290.00, 1290.00, 0.00)	DC	
	5TH HIGHEST VALUE IS	1.26724	AT (421000.00, 4509000.00, 1291.42, 1291.42, 0.00)	DC	
	6TH HIGHEST VALUE IS	1.21290	AT (420000.00, 4509000.00, 1291.00, 1291.00, 0.00)	DC	
	7TH HIGHEST VALUE IS	1.21119	AT (422000.00, 4511000.00, 1289.89, 1289.89, 0.00)	DC	

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          8TH HIGHEST VALUE IS       1.20604 AT (  418000.00,  4516000.00,  1286.00,  1286.00,    0.00)  DC
          9TH HIGHEST VALUE IS       1.19889 AT (  417500.00,  4516000.00,  1286.00,  1286.00,    0.00)  DC
         10TH HIGHEST VALUE IS       1.19232 AT (  417500.00,  4516500.00,  1286.00,  1286.00,    0.00)  DC

TESORO    1ST HIGHEST VALUE IS       2.47951 AT (  424000.00,  4516000.00,  1305.59,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.93027 AT (  423500.00,  4516500.00,  1293.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.64497 AT (  423500.00,  4517000.00,  1340.85,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.50009 AT (  424000.00,  4516500.00,  1348.58,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.35254 AT (  424500.00,  4516000.00,  1482.12,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.31411 AT (  423500.00,  4516000.00,  1289.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.11467 AT (  424000.00,  4515000.00,  1291.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.08692 AT (  423000.00,  4517000.00,  1292.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.06603 AT (  423000.00,  4514000.00,  1288.00,  2764.40,    0.00)  DC
         10TH HIGHEST VALUE IS       1.05920 AT (  423000.00,  4517500.00,  1300.00,  2867.37,    0.00)  DC
```



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                                   *** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER   1 YEARS ***


                                    ** CONC OF NO2      IN MICROGRAMS/M**3                        **

                                                                                                          NETWORK
GROUP ID                       AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

CHEVRON   1ST HIGHEST VALUE IS       2.63215 AT (  422500.00,  4519500.00,  1289.88,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.62204 AT (  422000.00,  4519000.00,  1287.16,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.23588 AT (  422500.00,  4519000.00,  1288.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.15107 AT (  423000.00,  4519500.00,  1322.98,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.05211 AT (  422000.00,  4518500.00,  1283.42,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.91379 AT (  422000.00,  4518000.00,  1284.01,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.86047 AT (  422000.00,  4520500.00,  1287.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.86020 AT (  422000.00,  4517500.00,  1286.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       1.85293 AT (  423000.00,  4520000.00,  1361.35,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       1.84374 AT (  422000.00,  4520000.00,  1286.43,  2867.37,    0.00)  DC

BIGWEST   1ST HIGHEST VALUE IS       5.68980 AT (  422600.00,  4521000.00,  1297.53,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       5.12497 AT (  422400.00,  4521200.00,  1291.48,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       4.62887 AT (  422600.00,  4521200.00,  1297.70,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       4.31433 AT (  422400.00,  4521000.00,  1292.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.30780 AT (  422800.00,  4521200.00,  1304.99,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.24451 AT (  422400.00,  4521400.00,  1291.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.05692 AT (  422800.00,  4521000.00,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.85886 AT (  422500.00,  4520500.00,  1292.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.85122 AT (  422400.00,  4521600.00,  1290.31,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.73107 AT (  422200.00,  4521400.00,  1289.03,  2867.37,    0.00)  DC

SI_EAGLE  1ST HIGHEST VALUE IS       3.47418 AT (  423400.00,  4524400.00,  1305.77,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       3.28913 AT (  423200.00,  4524600.00,  1303.27,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.80759 AT (  423400.00,  4524200.00,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.55300 AT (  423200.00,  4524000.00,  1303.06,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.49390 AT (  423400.00,  4524000.00,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.43643 AT (  423200.00,  4523800.00,  1304.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       2.37922 AT (  423200.00,  4524800.00,  1303.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.36783 AT (  423200.00,  4523600.00,  1304.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.34393 AT (  423200.00,  4524200.00,  1303.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.33265 AT (  423600.00,  4524400.00,  1308.00,  2867.37,    0.00)  DC

ALL       1ST HIGHEST VALUE IS       8.96672 AT (  422600.00,  4521000.00,  1297.53,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       8.22308 AT (  422400.00,  4521200.00,  1291.48,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       7.82514 AT (  422600.00,  4521200.00,  1297.70,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       7.56591 AT (  422400.00,  4521000.00,  1292.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       6.80734 AT (  422000.00,  4519000.00,  1287.16,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       6.77995 AT (  422500.00,  4519500.00,  1289.88,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       6.47027 AT (  422800.00,  4521200.00,  1304.99,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       6.38167 AT (  422000.00,  4520000.00,  1286.43,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       6.33602 AT (  422500.00,  4520500.00,  1292.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       6.29373 AT (  422400.00,  4521400.00,  1291.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 24 Warning Message(s)
A Total of 146 Informational Message(s)

A Total of 8784 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 146 Missing Hours Identified (1.66 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

```
SO W320    1673  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
SO W320    2705  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H2
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:          12H1
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE104
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE108
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ301
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ307
CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ308
CN W305       4 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ316
CN W305       4 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ320
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLAREN
CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE106
CN W305       6 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE105
CN W305       6 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ319
CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE102
CN W305       8 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H1
CN W305       8 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ322
CN W305       9 WAKFLG:Stack height > or = EPA formula height for SRCID:           4H1
CN W305      44 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
```

```
*** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Short Term Averages           ***        05/10/12
                                  *** 4-years Met Data - Syracuse 2006-2009                               ***        09:22:59
                                                                                                                     PAGE   1
**MODELOPTs:  NonDFAULT CONC                                                 ELEV
                                                                                       PVMRM

                                           ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses URBAN Dispersion Algorithm for the SBL for   109 Source(s),
  for Total of    2 Urban Area(s):
  Urban ID = DAVIS_CO ;  Urban Population =    306479.0 ;  Urban Roughness Length =  1.000 m
  Urban ID = SLCOUNTY ;  Urban Population =   1029655.0 ;  Urban Roughness Length =  1.000 m

**Model Allows User-Specified Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Plume Volume Molar Ratio Method (PVMRM) Used for NO2 Conversion
           with an Equilibrium NO2/NOx Ratio of  0.900
           and with a Default In-stack Ratio of  0.250
        7. Urban Roughness Length of 1.0 Meter Used.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates ANNUAL Averages Only

**This Run Includes:    110 Source(s);       8 Source Group(s); and   10025 Receptor(s)

**The Model Assumes A Pollutant Type of:  NO2

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of ANNUAL Averages by Receptor
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1288.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                               ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     57.3 MB of RAM.

**Input Runstream File:          Holly_FI11_NO2_lt_2009_NO2.DTA
**Output Print File:             Holly_FI11_NO2_lt_2009_NO2.LST

**File for Summary of Results:   C:\beast\Holly\Holly_FI11_NO2_lt_2009_NO2.SUM

*** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Short Term Averages           ***        05/10/12
                                  *** 4-years Met Data - Syracuse 2006-2009                               ***        09:22:59
                                                                                                                     PAGE   2
**MODELOPTs:  NonDFAULT CONC                                                 ELEV
                                                                                       PVMRM

                                           *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                              (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                  *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                         (METERS/SEC)

                                               1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2009.SFC Met Version: 11059
Profile file: SY2009.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 72572
Name: SALT_LAKE_CITY,UT Name: UNKNOWN
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.00	127.	10.0	267.9	10.0
09	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	1.80	120.	10.0	268.0	10.0
09	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	3.00	106.	10.0	269.1	10.0
09	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.10	132.	10.0	270.2	10.0
09	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.80	141.	10.0	269.8	10.0
09	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.50	148.	10.0	269.4	10.0
09	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	1.90	96.	10.0	269.2	10.0
09	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.12	0.28	1.00	0.80	178.	10.0	269.6	10.0
09	01	01	1	09	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	0.51	2.70	149.	10.0	270.9	10.0
09	01	01	1	10	9.0	0.274	0.144	0.005	10.	330.	-177.5	0.12	0.28	0.30	2.90	154.	10.0	271.9	10.0
09	01	01	1	11	22.7	0.173	0.298	0.012	36.	169.	-17.8	0.09	0.28	0.22	1.70	190.	10.0	273.9	10.0
09	01	01	1	12	31.6	0.109	0.420	0.018	73.	84.	-3.2	0.05	0.28	0.19	1.00	46.	10.0	275.6	10.0
09	01	01	1	13	34.8	0.258	0.504	0.005	114.	301.	-38.1	0.12	0.28	0.19	2.50	163.	10.0	277.0	10.0
09	01	01	1	14	32.1	0.113	0.539	0.013	151.	102.	-3.5	0.12	0.28	0.19	0.80	154.	10.0	277.9	10.0
09	01	01	1	15	4.7	0.155	0.288	0.013	157.	141.	-62.0	0.07	0.28	0.22	1.80	124.	10.0	278.8	10.0
09	01	01	1	16	0.4	0.334	0.124	0.005	158.	444.	-7805.0	0.07	0.28	0.29	4.20	143.	10.0	278.6	10.0
09	01	01	1	17	-14.1	0.342	-9.000	-9.000	-999.	460.	219.8	0.07	0.28	0.49	4.50	146.	10.0	277.9	10.0
09	01	01	1	18	-26.4	0.354	-9.000	-9.000	-999.	485.	130.6	0.07	0.28	1.00	4.80	146.	10.0	277.4	10.0
09	01	01	1	19	-35.5	0.392	-9.000	-9.000	-999.	564.	131.3	0.12	0.28	1.00	4.70	169.	10.0	277.4	10.0
09	01	01	1	20	-28.1	0.311	-9.000	-9.000	-999.	402.	82.5	0.12	0.28	1.00	3.90	150.	10.0	277.6	10.0
09	01	01	1	21	-29.8	0.330	-9.000	-9.000	-999.	437.	93.6	0.07	0.28	1.00	4.60	129.	10.0	278.5	10.0
09	01	01	1	22	-14.1	0.288	-9.000	-9.000	-999.	356.	130.9	0.07	0.28	1.00	3.90	131.	10.0	278.8	10.0
09	01	01	1	23	-23.6	0.320	-9.000	-9.000	-999.	416.	107.0	0.07	0.28	1.00	4.40	122.	10.0	278.9	10.0
09	01	01	1	24	-24.9	0.337	-9.000	-9.000	-999.	450.	118.7	0.07	0.28	1.00	4.60	130.	10.0	278.4	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	127.	3.00	267.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER 1 YEARS ***

** CONC OF NO2 IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE	NETWORK GRID-ID
HOLLY	1ST HIGHEST VALUE IS	4.53249	AT (424019.30, 4526585.90, 1306.09, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	4.52721	AT (424019.60, 4526610.40, 1306.04, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	4.51353	AT (423999.40, 4526610.20, 1304.83, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	4.47986	AT (424000.00, 4526600.00, 1304.70, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	4.46758	AT (423999.60, 4526635.10, 1305.00, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	4.44301	AT (424019.10, 4526561.40, 1306.00, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	4.42681	AT (424116.80, 4526553.40, 1308.40, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	4.40810	AT (424108.60, 4526530.70, 1308.63, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	4.40672	AT (424124.90, 4526576.10, 1308.06, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	4.40111	AT (423999.10, 4526585.40, 1305.28, 2867.37, 0.00)	DC	
BTFLPWR	1ST HIGHEST VALUE IS	1.34963	AT (425400.00, 4526200.00, 1334.01, 2867.37, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.31618	AT (425400.00, 4526300.00, 1332.82, 2867.37, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.27757	AT (425500.00, 4526200.00, 1335.95, 2867.37, 0.00)	DC	
	4TH HIGHEST VALUE IS	1.27576	AT (425400.00, 4526100.00, 1335.08, 2867.37, 0.00)	DC	
	5TH HIGHEST VALUE IS	1.22090	AT (425500.00, 4526100.00, 1337.26, 2867.37, 0.00)	DC	
	6TH HIGHEST VALUE IS	1.15273	AT (425400.00, 4526000.00, 1336.08, 2867.37, 0.00)	DC	
	7TH HIGHEST VALUE IS	1.12596	AT (425800.00, 4526400.00, 1339.56, 2867.37, 0.00)	DC	
	8TH HIGHEST VALUE IS	1.12157	AT (425500.00, 4526300.00, 1334.69, 2867.37, 0.00)	DC	
	9TH HIGHEST VALUE IS	1.10814	AT (425500.00, 4526000.00, 1338.62, 2867.37, 0.00)	DC	
	10TH HIGHEST VALUE IS	1.06077	AT (425400.00, 4525900.00, 1337.65, 2867.37, 0.00)	DC	
GADSBY	1ST HIGHEST VALUE IS	1.73465	AT (421000.00, 4510000.00, 1290.68, 1290.68, 0.00)	DC	
	2ND HIGHEST VALUE IS	1.65369	AT (421000.00, 4509000.00, 1291.42, 1291.42, 0.00)	DC	
	3RD HIGHEST VALUE IS	1.61062	AT (421000.00, 4511000.00, 1288.42, 1288.42, 0.00)	DC	
	4TH HIGHEST VALUE IS	1.53857	AT (421000.00, 4508000.00, 1292.52, 1292.52, 0.00)	DC	
	5TH HIGHEST VALUE IS	1.42377	AT (421000.00, 4507000.00, 1293.00, 1293.00, 0.00)	DC	
	6TH HIGHEST VALUE IS	1.42283	AT (422000.00, 4511000.00, 1289.89, 1289.89, 0.00)	DC	
	7TH HIGHEST VALUE IS	1.40584	AT (422000.00, 4512000.00, 1290.00, 1290.00, 0.00)	DC	

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          8TH HIGHEST VALUE IS       1.38836 AT (  422000.00,  4510000.00,  1289.16,  1289.16,    0.00)  DC
          9TH HIGHEST VALUE IS       1.38236 AT (  423000.00,  4513000.00,  1289.00,  2725.66,    0.00)  DC
         10TH HIGHEST VALUE IS       1.34095 AT (  420000.00,  4508000.00,  1292.11,  1292.11,    0.00)  DC

TESORO    1ST HIGHEST VALUE IS       2.47003 AT (  424000.00,  4516000.00,  1305.59,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       1.77703 AT (  423500.00,  4516500.00,  1293.01,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       1.47355 AT (  424500.00,  4516000.00,  1482.12,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       1.47152 AT (  424000.00,  4516500.00,  1348.58,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       1.34543 AT (  423500.00,  4517000.00,  1340.85,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       1.31075 AT (  423500.00,  4516000.00,  1289.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       1.24870 AT (  424000.00,  4515000.00,  1291.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       1.22114 AT (  423000.00,  4513000.00,  1289.00,  2725.66,    0.00)  DC
          9TH HIGHEST VALUE IS       1.21646 AT (  423000.00,  4514000.00,  1288.00,  2764.40,    0.00)  DC
         10TH HIGHEST VALUE IS       1.08797 AT (  423000.00,  4512000.00,  1290.25,  2454.75,    0.00)  DC

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Short Term Averages            ***        05/10/12
                                   *** 4-years Met Data - Syracuse 2006-2009                                ***        09:22:59
                                                                                                                       PAGE   5
 **MODELOPTs:  NonDFAULT CONC                                                ELEV
                                                                                     PVMRM

                                   *** THE SUMMARY OF MAXIMUM ANNUAL RESULTS AVERAGED OVER   1 YEARS ***


                                    ** CONC OF NO2      IN MICROGRAMS/M**3                          **

                                                                                                          NETWORK
GROUP ID                       AVERAGE CONC               RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

CHEVRON   1ST HIGHEST VALUE IS       2.77650 AT (  422000.00,  4519000.00,  1287.16,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.64981 AT (  422500.00,  4519500.00,  1289.88,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.33773 AT (  422500.00,  4519000.00,  1288.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.32233 AT (  423000.00,  4519500.00,  1322.98,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.31562 AT (  422000.00,  4518500.00,  1283.42,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.30887 AT (  422000.00,  4517500.00,  1286.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       2.28451 AT (  422000.00,  4518000.00,  1284.01,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.19367 AT (  422000.00,  4517000.00,  1286.14,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.07135 AT (  421500.00,  4517000.00,  1284.03,  2795.96,    0.00)  DC
         10TH HIGHEST VALUE IS       2.06046 AT (  421500.00,  4516500.00,  1286.00,  2764.40,    0.00)  DC

BIGWEST   1ST HIGHEST VALUE IS       5.76656 AT (  422600.00,  4521000.00,  1297.53,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       4.89633 AT (  422400.00,  4521200.00,  1291.48,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       4.57911 AT (  422600.00,  4521200.00,  1297.70,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       4.13301 AT (  422400.00,  4521000.00,  1292.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       3.35702 AT (  422800.00,  4521200.00,  1304.99,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       3.17830 AT (  422500.00,  4520500.00,  1292.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       3.17235 AT (  422800.00,  4521000.00,  1306.00,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       3.07323 AT (  422400.00,  4521400.00,  1291.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.89909 AT (  422000.00,  4520000.00,  1286.43,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.79087 AT (  422000.00,  4519500.00,  1286.00,  2867.37,    0.00)  DC

SI_EAGLE  1ST HIGHEST VALUE IS       3.47533 AT (  423400.00,  4524400.00,  1305.77,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       2.98763 AT (  423200.00,  4524600.00,  1303.27,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       2.90367 AT (  423400.00,  4524200.00,  1306.00,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       2.65100 AT (  423200.00,  4523600.00,  1304.00,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       2.64132 AT (  423400.00,  4524000.00,  1306.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       2.63365 AT (  423200.00,  4523800.00,  1304.00,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       2.62508 AT (  423200.00,  4523400.00,  1305.06,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       2.60831 AT (  423200.00,  4524000.00,  1303.06,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       2.53315 AT (  423200.00,  4523200.00,  1305.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       2.47529 AT (  423600.00,  4524400.00,  1308.00,  2867.37,    0.00)  DC

ALL       1ST HIGHEST VALUE IS       9.26048 AT (  422600.00,  4521000.00,  1297.53,  2867.37,    0.00)  DC
          2ND HIGHEST VALUE IS       8.05647 AT (  422400.00,  4521200.00,  1291.48,  2867.37,    0.00)  DC
          3RD HIGHEST VALUE IS       8.00344 AT (  422600.00,  4521200.00,  1297.70,  2867.37,    0.00)  DC
          4TH HIGHEST VALUE IS       7.52285 AT (  422000.00,  4519000.00,  1287.16,  2867.37,    0.00)  DC
          5TH HIGHEST VALUE IS       7.42865 AT (  422400.00,  4521000.00,  1292.00,  2867.37,    0.00)  DC
          6TH HIGHEST VALUE IS       7.33634 AT (  422500.00,  4519500.00,  1289.88,  2867.37,    0.00)  DC
          7TH HIGHEST VALUE IS       6.86959 AT (  422800.00,  4521200.00,  1304.99,  2867.37,    0.00)  DC
          8TH HIGHEST VALUE IS       6.75777 AT (  422000.00,  4519500.00,  1286.00,  2867.37,    0.00)  DC
          9TH HIGHEST VALUE IS       6.75728 AT (  422500.00,  4520500.00,  1292.00,  2867.37,    0.00)  DC
         10TH HIGHEST VALUE IS       6.65065 AT (  422800.00,  4521000.00,  1306.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```

**MODELOPTs: NonDFAULT CONC ELEV
PVMRM

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 24 Warning Message(s)
A Total of 802 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 9 Calm Hours Identified

A Total of 793 Missing Hours Identified (9.05 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********

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SO W320    1673  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
SO W320    2705  PPARM:Input Parameter May Be Out-of-Range for Parameter            VS
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H2
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:          12H1
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE108
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ301
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ307
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ308
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ316
CN W305      10 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ320
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:           4H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:           9H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLAREN
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE105
CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ319
CN W305      12 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE102
CN W305      12 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE106
CN W305      16 WAKFLG:Stack height > or = EPA formula height for SRCID:         TE104
CN W305     233 WAKFLG:Stack height > or = EPA formula height for SRCID:           7H3
CN W305     252 WAKFLG:Stack height > or = EPA formula height for SRCID:          10H2
CN W305     253 WAKFLG:Stack height > or = EPA formula height for SRCID:          19H1
CN W305     256 WAKFLG:Stack height > or = EPA formula height for SRCID:         FJ322
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Appendix K
HAPS Spreadsheet

Holly Marketing & Refining
Model Determination Calculations for HAPs

Reference: **ACGIH 2011**
Source: **All Sources**
Type of Release Point: Vertically Restricted

HAP Name	CAS Number	Potential Emissions	Type of HAP	UDAQ published TLV/ TWA (1)			UDAQ's Emission Threshold Factor (ETF) for Vertically Restricted Sources (1)				Emission Threshold Value (ETV) (2)				Ratio of Potential Emissions to ETV (3)				Modeling Required?			
				(ug/m^3)			(m^3 lb / mg hr)				(lb/hr)											
		lb/hr		acute	chronic	carcinogenic	< 20 m	21 - 50 m	51 - 100 m	> 100 m	< 20 m	21 - 50 m	51 - 100 m	> 100 m	< 20 m	21 - 50 m	51 - 100 m	> 100 m	< 20 m	21 - 50 m	51 - 100 m	> 100 m
Benzene	71-43-2	1.99E-01	carcinogenic			1597	0.017	0.022	0.041	0.09	2.7E-02	3.5E-02	6.5E-02	1.4E-01	7.3E+00	5.7E+00	3.0E+00	1.4E+00	Yes	Yes	Yes	Yes
Toluene	108-88-3	1.63E-01	chronic		75315		0.051	0.066	0.123	0.269	3.8E+00	5.0E+00	9.3E+00	2.0E+01	4.2E-02	3.3E-02	1.8E-02	8.0E-03	No	No	No	No
Xylene	1330-20-7	1.07E-01	chronic		433926		0.051	0.066	0.123	0.269	2.2E+01	2.9E+01	5.3E+01	1.2E+02	4.8E-03	3.7E-03	2.0E-03	9.2E-04	No	No	No	No
2,2,4-Trimethylpentane	540-84-1	1.59E-01	unclassified																			
Formaldehyde	50-00-0	6.16E-02	acute	368			0.038	0.051	0.092	0.18	1.4E-02	1.9E-02	3.4E-02	6.6E-02	4.4E+00	3.3E+00	1.8E+00	9.3E-01	Yes	Yes	Yes	No
Acetaldehyde	75-07-0	4.04E-02	acute	61312			0.038	0.051	0.092	0.18	2.3E+00	3.1E+00	5.6E+00	1.1E+01	1.7E-02	1.3E-02	7.2E-03	3.7E-03	No	No	No	No
Acrolein	107-02-8	6.50E-04	chronic		229		0.051	0.066	0.123	0.269	1.2E-02	1.5E-02	2.8E-02	6.2E-02	5.6E-02	4.3E-02	2.3E-02	1.1E-02	No	No	No	No
Naphthalene	91-20-3	1.23E-03	chronic		52397		0.051	0.066	0.123	0.269	2.7E+00	3.5E+00	6.4E+00	1.4E+01	4.6E-04	3.6E-04	1.9E-04	8.7E-05	No	No	No	No
Hexane	110-54-3	1.09E+00	chronic		176237		0.051	0.066	0.123	0.269	9.0E+00	1.2E+01	2.2E+01	4.7E+01	1.2E-01	9.4E-02	5.0E-02	2.3E-02	No	No	No	No
Arsenic	7440-38-2	9.00E-05	chronic		10		0.051	0.066	0.123	0.269	5.1E-04	6.6E-04	1.2E-03	2.7E-03	1.8E-01	1.4E-01	7.3E-02	3.3E-02	No	No	No	No
Beryllium	7440-41-7	1.00E-05	chronic		0.05		0.051	0.066	0.123	0.269	2.6E-06	3.3E-06	6.2E-06	1.3E-05	3.9E+00	3.0E+00	1.6E+00	7.4E-01	Yes	Yes	Yes	No
Cadmium	7440-43-9	5.20E-04	carcinogenic			2	0.017	0.022	0.041	0.09	3.4E-05	4.4E-05	8.2E-05	1.8E-04	1.5E+01	1.2E+01	6.3E+00	2.9E+00	Yes	Yes	Yes	Yes
Chromium	7440-47-3	6.60E-04	carcinogenic			10	0.017	0.022	0.041	0.09	1.7E-04	2.2E-04	4.1E-04	9.0E-04	3.9E+00	3.0E+00	1.6E+00	7.3E-01	Yes	Yes	Yes	No
Cobalt	7440-48-4	4.00E-05	chronic		20		0.051	0.066	0.123	0.269	1.0E-03	1.3E-03	2.5E-03	5.4E-03	3.9E-02	3.0E-02	1.6E-02	7.4E-03	No	No	No	No
Manganese	7439-96-5	1.80E-04	chronic		200		0.051	0.066	0.123	0.269	1.0E-02	1.3E-02	2.5E-02	5.4E-02	1.8E-02	1.4E-02	7.3E-03	3.3E-03	No	No	No	No
Mercury	7439-97-6	1.20E-04	chronic		10		0.051	0.066	0.123	0.269	5.1E-04	6.6E-04	1.2E-03	2.7E-03	2.4E-01	1.8E-01	9.8E-02	4.5E-02	No	No	No	No
Nickel	7440-02-0	1.00E-03	chronic		1500		0.051	0.066	0.123	0.269	7.7E-02	9.9E-02	1.8E-01	4.0E-01	1.3E-02	1.0E-02	5.4E-03	2.5E-03	No	No	No	No
Selenium	7782-49-2	1.00E-05	chronic		200		0.051	0.066	0.123	0.269	1.0E-02	1.3E-02	2.5E-02	5.4E-02	9.8E-04	7.6E-04	4.1E-04	1.9E-04	No	No	No	No
Ethylbenzene	100-41-4	3.15E-02	chronic		86785		0.051	0.066	0.123	0.269	4.4E+00	5.7E+00	1.1E+01	2.3E+01	7.1E-03	5.5E-03	2.9E-03	1.3E-03	No	No	No	No
Propylene Oxide	75-56-9	4.15E-02	chronic		3440		0.051	0.066	0.123	0.269	1.8E-01	2.3E-01	4.2E-01	9.3E-01	2.4E-01	1.8E-01	9.8E-02	4.5E-02	No	No	No	No
Chlorine	7782-50-5	5.44E-01	chronic		1449		0.051	0.066	0.123	0.269	7.4E-02	9.6E-02	1.8E-01	3.9E-01	7.4E+00	5.7E+00	3.1E+00	1.4E+00	Yes	Yes	Yes	Yes

Appendix L
HAPS AERMOD Analyses Results

```
                                           ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     21 Source(s);      22 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  BENZENE

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     23.2 MB of RAM.

**Input Runstream File:          Holly_HAPS_2006_BENZENE.DTA
**Output Print File:             Holly_HAPS_2006_BENZENE.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2006_BENZENE.SUM
```



```
                                           *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                              (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                 *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                           (METERS/SEC)

                                          1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2006.SFC Met Version: 11059
Profile file: SY2006.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2006 Year: 2006

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
06	01	01	1	01	-11.8	0.241	-9.000	-9.000	-999.	273.	91.0	0.09	0.28	1.00	3.20	185.	10.0	276.0	10.0
06	01	01	1	02	-11.9	0.244	-9.000	-9.000	-999.	277.	93.0	0.01	0.28	1.00	4.60	248.	10.0	276.5	10.0
06	01	01	1	03	-24.7	0.504	-9.000	-9.000	-999.	824.	399.2	0.01	0.28	1.00	9.00	269.	10.0	277.0	10.0
06	01	01	1	04	-40.4	0.427	-9.000	-9.000	-999.	646.	146.0	0.02	0.28	1.00	7.00	290.	10.0	276.9	10.0
06	01	01	1	05	-15.9	0.324	-9.000	-9.000	-999.	430.	164.1	0.04	0.28	1.00	4.80	301.	10.0	276.4	10.0
06	01	01	1	06	-18.0	0.366	-9.000	-9.000	-999.	508.	209.4	0.02	0.28	1.00	5.90	298.	10.0	276.4	10.0
06	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.02	0.28	1.00	6.30	289.	10.0	275.9	10.0
06	01	01	1	08	-34.7	0.381	-9.000	-9.000	-999.	540.	122.8	0.02	0.28	1.00	6.30	282.	10.0	275.4	10.0
06	01	01	1	09	-21.0	0.324	-9.000	-9.000	-999.	425.	124.8	0.01	0.28	0.51	6.00	268.	10.0	275.1	10.0
06	01	01	1	10	10.5	0.195	0.315	0.005	92.	206.	-54.3	0.01	0.28	0.30	3.20	249.	10.0	276.1	10.0
06	01	01	1	11	27.6	0.203	0.649	0.005	307.	211.	-23.6	0.01	0.28	0.22	3.20	248.	10.0	277.5	10.0
06	01	01	1	12	38.6	0.170	0.825	0.005	450.	161.	-9.8	0.01	0.28	0.19	2.50	249.	10.0	278.4	10.0
06	01	01	1	13	42.5	0.283	0.942	0.005	608.	346.	-41.1	0.09	0.28	0.19	3.00	207.	10.0	279.2	10.0
06	01	01	1	14	32.3	0.382	0.913	0.005	729.	543.	-133.3	0.12	0.28	0.19	4.00	168.	10.0	279.9	10.0
06	01	01	1	15	4.8	0.338	0.487	0.005	746.	452.	-623.1	0.07	0.28	0.22	4.20	148.	10.0	279.8	10.0
06	01	01	1	16	0.4	0.444	0.218	0.005	747.	681.	-8888.0	0.12	0.28	0.29	4.90	155.	10.0	279.4	10.0
06	01	01	1	17	-17.9	0.410	-9.000	-9.000	-999.	605.	298.0	0.12	0.28	0.49	4.70	161.	10.0	278.4	10.0
06	01	01	1	18	-25.2	0.339	-9.000	-9.000	-999.	457.	119.9	0.12	0.28	1.00	4.10	163.	10.0	277.4	10.0
06	01	01	1	19	-21.1	0.284	-9.000	-9.000	-999.	349.	83.7	0.07	0.28	1.00	4.00	149.	10.0	276.6	10.0
06	01	01	1	20	-9.3	0.189	-9.000	-9.000	-999.	192.	55.7	0.07	0.28	1.00	2.80	124.	10.0	276.0	10.0
06	01	01	1	21	-18.7	0.381	-9.000	-9.000	-999.	540.	227.2	0.07	0.28	1.00	5.00	140.	10.0	276.9	10.0
06	01	01	1	22	-12.9	0.262	-9.000	-9.000	-999.	316.	108.2	0.12	0.28	1.00	3.20	165.	10.0	277.1	10.0
06	01	01	1	23	-14.5	0.296	-9.000	-9.000	-999.	371.	138.0	0.07	0.28	1.00	4.00	134.	10.0	277.2	10.0
06	01	01	1	24	-18.2	0.372	-9.000	-9.000	-999.	522.	218.0	0.07	0.28	1.00	4.90	133.	10.0	277.8	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
06	01	01	01	10.0	1	185.	3.20	276.1	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF BENZENE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	4.41529	ON 06082720:	AT (423950.00, 4526300.00, 1306.66, 2867.37, 0.00)	DC
20H3	HIGH 1ST HIGH VALUE IS	0.00058	ON 06022420:	AT (427000.00, 4526400.00, 1388.10, 2867.37, 0.00)	DC
24H1	HIGH 1ST HIGH VALUE IS	0.00060	ON 06022420:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
25H1	HIGH 1ST HIGH VALUE IS	0.00049	ON 06022420:	AT (427000.00, 4526800.00, 1382.27, 2867.37, 0.00)	DC
26H1	HIGH 1ST HIGH VALUE IS	0.00028	ON 06022420:	AT (426600.00, 4526800.00, 1356.70, 2867.37, 0.00)	DC
27H1	HIGH 1ST HIGH VALUE IS	0.00008	ON 06022420:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
33H1	HIGH 1ST HIGH VALUE IS	0.00094	ON 06022420:	AT (427400.00, 4526400.00, 1420.32, 2867.37, 0.00)	DC
BOILER11	HIGH 1ST HIGH VALUE IS	0.00107	ON 06022420:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
68H6	HIGH 1ST HIGH VALUE IS	0.00014	ON 06092904:	AT (424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC
68H7	HIGH 1ST HIGH VALUE IS	0.00015	ON 06120622:	AT (424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC
68H10	HIGH 1ST HIGH VALUE IS	0.00007	ON 06110718:	AT (425000.00, 4525800.00, 1331.29, 2867.37, 0.00)	DC
68H11	HIGH 1ST HIGH VALUE IS	0.00007	ON 06022420:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH 1ST HIGH VALUE IS	0.00007	ON 06022420:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC

68H13	HIGH	1ST HIGH VALUE IS	0.00007	ON 06110718: AT (	425000.00,	4525700.00,	1332.22,	2867.37,	0.00)	DC
CWT10	HIGH	1ST HIGH VALUE IS	1.74549	ON 06072401: AT (	424001.70,	4526834.10,	1303.51,	2867.37,	0.00)	DC
CWT11	HIGH	1ST HIGH VALUE IS	1.07602	ON 06061924: AT (	423776.40,	4526311.50,	1303.07,	2867.37,	0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.01373	ON 06022420: AT (	427200.00,	4526800.00,	1397.26,	2867.37,	0.00)	DC
TANK70	HIGH	1ST HIGH VALUE IS	0.01973	ON 06050920: AT (	424214.70,	4526825.30,	1307.63,	2867.37,	0.00)	DC
TANK71	HIGH	1ST HIGH VALUE IS	0.02214	ON 06050920: AT (	424239.20,	4526893.30,	1307.25,	2867.37,	0.00)	DC
TANK72	HIGH	1ST HIGH VALUE IS	0.02400	ON 06021605: AT (	424022.30,	4526879.70,	1303.97,	2867.37,	0.00)	DC
TANK90	HIGH	1ST HIGH VALUE IS	0.00364	ON 06120521: AT (	423629.70,	4526311.40,	1301.93,	2867.37,	0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	4.41426	ON 06082720: AT (	423950.00,	4526300.00,	1306.66,	2867.37,	0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF BENZENE IN MICROGRAMS/M**3 **

NETWORK GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR,	YR,	ZELEV,	ZHILL,	ZFLAG)	OF TYPE GRID-ID
ALL	HIGH	1ST HIGH VALUE IS	0.84071	ON 06120824: AT (	423923.00,	4526311.70,	1306.13,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00010	ON 06120824: AT (	425400.00,	4523800.00,	1381.29,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00010	ON 06120824: AT (	425400.00,	4523800.00,	1381.29,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00009	ON 06120824: AT (	425400.00,	4523800.00,	1381.29,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00004	ON 06120824: AT (	425200.00,	4524400.00,	1356.99,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00001	ON 06120824: AT (	425600.00,	4523600.00,	1398.25,	2867.37,	0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00018	ON 06120824: AT (	425600.00,	4523400.00,	1407.26,	2867.37,	0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00022	ON 06122816: AT (	423800.80,	4526311.60,	1303.75,	2867.37,	0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00007	ON 06092508: AT (	424021.30,	4526781.80,	1304.07,	2867.37,	0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00007m	ON 06090408: AT (	424021.80,	4526830.80,	1304.02,	2867.37,	0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00002	ON 06021908: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00002	ON 06022008: AT (	423703.10,	4526311.50,	1302.74,	2867.37,	0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00002	ON 06021908: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00002	ON 06021908: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
CWT10	HIGH	1ST HIGH VALUE IS	0.60995	ON 06022808: AT (	423863.70,	4526986.50,	1300.17,	2867.37,	0.00)	DC
CWT11	HIGH	1ST HIGH VALUE IS	0.56782	ON 06061924: AT (	423800.80,	4526311.60,	1303.75,	2867.37,	0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.00246	ON 06120824: AT (	425400.00,	4523600.00,	1388.65,	2867.37,	0.00)	DC
TANK70	HIGH	1ST HIGH VALUE IS	0.00601	ON 06012524: AT (	424214.70,	4526825.30,	1307.63,	2867.37,	0.00)	DC
TANK71	HIGH	1ST HIGH VALUE IS	0.00660	ON 06012524: AT (	424239.20,	4526893.30,	1307.25,	2867.37,	0.00)	DC
TANK72	HIGH	1ST HIGH VALUE IS	0.00946m	ON 06090408: AT (	424022.80,	4526928.70,	1303.00,	2867.37,	0.00)	DC
TANK90	HIGH	1ST HIGH VALUE IS	0.00166	ON 06022008: AT (	423629.70,	4526311.40,	1301.93,	2867.37,	0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	0.84017	ON 06120824: AT (	423923.00,	4526311.70,	1306.13,	2867.37,	0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDEFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF BENZENE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.56865	ON 06122824:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00004m	ON 06123024:	AT (426200.00, 4524800.00, 1384.77, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00004m	ON 06123024:	AT (426400.00, 4525000.00, 1388.52, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00003	ON 06120824:	AT (425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00003	ON 06122824:	AT (423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 06120824:	AT (425600.00, 4523600.00, 1398.25, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00006m	ON 06100824:	AT (427000.00, 4526200.00, 1385.51, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00018	ON 06122824:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00003m	ON 06093024:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00004	ON 06110624:	AT (424022.10, 4526855.30, 1304.00, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00001m	ON 06121624:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00001m	ON 06121624:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00001m	ON 06121624:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00001m	ON 06121624:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
CWT10	HIGH	1ST HIGH VALUE IS	0.28574m	ON 06022824:	AT (423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC
CWT11	HIGH	1ST HIGH VALUE IS	0.42853	ON 06122824:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.00083m	ON 06123024:	AT (426400.00, 4524800.00, 1394.52, 2867.37, 0.00)	DC
TANK70	HIGH	1ST HIGH VALUE IS	0.00347	ON 06012624:	AT (424214.70, 4526825.30, 1307.63, 2867.37, 0.00)	DC
TANK71	HIGH	1ST HIGH VALUE IS	0.00380	ON 06012624:	AT (424239.20, 4526893.30, 1307.25, 2867.37, 0.00)	DC
TANK72	HIGH	1ST HIGH VALUE IS	0.00431m	ON 06111524:	AT (424022.80, 4526928.70, 1303.00, 2867.37, 0.00)	DC
TANK90	HIGH	1ST HIGH VALUE IS	0.00082	ON 06020724:	AT (423605.30, 4526311.40, 1301.42, 2867.37, 0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	0.37157	ON 06010624:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDEFAULT CONC ELEV

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 2 Warning Message(s)
A Total of 525 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 525 Missing Hours Identified (5.99 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
CN W305 2 WAKFLG:Stack height > or = EPA formula height for SRCID: FLARES
CN W305 13 WAKFLG:Stack height > or = EPA formula height for SRCID: 33H1

```
 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications -
Hazardour Air Pollutants      ***       05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                      ***        16:55:47
                                                                                                                         PAGE   1
 **MODELOPTs:  RegDFAULT CONC                                                      ELEV


                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses RURAL Dispersion Only.

 **Model Uses Regulatory DEFAULT Options:
         1. Stack-tip Downwash.
         2. Model Accounts for ELEVated Terrain Effects.
         3. Use Calms Processing Routine.
         4. Use Missing Data Processing Routine.
         5. No Exponential Decay.

 **Model Assumes No FLAGPOLE Receptor Heights.

 **Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

 **This Run Includes:     21 Source(s);      22 Source Group(s); and   10024 Receptor(s)

 **The Model Assumes A Pollutant Type of:  BENZENE

 **Model Set To Continue RUNning After the Setup Testing.

 **Output Options Selected:
          Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
          Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
          Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                  Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =     23.2 MB of RAM.

 **Input Runstream File:          Holly_HAPS_2007_BENZENE.DTA
 **Output Print File:             Holly_HAPS_2007_BENZENE.LST

 **File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2007_BENZENE.SUM

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants      ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                      ***        16:55:47
                                                                                                                         PAGE   2
 **MODELOPTs:  RegDFAULT CONC                                                      ELEV


                                          *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                          (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                       (METERS/SEC)

                                               1.54,   3.09,   5.14,   8.23,  10.80,
 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants      ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                      ***        16:55:47
                                                                                                                         PAGE   3
 **MODELOPTs:  RegDFAULT CONC                                                      ELEV


                                  *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

   Surface file:   SY2007.SFC                                                                      Met Version:  11059
   Profile file:   SY2007.PFL
   Surface format: FREE
```

Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2007 Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-2.0	0.051	-9.000	-9.000	-999.	27.	5.4	0.01	0.28	1.00	1.80	267.	10.0	270.4	10.0
07	01	01	1	02	-1.2	0.042	-9.000	-9.000	-999.	20.	4.6	0.02	0.28	1.00	1.30	295.	10.0	270.9	10.0
07	01	01	1	03	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	93.	10.0	270.6	10.0
07	01	01	1	04	-0.8	0.036	-9.000	-9.000	-999.	16.	4.4	0.07	0.28	1.00	0.90	141.	10.0	270.6	10.0
07	01	01	1	05	-2.4	0.063	-9.000	-9.000	-999.	37.	8.4	0.12	0.28	1.00	1.40	172.	10.0	270.4	10.0
07	01	01	1	06	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	114.	10.0	270.4	10.0
07	01	01	1	07	-0.5	0.029	-9.000	-9.000	-999.	11.	3.3	0.04	0.28	1.00	0.80	87.	10.0	270.0	10.0
07	01	01	1	08	-0.5	0.026	-9.000	-9.000	-999.	9.	2.7	0.01	0.28	1.00	0.90	262.	10.0	269.5	10.0
07	01	01	1	09	-4.5	0.099	-9.000	-9.000	-999.	71.	16.8	0.09	0.28	0.51	1.90	347.	10.0	269.0	10.0
07	01	01	1	10	9.0	0.139	0.572	0.017	655.	119.	-23.4	0.04	0.28	0.30	1.70	315.	10.0	271.0	10.0
07	01	01	1	11	22.7	0.145	0.787	0.018	677.	128.	-10.7	0.06	0.28	0.22	1.50	14.	10.0	272.8	10.0
07	01	01	1	12	31.5	0.186	0.891	0.018	707.	184.	-16.0	0.06	0.28	0.19	2.00	13.	10.0	272.9	10.0
07	01	01	1	13	34.6	0.222	0.934	0.018	740.	241.	-25.0	0.06	0.28	0.19	2.50	5.	10.0	273.4	10.0
07	01	01	1	14	38.8	0.298	0.985	0.018	777.	374.	-53.6	0.09	0.28	0.19	3.20	359.	10.0	273.9	10.0
07	01	01	1	15	28.3	0.138	0.898	0.018	805.	136.	-7.3	0.04	0.28	0.22	1.50	64.	10.0	275.4	10.0
07	01	01	1	16	11.6	0.177	0.671	0.018	816.	171.	-37.4	0.05	0.28	0.29	2.10	111.	10.0	275.1	10.0
07	01	01	1	17	-7.2	0.120	-9.000	-9.000	-999.	96.	18.8	0.07	0.28	0.49	2.30	134.	10.0	273.6	10.0
07	01	01	1	18	-4.8	0.077	-9.000	-9.000	-999.	49.	7.5	0.12	0.28	1.00	1.70	152.	10.0	272.0	10.0
07	01	01	1	19	-2.1	0.045	-9.000	-9.000	-999.	22.	3.4	0.01	0.28	1.00	1.50	221.	10.0	271.0	10.0
07	01	01	1	20	-0.8	0.029	-9.000	-9.000	-999.	11.	2.4	0.01	0.28	1.00	1.00	242.	10.0	270.4	10.0
07	01	01	1	21	-6.2	0.083	-9.000	-9.000	-999.	55.	7.3	0.07	0.28	1.00	2.10	128.	10.0	269.8	10.0
07	01	01	1	22	-8.2	0.095	-9.000	-9.000	-999.	68.	8.4	0.07	0.28	1.00	2.40	136.	10.0	269.4	10.0
07	01	01	1	23	-9.6	0.103	-9.000	-9.000	-999.	76.	9.1	0.07	0.28	1.00	2.60	142.	10.0	268.8	10.0
07	01	01	1	24	-5.1	0.075	-9.000	-9.000	-999.	48.	6.6	0.07	0.28	1.00	1.90	148.	10.0	269.0	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	10.0	1	267.	1.80	270.5	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF BENZENE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	4.27285	ON 07020507:	AT (423976.40, 4526296.50, 1307.98, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00063	ON 07012406:	AT (427000.00, 4526400.00, 1388.10, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00064	ON 07012406:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00054	ON 07012406:	AT (427000.00, 4526800.00, 1382.27, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00032	ON 07011618:	AT (426000.00, 4525800.00, 1353.21, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00008	ON 07012406:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00101	ON 07012406:	AT (427400.00, 4526400.00, 1420.32, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00114	ON 07012406:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00014	ON 07102424:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00016	ON 07012618:	AT (424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00007	ON 07012401:	AT (425300.00, 4526200.00, 1331.56, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00007	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00008	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00007	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
CWT10	HIGH	1ST HIGH VALUE IS	1.22202	ON 07041904:	AT (424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC
CWT11	HIGH	1ST HIGH VALUE IS	1.09660	ON 07060521:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.01510	ON 07012406:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
TANK70	HIGH	1ST HIGH VALUE IS	0.02351	ON 07012910:	AT (424222.80, 4526848.00, 1307.57, 2867.37, 0.00)	DC
TANK71	HIGH	1ST HIGH VALUE IS	0.02611	ON 07012910:	AT (424247.30, 4526916.00, 1307.11, 2867.37, 0.00)	DC

TANK72	HIGH	1ST HIGH VALUE IS	0.02788	ON 07012910: AT (	424247.30,	4526916.00,	1307.11,	2867.37,	0.00)	DC
TANK90	HIGH	1ST HIGH VALUE IS	0.00386	ON 07120722: AT (	423678.60,	4526311.50,	1302.00,	2867.37,	0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	4.27193	ON 07020507: AT (	423976.40,	4526296.50,	1307.98,	2867.37,	0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF BENZENE IN MICROGRAMS/M**3 **

NETWORK GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR,	YR,	ZELEV,	ZHILL,	ZFLAG)	OF TYPE GRID-ID
ALL	HIGH	1ST HIGH VALUE IS	0.99617	ON 07041908: AT (	424001.70,	4526834.10,	1303.51,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00012	ON 07102608: AT (	426600.00,	4526200.00,	1369.60,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00013	ON 07042024: AT (	426600.00,	4525600.00,	1382.42,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00012	ON 07042024: AT (	426400.00,	4525600.00,	1373.63,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00007	ON 07042024: AT (	425800.00,	4525800.00,	1348.50,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00002	ON 07102608: AT (	427000.00,	4526600.00,	1385.23,	2867.37,	0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00020	ON 07120724: AT (	426200.00,	4524000.00,	1419.65,	2867.37,	0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00028	ON 07041908: AT (	424141.30,	4526621.40,	1308.11,	2867.37,	0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00007m	ON 07102424: AT (	424021.30,	4526781.80,	1304.07,	2867.37,	0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00007	ON 07110308: AT (	424021.80,	4526830.80,	1304.02,	2867.37,	0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00002	ON 07021408: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00002m	ON 07090924: AT (	423703.10,	4526311.50,	1302.74,	2867.37,	0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00002	ON 07021408: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00002	ON 07021408: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
CWT10	HIGH	1ST HIGH VALUE IS	0.95080	ON 07041908: AT (	424001.70,	4526834.10,	1303.51,	2867.37,	0.00)	DC
CWT11	HIGH	1ST HIGH VALUE IS	0.69805	ON 07041524: AT (	423800.80,	4526311.60,	1303.75,	2867.37,	0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.00309	ON 07102608: AT (	427000.00,	4526600.00,	1385.23,	2867.37,	0.00)	DC
TANK70	HIGH	1ST HIGH VALUE IS	0.00705	ON 07120724: AT (	424206.50,	4526802.70,	1307.25,	2867.37,	0.00)	DC
TANK71	HIGH	1ST HIGH VALUE IS	0.00765	ON 07120724: AT (	424231.00,	4526870.60,	1306.99,	2867.37,	0.00)	DC
TANK72	HIGH	1ST HIGH VALUE IS	0.00982	ON 07110408: AT (	424023.00,	4526953.20,	1303.00,	2867.37,	0.00)	DC
TANK90	HIGH	1ST HIGH VALUE IS	0.00142	ON 07120624: AT (	423580.90,	4526311.40,	1301.00,	2867.37,	0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	0.95417	ON 07120724: AT (	423950.00,	4526300.00,	1306.66,	2867.37,	0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF BENZENE IN MICROGRAMS/M**3 **

DATE
NETWORK

```
GROUP ID                          AVERAGE CONC     (YYMMDDHH)            RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS      0.51199  ON 07041524: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC

20H3     HIGH   1ST HIGH VALUE IS      0.00006m ON 07102624: AT (  426600.00,  4526200.00,  1369.60,  2867.37,    0.00)  DC

24H1     HIGH   1ST HIGH VALUE IS      0.00006m ON 07102624: AT (  427000.00,  4526600.00,  1385.23,  2867.37,    0.00)  DC

25H1     HIGH   1ST HIGH VALUE IS      0.00006m ON 07102624: AT (  426800.00,  4526600.00,  1371.13,  2867.37,    0.00)  DC

26H1     HIGH   1ST HIGH VALUE IS      0.00003m ON 07122824: AT (  423538.80,  4527067.90,  1294.00,  2867.37,    0.00)  DC

27H1     HIGH   1ST HIGH VALUE IS      0.00001m ON 07102624: AT (  427000.00,  4526600.00,  1385.23,  2867.37,    0.00)  DC

33H1     HIGH   1ST HIGH VALUE IS      0.00009m ON 07102624: AT (  427200.00,  4526200.00,  1406.81,  2867.37,    0.00)  DC

BOILER11 HIGH   1ST HIGH VALUE IS      0.00014  ON 07041524: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC

68H6     HIGH   1ST HIGH VALUE IS      0.00004m ON 07102424: AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC

68H7     HIGH   1ST HIGH VALUE IS      0.00004m ON 07110324: AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS      0.00001  ON 07011124: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS      0.00001m ON 07121424: AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS      0.00001  ON 07021324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS      0.00001  ON 07011124: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

CWT10    HIGH   1ST HIGH VALUE IS      0.35337  ON 07041924: AT (  424001.70,  4526834.10,  1303.51,  2867.37,    0.00)  DC

CWT11    HIGH   1ST HIGH VALUE IS      0.36925  ON 07041524: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC

FLARES   HIGH   1ST HIGH VALUE IS      0.00145m ON 07102624: AT (  427000.00,  4526600.00,  1385.23,  2867.37,    0.00)  DC

TANK70   HIGH   1ST HIGH VALUE IS      0.00402  ON 07020724: AT (  424206.50,  4526802.70,  1307.25,  2867.37,    0.00)  DC

TANK71   HIGH   1ST HIGH VALUE IS      0.00442  ON 07020724: AT (  424231.00,  4526870.60,  1306.99,  2867.37,    0.00)  DC

TANK72   HIGH   1ST HIGH VALUE IS      0.00615m ON 07102424: AT (  424022.30,  4526879.70,  1303.97,  2867.37,    0.00)  DC

TANK90   HIGH   1ST HIGH VALUE IS      0.00097m ON 07120924: AT (  423605.30,  4526311.40,  1301.42,  2867.37,    0.00)  DC

FUGITIVE HIGH   1ST HIGH VALUE IS      0.46607m ON 07120724: AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



```
 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of           0 Fatal Error Message(s)
 A Total of           2 Warning Message(s)
 A Total of        2026 Informational Message(s)

 A Total of        8760 Hours Were Processed

 A Total of           0 Calm Hours Identified

 A Total of        2026 Missing Hours Identified ( 23.13 Percent)

 CAUTION!:  Number of Missing Hours Exceeds 10 Percent of Total!
            Data May Not Be Acceptable for Regulatory Applications.
            See Section 5.3.2 of "Meteorological Monitoring Guidance
            for Regulatory Modeling Applications" (EPA-454/R-99-005).


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

```
                                    ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     21 Source(s);      22 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  BENZENE

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     23.2 MB of RAM.

**Input Runstream File:          Holly_HAPS_2008_BENZENE.DTA
**Output Print File:             Holly_HAPS_2008_BENZENE.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2008_BENZENE.SUM
```



```
                                       *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                          (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                  *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                         (METERS/SEC)

                                               1.54,   3.09,   5.14,   8.23,  10.80,
```



```
                                    *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

  Surface file:   SY2008.SFC                                                                      Met Version:  11059
  Profile file:   SY2008.PFL
  Surface format: FREE
  Profile format: FREE
```

Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2008 Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-24.3	0.228	-9.000	-9.000	-999.	250.	38.8	0.07	0.28	1.00	3.60	144.	10.0	264.2	10.0
08	01	01	1	02	-9.9	0.103	-9.000	-9.000	-999.	85.	8.9	0.07	0.28	1.00	2.60	130.	10.0	263.6	10.0
08	01	01	1	03	-3.8	0.064	-9.000	-9.000	-999.	37.	5.5	0.07	0.28	1.00	1.60	127.	10.0	263.0	10.0
08	01	01	1	04	-10.3	0.109	-9.000	-9.000	-999.	82.	10.0	0.12	0.28	1.00	2.40	153.	10.0	263.6	10.0
08	01	01	1	05	-8.5	0.095	-9.000	-9.000	-999.	68.	8.2	0.07	0.28	1.00	2.40	123.	10.0	263.1	10.0
08	01	01	1	06	-7.9	0.091	-9.000	-9.000	-999.	63.	7.6	0.05	0.28	1.00	2.40	93.	10.0	262.9	10.0
08	01	01	1	07	-7.2	0.086	-9.000	-9.000	-999.	58.	7.0	0.04	0.28	1.00	2.40	63.	10.0	262.6	10.0
08	01	01	1	08	-11.6	0.116	-9.000	-9.000	-999.	91.	10.9	0.05	0.28	1.00	2.90	30.	10.0	261.4	10.0
08	01	01	1	09	-13.2	0.185	-9.000	-9.000	-999.	184.	38.9	0.06	0.28	0.51	3.00	24.	10.0	262.9	10.0
08	01	01	1	10	10.3	0.229	0.258	0.005	54.	252.	-94.0	0.06	0.28	0.30	2.80	26.	10.0	264.2	10.0
08	01	01	1	11	27.2	0.247	0.447	0.005	105.	283.	-44.5	0.06	0.28	0.22	2.90	23.	10.0	265.8	10.0
08	01	01	1	12	31.4	0.256	0.518	0.005	142.	298.	-43.0	0.06	0.28	0.19	3.00	24.	10.0	267.2	10.0
08	01	01	1	13	34.5	0.201	0.582	0.007	183.	208.	-18.9	0.05	0.28	0.19	2.30	54.	10.0	268.6	10.0
08	01	01	1	14	31.7	0.255	0.602	0.005	220.	296.	-41.7	0.05	0.28	0.19	3.10	37.	10.0	267.6	10.0
08	01	01	1	15	23.3	0.252	0.565	0.005	247.	291.	-55.2	0.06	0.28	0.22	3.00	3.	10.0	267.8	10.0
08	01	01	1	16	-0.3	0.246	-9.000	-9.000	-999.	281.	4710.6	0.06	0.28	0.29	3.20	17.	10.0	267.4	10.0
08	01	01	1	17	-8.9	0.196	-9.000	-9.000	-999.	200.	68.0	0.06	0.28	0.49	2.90	13.	10.0	266.1	10.0
08	01	01	1	18	-13.0	0.244	-9.000	-9.000	-999.	277.	88.9	0.06	0.28	1.00	3.50	8.	10.0	264.5	10.0
08	01	01	1	19	-5.5	0.104	-9.000	-9.000	-999.	90.	16.1	0.05	0.28	1.00	2.20	35.	10.0	264.2	10.0
08	01	01	1	20	-2.6	0.056	-9.000	-9.000	-999.	31.	5.3	0.05	0.28	1.00	1.50	48.	10.0	264.2	10.0
08	01	01	1	21	-2.5	0.062	-9.000	-9.000	-999.	35.	7.4	0.06	0.28	1.00	1.60	17.	10.0	263.4	10.0
08	01	01	1	22	-2.9	0.066	-9.000	-9.000	-999.	39.	7.9	0.06	0.28	1.00	1.70	26.	10.0	263.9	10.0
08	01	01	1	23	-8.6	0.160	-9.000	-9.000	-999.	147.	38.2	0.06	0.28	1.00	2.60	24.	10.0	263.0	10.0
08	01	01	1	24	-26.9	0.273	-9.000	-9.000	-999.	327.	60.1	0.06	0.28	1.00	4.10	15.	10.0	262.9	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	10.0	1	144.	3.60	264.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF BENZENE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	4.46968	ON 08111907:	AT (423976.40, 4526296.50, 1307.98, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00062	ON 08102707:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00061	ON 08111421:	AT (426800.00, 4525800.00, 1386.05, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00055	ON 08012607:	AT (427000.00, 4527200.00, 1378.30, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00030	ON 08101523:	AT (426000.00, 4525800.00, 1353.21, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00008	ON 08012607:	AT (427200.00, 4527200.00, 1393.45, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00094	ON 08012607:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00114	ON 08012607:	AT (426800.00, 4527000.00, 1364.47, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00014	ON 08101819:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00016	ON 08042320:	AT (424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00007	ON 08111624:	AT (424800.00, 4525850.00, 1326.46, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00007	ON 08111702:	AT (424750.00, 4525600.00, 1326.88, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00007	ON 08081220:	AT (424800.00, 4525850.00, 1326.46, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00007	ON 08102721:	AT (425000.00, 4525700.00, 1332.22, 2867.37, 0.00)	DC
CWT10	HIGH	1ST HIGH VALUE IS	1.85530	ON 08072920:	AT (424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC
CWT11	HIGH	1ST HIGH VALUE IS	1.46533	ON 08083021:	AT (424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.01362	ON 08012607:	AT (427200.00, 4527200.00, 1393.45, 2867.37, 0.00)	DC
TANK70	HIGH	1ST HIGH VALUE IS	0.02493	ON 08103009:	AT (424214.70, 4526825.30, 1307.63, 2867.37, 0.00)	DC
TANK71	HIGH	1ST HIGH VALUE IS	0.02746	ON 08103009:	AT (424239.20, 4526893.30, 1307.25, 2867.37, 0.00)	DC

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TANK72   HIGH   1ST HIGH VALUE IS       0.03628  ON 08111809: AT (  424020.60,  4526708.40,  1305.02,  2867.37,    0.00)  DC

TANK90   HIGH   1ST HIGH VALUE IS       0.00886  ON 08111809: AT (  423605.30,  4526311.40,  1301.42,  2867.37,    0.00)  DC

FUGITIVE HIGH   1ST HIGH VALUE IS       4.46881  ON 08111907: AT (  423976.40,  4526296.50,  1307.98,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



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                                                  *** THE SUMMARY OF HIGHEST  8-HR RESULTS ***

                                    ** CONC OF BENZENE  IN MICROGRAMS/M**3                                   **

                                                          DATE
NETWORK
GROUP ID                         AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS       0.81995  ON 08062624: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC

20H3     HIGH   1ST HIGH VALUE IS       0.00015  ON 08111924: AT (  425200.00,  4523800.00,  1372.25,  2867.37,    0.00)  DC

24H1     HIGH   1ST HIGH VALUE IS       0.00014  ON 08111924: AT (  425400.00,  4523800.00,  1381.29,  2867.37,    0.00)  DC

25H1     HIGH   1ST HIGH VALUE IS       0.00011  ON 08111924: AT (  425200.00,  4523800.00,  1372.25,  2867.37,    0.00)  DC

26H1     HIGH   1ST HIGH VALUE IS       0.00006  ON 08111924: AT (  425000.00,  4524400.00,  1350.15,  2867.37,    0.00)  DC

27H1     HIGH   1ST HIGH VALUE IS       0.00002  ON 08111924: AT (  425400.00,  4523600.00,  1388.65,  2867.37,    0.00)  DC

33H1     HIGH   1ST HIGH VALUE IS       0.00026  ON 08111924: AT (  425400.00,  4523400.00,  1398.40,  2867.37,    0.00)  DC

BOILER11 HIGH   1ST HIGH VALUE IS       0.00025  ON 08111924: AT (  425000.00,  4524200.00,  1354.78,  2867.37,    0.00)  DC

68H6     HIGH   1ST HIGH VALUE IS       0.00006  ON 08090208: AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC

68H7     HIGH   1ST HIGH VALUE IS       0.00006  ON 08080508: AT (  424021.60,  4526806.30,  1304.09,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00002m ON 08022824: AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00003m ON 08022824: AT (  423678.60,  4526311.50,  1302.00,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00002  ON 08022016: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00002  ON 08110824: AT (  423629.70,  4526311.40,  1301.93,  2867.37,    0.00)  DC

CWT10    HIGH   1ST HIGH VALUE IS       0.53288  ON 08012724: AT (  423863.70,  4526986.50,  1300.17,  2867.37,    0.00)  DC

CWT11    HIGH   1ST HIGH VALUE IS       0.62118m ON 08032624: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC

FLARES   HIGH   1ST HIGH VALUE IS       0.00308  ON 08111924: AT (  425200.00,  4523600.00,  1379.15,  2867.37,    0.00)  DC

TANK70   HIGH   1ST HIGH VALUE IS       0.00665  ON 08012524: AT (  424190.20,  4526757.30,  1307.52,  2867.37,    0.00)  DC

TANK71   HIGH   1ST HIGH VALUE IS       0.00717  ON 08012524: AT (  424214.70,  4526825.30,  1307.63,  2867.37,    0.00)  DC

TANK72   HIGH   1ST HIGH VALUE IS       0.00920  ON 08011808: AT (  424023.00,  4526953.20,  1303.00,  2867.37,    0.00)  DC

TANK90   HIGH   1ST HIGH VALUE IS       0.00132  ON 08012524: AT (  423654.20,  4526311.40,  1302.00,  2867.37,    0.00)  DC

FUGITIVE HIGH   1ST HIGH VALUE IS       0.74084  ON 08011324: AT (  424000.00,  4526450.00,  1307.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



```
                                                  *** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

                                    ** CONC OF BENZENE  IN MICROGRAMS/M**3                                   **

                                                          DATE
NETWORK
GROUP ID                         AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
```

- -

ALL	HIGH	1ST HIGH VALUE IS	0.51854	ON 08111924: AT (	423923.00,	4526311.70,	1306.13,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00006	ON 08111924: AT (	425200.00,	4523800.00,	1372.25,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00006	ON 08111924: AT (	425400.00,	4523800.00,	1381.29,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00005	ON 08111924: AT (	425400.00,	4523800.00,	1381.29,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00003	ON 08111924: AT (	425000.00,	4524400.00,	1350.15,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00001	ON 08111924: AT (	425400.00,	4523600.00,	1388.65,	2867.37,	0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00010	ON 08111924: AT (	425400.00,	4523400.00,	1398.40,	2867.37,	0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00013	ON 08031624: AT (	423776.40,	4526311.50,	1303.07,	2867.37,	0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00003	ON 08011124: AT (	424022.60,	4526904.20,	1303.05,	2867.37,	0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00003m	ON 08021224: AT (	424022.60,	4526904.20,	1303.05,	2867.37,	0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00001	ON 08030224: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00001	ON 08030224: AT (	423727.50,	4526311.50,	1303.00,	2867.37,	0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00001	ON 08030224: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00001	ON 08031624: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
CWT10	HIGH	1ST HIGH VALUE IS	0.32084m	ON 08122524: AT (	423840.40,	4526987.00,	1299.47,	2867.37,	0.00)	DC
CWT11	HIGH	1ST HIGH VALUE IS	0.28290	ON 08031624: AT (	423800.80,	4526311.60,	1303.75,	2867.37,	0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.00125	ON 08111924: AT (	425400.00,	4523600.00,	1388.65,	2867.37,	0.00)	DC
TANK70	HIGH	1ST HIGH VALUE IS	0.00387	ON 08111924: AT (	424198.40,	4526780.00,	1307.25,	2867.37,	0.00)	DC
TANK71	HIGH	1ST HIGH VALUE IS	0.00416	ON 08111924: AT (	424222.80,	4526848.00,	1307.57,	2867.37,	0.00)	DC
TANK72	HIGH	1ST HIGH VALUE IS	0.00393	ON 08111524: AT (	424023.00,	4526953.20,	1303.00,	2867.37,	0.00)	DC
TANK90	HIGH	1ST HIGH VALUE IS	0.00078	ON 08022024: AT (	423629.70,	4526311.40,	1301.93,	2867.37,	0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	0.51790	ON 08111924: AT (	423923.00,	4526311.70,	1306.13,	2867.37,	0.00)	DC

```
 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



```
 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of           0 Fatal Error Message(s)
 A Total of           2 Warning Message(s)
 A Total of         146 Informational Message(s)

 A Total of        8784 Hours Were Processed

 A Total of           0 Calm Hours Identified

 A Total of         146 Missing Hours Identified (  1.66 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
 CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

```
                                   ***     MODEL SETUP OPTIONS SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses RURAL Dispersion Only.

 **Model Uses Regulatory DEFAULT Options:
         1. Stack-tip Downwash.
         2. Model Accounts for ELEVated Terrain Effects.
         3. Use Calms Processing Routine.
         4. Use Missing Data Processing Routine.
         5. No Exponential Decay.

 **Model Assumes No FLAGPOLE Receptor Heights.

 **Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

 **This Run Includes:     21 Source(s);      22 Source Group(s); and   10024 Receptor(s)

 **The Model Assumes A Pollutant Type of:  BENZENE

 **Model Set To Continue RUNning After the Setup Testing.

 **Output Options Selected:
          Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
          Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
          Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                 m for Missing Hours
                                                                 b for Both Calm and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                  Emission Units = GRAMS/SEC                                 ;  Emission Rate Unit Factor =   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =     23.2 MB of RAM.

 **Input Runstream File:          Holly_HAPS_2009_BENZENE.DTA
 **Output Print File:             Holly_HAPS_2009_BENZENE.LST

 **File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2009_BENZENE.SUM
```



```
                                   *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                      (1=YES; 0=NO)

          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

              NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                         *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                   (METERS/SEC)

                                      1.54,   3.09,   5.14,   8.23,  10.80,
```



```
                           *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

   Surface file:   SY2009.SFC                                                          Met Version:  11059
   Profile file:   SY2009.PFL
```

Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 72572
Name: SALT_LAKE_CITY,UT Name: UNKNOWN
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.00	127.	10.0	267.9	10.0
09	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	1.80	120.	10.0	268.0	10.0
09	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	3.00	106.	10.0	269.1	10.0
09	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.10	132.	10.0	270.2	10.0
09	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.80	141.	10.0	269.8	10.0
09	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.50	148.	10.0	269.4	10.0
09	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	1.90	96.	10.0	269.2	10.0
09	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.12	0.28	1.00	0.80	178.	10.0	269.6	10.0
09	01	01	1	09	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	0.51	2.70	149.	10.0	270.9	10.0
09	01	01	1	10	9.0	0.274	0.144	0.005	10.	330.	-177.5	0.12	0.28	0.30	2.90	154.	10.0	271.9	10.0
09	01	01	1	11	22.7	0.173	0.298	0.012	36.	169.	-17.8	0.09	0.28	0.22	1.70	190.	10.0	273.9	10.0
09	01	01	1	12	31.6	0.109	0.420	0.018	73.	84.	-3.2	0.05	0.28	0.19	1.00	46.	10.0	275.6	10.0
09	01	01	1	13	34.8	0.258	0.504	0.005	114.	301.	-38.1	0.12	0.28	0.19	2.50	163.	10.0	277.0	10.0
09	01	01	1	14	32.1	0.113	0.539	0.013	151.	102.	-3.5	0.12	0.28	0.19	0.80	154.	10.0	277.9	10.0
09	01	01	1	15	4.7	0.155	0.288	0.013	157.	141.	-62.0	0.07	0.28	0.22	1.80	124.	10.0	278.8	10.0
09	01	01	1	16	0.4	0.334	0.124	0.005	158.	444.	-7805.0	0.07	0.28	0.29	4.20	143.	10.0	278.6	10.0
09	01	01	1	17	-14.1	0.342	-9.000	-9.000	-999.	460.	219.8	0.07	0.28	0.49	4.50	146.	10.0	277.9	10.0
09	01	01	1	18	-26.4	0.354	-9.000	-9.000	-999.	485.	130.6	0.07	0.28	1.00	4.80	146.	10.0	277.4	10.0
09	01	01	1	19	-35.5	0.392	-9.000	-9.000	-999.	564.	131.3	0.12	0.28	1.00	4.70	169.	10.0	277.4	10.0
09	01	01	1	20	-28.1	0.311	-9.000	-9.000	-999.	402.	82.5	0.12	0.28	1.00	3.90	150.	10.0	277.6	10.0
09	01	01	1	21	-29.8	0.330	-9.000	-9.000	-999.	437.	93.6	0.07	0.28	1.00	4.60	129.	10.0	278.5	10.0
09	01	01	1	22	-14.1	0.288	-9.000	-9.000	-999.	356.	130.9	0.07	0.28	1.00	3.90	131.	10.0	278.8	10.0
09	01	01	1	23	-23.6	0.320	-9.000	-9.000	-999.	416.	107.0	0.07	0.28	1.00	4.40	122.	10.0	278.9	10.0
09	01	01	1	24	-24.9	0.337	-9.000	-9.000	-999.	450.	118.7	0.07	0.28	1.00	4.60	130.	10.0	278.4	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	127.	3.00	267.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF BENZENE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	3.49714	ON 09110920:	AT (423962.20, 4526296.80, 1306.98, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00060	ON 09112608:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00061	ON 09012102:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00056	ON 09012102:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00030	ON 09110119:	AT (426400.00, 4526400.00, 1357.10, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00009	ON 09012102:	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00098	ON 09110218:	AT (427000.00, 4525800.00, 1404.56, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00115	ON 09012102:	AT (426800.00, 4526800.00, 1365.89, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00014	ON 09012021:	AT (424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00016	ON 09012102:	AT (424242.70, 4526812.50, 1308.00, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00007	ON 09100821:	AT (424750.00, 4525700.00, 1326.84, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00007	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00007	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00007	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
CWT10	HIGH	1ST HIGH VALUE IS	1.24243	ON 09061720:	AT (424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC
CWT11	HIGH	1ST HIGH VALUE IS	1.10308	ON 09072721:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.01389	ON 09012102:	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC
TANK70	HIGH	1ST HIGH VALUE IS	0.03447	ON 09112809:	AT (424222.80, 4526848.00, 1307.57, 2867.37, 0.00)	DC

TANK71	HIGH	1ST HIGH VALUE IS	0.03868	ON 09112809: AT (	424247.30,	4526916.00,	1307.11,	2867.37,	0.00)	DC
TANK72	HIGH	1ST HIGH VALUE IS	0.04303	ON 09112809: AT (	424247.30,	4526916.00,	1307.11,	2867.37,	0.00)	DC
TANK90	HIGH	1ST HIGH VALUE IS	0.00369	ON 09012006: AT (	423629.70,	4526311.40,	1301.93,	2867.37,	0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	3.49629	ON 09110920: AT (	423962.20,	4526296.80,	1306.98,	2867.37,	0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF BENZENE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR,	YR,	ZELEV,	ZHILL,	ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	1.13351	ON 09012008: AT (	423900.00,	4526300.00,	1306.00,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00014c	ON 09012108: AT (	427000.00,	4526600.00,	1385.23,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00014c	ON 09012108: AT (	427200.00,	4527000.00,	1395.57,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00012c	ON 09012108: AT (	427000.00,	4527000.00,	1380.98,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00006c	ON 09012108: AT (	426600.00,	4527000.00,	1353.33,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00002c	ON 09012108: AT (	427400.00,	4527000.00,	1410.95,	2867.37,	0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00022c	ON 09012108: AT (	427400.00,	4526600.00,	1416.24,	2867.37,	0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00024c	ON 09012108: AT (	426800.00,	4526800.00,	1365.89,	2867.37,	0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00006m	ON 09020908: AT (	424001.20,	4526784.40,	1303.92,	2867.37,	0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00007c	ON 09011024: AT (	424022.30,	4526879.70,	1303.97,	2867.37,	0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00003m	ON 09011624: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00003m	ON 09013024: AT (	423703.10,	4526311.50,	1302.74,	2867.37,	0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00002m	ON 09011624: AT (	423751.90,	4526311.50,	1303.00,	2867.37,	0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00003m	ON 09011624: AT (	423750.00,	4526300.00,	1303.46,	2867.37,	0.00)	DC
CWT10	HIGH	1ST HIGH VALUE IS	0.42906	ON 09032124: AT (	423933.50,	4526984.90,	1300.98,	2867.37,	0.00)	DC
CWT11	HIGH	1ST HIGH VALUE IS	0.63730m	ON 09092108: AT (	423800.80,	4526311.60,	1303.75,	2867.37,	0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.00332c	ON 09012108: AT (	427200.00,	4527000.00,	1395.57,	2867.37,	0.00)	DC
TANK70	HIGH	1ST HIGH VALUE IS	0.00670m	ON 09012024: AT (	424206.50,	4526802.70,	1307.25,	2867.37,	0.00)	DC
TANK71	HIGH	1ST HIGH VALUE IS	0.00732m	ON 09012024: AT (	424231.00,	4526870.60,	1306.99,	2867.37,	0.00)	DC
TANK72	HIGH	1ST HIGH VALUE IS	0.01123m	ON 09020908: AT (	424022.60,	4526904.20,	1303.05,	2867.37,	0.00)	DC
TANK90	HIGH	1ST HIGH VALUE IS	0.00170	ON 09122508: AT (	423605.30,	4526311.40,	1301.42,	2867.37,	0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	1.13261	ON 09012008: AT (	423900.00,	4526300.00,	1306.00,	2867.37,	0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF BENZENE IN MICROGRAMS/M**3 **

DATE

NETWORK

```
GROUP ID                         AVERAGE CONC      (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS       0.58707  ON 09122824: AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC

20H3     HIGH   1ST HIGH VALUE IS       0.00005b ON 09012124: AT (  425600.00,  4524200.00,  1376.93,  2867.37,    0.00)  DC

24H1     HIGH   1ST HIGH VALUE IS       0.00006b ON 09012124: AT (  425800.00,  4524400.00,  1379.76,  2867.37,    0.00)  DC

25H1     HIGH   1ST HIGH VALUE IS       0.00005m ON 09012024: AT (  425800.00,  4524600.00,  1374.94,  2867.37,    0.00)  DC

26H1     HIGH   1ST HIGH VALUE IS       0.00003m ON 09012024: AT (  425500.00,  4525000.00,  1352.18,  2867.37,    0.00)  DC

27H1     HIGH   1ST HIGH VALUE IS       0.00001b ON 09012124: AT (  425800.00,  4524000.00,  1393.12,  2867.37,    0.00)  DC

33H1     HIGH   1ST HIGH VALUE IS       0.00009b ON 09012124: AT (  425800.00,  4523800.00,  1400.43,  2867.37,    0.00)  DC

BOILER11 HIGH   1ST HIGH VALUE IS       0.00018  ON 09102824: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H6     HIGH   1ST HIGH VALUE IS       0.00003m ON 09072224: AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC

68H7     HIGH   1ST HIGH VALUE IS       0.00003m ON 09072224: AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00001  ON 09122324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00001m ON 09022724: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00001  ON 09122324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00001  ON 09122324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

CWT10    HIGH   1ST HIGH VALUE IS       0.24655m ON 09092924: AT (  423933.50,  4526984.90,  1300.98,  2867.37,    0.00)  DC

CWT11    HIGH   1ST HIGH VALUE IS       0.42468  ON 09102824: AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC

FLARES   HIGH   1ST HIGH VALUE IS       0.00121b ON 09012124: AT (  425800.00,  4524200.00,  1385.06,  2867.37,    0.00)  DC

TANK70   HIGH   1ST HIGH VALUE IS       0.00351  ON 09122024: AT (  424214.70,  4526825.30,  1307.63,  2867.37,    0.00)  DC

TANK71   HIGH   1ST HIGH VALUE IS       0.00386  ON 09122024: AT (  424239.20,  4526893.30,  1307.25,  2867.37,    0.00)  DC

TANK72   HIGH   1ST HIGH VALUE IS       0.00433b ON 09042024: AT (  424023.00,  4526953.20,  1303.00,  2867.37,    0.00)  DC

TANK90   HIGH   1ST HIGH VALUE IS       0.00124  ON 09122824: AT (  423629.70,  4526311.40,  1301.93,  2867.37,    0.00)  DC

FUGITIVE HIGH   1ST HIGH VALUE IS       0.57712  ON 09122824: AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



```
 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of           0 Fatal Error Message(s)
 A Total of           2 Warning Message(s)
 A Total of         802 Informational Message(s)

 A Total of        8760 Hours Were Processed

 A Total of           9 Calm Hours Identified

 A Total of         793 Missing Hours Identified (  9.05 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:         33H1
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:       FLARES
```

*** MODEL SETUP OPTIONS SUMMARY ***

```
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     13 Source(s);      14 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  BERYLLIU

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                  ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     16.3 MB of RAM.

**Input Runstream File:          Holly_HAPS_2006_BERYLLIU.DTA
**Output Print File:             Holly_HAPS_2006_BERYLLIU.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2006_BERYLLIU.SUM
```


*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.
```

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2006.SFC Met Version: 11059
Profile file: SY2006.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2006 Year: 2006

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
06	01	01	1	01	-11.8	0.241	-9.000	-9.000	-999.	273.	91.0	0.09	0.28	1.00	3.20	185.	10.0	276.0	10.0
06	01	01	1	02	-11.9	0.244	-9.000	-9.000	-999.	277.	93.0	0.01	0.28	1.00	4.60	248.	10.0	276.5	10.0
06	01	01	1	03	-24.7	0.504	-9.000	-9.000	-999.	824.	399.2	0.01	0.28	1.00	9.00	269.	10.0	277.0	10.0
06	01	01	1	04	-40.4	0.427	-9.000	-9.000	-999.	646.	146.0	0.02	0.28	1.00	7.00	290.	10.0	276.9	10.0
06	01	01	1	05	-15.9	0.324	-9.000	-9.000	-999.	430.	164.1	0.04	0.28	1.00	4.80	301.	10.0	276.4	10.0
06	01	01	1	06	-18.0	0.366	-9.000	-9.000	-999.	508.	209.4	0.02	0.28	1.00	5.90	298.	10.0	276.4	10.0
06	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.02	0.28	1.00	6.30	289.	10.0	275.9	10.0
06	01	01	1	08	-34.7	0.381	-9.000	-9.000	-999.	540.	122.8	0.02	0.28	1.00	6.30	282.	10.0	275.4	10.0
06	01	01	1	09	-21.0	0.324	-9.000	-9.000	-999.	425.	124.8	0.01	0.28	0.51	6.00	268.	10.0	275.1	10.0
06	01	01	1	10	10.5	0.195	0.315	0.005	92.	206.	-54.3	0.01	0.28	0.30	3.20	249.	10.0	276.1	10.0
06	01	01	1	11	27.6	0.203	0.649	0.005	307.	211.	-23.6	0.01	0.28	0.22	3.20	248.	10.0	277.5	10.0
06	01	01	1	12	38.6	0.170	0.825	0.005	450.	161.	-9.8	0.01	0.28	0.19	2.50	249.	10.0	278.4	10.0
06	01	01	1	13	42.5	0.283	0.942	0.005	608.	346.	-41.1	0.09	0.28	0.19	3.00	207.	10.0	279.2	10.0
06	01	01	1	14	32.3	0.382	0.913	0.005	729.	543.	-133.3	0.12	0.28	0.19	4.00	168.	10.0	279.9	10.0
06	01	01	1	15	4.8	0.338	0.487	0.005	746.	452.	-623.1	0.07	0.28	0.22	4.20	148.	10.0	279.8	10.0
06	01	01	1	16	0.4	0.444	0.218	0.005	747.	681.	-8888.0	0.12	0.28	0.29	4.90	155.	10.0	279.4	10.0
06	01	01	1	17	-17.9	0.410	-9.000	-9.000	-999.	605.	298.0	0.12	0.28	0.49	4.70	161.	10.0	278.4	10.0
06	01	01	1	18	-25.2	0.339	-9.000	-9.000	-999.	457.	119.9	0.12	0.28	1.00	4.10	163.	10.0	277.4	10.0
06	01	01	1	19	-21.1	0.284	-9.000	-9.000	-999.	349.	83.7	0.07	0.28	1.00	4.00	149.	10.0	276.6	10.0
06	01	01	1	20	-9.3	0.189	-9.000	-9.000	-999.	192.	55.7	0.07	0.28	1.00	2.80	124.	10.0	276.0	10.0
06	01	01	1	21	-18.7	0.381	-9.000	-9.000	-999.	540.	227.2	0.07	0.28	1.00	5.00	140.	10.0	276.9	10.0
06	01	01	1	22	-12.9	0.262	-9.000	-9.000	-999.	316.	108.2	0.12	0.28	1.00	3.20	165.	10.0	277.1	10.0
06	01	01	1	23	-14.5	0.296	-9.000	-9.000	-999.	371.	138.0	0.07	0.28	1.00	4.00	134.	10.0	277.2	10.0
06	01	01	1	24	-18.2	0.372	-9.000	-9.000	-999.	522.	218.0	0.07	0.28	1.00	4.90	133.	10.0	277.8	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
06	01	01	01	10.0	1	185.	3.20	276.1	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF BERYLLIU IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00002	ON 06123022:	AT (426200.00, 4524800.00, 1384.77, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00000	ON 06022420:	AT (427000.00, 4526400.00, 1388.10, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 06022420:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 06022420:	AT (427000.00, 4526800.00, 1382.27, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 06022420:	AT (426600.00, 4526800.00, 1356.70, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 06022420:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00001	ON 06022420:	AT (427400.00, 4526400.00, 1420.32, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00001	ON 06022420:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00000	ON 06092904:	AT (424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00000	ON 06120622:	AT (424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00000	ON 06110718:	AT (425000.00, 4525800.00, 1331.29, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00000	ON 06022420:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00000	ON 06022420:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC

```
68H13    HIGH   1ST HIGH VALUE IS       0.00000  ON 06110718: AT (  425000.00,  4525700.00,  1332.22,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



```
                                  *** THE SUMMARY OF HIGHEST  8-HR RESULTS ***

                         ** CONC OF BERYLLIU IN MICROGRAMS/M**3                              **

                                                DATE
NETWORK
GROUP ID                         AVERAGE CONC     (YYMMDDHH)            RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS       0.00000  ON 06120824: AT (  425400.00,  4523800.00,  1381.29,  2867.37,    0.00)  DC

20H3     HIGH   1ST HIGH VALUE IS       0.00000  ON 06120824: AT (  425400.00,  4523800.00,  1381.29,  2867.37,    0.00)  DC

24H1     HIGH   1ST HIGH VALUE IS       0.00000  ON 06120824: AT (  425400.00,  4523800.00,  1381.29,  2867.37,    0.00)  DC

25H1     HIGH   1ST HIGH VALUE IS       0.00000  ON 06120824: AT (  425400.00,  4523800.00,  1381.29,  2867.37,    0.00)  DC

26H1     HIGH   1ST HIGH VALUE IS       0.00000  ON 06120824: AT (  425200.00,  4524400.00,  1356.99,  2867.37,    0.00)  DC

27H1     HIGH   1ST HIGH VALUE IS       0.00000  ON 06120824: AT (  425600.00,  4523600.00,  1398.25,  2867.37,    0.00)  DC

33H1     HIGH   1ST HIGH VALUE IS       0.00000  ON 06120824: AT (  425600.00,  4523400.00,  1407.26,  2867.37,    0.00)  DC

BOILER11 HIGH   1ST HIGH VALUE IS       0.00000  ON 06122816: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC

68H6     HIGH   1ST HIGH VALUE IS       0.00000  ON 06092508: AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC

68H7     HIGH   1ST HIGH VALUE IS       0.00000m ON 06090408: AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00000  ON 06021908: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00000  ON 06022008: AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00000  ON 06021908: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00000  ON 06021908: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



```
                                  *** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

                         ** CONC OF BERYLLIU IN MICROGRAMS/M**3                              **

                                                DATE
NETWORK
GROUP ID                         AVERAGE CONC     (YYMMDDHH)            RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS       0.00000  ON 06122824: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC

20H3     HIGH   1ST HIGH VALUE IS       0.00000m ON 06123024: AT (  426200.00,  4524800.00,  1384.77,  2867.37,    0.00)  DC

24H1     HIGH   1ST HIGH VALUE IS       0.00000m ON 06123024: AT (  426400.00,  4525000.00,  1388.52,  2867.37,    0.00)  DC

25H1     HIGH   1ST HIGH VALUE IS       0.00000  ON 06120824: AT (  425400.00,  4523800.00,  1381.29,  2867.37,    0.00)  DC

26H1     HIGH   1ST HIGH VALUE IS       0.00000  ON 06122824: AT (  423825.30,  4526311.60,  1304.00,  2867.37,    0.00)  DC

27H1     HIGH   1ST HIGH VALUE IS       0.00000  ON 06120824: AT (  425600.00,  4523600.00,  1398.25,  2867.37,    0.00)  DC

33H1     HIGH   1ST HIGH VALUE IS       0.00000m ON 06100824: AT (  427000.00,  4526200.00,  1385.51,  2867.37,    0.00)  DC

BOILER11 HIGH   1ST HIGH VALUE IS       0.00000  ON 06122824: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC

68H6     HIGH   1ST HIGH VALUE IS       0.00000m ON 06093024: AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
```

```
68H7     HIGH   1ST HIGH VALUE IS       0.00000  ON 06110624: AT (  424022.10,  4526855.30,  1304.00,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00000m ON 06121624: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00000m ON 06121624: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00000m ON 06121624: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00000m ON 06121624: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        13:02:04
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of          525 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of          525 Missing Hours Identified (  5.99 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305      13 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

*** MODEL SETUP OPTIONS SUMMARY ***

```
**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     13 Source(s);      14 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  BERYLLIU

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                              ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     16.3 MB of RAM.

**Input Runstream File:          Holly_HAPS_2007_BERYLLIU.DTA
**Output Print File:             Holly_HAPS_2007_BERYLLIU.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2007_BERYLLIU.SUM
```


*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23, 10.80,

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

```
  Surface file:   SY2007.SFC                                                                               Met Version:  11059
  Profile file:   SY2007.PFL
  Surface format: FREE
  Profile format: FREE
```

Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2007 Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-2.0	0.051	-9.000	-9.000	-999.	27.	5.4	0.01	0.28	1.00	1.80	267.	10.0	270.4	10.0
07	01	01	1	02	-1.2	0.042	-9.000	-9.000	-999.	20.	4.6	0.02	0.28	1.00	1.30	295.	10.0	270.9	10.0
07	01	01	1	03	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	93.	10.0	270.6	10.0
07	01	01	1	04	-0.8	0.036	-9.000	-9.000	-999.	16.	4.4	0.07	0.28	1.00	0.90	141.	10.0	270.6	10.0
07	01	01	1	05	-2.4	0.063	-9.000	-9.000	-999.	37.	8.4	0.12	0.28	1.00	1.40	172.	10.0	270.4	10.0
07	01	01	1	06	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	114.	10.0	270.4	10.0
07	01	01	1	07	-0.5	0.029	-9.000	-9.000	-999.	11.	3.3	0.04	0.28	1.00	0.80	87.	10.0	270.0	10.0
07	01	01	1	08	-0.5	0.026	-9.000	-9.000	-999.	9.	2.7	0.01	0.28	1.00	0.90	262.	10.0	269.5	10.0
07	01	01	1	09	-4.5	0.099	-9.000	-9.000	-999.	71.	16.8	0.09	0.28	0.51	1.90	347.	10.0	269.0	10.0
07	01	01	1	10	9.0	0.139	0.572	0.017	655.	119.	-23.4	0.04	0.28	0.30	1.70	315.	10.0	271.0	10.0
07	01	01	1	11	22.7	0.145	0.787	0.018	677.	128.	-10.7	0.06	0.28	0.22	1.50	14.	10.0	272.8	10.0
07	01	01	1	12	31.5	0.186	0.891	0.018	707.	184.	-16.0	0.06	0.28	0.19	2.00	13.	10.0	272.9	10.0
07	01	01	1	13	34.6	0.222	0.934	0.018	740.	241.	-25.0	0.06	0.28	0.19	2.50	5.	10.0	273.4	10.0
07	01	01	1	14	38.8	0.298	0.985	0.018	777.	374.	-53.6	0.09	0.28	0.19	3.20	359.	10.0	273.9	10.0
07	01	01	1	15	28.3	0.138	0.898	0.018	805.	136.	-7.3	0.04	0.28	0.22	1.50	64.	10.0	275.4	10.0
07	01	01	1	16	11.6	0.177	0.671	0.018	816.	171.	-37.4	0.05	0.28	0.29	2.10	111.	10.0	275.1	10.0
07	01	01	1	17	-7.2	0.120	-9.000	-9.000	-999.	96.	18.8	0.07	0.28	0.49	2.30	134.	10.0	273.6	10.0
07	01	01	1	18	-4.8	0.077	-9.000	-9.000	-999.	49.	7.5	0.12	0.28	1.00	1.70	152.	10.0	272.0	10.0
07	01	01	1	19	-2.1	0.045	-9.000	-9.000	-999.	22.	3.4	0.01	0.28	1.00	1.50	221.	10.0	271.0	10.0
07	01	01	1	20	-0.8	0.029	-9.000	-9.000	-999.	11.	2.4	0.01	0.28	1.00	1.00	242.	10.0	270.4	10.0
07	01	01	1	21	-6.2	0.083	-9.000	-9.000	-999.	55.	7.3	0.07	0.28	1.00	2.10	128.	10.0	269.8	10.0
07	01	01	1	22	-8.2	0.095	-9.000	-9.000	-999.	68.	8.4	0.07	0.28	1.00	2.40	136.	10.0	269.4	10.0
07	01	01	1	23	-9.6	0.103	-9.000	-9.000	-999.	76.	9.1	0.07	0.28	1.00	2.60	142.	10.0	268.8	10.0
07	01	01	1	24	-5.1	0.075	-9.000	-9.000	-999.	48.	6.6	0.07	0.28	1.00	1.90	148.	10.0	269.0	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	10.0	1	267.	1.80	270.5	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF BERYLLIU IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00002	ON 07012406:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00000	ON 07012406:	AT (427000.00, 4526400.00, 1388.10, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 07012406:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 07012406:	AT (427000.00, 4526800.00, 1382.27, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 07011618:	AT (426000.00, 4525800.00, 1353.21, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 07012406:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00001	ON 07012406:	AT (427400.00, 4526400.00, 1420.32, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00001	ON 07012406:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00000	ON 07102424:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00000	ON 07012618:	AT (424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00000	ON 07012401:	AT (425300.00, 4526200.00, 1331.56, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00000	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00000	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00000	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF BERYLLIU IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00000	ON 07120724:	AT (426000.00, 4524200.00, 1395.05, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00000	ON 07102608:	AT (426600.00, 4526200.00, 1369.60, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 07042024:	AT (426600.00, 4525600.00, 1382.42, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 07042024:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 07042024:	AT (425800.00, 4525800.00, 1348.50, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 07102608:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 07120724:	AT (426200.00, 4524000.00, 1419.65, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00000	ON 07041908:	AT (424141.30, 4526621.40, 1308.11, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00000m	ON 07102424:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00000	ON 07110308:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00000	ON 07021408:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00000m	ON 07090924:	AT (423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00000	ON 07021408:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00000	ON 07021408:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF BERYLLIU IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00000m	ON 07120724:	AT (426000.00, 4524200.00, 1395.05, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00000m	ON 07102624:	AT (426600.00, 4526200.00, 1369.60, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00000m	ON 07102624:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00000m	ON 07102624:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00000m	ON 07122824:	AT (423538.80, 4527067.90, 1294.00, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00000m	ON 07102624:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00000m	ON 07102624:	AT (427200.00, 4526200.00, 1406.81, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00000	ON 07041524:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00000m	ON 07102424:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00000m	ON 07110324:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00000	ON 07011124:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00000m	ON 07121424:	AT (423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00000	ON 07021324:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

```
68H13    HIGH   1ST HIGH VALUE IS       0.00000  ON 07011124: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        15:12:42
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                 ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of         2026 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of         2026 Missing Hours Identified ( 23.13 Percent)

 CAUTION!:  Number of Missing Hours Exceeds 10 Percent of Total!
            Data May Not Be Acceptable for Regulatory Applications.
            See Section 5.3.2 of "Meteorological Monitoring Guidance
            for Regulatory Modeling Applications" (EPA-454/R-99-005).


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

**MODELOPTs: RegDFAULT CONC   ELEV

*** MODEL SETUP OPTIONS SUMMARY ***

- -

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 3 Short Term Average(s) of: 1-HR 8-HR 24-HR

**This Run Includes: 13 Source(s); 14 Source Group(s); and 10024 Receptor(s)

**The Model Assumes A Pollutant Type of: BERYLLIU

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1308.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 16.3 MB of RAM.

**Input Runstream File: Holly_HAPS_2008_BERYLLIU.DTA
**Output Print File: Holly_HAPS_2008_BERYLLIU.LST

**File for Summary of Results: C:\beast\Holly\HAPs\Holly_HAPS_2008_BERYLLIU.SUM

**MODELOPTs: RegDFAULT CONC   ELEV

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2008.SFC Met Version: 11059
Profile file: SY2008.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2008 Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-24.3	0.228	-9.000	-9.000	-999.	250.	38.8	0.07	0.28	1.00	3.60	144.	10.0	264.2	10.0
08	01	01	1	02	-9.9	0.103	-9.000	-9.000	-999.	85.	8.9	0.07	0.28	1.00	2.60	130.	10.0	263.6	10.0
08	01	01	1	03	-3.8	0.064	-9.000	-9.000	-999.	37.	5.5	0.07	0.28	1.00	1.60	127.	10.0	263.0	10.0
08	01	01	1	04	-10.3	0.109	-9.000	-9.000	-999.	82.	10.0	0.12	0.28	1.00	2.40	153.	10.0	263.6	10.0
08	01	01	1	05	-8.5	0.095	-9.000	-9.000	-999.	68.	8.2	0.07	0.28	1.00	2.40	123.	10.0	263.1	10.0
08	01	01	1	06	-7.9	0.091	-9.000	-9.000	-999.	63.	7.6	0.05	0.28	1.00	2.40	93.	10.0	262.9	10.0
08	01	01	1	07	-7.2	0.086	-9.000	-9.000	-999.	58.	7.0	0.04	0.28	1.00	2.40	63.	10.0	262.6	10.0
08	01	01	1	08	-11.6	0.116	-9.000	-9.000	-999.	91.	10.9	0.05	0.28	1.00	2.90	30.	10.0	261.4	10.0
08	01	01	1	09	-13.2	0.185	-9.000	-9.000	-999.	184.	38.9	0.06	0.28	0.51	3.00	24.	10.0	262.9	10.0
08	01	01	1	10	10.3	0.229	0.258	0.005	54.	252.	-94.0	0.06	0.28	0.30	2.80	26.	10.0	264.2	10.0
08	01	01	1	11	27.2	0.247	0.447	0.005	105.	283.	-44.5	0.06	0.28	0.22	2.90	23.	10.0	265.8	10.0
08	01	01	1	12	31.4	0.256	0.518	0.005	142.	298.	-43.0	0.06	0.28	0.19	3.00	24.	10.0	267.2	10.0
08	01	01	1	13	34.5	0.201	0.582	0.007	183.	208.	-18.9	0.05	0.28	0.19	2.30	54.	10.0	268.6	10.0
08	01	01	1	14	31.7	0.255	0.602	0.005	220.	296.	-41.7	0.05	0.28	0.19	3.10	37.	10.0	267.6	10.0
08	01	01	1	15	23.3	0.252	0.565	0.005	247.	291.	-55.2	0.06	0.28	0.22	3.00	3.	10.0	267.8	10.0
08	01	01	1	16	-0.3	0.246	-9.000	-9.000	-999.	281.	4710.6	0.06	0.28	0.29	3.20	17.	10.0	267.4	10.0
08	01	01	1	17	-8.9	0.196	-9.000	-9.000	-999.	200.	68.0	0.06	0.28	0.49	2.90	13.	10.0	266.1	10.0
08	01	01	1	18	-13.0	0.244	-9.000	-9.000	-999.	277.	88.9	0.06	0.28	1.00	3.50	8.	10.0	264.5	10.0
08	01	01	1	19	-5.5	0.104	-9.000	-9.000	-999.	90.	16.1	0.05	0.28	1.00	2.20	35.	10.0	264.2	10.0
08	01	01	1	20	-2.6	0.056	-9.000	-9.000	-999.	31.	5.3	0.05	0.28	1.00	1.50	48.	10.0	264.2	10.0
08	01	01	1	21	-2.5	0.062	-9.000	-9.000	-999.	35.	7.4	0.06	0.28	1.00	1.60	17.	10.0	263.4	10.0
08	01	01	1	22	-2.9	0.066	-9.000	-9.000	-999.	39.	7.9	0.06	0.28	1.00	1.70	26.	10.0	263.9	10.0
08	01	01	1	23	-8.6	0.160	-9.000	-9.000	-999.	147.	38.2	0.06	0.28	1.00	2.60	24.	10.0	263.0	10.0
08	01	01	1	24	-26.9	0.273	-9.000	-9.000	-999.	327.	60.1	0.06	0.28	1.00	4.10	15.	10.0	262.9	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	10.0	1	144.	3.60	264.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF BERYLLIU IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00002	ON 08111907:	AT (425600.00, 4523800.00, 1390.79, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00000	ON 08102707:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111421:	AT (426800.00, 4525800.00, 1386.05, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08012607:	AT (427000.00, 4527200.00, 1378.30, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08101523:	AT (426000.00, 4525800.00, 1353.21, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08012607:	AT (427200.00, 4527200.00, 1393.45, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00001	ON 08012607:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00001	ON 08012607:	AT (426800.00, 4527000.00, 1364.47, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00000	ON 08101819:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00000	ON 08042320:	AT (424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111624:	AT (424800.00, 4525850.00, 1326.46, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111702:	AT (424750.00, 4525600.00, 1326.88, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00000	ON 08081220:	AT (424800.00, 4525850.00, 1326.46, 2867.37, 0.00)	DC

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68H13    HIGH   1ST HIGH VALUE IS       0.00000  ON 08102721: AT (  425000.00,  4525700.00,  1332.22,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```

```
 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        16:41:41
                                                                                                                       PAGE   5
 **MODELOPTs:  RegDFAULT CONC                                              ELEV
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*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF BERYLLIU IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)					OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425200.00,	4523800.00,	1372.25,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425200.00,	4523800.00,	1372.25,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425400.00,	4523800.00,	1381.29,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425200.00,	4523800.00,	1372.25,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425000.00,	4524400.00,	1350.15,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425400.00,	4523600.00,	1388.65,	2867.37,	0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425400.00,	4523400.00,	1398.40,	2867.37,	0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425000.00,	4524200.00,	1354.78,	2867.37,	0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00000	ON 08090208: AT (	424021.30,	4526781.80,	1304.07,	2867.37,	0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00000	ON 08080508: AT (	424021.60,	4526806.30,	1304.09,	2867.37,	0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00000m	ON 08022824: AT (	423678.60,	4526311.50,	1302.00,	2867.37,	0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00000m	ON 08022824: AT (	423678.60,	4526311.50,	1302.00,	2867.37,	0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00000	ON 08022016: AT (	423727.50,	4526311.50,	1303.00,	2867.37,	0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00000	ON 08110824: AT (	423629.70,	4526311.40,	1301.93,	2867.37,	0.00)	DC

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 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```

```
 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        16:41:41
                                                                                                                       PAGE   6
 **MODELOPTs:  RegDFAULT CONC                                              ELEV
```

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF BERYLLIU IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)					OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425400.00,	4523800.00,	1381.29,	2867.37,	0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425200.00,	4523800.00,	1372.25,	2867.37,	0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425400.00,	4523800.00,	1381.29,	2867.37,	0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425400.00,	4523800.00,	1381.29,	2867.37,	0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425000.00,	4524400.00,	1350.15,	2867.37,	0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425400.00,	4523600.00,	1388.65,	2867.37,	0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 08111924: AT (	425400.00,	4523400.00,	1398.40,	2867.37,	0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00000	ON 08031624: AT (	423776.40,	4526311.50,	1303.07,	2867.37,	0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00000	ON 08011124: AT (	424022.60,	4526904.20,	1303.05,	2867.37,	0.00)	DC

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68H7     HIGH   1ST HIGH VALUE IS       0.00000m ON 08021224: AT (  424022.60,  4526904.20,  1303.05,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00000  ON 08030224: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00000  ON 08030224: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00000  ON 08030224: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00000  ON 08031624: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



```
 **MODELOPTs:  RegDFAULT CONC                                          ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of          146 Informational Message(s)

 A Total of         8784 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of          146 Missing Hours Identified (  1.66 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

*** MODEL SETUP OPTIONS SUMMARY ***

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 3 Short Term Average(s) of: 1-HR   8-HR 24-HR

**This Run Includes: 13 Source(s);   14 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of: BERYLLIU

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1308.00 ; Decay Coef. =   0.000   ; Rot. Angle =   0.0
Emission Units = GRAMS/SEC   ; Emission Rate Unit Factor =   0.10000E+07
Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =   16.3 MB of RAM.

**Input Runstream File: Holly_HAPS_2009_BERYLLIU.DTA
**Output Print File: Holly_HAPS_2009_BERYLLIU.LST

**File for Summary of Results: C:\beast\Holly\HAPs\Holly_HAPS_2009_BERYLLIU.SUM

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23, 10.80,

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2009.SFC   Met Version: 11059
Profile file: SY2009.PFL
Surface format: FREE
Profile format: FREE

Surface station no.: 24127 Upper air station no.: 72572
Name: SALT_LAKE_CITY,UT Name: UNKNOWN
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.00	127.	10.0	267.9	10.0
09	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	1.80	120.	10.0	268.0	10.0
09	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	3.00	106.	10.0	269.1	10.0
09	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.10	132.	10.0	270.2	10.0
09	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.80	141.	10.0	269.8	10.0
09	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.50	148.	10.0	269.4	10.0
09	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	1.90	96.	10.0	269.2	10.0
09	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.12	0.28	1.00	0.80	178.	10.0	269.6	10.0
09	01	01	1	09	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	0.51	2.70	149.	10.0	270.9	10.0
09	01	01	1	10	9.0	0.274	0.144	0.005	10.	330.	-177.5	0.12	0.28	0.30	2.90	154.	10.0	271.9	10.0
09	01	01	1	11	22.7	0.173	0.298	0.012	36.	169.	-17.8	0.09	0.28	0.22	1.70	190.	10.0	273.9	10.0
09	01	01	1	12	31.6	0.109	0.420	0.018	73.	84.	-3.2	0.05	0.28	0.19	1.00	46.	10.0	275.6	10.0
09	01	01	1	13	34.8	0.258	0.504	0.005	114.	301.	-38.1	0.12	0.28	0.19	2.50	163.	10.0	277.0	10.0
09	01	01	1	14	32.1	0.113	0.539	0.013	151.	102.	-3.5	0.12	0.28	0.19	0.80	154.	10.0	277.9	10.0
09	01	01	1	15	4.7	0.155	0.288	0.013	157.	141.	-62.0	0.07	0.28	0.22	1.80	124.	10.0	278.8	10.0
09	01	01	1	16	0.4	0.334	0.124	0.005	158.	444.	-7805.0	0.07	0.28	0.29	4.20	143.	10.0	278.6	10.0
09	01	01	1	17	-14.1	0.342	-9.000	-9.000	-999.	460.	219.8	0.07	0.28	0.49	4.50	146.	10.0	277.9	10.0
09	01	01	1	18	-26.4	0.354	-9.000	-9.000	-999.	485.	130.6	0.07	0.28	1.00	4.80	146.	10.0	277.4	10.0
09	01	01	1	19	-35.5	0.392	-9.000	-9.000	-999.	564.	131.3	0.12	0.28	1.00	4.70	169.	10.0	277.4	10.0
09	01	01	1	20	-28.1	0.311	-9.000	-9.000	-999.	402.	82.5	0.12	0.28	1.00	3.90	150.	10.0	277.6	10.0
09	01	01	1	21	-29.8	0.330	-9.000	-9.000	-999.	437.	93.6	0.07	0.28	1.00	4.60	129.	10.0	278.5	10.0
09	01	01	1	22	-14.1	0.288	-9.000	-9.000	-999.	356.	130.9	0.07	0.28	1.00	3.90	131.	10.0	278.8	10.0
09	01	01	1	23	-23.6	0.320	-9.000	-9.000	-999.	416.	107.0	0.07	0.28	1.00	4.40	122.	10.0	278.9	10.0
09	01	01	1	24	-24.9	0.337	-9.000	-9.000	-999.	450.	118.7	0.07	0.28	1.00	4.60	130.	10.0	278.4	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	127.	3.00	267.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF BERYLLIU IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00002	ON 09121804:	AT (425600.00, 4523800.00, 1390.79, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00000	ON 09112608:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 09012102:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 09012102:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 09110119:	AT (426400.00, 4526400.00, 1357.10, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00000	ON 09012102:	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00001	ON 09110218:	AT (427000.00, 4525800.00, 1404.56, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00001	ON 09012102:	AT (426800.00, 4526800.00, 1365.89, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00000	ON 09012021:	AT (424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00000	ON 09012102:	AT (424242.70, 4526812.50, 1308.00, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00000	ON 09100821:	AT (424750.00, 4525700.00, 1326.84, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00000	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00000	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00000	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF BERYLLIU IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00000c	ON 09012108:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00000c	ON 09012108:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00000c	ON 09012108:	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00000c	ON 09012108:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00000c	ON 09012108:	AT (426600.00, 4527000.00, 1353.33, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00000c	ON 09012108:	AT (427400.00, 4527000.00, 1410.95, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00000c	ON 09012108:	AT (427400.00, 4526600.00, 1416.24, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00000c	ON 09012108:	AT (426800.00, 4526800.00, 1365.89, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00000m	ON 09020908:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00000c	ON 09011024:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00000m	ON 09011624:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00000m	ON 09013024:	AT (423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00000m	ON 09011624:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00000m	ON 09011624:	AT (423750.00, 4526300.00, 1303.46, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF BERYLLIU IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00000	ON 09102824:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00000b	ON 09012124:	AT (425600.00, 4524200.00, 1376.93, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00000b	ON 09012124:	AT (425800.00, 4524400.00, 1379.76, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00000m	ON 09012024:	AT (425800.00, 4524600.00, 1374.94, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00000m	ON 09012024:	AT (425500.00, 4525000.00, 1352.18, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00000b	ON 09012124:	AT (425800.00, 4524000.00, 1393.12, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00000b	ON 09012124:	AT (425800.00, 4523800.00, 1400.43, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00000	ON 09102824:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00000m	ON 09072224:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00000m	ON 09072224:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00000	ON 09122324:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00000m	ON 09022724:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00000	ON 09122324:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

```
68H13    HIGH   1ST HIGH VALUE IS       0.00000  ON 09122324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        18:48:00
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of          802 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            9 Calm Hours Identified

 A Total of          793 Missing Hours Identified (  9.05 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

```
                                        ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     13 Source(s);      14 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  CADMIUM

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     16.3 MB of RAM.

**Input Runstream File:          Holly_HAPS_2006_CADMIUM.DTA
**Output Print File:             Holly_HAPS_2006_CADMIUM.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2006_CADMIUM.SUM
```



```
                                        *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                              *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                        (METERS/SEC)

                                            1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2006.SFC Met Version: 11059
Profile file: SY2006.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2006 Year: 2006

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
06	01	01	1	01	-11.8	0.241	-9.000	-9.000	-999.	273.	91.0	0.09	0.28	1.00	3.20	185.	10.0	276.0	10.0
06	01	01	1	02	-11.9	0.244	-9.000	-9.000	-999.	277.	93.0	0.01	0.28	1.00	4.60	248.	10.0	276.5	10.0
06	01	01	1	03	-24.7	0.504	-9.000	-9.000	-999.	824.	399.2	0.01	0.28	1.00	9.00	269.	10.0	277.0	10.0
06	01	01	1	04	-40.4	0.427	-9.000	-9.000	-999.	646.	146.0	0.02	0.28	1.00	7.00	290.	10.0	276.9	10.0
06	01	01	1	05	-15.9	0.324	-9.000	-9.000	-999.	430.	164.1	0.04	0.28	1.00	4.80	301.	10.0	276.4	10.0
06	01	01	1	06	-18.0	0.366	-9.000	-9.000	-999.	508.	209.4	0.02	0.28	1.00	5.90	298.	10.0	276.4	10.0
06	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.02	0.28	1.00	6.30	289.	10.0	275.9	10.0
06	01	01	1	08	-34.7	0.381	-9.000	-9.000	-999.	540.	122.8	0.02	0.28	1.00	6.30	282.	10.0	275.4	10.0
06	01	01	1	09	-21.0	0.324	-9.000	-9.000	-999.	425.	124.8	0.01	0.28	0.51	6.00	268.	10.0	275.1	10.0
06	01	01	1	10	10.5	0.195	0.315	0.005	92.	206.	-54.3	0.01	0.28	0.30	3.20	249.	10.0	276.1	10.0
06	01	01	1	11	27.6	0.203	0.649	0.005	307.	211.	-23.6	0.01	0.28	0.22	3.20	248.	10.0	277.5	10.0
06	01	01	1	12	38.6	0.170	0.825	0.005	450.	161.	-9.8	0.01	0.28	0.19	2.50	249.	10.0	278.4	10.0
06	01	01	1	13	42.5	0.283	0.942	0.005	608.	346.	-41.1	0.09	0.28	0.19	3.00	207.	10.0	279.2	10.0
06	01	01	1	14	32.3	0.382	0.913	0.005	729.	543.	-133.3	0.12	0.28	0.19	4.00	168.	10.0	279.9	10.0
06	01	01	1	15	4.8	0.338	0.487	0.005	746.	452.	-623.1	0.07	0.28	0.22	4.20	148.	10.0	279.8	10.0
06	01	01	1	16	0.4	0.444	0.218	0.005	747.	681.	-8888.0	0.12	0.28	0.29	4.90	155.	10.0	279.4	10.0
06	01	01	1	17	-17.9	0.410	-9.000	-9.000	-999.	605.	298.0	0.12	0.28	0.49	4.70	161.	10.0	278.4	10.0
06	01	01	1	18	-25.2	0.339	-9.000	-9.000	-999.	457.	119.9	0.12	0.28	1.00	4.10	163.	10.0	277.4	10.0
06	01	01	1	19	-21.1	0.284	-9.000	-9.000	-999.	349.	83.7	0.07	0.28	1.00	4.00	149.	10.0	276.6	10.0
06	01	01	1	20	-9.3	0.189	-9.000	-9.000	-999.	192.	55.7	0.07	0.28	1.00	2.80	124.	10.0	276.0	10.0
06	01	01	1	21	-18.7	0.381	-9.000	-9.000	-999.	540.	227.2	0.07	0.28	1.00	5.00	140.	10.0	276.9	10.0
06	01	01	1	22	-12.9	0.262	-9.000	-9.000	-999.	316.	108.2	0.12	0.28	1.00	3.20	165.	10.0	277.1	10.0
06	01	01	1	23	-14.5	0.296	-9.000	-9.000	-999.	371.	138.0	0.07	0.28	1.00	4.00	134.	10.0	277.2	10.0
06	01	01	1	24	-18.2	0.372	-9.000	-9.000	-999.	522.	218.0	0.07	0.28	1.00	4.90	133.	10.0	277.8	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
06	01	01	01	10.0	1	185.	3.20	276.1	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CADMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00146	ON 06123022:	AT (426200.00, 4524800.00, 1384.77, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00030	ON 06022420:	AT (427000.00, 4526400.00, 1388.10, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00031	ON 06022420:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00025	ON 06022420:	AT (427000.00, 4526800.00, 1382.27, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00015	ON 06022420:	AT (426600.00, 4526800.00, 1356.70, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00040	ON 06022420:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00049	ON 06022420:	AT (427400.00, 4526400.00, 1420.32, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00056	ON 06022420:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00007	ON 06092904:	AT (424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00008	ON 06120622:	AT (424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00003	ON 06110718:	AT (425000.00, 4525800.00, 1331.29, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00003	ON 06022420:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00004	ON 06022420:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC

68H13 HIGH 1ST HIGH VALUE IS 0.00004 ON 06110718: AT (425000.00, 4525700.00, 1332.22, 2867.37, 0.00) DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CADMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00029	ON 06120824: AT	(425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00005	ON 06120824: AT	(425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00005	ON 06120824: AT	(425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00005	ON 06120824: AT	(425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00002	ON 06120824: AT	(425200.00, 4524400.00, 1356.99, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00008	ON 06120824: AT	(425600.00, 4523600.00, 1398.25, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00009	ON 06120824: AT	(425600.00, 4523400.00, 1407.26, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00012	ON 06122816: AT	(423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00004	ON 06092508: AT	(424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00004m	ON 06090408: AT	(424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00001	ON 06021908: AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00001	ON 06022008: AT	(423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00001	ON 06021908: AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00001	ON 06021908: AT	(423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF CADMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00014	ON 06122824: AT	(423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00002m	ON 06123024: AT	(426200.00, 4524800.00, 1384.77, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00002m	ON 06123024: AT	(426400.00, 4525000.00, 1388.52, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00002	ON 06120824: AT	(425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00001	ON 06122824: AT	(423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00003	ON 06120824: AT	(425600.00, 4523600.00, 1398.25, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00003m	ON 06100824: AT	(427000.00, 4526200.00, 1385.51, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00009	ON 06122824: AT	(423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00001m	ON 06093024: AT	(424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC

```
68H7     HIGH   1ST HIGH VALUE IS       0.00002  ON 06110624: AT (  424022.10,  4526855.30,  1304.00,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00001m ON 06121624: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00001m ON 06121624: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00001m ON 06121624: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00001m ON 06121624: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        13:02:04
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of          525 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of          525 Missing Hours Identified (  5.99 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305      13 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

*** MODEL SETUP OPTIONS SUMMARY ***

- -

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 3 Short Term Average(s) of: 1-HR 8-HR 24-HR

**This Run Includes: 13 Source(s); 14 Source Group(s); and 10024 Receptor(s)

**The Model Assumes A Pollutant Type of: CADMIUM

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1308.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 16.3 MB of RAM.

**Input Runstream File: Holly_HAPS_2007_CADMIUM.DTA
**Output Print File: Holly_HAPS_2007_CADMIUM.LST

**File for Summary of Results: C:\beast\Holly\HAPs\Holly_HAPS_2007_CADMIUM.SUM

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2007.SFC Met Version: 11059
Profile file: SY2007.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2007 Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-2.0	0.051	-9.000	-9.000	-999.	27.	5.4	0.01	0.28	1.00	1.80	267.	10.0	270.4	10.0
07	01	01	1	02	-1.2	0.042	-9.000	-9.000	-999.	20.	4.6	0.02	0.28	1.00	1.30	295.	10.0	270.9	10.0
07	01	01	1	03	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	93.	10.0	270.6	10.0
07	01	01	1	04	-0.8	0.036	-9.000	-9.000	-999.	16.	4.4	0.07	0.28	1.00	0.90	141.	10.0	270.6	10.0
07	01	01	1	05	-2.4	0.063	-9.000	-9.000	-999.	37.	8.4	0.12	0.28	1.00	1.40	172.	10.0	270.4	10.0
07	01	01	1	06	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	114.	10.0	270.4	10.0
07	01	01	1	07	-0.5	0.029	-9.000	-9.000	-999.	11.	3.3	0.04	0.28	1.00	0.80	87.	10.0	270.0	10.0
07	01	01	1	08	-0.5	0.026	-9.000	-9.000	-999.	9.	2.7	0.01	0.28	1.00	0.90	262.	10.0	269.5	10.0
07	01	01	1	09	-4.5	0.099	-9.000	-9.000	-999.	71.	16.8	0.09	0.28	0.51	1.90	347.	10.0	269.0	10.0
07	01	01	1	10	9.0	0.139	0.572	0.017	655.	119.	-23.4	0.04	0.28	0.30	1.70	315.	10.0	271.0	10.0
07	01	01	1	11	22.7	0.145	0.787	0.018	677.	128.	-10.7	0.06	0.28	0.22	1.50	14.	10.0	272.8	10.0
07	01	01	1	12	31.5	0.186	0.891	0.018	707.	184.	-16.0	0.06	0.28	0.19	2.00	13.	10.0	272.9	10.0
07	01	01	1	13	34.6	0.222	0.934	0.018	740.	241.	-25.0	0.06	0.28	0.19	2.50	5.	10.0	273.4	10.0
07	01	01	1	14	38.8	0.298	0.985	0.018	777.	374.	-53.6	0.09	0.28	0.19	3.20	359.	10.0	273.9	10.0
07	01	01	1	15	28.3	0.138	0.898	0.018	805.	136.	-7.3	0.04	0.28	0.22	1.50	64.	10.0	275.4	10.0
07	01	01	1	16	11.6	0.177	0.671	0.018	816.	171.	-37.4	0.05	0.28	0.29	2.10	111.	10.0	275.1	10.0
07	01	01	1	17	-7.2	0.120	-9.000	-9.000	-999.	96.	18.8	0.07	0.28	0.49	2.30	134.	10.0	273.6	10.0
07	01	01	1	18	-4.8	0.077	-9.000	-9.000	-999.	49.	7.5	0.12	0.28	1.00	1.70	152.	10.0	272.0	10.0
07	01	01	1	19	-2.1	0.045	-9.000	-9.000	-999.	22.	3.4	0.01	0.28	1.00	1.50	221.	10.0	271.0	10.0
07	01	01	1	20	-0.8	0.029	-9.000	-9.000	-999.	11.	2.4	0.01	0.28	1.00	1.00	242.	10.0	270.4	10.0
07	01	01	1	21	-6.2	0.083	-9.000	-9.000	-999.	55.	7.3	0.07	0.28	1.00	2.10	128.	10.0	269.8	10.0
07	01	01	1	22	-8.2	0.095	-9.000	-9.000	-999.	68.	8.4	0.07	0.28	1.00	2.40	136.	10.0	269.4	10.0
07	01	01	1	23	-9.6	0.103	-9.000	-9.000	-999.	76.	9.1	0.07	0.28	1.00	2.60	142.	10.0	268.8	10.0
07	01	01	1	24	-5.1	0.075	-9.000	-9.000	-999.	48.	6.6	0.07	0.28	1.00	1.90	148.	10.0	269.0	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	10.0	1	267.	1.80	270.5	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CADMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00151	ON 07012406:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00033	ON 07012406:	AT (427000.00, 4526400.00, 1388.10, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00033	ON 07012406:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00029	ON 07012406:	AT (427000.00, 4526800.00, 1382.27, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00017	ON 07011618:	AT (426000.00, 4525800.00, 1353.21, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00044	ON 07012406:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00053	ON 07012406:	AT (427400.00, 4526400.00, 1420.32, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00060	ON 07012406:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00007	ON 07102424:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00008	ON 07012618:	AT (424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00004	ON 07012401:	AT (425300.00, 4526200.00, 1331.56, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00004	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00004	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC

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68H13    HIGH   1ST HIGH VALUE IS       0.00004  ON 07012406: AT (  425400.00,  4526500.00,  1330.75,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        15:12:21
                                                                                                                       PAGE   5
 **MODELOPTs:  RegDFAULT CONC                                               ELEV

                                                  *** THE SUMMARY OF HIGHEST  8-HR RESULTS ***

                                    ** CONC OF CADMIUM  IN MICROGRAMS/M**3                          **

                                                                DATE
NETWORK
GROUP ID                         AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS       0.00033  ON 07120724: AT (  426000.00,  4524200.00,  1395.05,  2867.37,    0.00)  DC

20H3     HIGH   1ST HIGH VALUE IS       0.00006  ON 07102608: AT (  426600.00,  4526200.00,  1369.60,  2867.37,    0.00)  DC

24H1     HIGH   1ST HIGH VALUE IS       0.00007  ON 07042024: AT (  426600.00,  4525600.00,  1382.42,  2867.37,    0.00)  DC

25H1     HIGH   1ST HIGH VALUE IS       0.00006  ON 07042024: AT (  426400.00,  4525600.00,  1373.63,  2867.37,    0.00)  DC

26H1     HIGH   1ST HIGH VALUE IS       0.00003  ON 07042024: AT (  425800.00,  4525800.00,  1348.50,  2867.37,    0.00)  DC

27H1     HIGH   1ST HIGH VALUE IS       0.00009  ON 07102608: AT (  427000.00,  4526600.00,  1385.23,  2867.37,    0.00)  DC

33H1     HIGH   1ST HIGH VALUE IS       0.00010  ON 07120724: AT (  426200.00,  4524000.00,  1419.65,  2867.37,    0.00)  DC

BOILER11 HIGH   1ST HIGH VALUE IS       0.00015  ON 07041908: AT (  424141.30,  4526621.40,  1308.11,  2867.37,    0.00)  DC

68H6     HIGH   1ST HIGH VALUE IS       0.00003m ON 07102424: AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC

68H7     HIGH   1ST HIGH VALUE IS       0.00004  ON 07110308: AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00001  ON 07021408: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00001m ON 07090924: AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00001  ON 07021408: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00001  ON 07021408: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        15:12:21
                                                                                                                       PAGE   6
 **MODELOPTs:  RegDFAULT CONC                                               ELEV

                                                  *** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

                                    ** CONC OF CADMIUM  IN MICROGRAMS/M**3                          **

                                                                DATE
NETWORK
GROUP ID                         AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS       0.00015m ON 07120724: AT (  426000.00,  4524200.00,  1395.05,  2867.37,    0.00)  DC

20H3     HIGH   1ST HIGH VALUE IS       0.00003m ON 07102624: AT (  426600.00,  4526200.00,  1369.60,  2867.37,    0.00)  DC

24H1     HIGH   1ST HIGH VALUE IS       0.00003m ON 07102624: AT (  427000.00,  4526600.00,  1385.23,  2867.37,    0.00)  DC

25H1     HIGH   1ST HIGH VALUE IS       0.00003m ON 07102624: AT (  426800.00,  4526600.00,  1371.13,  2867.37,    0.00)  DC

26H1     HIGH   1ST HIGH VALUE IS       0.00002m ON 07122824: AT (  423538.80,  4527067.90,  1294.00,  2867.37,    0.00)  DC

27H1     HIGH   1ST HIGH VALUE IS       0.00005m ON 07102624: AT (  427000.00,  4526600.00,  1385.23,  2867.37,    0.00)  DC

33H1     HIGH   1ST HIGH VALUE IS       0.00005m ON 07102624: AT (  427200.00,  4526200.00,  1406.81,  2867.37,    0.00)  DC

BOILER11 HIGH   1ST HIGH VALUE IS       0.00007  ON 07041524: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC

68H6     HIGH   1ST HIGH VALUE IS       0.00002m ON 07102424: AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC
```

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68H7     HIGH   1ST HIGH VALUE IS       0.00002m ON 07110324: AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00000  ON 07011124: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00001m ON 07121424: AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00001  ON 07021324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00001  ON 07011124: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        15:12:21
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                  ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of           0 Fatal Error Message(s)
 A Total of           1 Warning Message(s)
 A Total of        2026 Informational Message(s)

 A Total of        8760 Hours Were Processed

 A Total of           0 Calm Hours Identified

 A Total of        2026 Missing Hours Identified ( 23.13 Percent)

 CAUTION!:  Number of Missing Hours Exceeds 10 Percent of Total!
            Data May Not Be Acceptable for Regulatory Applications.
            See Section 5.3.2 of "Meteorological Monitoring Guidance
            for Regulatory Modeling Applications" (EPA-454/R-99-005).


    ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

```
 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        16:41:55
                                                                                                                       PAGE   1
**MODELOPTs:  RegDFAULT CONC                                            ELEV


                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     13 Source(s);      14 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  CADMIUM

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                      ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     16.3 MB of RAM.

**Input Runstream File:          Holly_HAPS_2008_CADMIUM.DTA
**Output Print File:             Holly_HAPS_2008_CADMIUM.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2008_CADMIUM.SUM

*** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                  *** 5-years Met Data - KSLC 2006-2010                                    ***        16:41:55
                                                                                                                      PAGE   2
**MODELOPTs:  RegDFAULT CONC                                            ELEV


                                          *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                 *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                        (METERS/SEC)

                                               1.54,   3.09,   5.14,   8.23,  10.80,

*** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                  *** 5-years Met Data - KSLC 2006-2010                                    ***        16:41:55
                                                                                                                      PAGE   3
**MODELOPTs:  RegDFAULT CONC                                            ELEV


                                   *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

  Surface file:   SY2008.SFC                                                                      Met Version:  11059
  Profile file:   SY2008.PFL
  Surface format: FREE
  Profile format: FREE
```

Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2008 Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-24.3	0.228	-9.000	-9.000	-999.	250.	38.8	0.07	0.28	1.00	3.60	144.	10.0	264.2	10.0
08	01	01	1	02	-9.9	0.103	-9.000	-9.000	-999.	85.	8.9	0.07	0.28	1.00	2.60	130.	10.0	263.6	10.0
08	01	01	1	03	-3.8	0.064	-9.000	-9.000	-999.	37.	5.5	0.07	0.28	1.00	1.60	127.	10.0	263.0	10.0
08	01	01	1	04	-10.3	0.109	-9.000	-9.000	-999.	82.	10.0	0.12	0.28	1.00	2.40	153.	10.0	263.6	10.0
08	01	01	1	05	-8.5	0.095	-9.000	-9.000	-999.	68.	8.2	0.07	0.28	1.00	2.40	123.	10.0	263.1	10.0
08	01	01	1	06	-7.9	0.091	-9.000	-9.000	-999.	63.	7.6	0.05	0.28	1.00	2.40	93.	10.0	262.9	10.0
08	01	01	1	07	-7.2	0.086	-9.000	-9.000	-999.	58.	7.0	0.04	0.28	1.00	2.40	63.	10.0	262.6	10.0
08	01	01	1	08	-11.6	0.116	-9.000	-9.000	-999.	91.	10.9	0.05	0.28	1.00	2.90	30.	10.0	261.4	10.0
08	01	01	1	09	-13.2	0.185	-9.000	-9.000	-999.	184.	38.9	0.06	0.28	0.51	3.00	24.	10.0	262.9	10.0
08	01	01	1	10	10.3	0.229	0.258	0.005	54.	252.	-94.0	0.06	0.28	0.30	2.80	26.	10.0	264.2	10.0
08	01	01	1	11	27.2	0.247	0.447	0.005	105.	283.	-44.5	0.06	0.28	0.22	2.90	23.	10.0	265.8	10.0
08	01	01	1	12	31.4	0.256	0.518	0.005	142.	298.	-43.0	0.06	0.28	0.19	3.00	24.	10.0	267.2	10.0
08	01	01	1	13	34.5	0.201	0.582	0.007	183.	208.	-18.9	0.05	0.28	0.19	2.30	54.	10.0	268.6	10.0
08	01	01	1	14	31.7	0.255	0.602	0.005	220.	296.	-41.7	0.05	0.28	0.19	3.10	37.	10.0	267.6	10.0
08	01	01	1	15	23.3	0.252	0.565	0.005	247.	291.	-55.2	0.06	0.28	0.22	3.00	3.	10.0	267.8	10.0
08	01	01	1	16	-0.3	0.246	-9.000	-9.000	-999.	281.	4710.6	0.06	0.28	0.29	3.20	17.	10.0	267.4	10.0
08	01	01	1	17	-8.9	0.196	-9.000	-9.000	-999.	200.	68.0	0.06	0.28	0.49	2.90	13.	10.0	266.1	10.0
08	01	01	1	18	-13.0	0.244	-9.000	-9.000	-999.	277.	88.9	0.06	0.28	1.00	3.50	8.	10.0	264.5	10.0
08	01	01	1	19	-5.5	0.104	-9.000	-9.000	-999.	90.	16.1	0.05	0.28	1.00	2.20	35.	10.0	264.2	10.0
08	01	01	1	20	-2.6	0.056	-9.000	-9.000	-999.	31.	5.3	0.05	0.28	1.00	1.50	48.	10.0	264.2	10.0
08	01	01	1	21	-2.5	0.062	-9.000	-9.000	-999.	35.	7.4	0.06	0.28	1.00	1.60	17.	10.0	263.4	10.0
08	01	01	1	22	-2.9	0.066	-9.000	-9.000	-999.	39.	7.9	0.06	0.28	1.00	1.70	26.	10.0	263.9	10.0
08	01	01	1	23	-8.6	0.160	-9.000	-9.000	-999.	147.	38.2	0.06	0.28	1.00	2.60	24.	10.0	263.0	10.0
08	01	01	1	24	-26.9	0.273	-9.000	-9.000	-999.	327.	60.1	0.06	0.28	1.00	4.10	15.	10.0	262.9	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	10.0	1	144.	3.60	264.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CADMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00146	ON 08111907:	AT (425600.00, 4523800.00, 1390.79, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00032	ON 08102707:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00032	ON 08111421:	AT (426800.00, 4525800.00, 1386.05, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00029	ON 08012607:	AT (427000.00, 4527200.00, 1378.30, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00016	ON 08101523:	AT (426000.00, 4525800.00, 1353.21, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00044	ON 08012607:	AT (427200.00, 4527200.00, 1393.45, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00049	ON 08012607:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00060	ON 08012607:	AT (426800.00, 4527000.00, 1364.47, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00007	ON 08101819:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00008	ON 08042320:	AT (424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00004	ON 08111624:	AT (424800.00, 4525850.00, 1326.46, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00003	ON 08111702:	AT (424750.00, 4525600.00, 1326.88, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00004	ON 08081220:	AT (424800.00, 4525850.00, 1326.46, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00004	ON 08102721:	AT (425000.00, 4525700.00, 1332.22, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CADMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00036	ON 08111924:	AT (425200.00, 4523800.00, 1372.25, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00008	ON 08111924:	AT (425200.00, 4523800.00, 1372.25, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00007	ON 08111924:	AT (425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00006	ON 08111924:	AT (425200.00, 4523800.00, 1372.25, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00003	ON 08111924:	AT (425000.00, 4524400.00, 1350.15, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00010	ON 08111924:	AT (425400.00, 4523600.00, 1388.65, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00014	ON 08111924:	AT (425400.00, 4523400.00, 1398.40, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00013	ON 08111924:	AT (425000.00, 4524200.00, 1354.78, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00003	ON 08090208:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00003	ON 08080508:	AT (424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00001m	ON 08022824:	AT (423678.60, 4526311.50, 1302.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00001m	ON 08022824:	AT (423678.60, 4526311.50, 1302.00, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00001	ON 08022016:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00001	ON 08110824:	AT (423629.70, 4526311.40, 1301.93, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF CADMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00017	ON 08111924:	AT (425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00003	ON 08111924:	AT (425200.00, 4523800.00, 1372.25, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00003	ON 08111924:	AT (425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00002	ON 08111924:	AT (425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00001	ON 08111924:	AT (425000.00, 4524400.00, 1350.15, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00004	ON 08111924:	AT (425400.00, 4523600.00, 1388.65, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00005	ON 08111924:	AT (425400.00, 4523400.00, 1398.40, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00007	ON 08031624:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00001	ON 08011124:	AT (424022.60, 4526904.20, 1303.05, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00002m	ON 08021224:	AT (424022.60, 4526904.20, 1303.05, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00001	ON 08030224:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00001	ON 08030224:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00001	ON 08030224:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

```
68H13    HIGH   1ST HIGH VALUE IS       0.00001  ON 08031624: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        16:41:55
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of          146 Informational Message(s)

 A Total of         8784 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of          146 Missing Hours Identified (  1.66 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

```
                                         ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     13 Source(s);      14 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  CADMIUM

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                      ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     16.3 MB of RAM.

**Input Runstream File:          Holly_HAPS_2009_CADMIUM.DTA
**Output Print File:             Holly_HAPS_2009_CADMIUM.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2009_CADMIUM.SUM
```



```
                                         *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                   *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                          (METERS/SEC)

                                                1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2009.SFC Met Version: 11059
Profile file: SY2009.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 72572
Name: SALT_LAKE_CITY,UT Name: UNKNOWN
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.00	127.	10.0	267.9	10.0
09	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	1.80	120.	10.0	268.0	10.0
09	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	3.00	106.	10.0	269.1	10.0
09	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.10	132.	10.0	270.2	10.0
09	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.80	141.	10.0	269.8	10.0
09	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.50	148.	10.0	269.4	10.0
09	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	1.90	96.	10.0	269.2	10.0
09	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.12	0.28	1.00	0.80	178.	10.0	269.6	10.0
09	01	01	1	09	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	0.51	2.70	149.	10.0	270.9	10.0
09	01	01	1	10	9.0	0.274	0.144	0.005	10.	330.	-177.5	0.12	0.28	0.30	2.90	154.	10.0	271.9	10.0
09	01	01	1	11	22.7	0.173	0.298	0.012	36.	169.	-17.8	0.09	0.28	0.22	1.70	190.	10.0	273.9	10.0
09	01	01	1	12	31.6	0.109	0.420	0.018	73.	84.	-3.2	0.05	0.28	0.19	1.00	46.	10.0	275.6	10.0
09	01	01	1	13	34.8	0.258	0.504	0.005	114.	301.	-38.1	0.12	0.28	0.19	2.50	163.	10.0	277.0	10.0
09	01	01	1	14	32.1	0.113	0.539	0.013	151.	102.	-3.5	0.12	0.28	0.19	0.80	154.	10.0	277.9	10.0
09	01	01	1	15	4.7	0.155	0.288	0.013	157.	141.	-62.0	0.07	0.28	0.22	1.80	124.	10.0	278.8	10.0
09	01	01	1	16	0.4	0.334	0.124	0.005	158.	444.	-7805.0	0.07	0.28	0.29	4.20	143.	10.0	278.6	10.0
09	01	01	1	17	-14.1	0.342	-9.000	-9.000	-999.	460.	219.8	0.07	0.28	0.49	4.50	146.	10.0	277.9	10.0
09	01	01	1	18	-26.4	0.354	-9.000	-9.000	-999.	485.	130.6	0.07	0.28	1.00	4.80	146.	10.0	277.4	10.0
09	01	01	1	19	-35.5	0.392	-9.000	-9.000	-999.	564.	131.3	0.12	0.28	1.00	4.70	169.	10.0	277.4	10.0
09	01	01	1	20	-28.1	0.311	-9.000	-9.000	-999.	402.	82.5	0.12	0.28	1.00	3.90	150.	10.0	277.6	10.0
09	01	01	1	21	-29.8	0.330	-9.000	-9.000	-999.	437.	93.6	0.07	0.28	1.00	4.60	129.	10.0	278.5	10.0
09	01	01	1	22	-14.1	0.288	-9.000	-9.000	-999.	356.	130.9	0.07	0.28	1.00	3.90	131.	10.0	278.8	10.0
09	01	01	1	23	-23.6	0.320	-9.000	-9.000	-999.	416.	107.0	0.07	0.28	1.00	4.40	122.	10.0	278.9	10.0
09	01	01	1	24	-24.9	0.337	-9.000	-9.000	-999.	450.	118.7	0.07	0.28	1.00	4.60	130.	10.0	278.4	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	127.	3.00	267.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CADMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00145	ON 09121804:	AT (425600.00, 4523800.00, 1390.79, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00031	ON 09112608:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00032	ON 09012102:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00029	ON 09012102:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00016	ON 09110119:	AT (426400.00, 4526400.00, 1357.10, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00045	ON 09012102:	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00051	ON 09110218:	AT (427000.00, 4525800.00, 1404.56, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00060	ON 09012102:	AT (426800.00, 4526800.00, 1365.89, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00007	ON 09012021:	AT (424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00009	ON 09012102:	AT (424242.70, 4526812.50, 1308.00, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00004	ON 09100821:	AT (424750.00, 4525700.00, 1326.84, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00003	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00004	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC

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68H13    HIGH   1ST HIGH VALUE IS       0.00003  ON 09111522: AT (  425400.00,  4526500.00,  1330.75,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        18:48:10
                                                                                                                       PAGE   5
 **MODELOPTs:  RegDFAULT CONC                                                  ELEV

                                           *** THE SUMMARY OF HIGHEST  8-HR RESULTS ***

                                   ** CONC OF CADMIUM  IN MICROGRAMS/M**3                             **

                                                     DATE
NETWORK
GROUP ID                         AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS       0.00034c ON 09012108: AT (  427200.00,  4526800.00,  1397.26,  2867.37,    0.00)  DC

20H3     HIGH   1ST HIGH VALUE IS       0.00007c ON 09012108: AT (  427000.00,  4526600.00,  1385.23,  2867.37,    0.00)  DC

24H1     HIGH   1ST HIGH VALUE IS       0.00007c ON 09012108: AT (  427200.00,  4527000.00,  1395.57,  2867.37,    0.00)  DC

25H1     HIGH   1ST HIGH VALUE IS       0.00006c ON 09012108: AT (  427000.00,  4527000.00,  1380.98,  2867.37,    0.00)  DC

26H1     HIGH   1ST HIGH VALUE IS       0.00003c ON 09012108: AT (  426600.00,  4527000.00,  1353.33,  2867.37,    0.00)  DC

27H1     HIGH   1ST HIGH VALUE IS       0.00010c ON 09012108: AT (  427400.00,  4527000.00,  1410.95,  2867.37,    0.00)  DC

33H1     HIGH   1ST HIGH VALUE IS       0.00012c ON 09012108: AT (  427400.00,  4526600.00,  1416.24,  2867.37,    0.00)  DC

BOILER11 HIGH   1ST HIGH VALUE IS       0.00013c ON 09012108: AT (  426800.00,  4526800.00,  1365.89,  2867.37,    0.00)  DC

68H6     HIGH   1ST HIGH VALUE IS       0.00003m ON 09020908: AT (  424001.20,  4526784.40,  1303.92,  2867.37,    0.00)  DC

68H7     HIGH   1ST HIGH VALUE IS       0.00004c ON 09011024: AT (  424022.30,  4526879.70,  1303.97,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00001m ON 09011624: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00001m ON 09013024: AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00001m ON 09011624: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00001m ON 09011624: AT (  423750.00,  4526300.00,  1303.46,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        18:48:10
                                                                                                                       PAGE   6
 **MODELOPTs:  RegDFAULT CONC                                                  ELEV

                                           *** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

                                   ** CONC OF CADMIUM  IN MICROGRAMS/M**3                             **

                                                     DATE
NETWORK
GROUP ID                         AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS       0.00016  ON 09102824: AT (  423776.40,  4526311.50,  1303.07,  2867.37,    0.00)  DC

20H3     HIGH   1ST HIGH VALUE IS       0.00003b ON 09012124: AT (  425600.00,  4524200.00,  1376.93,  2867.37,    0.00)  DC

24H1     HIGH   1ST HIGH VALUE IS       0.00003b ON 09012124: AT (  425800.00,  4524400.00,  1379.76,  2867.37,    0.00)  DC

25H1     HIGH   1ST HIGH VALUE IS       0.00002m ON 09012024: AT (  425800.00,  4524600.00,  1374.94,  2867.37,    0.00)  DC

26H1     HIGH   1ST HIGH VALUE IS       0.00001m ON 09012024: AT (  425500.00,  4525000.00,  1352.18,  2867.37,    0.00)  DC

27H1     HIGH   1ST HIGH VALUE IS       0.00004b ON 09012124: AT (  425800.00,  4524000.00,  1393.12,  2867.37,    0.00)  DC

33H1     HIGH   1ST HIGH VALUE IS       0.00005b ON 09012124: AT (  425800.00,  4523800.00,  1400.43,  2867.37,    0.00)  DC

BOILER11 HIGH   1ST HIGH VALUE IS       0.00009  ON 09102824: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H6     HIGH   1ST HIGH VALUE IS       0.00002m ON 09072224: AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC
```

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68H7     HIGH   1ST HIGH VALUE IS       0.00002m ON 09072224: AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00001  ON 09122324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00001m ON 09022724: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00001  ON 09122324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00001  ON 09122324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



```
 **MODELOPTs:  RegDFAULT CONC                                          ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of          802 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            9 Calm Hours Identified

 A Total of          793 Missing Hours Identified (  9.05 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

```
**MODELOPTs:  RegDFAULT CONC                                          ELEV


                                        ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:      2 Source(s);       3 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  CHLORINE

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =      6.8 MB of RAM.

**Input Runstream File:          Holly_HAPS_2006_CHLORINE.DTA
**Output Print File:             Holly_HAPS_2006_CHLORINE.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2006_CHLORINE.SUM
```



```
**MODELOPTs:  RegDFAULT CONC                                          ELEV


                                        *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                   (1=YES; 0=NO)

          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
          1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1

              NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                      *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                   (METERS/SEC)

                                          1.54,   3.09,   5.14,   8.23,  10.80,
```

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2006.SFC Met Version: 11059
Profile file: SY2006.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2006 Year: 2006

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
06	01	01	1	01	-11.8	0.241	-9.000	-9.000	-999.	273.	91.0	0.09	0.28	1.00	3.20	185.	10.0	276.0	10.0
06	01	01	1	02	-11.9	0.244	-9.000	-9.000	-999.	277.	93.0	0.01	0.28	1.00	4.60	248.	10.0	276.5	10.0
06	01	01	1	03	-24.7	0.504	-9.000	-9.000	-999.	824.	399.2	0.01	0.28	1.00	9.00	269.	10.0	277.0	10.0
06	01	01	1	04	-40.4	0.427	-9.000	-9.000	-999.	646.	146.0	0.02	0.28	1.00	7.00	290.	10.0	276.9	10.0
06	01	01	1	05	-15.9	0.324	-9.000	-9.000	-999.	430.	164.1	0.04	0.28	1.00	4.80	301.	10.0	276.4	10.0
06	01	01	1	06	-18.0	0.366	-9.000	-9.000	-999.	508.	209.4	0.02	0.28	1.00	5.90	298.	10.0	276.4	10.0
06	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.02	0.28	1.00	6.30	289.	10.0	275.9	10.0
06	01	01	1	08	-34.7	0.381	-9.000	-9.000	-999.	540.	122.8	0.02	0.28	1.00	6.30	282.	10.0	275.4	10.0
06	01	01	1	09	-21.0	0.324	-9.000	-9.000	-999.	425.	124.8	0.01	0.28	0.51	6.00	268.	10.0	275.1	10.0
06	01	01	1	10	10.5	0.195	0.315	0.005	92.	206.	-54.3	0.01	0.28	0.30	3.20	249.	10.0	276.1	10.0
06	01	01	1	11	27.6	0.203	0.649	0.005	307.	211.	-23.6	0.01	0.28	0.22	3.20	248.	10.0	277.5	10.0
06	01	01	1	12	38.6	0.170	0.825	0.005	450.	161.	-9.8	0.01	0.28	0.19	2.50	249.	10.0	278.4	10.0
06	01	01	1	13	42.5	0.283	0.942	0.005	608.	346.	-41.1	0.09	0.28	0.19	3.00	207.	10.0	279.2	10.0
06	01	01	1	14	32.3	0.382	0.913	0.005	729.	543.	-133.3	0.12	0.28	0.19	4.00	168.	10.0	279.9	10.0
06	01	01	1	15	4.8	0.338	0.487	0.005	746.	452.	-623.1	0.07	0.28	0.22	4.20	148.	10.0	279.8	10.0
06	01	01	1	16	0.4	0.444	0.218	0.005	747.	681.	-8888.0	0.12	0.28	0.29	4.90	155.	10.0	279.4	10.0
06	01	01	1	17	-17.9	0.410	-9.000	-9.000	-999.	605.	298.0	0.12	0.28	0.49	4.70	161.	10.0	278.4	10.0
06	01	01	1	18	-25.2	0.339	-9.000	-9.000	-999.	457.	119.9	0.12	0.28	1.00	4.10	163.	10.0	277.4	10.0
06	01	01	1	19	-21.1	0.284	-9.000	-9.000	-999.	349.	83.7	0.07	0.28	1.00	4.00	149.	10.0	276.6	10.0
06	01	01	1	20	-9.3	0.189	-9.000	-9.000	-999.	192.	55.7	0.07	0.28	1.00	2.80	124.	10.0	276.0	10.0
06	01	01	1	21	-18.7	0.381	-9.000	-9.000	-999.	540.	227.2	0.07	0.28	1.00	5.00	140.	10.0	276.9	10.0
06	01	01	1	22	-12.9	0.262	-9.000	-9.000	-999.	316.	108.2	0.12	0.28	1.00	3.20	165.	10.0	277.1	10.0
06	01	01	1	23	-14.5	0.296	-9.000	-9.000	-999.	371.	138.0	0.07	0.28	1.00	4.00	134.	10.0	277.2	10.0
06	01	01	1	24	-18.2	0.372	-9.000	-9.000	-999.	522.	218.0	0.07	0.28	1.00	4.90	133.	10.0	277.8	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
06	01	01	01	10.0	1	185.	3.20	276.1	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CHLORINE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	6.49575	ON 06072401:	AT (424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC
CWT10	HIGH 1ST HIGH VALUE IS	6.49275	ON 06072401:	AT (424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC
CWT11	HIGH 1ST HIGH VALUE IS	4.00917	ON 06061924:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CHLORINE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	2.44687	ON 06022808:	AT (423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC
CWT10	HIGH 1ST HIGH VALUE IS	2.26885	ON 06022808:	AT (423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC
CWT11	HIGH 1ST HIGH VALUE IS	2.11567	ON 06061924:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF CHLORINE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	1.71414	ON 06122824:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
CWT10	HIGH 1ST HIGH VALUE IS	1.06286m	ON 06022824:	AT (423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC
CWT11	HIGH 1ST HIGH VALUE IS	1.59668	ON 06122824:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 0 Warning Message(s)
A Total of 525 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 525 Missing Hours Identified (5.99 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
*** NONE ***

*** MODEL SETUP OPTIONS SUMMARY ***

- -

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 3 Short Term Average(s) of: 1-HR 8-HR 24-HR

**This Run Includes: 2 Source(s); 3 Source Group(s); and 10024 Receptor(s)

**The Model Assumes A Pollutant Type of: CHLORINE

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1308.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 6.8 MB of RAM.

**Input Runstream File: Holly_HAPS_2007_CHLORINE.DTA
**Output Print File: Holly_HAPS_2007_CHLORINE.LST

**File for Summary of Results: C:\beast\Holly\HAPs\Holly_HAPS_2007_CHLORINE.SUM

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2007.SFC Met Version: 11059
Profile file: SY2007.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2007 Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-2.0	0.051	-9.000	-9.000	-999.	27.	5.4	0.01	0.28	1.00	1.80	267.	10.0	270.4	10.0
07	01	01	1	02	-1.2	0.042	-9.000	-9.000	-999.	20.	4.6	0.02	0.28	1.00	1.30	295.	10.0	270.9	10.0
07	01	01	1	03	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	93.	10.0	270.6	10.0
07	01	01	1	04	-0.8	0.036	-9.000	-9.000	-999.	16.	4.4	0.07	0.28	1.00	0.90	141.	10.0	270.6	10.0
07	01	01	1	05	-2.4	0.063	-9.000	-9.000	-999.	37.	8.4	0.12	0.28	1.00	1.40	172.	10.0	270.4	10.0
07	01	01	1	06	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	114.	10.0	270.4	10.0
07	01	01	1	07	-0.5	0.029	-9.000	-9.000	-999.	11.	3.3	0.04	0.28	1.00	0.80	87.	10.0	270.0	10.0
07	01	01	1	08	-0.5	0.026	-9.000	-9.000	-999.	9.	2.7	0.01	0.28	1.00	0.90	262.	10.0	269.5	10.0
07	01	01	1	09	-4.5	0.099	-9.000	-9.000	-999.	71.	16.8	0.09	0.28	0.51	1.90	347.	10.0	269.0	10.0
07	01	01	1	10	9.0	0.139	0.572	0.017	655.	119.	-23.4	0.04	0.28	0.30	1.70	315.	10.0	271.0	10.0
07	01	01	1	11	22.7	0.145	0.787	0.018	677.	128.	-10.7	0.06	0.28	0.22	1.50	14.	10.0	272.8	10.0
07	01	01	1	12	31.5	0.186	0.891	0.018	707.	184.	-16.0	0.06	0.28	0.19	2.00	13.	10.0	272.9	10.0
07	01	01	1	13	34.6	0.222	0.934	0.018	740.	241.	-25.0	0.06	0.28	0.19	2.50	5.	10.0	273.4	10.0
07	01	01	1	14	38.8	0.298	0.985	0.018	777.	374.	-53.6	0.09	0.28	0.19	3.20	359.	10.0	273.9	10.0
07	01	01	1	15	28.3	0.138	0.898	0.018	805.	136.	-7.3	0.04	0.28	0.22	1.50	64.	10.0	275.4	10.0
07	01	01	1	16	11.6	0.177	0.671	0.018	816.	171.	-37.4	0.05	0.28	0.29	2.10	111.	10.0	275.1	10.0
07	01	01	1	17	-7.2	0.120	-9.000	-9.000	-999.	96.	18.8	0.07	0.28	0.49	2.30	134.	10.0	273.6	10.0
07	01	01	1	18	-4.8	0.077	-9.000	-9.000	-999.	49.	7.5	0.12	0.28	1.00	1.70	152.	10.0	272.0	10.0
07	01	01	1	19	-2.1	0.045	-9.000	-9.000	-999.	22.	3.4	0.01	0.28	1.00	1.50	221.	10.0	271.0	10.0
07	01	01	1	20	-0.8	0.029	-9.000	-9.000	-999.	11.	2.4	0.01	0.28	1.00	1.00	242.	10.0	270.4	10.0
07	01	01	1	21	-6.2	0.083	-9.000	-9.000	-999.	55.	7.3	0.07	0.28	1.00	2.10	128.	10.0	269.8	10.0
07	01	01	1	22	-8.2	0.095	-9.000	-9.000	-999.	68.	8.4	0.07	0.28	1.00	2.40	136.	10.0	269.4	10.0
07	01	01	1	23	-9.6	0.103	-9.000	-9.000	-999.	76.	9.1	0.07	0.28	1.00	2.60	142.	10.0	268.8	10.0
07	01	01	1	24	-5.1	0.075	-9.000	-9.000	-999.	48.	6.6	0.07	0.28	1.00	1.90	148.	10.0	269.0	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	10.0	1	267.	1.80	270.5	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CHLORINE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	5.22087	ON 07081620:	AT (423886.90, 4526986.00, 1299.62, 2867.37, 0.00)	DC
CWT10	HIGH 1ST HIGH VALUE IS	4.54557	ON 07041904:	AT (424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC
CWT11	HIGH 1ST HIGH VALUE IS	4.08586	ON 07060521:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CHLORINE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	3.53878	ON 07041908:	AT (424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC
CWT10	HIGH 1ST HIGH VALUE IS	3.53673	ON 07041908:	AT (424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC
CWT11	HIGH 1ST HIGH VALUE IS	2.60087	ON 07041524:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF CHLORINE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	1.45684	ON 07041524:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
CWT10	HIGH 1ST HIGH VALUE IS	1.31445	ON 07041924:	AT (424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC
CWT11	HIGH 1ST HIGH VALUE IS	1.37580	ON 07041524:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 0 Warning Message(s)
A Total of 2026 Informational Message(s)

A Total of 8760 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 2026 Missing Hours Identified (23.13 Percent)

CAUTION!: Number of Missing Hours Exceeds 10 Percent of Total!
Data May Not Be Acceptable for Regulatory Applications.
See Section 5.3.2 of "Meteorological Monitoring Guidance
for Regulatory Modeling Applications" (EPA-454/R-99-005).

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
*** NONE ***

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                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:      2 Source(s);       3 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  CHLORINE

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =      6.8 MB of RAM.

**Input Runstream File:          Holly_HAPS_2008_CHLORINE.DTA
**Output Print File:             Holly_HAPS_2008_CHLORINE.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2008_CHLORINE.SUM

*** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                  *** 5-years Met Data - KSLC 2006-2010                                    ***        13:35:05
                                                                                                                      PAGE   2
**MODELOPTs:  RegDFAULT CONC                                                ELEV

                                          *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                             (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
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           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                          (METERS/SEC)

                                               1.54,   3.09,   5.14,   8.23,  10.80,

*** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                  *** 5-years Met Data - KSLC 2006-2010                                    ***        13:35:05
                                                                                                                      PAGE   3
**MODELOPTs:  RegDFAULT CONC                                                ELEV

                                  *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

  Surface file:   SY2008.SFC                                                                 Met Version:  11059
  Profile file:   SY2008.PFL
  Surface format: FREE
  Profile format: FREE
```

Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2008 Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-24.3	0.228	-9.000	-9.000	-999.	250.	38.8	0.07	0.28	1.00	3.60	144.	10.0	264.2	10.0
08	01	01	1	02	-9.9	0.103	-9.000	-9.000	-999.	85.	8.9	0.07	0.28	1.00	2.60	130.	10.0	263.6	10.0
08	01	01	1	03	-3.8	0.064	-9.000	-9.000	-999.	37.	5.5	0.07	0.28	1.00	1.60	127.	10.0	263.0	10.0
08	01	01	1	04	-10.3	0.109	-9.000	-9.000	-999.	82.	10.0	0.12	0.28	1.00	2.40	153.	10.0	263.6	10.0
08	01	01	1	05	-8.5	0.095	-9.000	-9.000	-999.	68.	8.2	0.07	0.28	1.00	2.40	123.	10.0	263.1	10.0
08	01	01	1	06	-7.9	0.091	-9.000	-9.000	-999.	63.	7.6	0.05	0.28	1.00	2.40	93.	10.0	262.9	10.0
08	01	01	1	07	-7.2	0.086	-9.000	-9.000	-999.	58.	7.0	0.04	0.28	1.00	2.40	63.	10.0	262.6	10.0
08	01	01	1	08	-11.6	0.116	-9.000	-9.000	-999.	91.	10.9	0.05	0.28	1.00	2.90	30.	10.0	261.4	10.0
08	01	01	1	09	-13.2	0.185	-9.000	-9.000	-999.	184.	38.9	0.06	0.28	0.51	3.00	24.	10.0	262.9	10.0
08	01	01	1	10	10.3	0.229	0.258	0.005	54.	252.	-94.0	0.06	0.28	0.30	2.80	26.	10.0	264.2	10.0
08	01	01	1	11	27.2	0.247	0.447	0.005	105.	283.	-44.5	0.06	0.28	0.22	2.90	23.	10.0	265.8	10.0
08	01	01	1	12	31.4	0.256	0.518	0.005	142.	298.	-43.0	0.06	0.28	0.19	3.00	24.	10.0	267.2	10.0
08	01	01	1	13	34.5	0.201	0.582	0.007	183.	208.	-18.9	0.05	0.28	0.19	2.30	54.	10.0	268.6	10.0
08	01	01	1	14	31.7	0.255	0.602	0.005	220.	296.	-41.7	0.05	0.28	0.19	3.10	37.	10.0	267.6	10.0
08	01	01	1	15	23.3	0.252	0.565	0.005	247.	291.	-55.2	0.06	0.28	0.22	3.00	3.	10.0	267.8	10.0
08	01	01	1	16	-0.3	0.246	-9.000	-9.000	-999.	281.	4710.6	0.06	0.28	0.29	3.20	17.	10.0	267.4	10.0
08	01	01	1	17	-8.9	0.196	-9.000	-9.000	-999.	200.	68.0	0.06	0.28	0.49	2.90	13.	10.0	266.1	10.0
08	01	01	1	18	-13.0	0.244	-9.000	-9.000	-999.	277.	88.9	0.06	0.28	1.00	3.50	8.	10.0	264.5	10.0
08	01	01	1	19	-5.5	0.104	-9.000	-9.000	-999.	90.	16.1	0.05	0.28	1.00	2.20	35.	10.0	264.2	10.0
08	01	01	1	20	-2.6	0.056	-9.000	-9.000	-999.	31.	5.3	0.05	0.28	1.00	1.50	48.	10.0	264.2	10.0
08	01	01	1	21	-2.5	0.062	-9.000	-9.000	-999.	35.	7.4	0.06	0.28	1.00	1.60	17.	10.0	263.4	10.0
08	01	01	1	22	-2.9	0.066	-9.000	-9.000	-999.	39.	7.9	0.06	0.28	1.00	1.70	26.	10.0	263.9	10.0
08	01	01	1	23	-8.6	0.160	-9.000	-9.000	-999.	147.	38.2	0.06	0.28	1.00	2.60	24.	10.0	263.0	10.0
08	01	01	1	24	-26.9	0.273	-9.000	-9.000	-999.	327.	60.1	0.06	0.28	1.00	4.10	15.	10.0	262.9	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	10.0	1	144.	3.60	264.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CHLORINE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	6.90544	ON 08072920:	AT (424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC
CWT10	HIGH	1ST HIGH VALUE IS	6.90122	ON 08072920:	AT (424001.70, 4526834.10, 1303.51, 2867.37, 0.00)	DC
CWT11	HIGH	1ST HIGH VALUE IS	5.45974	ON 08083021:	AT (424000.00, 4526550.00, 1305.81, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CHLORINE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	2.46988m	ON 08032624:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
CWT10	HIGH 1ST HIGH VALUE IS	1.98218	ON 08012724:	AT (423863.70, 4526986.50, 1300.17, 2867.37, 0.00)	DC
CWT11	HIGH 1ST HIGH VALUE IS	2.31446m	ON 08032624:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF CHLORINE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	1.24777m	ON 08122524:	AT (423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC
CWT10	HIGH 1ST HIGH VALUE IS	1.19344m	ON 08122524:	AT (423840.40, 4526987.00, 1299.47, 2867.37, 0.00)	DC
CWT11	HIGH 1ST HIGH VALUE IS	1.05408	ON 08031624:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 0 Warning Message(s)
A Total of 146 Informational Message(s)

A Total of 8784 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 146 Missing Hours Identified (1.66 Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
*** NONE ***

```
                                  ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:      2 Source(s);       3 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  CHLORINE

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =      6.8 MB of RAM.

**Input Runstream File:          Holly_HAPS_2009_CHLORINE.DTA
**Output Print File:             Holly_HAPS_2009_CHLORINE.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2009_CHLORINE.SUM
```



```
                                  *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                   (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                            *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                  (METERS/SEC)

                                     1.54,   3.09,   5.14,   8.23,  10.80,
```



```
                             *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

  Surface file:   SY2009.SFC                                                                  Met Version:  11059
  Profile file:   SY2009.PFL
  Surface format: FREE
  Profile format: FREE
```

Surface station no.: 24127 Upper air station no.: 72572
Name: SALT_LAKE_CITY,UT Name: UNKNOWN
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.00	127.	10.0	267.9	10.0
09	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	1.80	120.	10.0	268.0	10.0
09	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	3.00	106.	10.0	269.1	10.0
09	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.10	132.	10.0	270.2	10.0
09	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.80	141.	10.0	269.8	10.0
09	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.50	148.	10.0	269.4	10.0
09	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	1.90	96.	10.0	269.2	10.0
09	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.12	0.28	1.00	0.80	178.	10.0	269.6	10.0
09	01	01	1	09	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	0.51	2.70	149.	10.0	270.9	10.0
09	01	01	1	10	9.0	0.274	0.144	0.005	10.	330.	-177.5	0.12	0.28	0.30	2.90	154.	10.0	271.9	10.0
09	01	01	1	11	22.7	0.173	0.298	0.012	36.	169.	-17.8	0.09	0.28	0.22	1.70	190.	10.0	273.9	10.0
09	01	01	1	12	31.6	0.109	0.420	0.018	73.	84.	-3.2	0.05	0.28	0.19	1.00	46.	10.0	275.6	10.0
09	01	01	1	13	34.8	0.258	0.504	0.005	114.	301.	-38.1	0.12	0.28	0.19	2.50	163.	10.0	277.0	10.0
09	01	01	1	14	32.1	0.113	0.539	0.013	151.	102.	-3.5	0.12	0.28	0.19	0.80	154.	10.0	277.9	10.0
09	01	01	1	15	4.7	0.155	0.288	0.013	157.	141.	-62.0	0.07	0.28	0.22	1.80	124.	10.0	278.8	10.0
09	01	01	1	16	0.4	0.334	0.124	0.005	158.	444.	-7805.0	0.07	0.28	0.29	4.20	143.	10.0	278.6	10.0
09	01	01	1	17	-14.1	0.342	-9.000	-9.000	-999.	460.	219.8	0.07	0.28	0.49	4.50	146.	10.0	277.9	10.0
09	01	01	1	18	-26.4	0.354	-9.000	-9.000	-999.	485.	130.6	0.07	0.28	1.00	4.80	146.	10.0	277.4	10.0
09	01	01	1	19	-35.5	0.392	-9.000	-9.000	-999.	564.	131.3	0.12	0.28	1.00	4.70	169.	10.0	277.4	10.0
09	01	01	1	20	-28.1	0.311	-9.000	-9.000	-999.	402.	82.5	0.12	0.28	1.00	3.90	150.	10.0	277.6	10.0
09	01	01	1	21	-29.8	0.330	-9.000	-9.000	-999.	437.	93.6	0.07	0.28	1.00	4.60	129.	10.0	278.5	10.0
09	01	01	1	22	-14.1	0.288	-9.000	-9.000	-999.	356.	130.9	0.07	0.28	1.00	3.90	131.	10.0	278.8	10.0
09	01	01	1	23	-23.6	0.320	-9.000	-9.000	-999.	416.	107.0	0.07	0.28	1.00	4.40	122.	10.0	278.9	10.0
09	01	01	1	24	-24.9	0.337	-9.000	-9.000	-999.	450.	118.7	0.07	0.28	1.00	4.60	130.	10.0	278.4	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	127.	3.00	267.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CHLORINE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	4.62436	ON 09061720:	AT (424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC
CWT10	HIGH	1ST HIGH VALUE IS	4.62149	ON 09061720:	AT (424001.40, 4526809.20, 1303.38, 2867.37, 0.00)	DC
CWT11	HIGH	1ST HIGH VALUE IS	4.11000	ON 09072721:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

```
 **MODELOPTs:  RegDFAULT CONC                                                ELEV

                                                   *** THE SUMMARY OF HIGHEST  8-HR RESULTS ***

                                     ** CONC OF CHLORINE IN MICROGRAMS/M**3                          **

                                                         DATE
NETWORK
GROUP ID                          AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)   OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS       2.59881m ON 09092108: AT (  423800.80,  4526311.60,  1303.75,  2867.37,   0.00)  DC

CWT10    HIGH   1ST HIGH VALUE IS       1.59600  ON 09032124: AT (  423933.50,  4526984.90,  1300.98,  2867.37,   0.00)  DC

CWT11    HIGH   1ST HIGH VALUE IS       2.37452m ON 09092108: AT (  423800.80,  4526311.60,  1303.75,  2867.37,   0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```

```
 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        13:55:38
                                                                                                                       PAGE   6
 **MODELOPTs:  RegDFAULT CONC                                                ELEV

                                                   *** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

                                     ** CONC OF CHLORINE IN MICROGRAMS/M**3                          **

                                                         DATE
NETWORK
GROUP ID                          AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)   OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS       1.73206  ON 09102824: AT (  423776.40,  4526311.50,  1303.07,  2867.37,   0.00)  DC

CWT10    HIGH   1ST HIGH VALUE IS       0.91711m ON 09092924: AT (  423933.50,  4526984.90,  1300.98,  2867.37,   0.00)  DC

CWT11    HIGH   1ST HIGH VALUE IS       1.58231  ON 09102824: AT (  423776.40,  4526311.50,  1303.07,  2867.37,   0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```

```
 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        13:55:38
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                ELEV

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of           0 Fatal Error Message(s)
 A Total of           0 Warning Message(s)
 A Total of         802 Informational Message(s)

 A Total of        8760 Hours Were Processed

 A Total of           9 Calm Hours Identified

 A Total of         793 Missing Hours Identified (  9.05 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
               ***  NONE  ***
```

*** MODEL SETUP OPTIONS SUMMARY ***

```
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     13 Source(s);      14 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  CHROMIUM

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     16.3 MB of RAM.

**Input Runstream File:          Holly_HAPS_2006_CHROMIUM.DTA
**Output Print File:             Holly_HAPS_2006_CHROMIUM.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2006_CHROMIUM.SUM
```


*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54,   3.09,   5.14,   8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2006.SFC Met Version: 11059
Profile file: SY2006.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2006 Year: 2006

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
06	01	01	1	01	-11.8	0.241	-9.000	-9.000	-999.	273.	91.0	0.09	0.28	1.00	3.20	185.	10.0	276.0	10.0
06	01	01	1	02	-11.9	0.244	-9.000	-9.000	-999.	277.	93.0	0.01	0.28	1.00	4.60	248.	10.0	276.5	10.0
06	01	01	1	03	-24.7	0.504	-9.000	-9.000	-999.	824.	399.2	0.01	0.28	1.00	9.00	269.	10.0	277.0	10.0
06	01	01	1	04	-40.4	0.427	-9.000	-9.000	-999.	646.	146.0	0.02	0.28	1.00	7.00	290.	10.0	276.9	10.0
06	01	01	1	05	-15.9	0.324	-9.000	-9.000	-999.	430.	164.1	0.04	0.28	1.00	4.80	301.	10.0	276.4	10.0
06	01	01	1	06	-18.0	0.366	-9.000	-9.000	-999.	508.	209.4	0.02	0.28	1.00	5.90	298.	10.0	276.4	10.0
06	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.02	0.28	1.00	6.30	289.	10.0	275.9	10.0
06	01	01	1	08	-34.7	0.381	-9.000	-9.000	-999.	540.	122.8	0.02	0.28	1.00	6.30	282.	10.0	275.4	10.0
06	01	01	1	09	-21.0	0.324	-9.000	-9.000	-999.	425.	124.8	0.01	0.28	0.51	6.00	268.	10.0	275.1	10.0
06	01	01	1	10	10.5	0.195	0.315	0.005	92.	206.	-54.3	0.01	0.28	0.30	3.20	249.	10.0	276.1	10.0
06	01	01	1	11	27.6	0.203	0.649	0.005	307.	211.	-23.6	0.01	0.28	0.22	3.20	248.	10.0	277.5	10.0
06	01	01	1	12	38.6	0.170	0.825	0.005	450.	161.	-9.8	0.01	0.28	0.19	2.50	249.	10.0	278.4	10.0
06	01	01	1	13	42.5	0.283	0.942	0.005	608.	346.	-41.1	0.09	0.28	0.19	3.00	207.	10.0	279.2	10.0
06	01	01	1	14	32.3	0.382	0.913	0.005	729.	543.	-133.3	0.12	0.28	0.19	4.00	168.	10.0	279.9	10.0
06	01	01	1	15	4.8	0.338	0.487	0.005	746.	452.	-623.1	0.07	0.28	0.22	4.20	148.	10.0	279.8	10.0
06	01	01	1	16	0.4	0.444	0.218	0.005	747.	681.	-8888.0	0.12	0.28	0.29	4.90	155.	10.0	279.4	10.0
06	01	01	1	17	-17.9	0.410	-9.000	-9.000	-999.	605.	298.0	0.12	0.28	0.49	4.70	161.	10.0	278.4	10.0
06	01	01	1	18	-25.2	0.339	-9.000	-9.000	-999.	457.	119.9	0.12	0.28	1.00	4.10	163.	10.0	277.4	10.0
06	01	01	1	19	-21.1	0.284	-9.000	-9.000	-999.	349.	83.7	0.07	0.28	1.00	4.00	149.	10.0	276.6	10.0
06	01	01	1	20	-9.3	0.189	-9.000	-9.000	-999.	192.	55.7	0.07	0.28	1.00	2.80	124.	10.0	276.0	10.0
06	01	01	1	21	-18.7	0.381	-9.000	-9.000	-999.	540.	227.2	0.07	0.28	1.00	5.00	140.	10.0	276.9	10.0
06	01	01	1	22	-12.9	0.262	-9.000	-9.000	-999.	316.	108.2	0.12	0.28	1.00	3.20	165.	10.0	277.1	10.0
06	01	01	1	23	-14.5	0.296	-9.000	-9.000	-999.	371.	138.0	0.07	0.28	1.00	4.00	134.	10.0	277.2	10.0
06	01	01	1	24	-18.2	0.372	-9.000	-9.000	-999.	522.	218.0	0.07	0.28	1.00	4.90	133.	10.0	277.8	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
06	01	01	01	10.0	1	185.	3.20	276.1	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CHROMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00186	ON 06123022:	AT (426200.00, 4524800.00, 1384.77, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00039	ON 06022420:	AT (427000.00, 4526400.00, 1388.10, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00040	ON 06022420:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00032	ON 06022420:	AT (427000.00, 4526800.00, 1382.27, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00019	ON 06022420:	AT (426600.00, 4526800.00, 1356.70, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00051	ON 06022420:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00062	ON 06022420:	AT (427400.00, 4526400.00, 1420.32, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00072	ON 06022420:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00009	ON 06092904:	AT (424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00010	ON 06120622:	AT (424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00004	ON 06110718:	AT (425000.00, 4525800.00, 1331.29, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00004	ON 06022420:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00005	ON 06022420:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC

68H13   HIGH   1ST HIGH VALUE IS   0.00005 ON 06110718: AT (425000.00, 4525700.00, 1332.22, 2867.37,   0.00) DC

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 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```

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 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        13:02:05
                                                                                                                       PAGE   5
 **MODELOPTs:  RegDFAULT CONC                                               ELEV
```

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CHROMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE GRID-ID
ALL	HIGH	1ST HIGH VALUE IS	0.00037	ON 06120824: AT (	425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00007	ON 06120824: AT (	425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00007	ON 06120824: AT (	425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00006	ON 06120824: AT (	425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00003	ON 06120824: AT (	425200.00, 4524400.00, 1356.99, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00010	ON 06120824: AT (	425600.00, 4523600.00, 1398.25, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00012	ON 06120824: AT (	425600.00, 4523400.00, 1407.26, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00015	ON 06122816: AT (	423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00005	ON 06092508: AT (	424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00005m	ON 06090408: AT (	424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00001	ON 06021908: AT (	423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00002	ON 06022008: AT (	423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00001	ON 06021908: AT (	423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00001	ON 06021908: AT (	423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

```
 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```

```
 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        13:02:05
                                                                                                                       PAGE   6
 **MODELOPTs:  RegDFAULT CONC                                               ELEV
```

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF CHROMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE GRID-ID
ALL	HIGH	1ST HIGH VALUE IS	0.00018	ON 06122824: AT (	423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00002m	ON 06123024: AT (	426200.00, 4524800.00, 1384.77, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00002m	ON 06123024: AT (	426400.00, 4525000.00, 1388.52, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00002	ON 06120824: AT (	425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00002	ON 06122824: AT (	423825.30, 4526311.60, 1304.00, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00003	ON 06120824: AT (	425600.00, 4523600.00, 1398.25, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00004m	ON 06100824: AT (	427000.00, 4526200.00, 1385.51, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00012	ON 06122824: AT (	423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00002m	ON 06093024: AT (	424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC

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68H7     HIGH   1ST HIGH VALUE IS       0.00002  ON 06110624: AT (  424022.10,  4526855.30,  1304.00,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00001m ON 06121624: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00001m ON 06121624: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00001m ON 06121624: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00001m ON 06121624: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        13:02:05
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of          525 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of          525 Missing Hours Identified (  5.99 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305      13 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

*** MODEL SETUP OPTIONS SUMMARY ***

- -

```
**Model Is Setup For Calculation of Average CONCentration Values.

  -- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     13 Source(s);      14 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  CHROMIUM

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                              ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     16.3 MB of RAM.

**Input Runstream File:          Holly_HAPS_2007_CHROMIUM.DTA
**Output Print File:             Holly_HAPS_2007_CHROMIUM.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2007_CHROMIUM.SUM
```


*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

```
  Surface file:   SY2007.SFC                                                              Met Version:  11059
  Profile file:   SY2007.PFL
  Surface format: FREE
  Profile format: FREE
```

Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2007 Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-2.0	0.051	-9.000	-9.000	-999.	27.	5.4	0.01	0.28	1.00	1.80	267.	10.0	270.4	10.0
07	01	01	1	02	-1.2	0.042	-9.000	-9.000	-999.	20.	4.6	0.02	0.28	1.00	1.30	295.	10.0	270.9	10.0
07	01	01	1	03	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	93.	10.0	270.6	10.0
07	01	01	1	04	-0.8	0.036	-9.000	-9.000	-999.	16.	4.4	0.07	0.28	1.00	0.90	141.	10.0	270.6	10.0
07	01	01	1	05	-2.4	0.063	-9.000	-9.000	-999.	37.	8.4	0.12	0.28	1.00	1.40	172.	10.0	270.4	10.0
07	01	01	1	06	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	114.	10.0	270.4	10.0
07	01	01	1	07	-0.5	0.029	-9.000	-9.000	-999.	11.	3.3	0.04	0.28	1.00	0.80	87.	10.0	270.0	10.0
07	01	01	1	08	-0.5	0.026	-9.000	-9.000	-999.	9.	2.7	0.01	0.28	1.00	0.90	262.	10.0	269.5	10.0
07	01	01	1	09	-4.5	0.099	-9.000	-9.000	-999.	71.	16.8	0.09	0.28	0.51	1.90	347.	10.0	269.0	10.0
07	01	01	1	10	9.0	0.139	0.572	0.017	655.	119.	-23.4	0.04	0.28	0.30	1.70	315.	10.0	271.0	10.0
07	01	01	1	11	22.7	0.145	0.787	0.018	677.	128.	-10.7	0.06	0.28	0.22	1.50	14.	10.0	272.8	10.0
07	01	01	1	12	31.5	0.186	0.891	0.018	707.	184.	-16.0	0.06	0.28	0.19	2.00	13.	10.0	272.9	10.0
07	01	01	1	13	34.6	0.222	0.934	0.018	740.	241.	-25.0	0.06	0.28	0.19	2.50	5.	10.0	273.4	10.0
07	01	01	1	14	38.8	0.298	0.985	0.018	777.	374.	-53.6	0.09	0.28	0.19	3.20	359.	10.0	273.9	10.0
07	01	01	1	15	28.3	0.138	0.898	0.018	805.	136.	-7.3	0.04	0.28	0.22	1.50	64.	10.0	275.4	10.0
07	01	01	1	16	11.6	0.177	0.671	0.018	816.	171.	-37.4	0.05	0.28	0.29	2.10	111.	10.0	275.1	10.0
07	01	01	1	17	-7.2	0.120	-9.000	-9.000	-999.	96.	18.8	0.07	0.28	0.49	2.30	134.	10.0	273.6	10.0
07	01	01	1	18	-4.8	0.077	-9.000	-9.000	-999.	49.	7.5	0.12	0.28	1.00	1.70	152.	10.0	272.0	10.0
07	01	01	1	19	-2.1	0.045	-9.000	-9.000	-999.	22.	3.4	0.01	0.28	1.00	1.50	221.	10.0	271.0	10.0
07	01	01	1	20	-0.8	0.029	-9.000	-9.000	-999.	11.	2.4	0.01	0.28	1.00	1.00	242.	10.0	270.4	10.0
07	01	01	1	21	-6.2	0.083	-9.000	-9.000	-999.	55.	7.3	0.07	0.28	1.00	2.10	128.	10.0	269.8	10.0
07	01	01	1	22	-8.2	0.095	-9.000	-9.000	-999.	68.	8.4	0.07	0.28	1.00	2.40	136.	10.0	269.4	10.0
07	01	01	1	23	-9.6	0.103	-9.000	-9.000	-999.	76.	9.1	0.07	0.28	1.00	2.60	142.	10.0	268.8	10.0
07	01	01	1	24	-5.1	0.075	-9.000	-9.000	-999.	48.	6.6	0.07	0.28	1.00	1.90	148.	10.0	269.0	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	10.0	1	267.	1.80	270.5	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CHROMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00192	ON 07012406:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00042	ON 07012406:	AT (427000.00, 4526400.00, 1388.10, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00042	ON 07012406:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00036	ON 07012406:	AT (427000.00, 4526800.00, 1382.27, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00021	ON 07011618:	AT (426000.00, 4525800.00, 1353.21, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00056	ON 07012406:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00067	ON 07012406:	AT (427400.00, 4526400.00, 1420.32, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00076	ON 07012406:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00009	ON 07102424:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00011	ON 07012618:	AT (424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00005	ON 07012401:	AT (425300.00, 4526200.00, 1331.56, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00005	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00005	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00005	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CHROMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00042	ON 07120724:	AT (426000.00, 4524200.00, 1395.05, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00008	ON 07102608:	AT (426600.00, 4526200.00, 1369.60, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00009	ON 07042024:	AT (426600.00, 4525600.00, 1382.42, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00008	ON 07042024:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00004	ON 07042024:	AT (425800.00, 4525800.00, 1348.50, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00012	ON 07102608:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00013	ON 07120724:	AT (426200.00, 4524000.00, 1419.65, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00019	ON 07041908:	AT (424141.30, 4526621.40, 1308.11, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00004m	ON 07102424:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00005	ON 07110308:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00001	ON 07021408:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00001m	ON 07090924:	AT (423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00001	ON 07021408:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00001	ON 07021408:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF CHROMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00019m	ON 07120724:	AT (426000.00, 4524200.00, 1395.05, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00004m	ON 07102624:	AT (426600.00, 4526200.00, 1369.60, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00004m	ON 07102624:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00004m	ON 07102624:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00002m	ON 07122824:	AT (423538.80, 4527067.90, 1294.00, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00006m	ON 07102624:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00006m	ON 07102624:	AT (427200.00, 4526200.00, 1406.81, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00010	ON 07041524:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00003m	ON 07102424:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00003m	ON 07110324:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00001	ON 07011124:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00001m	ON 07121424:	AT (423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00001	ON 07021324:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

```
68H13    HIGH   1ST HIGH VALUE IS       0.00001  ON 07011124: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        15:13:00
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                  ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of         2026 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of         2026 Missing Hours Identified ( 23.13 Percent)

 CAUTION!:  Number of Missing Hours Exceeds 10 Percent of Total!
            Data May Not Be Acceptable for Regulatory Applications.
            See Section 5.3.2 of "Meteorological Monitoring Guidance
            for Regulatory Modeling Applications" (EPA-454/R-99-005).


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

```
 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants      ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                   ***        16:42:00
                                                                                                                      PAGE   1
**MODELOPTs:  RegDFAULT CONC                                              ELEV


                                        ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     13 Source(s);      14 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  CHROMIUM

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                       ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     16.3 MB of RAM.

**Input Runstream File:          Holly_HAPS_2008_CHROMIUM.DTA
**Output Print File:             Holly_HAPS_2008_CHROMIUM.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2008_CHROMIUM.SUM

*** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants      ***        05/09/12
                                  *** 5-years Met Data - KSLC 2006-2010                                   ***        16:42:00
                                                                                                                     PAGE   2
**MODELOPTs:  RegDFAULT CONC                                              ELEV


                                        *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                  *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                       (METERS/SEC)

                                               1.54,   3.09,   5.14,   8.23,  10.80,

*** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants      ***        05/09/12
                                  *** 5-years Met Data - KSLC 2006-2010                                   ***        16:42:00
                                                                                                                     PAGE   3
**MODELOPTs:  RegDFAULT CONC                                              ELEV


                                    *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

  Surface file:   SY2008.SFC                                                                          Met Version:  11059
  Profile file:   SY2008.PFL
  Surface format: FREE
  Profile format: FREE
```

Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2008 Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-24.3	0.228	-9.000	-9.000	-999.	250.	38.8	0.07	0.28	1.00	3.60	144.	10.0	264.2	10.0
08	01	01	1	02	-9.9	0.103	-9.000	-9.000	-999.	85.	8.9	0.07	0.28	1.00	2.60	130.	10.0	263.6	10.0
08	01	01	1	03	-3.8	0.064	-9.000	-9.000	-999.	37.	5.5	0.07	0.28	1.00	1.60	127.	10.0	263.0	10.0
08	01	01	1	04	-10.3	0.109	-9.000	-9.000	-999.	82.	10.0	0.12	0.28	1.00	2.40	153.	10.0	263.6	10.0
08	01	01	1	05	-8.5	0.095	-9.000	-9.000	-999.	68.	8.2	0.07	0.28	1.00	2.40	123.	10.0	263.1	10.0
08	01	01	1	06	-7.9	0.091	-9.000	-9.000	-999.	63.	7.6	0.05	0.28	1.00	2.40	93.	10.0	262.9	10.0
08	01	01	1	07	-7.2	0.086	-9.000	-9.000	-999.	58.	7.0	0.04	0.28	1.00	2.40	63.	10.0	262.6	10.0
08	01	01	1	08	-11.6	0.116	-9.000	-9.000	-999.	91.	10.9	0.05	0.28	1.00	2.90	30.	10.0	261.4	10.0
08	01	01	1	09	-13.2	0.185	-9.000	-9.000	-999.	184.	38.9	0.06	0.28	0.51	3.00	24.	10.0	262.9	10.0
08	01	01	1	10	10.3	0.229	0.258	0.005	54.	252.	-94.0	0.06	0.28	0.30	2.80	26.	10.0	264.2	10.0
08	01	01	1	11	27.2	0.247	0.447	0.005	105.	283.	-44.5	0.06	0.28	0.22	2.90	23.	10.0	265.8	10.0
08	01	01	1	12	31.4	0.256	0.518	0.005	142.	298.	-43.0	0.06	0.28	0.19	3.00	24.	10.0	267.2	10.0
08	01	01	1	13	34.5	0.201	0.582	0.007	183.	208.	-18.9	0.05	0.28	0.19	2.30	54.	10.0	268.6	10.0
08	01	01	1	14	31.7	0.255	0.602	0.005	220.	296.	-41.7	0.05	0.28	0.19	3.10	37.	10.0	267.6	10.0
08	01	01	1	15	23.3	0.252	0.565	0.005	247.	291.	-55.2	0.06	0.28	0.22	3.00	3.	10.0	267.8	10.0
08	01	01	1	16	-0.3	0.246	-9.000	-9.000	-999.	281.	4710.6	0.06	0.28	0.29	3.20	17.	10.0	267.4	10.0
08	01	01	1	17	-8.9	0.196	-9.000	-9.000	-999.	200.	68.0	0.06	0.28	0.49	2.90	13.	10.0	266.1	10.0
08	01	01	1	18	-13.0	0.244	-9.000	-9.000	-999.	277.	88.9	0.06	0.28	1.00	3.50	8.	10.0	264.5	10.0
08	01	01	1	19	-5.5	0.104	-9.000	-9.000	-999.	90.	16.1	0.05	0.28	1.00	2.20	35.	10.0	264.2	10.0
08	01	01	1	20	-2.6	0.056	-9.000	-9.000	-999.	31.	5.3	0.05	0.28	1.00	1.50	48.	10.0	264.2	10.0
08	01	01	1	21	-2.5	0.062	-9.000	-9.000	-999.	35.	7.4	0.06	0.28	1.00	1.60	17.	10.0	263.4	10.0
08	01	01	1	22	-2.9	0.066	-9.000	-9.000	-999.	39.	7.9	0.06	0.28	1.00	1.70	26.	10.0	263.9	10.0
08	01	01	1	23	-8.6	0.160	-9.000	-9.000	-999.	147.	38.2	0.06	0.28	1.00	2.60	24.	10.0	263.0	10.0
08	01	01	1	24	-26.9	0.273	-9.000	-9.000	-999.	327.	60.1	0.06	0.28	1.00	4.10	15.	10.0	262.9	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	10.0	1	144.	3.60	264.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CHROMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00185	ON 08111907:	AT (425600.00, 4523800.00, 1390.79, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00041	ON 08102707:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00041	ON 08111421:	AT (426800.00, 4525800.00, 1386.05, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00036	ON 08012607:	AT (427000.00, 4527200.00, 1378.30, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00020	ON 08101523:	AT (426000.00, 4525800.00, 1353.21, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00056	ON 08012607:	AT (427200.00, 4527200.00, 1393.45, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00062	ON 08012607:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00076	ON 08012607:	AT (426800.00, 4527000.00, 1364.47, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00010	ON 08101819:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00010	ON 08042320:	AT (424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00005	ON 08111624:	AT (424800.00, 4525850.00, 1326.46, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00004	ON 08111702:	AT (424750.00, 4525600.00, 1326.88, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00005	ON 08081220:	AT (424800.00, 4525850.00, 1326.46, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00005	ON 08102721:	AT (425000.00, 4525700.00, 1332.22, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CHROMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00046	ON 08111924:	AT (425200.00, 4523800.00, 1372.25, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00010	ON 08111924:	AT (425200.00, 4523800.00, 1372.25, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00010	ON 08111924:	AT (425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00007	ON 08111924:	AT (425200.00, 4523800.00, 1372.25, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00004	ON 08111924:	AT (425000.00, 4524400.00, 1350.15, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00013	ON 08111924:	AT (425400.00, 4523600.00, 1388.65, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00017	ON 08111924:	AT (425400.00, 4523400.00, 1398.40, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00016	ON 08111924:	AT (425000.00, 4524200.00, 1354.78, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00004	ON 08090208:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00004	ON 08080508:	AT (424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00001m	ON 08022824:	AT (423678.60, 4526311.50, 1302.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00002m	ON 08022824:	AT (423678.60, 4526311.50, 1302.00, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00001	ON 08022016:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00001	ON 08110824:	AT (423629.70, 4526311.40, 1301.93, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF CHROMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00022	ON 08111924:	AT (425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00004	ON 08111924:	AT (425200.00, 4523800.00, 1372.25, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00004	ON 08111924:	AT (425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00003	ON 08111924:	AT (425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00002	ON 08111924:	AT (425000.00, 4524400.00, 1350.15, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00005	ON 08111924:	AT (425400.00, 4523600.00, 1388.65, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00007	ON 08111924:	AT (425400.00, 4523400.00, 1398.40, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00009	ON 08031624:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00002	ON 08011124:	AT (424022.60, 4526904.20, 1303.05, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00002m	ON 08021224:	AT (424022.60, 4526904.20, 1303.05, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00001	ON 08030224:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00001	ON 08030224:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00001	ON 08030224:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

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68H13    HIGH   1ST HIGH VALUE IS       0.00001  ON 08031624: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        16:42:00
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                 ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of          146 Informational Message(s)

 A Total of         8784 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of          146 Missing Hours Identified (  1.66 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

*** MODEL SETUP OPTIONS SUMMARY ***

- -

```
**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     13 Source(s);      14 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  CHROMIUM

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     16.3 MB of RAM.

**Input Runstream File:          Holly_HAPS_2009_CHROMIUM.DTA
**Output Print File:             Holly_HAPS_2009_CHROMIUM.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2009_CHROMIUM.SUM
```


*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
 1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
 1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
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 1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
 1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
 1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

```
  Surface file:   SY2009.SFC                                                                Met Version:  11059
  Profile file:   SY2009.PFL
  Surface format: FREE
  Profile format: FREE
```

Surface station no.: 24127 Upper air station no.: 72572
Name: SALT_LAKE_CITY,UT Name: UNKNOWN
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.00	127.	10.0	267.9	10.0
09	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	1.80	120.	10.0	268.0	10.0
09	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	3.00	106.	10.0	269.1	10.0
09	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.10	132.	10.0	270.2	10.0
09	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.80	141.	10.0	269.8	10.0
09	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.50	148.	10.0	269.4	10.0
09	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	1.90	96.	10.0	269.2	10.0
09	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.12	0.28	1.00	0.80	178.	10.0	269.6	10.0
09	01	01	1	09	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	0.51	2.70	149.	10.0	270.9	10.0
09	01	01	1	10	9.0	0.274	0.144	0.005	10.	330.	-177.5	0.12	0.28	0.30	2.90	154.	10.0	271.9	10.0
09	01	01	1	11	22.7	0.173	0.298	0.012	36.	169.	-17.8	0.09	0.28	0.22	1.70	190.	10.0	273.9	10.0
09	01	01	1	12	31.6	0.109	0.420	0.018	73.	84.	-3.2	0.05	0.28	0.19	1.00	46.	10.0	275.6	10.0
09	01	01	1	13	34.8	0.258	0.504	0.005	114.	301.	-38.1	0.12	0.28	0.19	2.50	163.	10.0	277.0	10.0
09	01	01	1	14	32.1	0.113	0.539	0.013	151.	102.	-3.5	0.12	0.28	0.19	0.80	154.	10.0	277.9	10.0
09	01	01	1	15	4.7	0.155	0.288	0.013	157.	141.	-62.0	0.07	0.28	0.22	1.80	124.	10.0	278.8	10.0
09	01	01	1	16	0.4	0.334	0.124	0.005	158.	444.	-7805.0	0.07	0.28	0.29	4.20	143.	10.0	278.6	10.0
09	01	01	1	17	-14.1	0.342	-9.000	-9.000	-999.	460.	219.8	0.07	0.28	0.49	4.50	146.	10.0	277.9	10.0
09	01	01	1	18	-26.4	0.354	-9.000	-9.000	-999.	485.	130.6	0.07	0.28	1.00	4.80	146.	10.0	277.4	10.0
09	01	01	1	19	-35.5	0.392	-9.000	-9.000	-999.	564.	131.3	0.12	0.28	1.00	4.70	169.	10.0	277.4	10.0
09	01	01	1	20	-28.1	0.311	-9.000	-9.000	-999.	402.	82.5	0.12	0.28	1.00	3.90	150.	10.0	277.6	10.0
09	01	01	1	21	-29.8	0.330	-9.000	-9.000	-999.	437.	93.6	0.07	0.28	1.00	4.60	129.	10.0	278.5	10.0
09	01	01	1	22	-14.1	0.288	-9.000	-9.000	-999.	356.	130.9	0.07	0.28	1.00	3.90	131.	10.0	278.8	10.0
09	01	01	1	23	-23.6	0.320	-9.000	-9.000	-999.	416.	107.0	0.07	0.28	1.00	4.40	122.	10.0	278.9	10.0
09	01	01	1	24	-24.9	0.337	-9.000	-9.000	-999.	450.	118.7	0.07	0.28	1.00	4.60	130.	10.0	278.4	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	127.	3.00	267.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF CHROMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00184	ON 09121804:	AT (425600.00, 4523800.00, 1390.79, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00040	ON 09112608:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00041	ON 09012102:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00037	ON 09012102:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00020	ON 09110119:	AT (426400.00, 4526400.00, 1357.10, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00057	ON 09012102:	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00065	ON 09110218:	AT (427000.00, 4525800.00, 1404.56, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00077	ON 09012102:	AT (426800.00, 4526800.00, 1365.89, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00009	ON 09012021:	AT (424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00011	ON 09012102:	AT (424242.70, 4526812.50, 1308.00, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00005	ON 09100821:	AT (424750.00, 4525700.00, 1326.84, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00004	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00005	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00004	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF CHROMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00044c	ON 09012108:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00009c	ON 09012108:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00009c	ON 09012108:	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00008c	ON 09012108:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00004c	ON 09012108:	AT (426600.00, 4527000.00, 1353.33, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00012c	ON 09012108:	AT (427400.00, 4527000.00, 1410.95, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00015c	ON 09012108:	AT (427400.00, 4526600.00, 1416.24, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00016c	ON 09012108:	AT (426800.00, 4526800.00, 1365.89, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00004m	ON 09020908:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00005c	ON 09011024:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00002m	ON 09011624:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00002m	ON 09013024:	AT (423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00002m	ON 09011624:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00002m	ON 09011624:	AT (423750.00, 4526300.00, 1303.46, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF CHROMIUM IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.00020	ON 09102824:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00003b	ON 09012124:	AT (425600.00, 4524200.00, 1376.93, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00004b	ON 09012124:	AT (425800.00, 4524400.00, 1379.76, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00003m	ON 09012024:	AT (425800.00, 4524600.00, 1374.94, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00002m	ON 09012024:	AT (425500.00, 4525000.00, 1352.18, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00005b	ON 09012124:	AT (425800.00, 4524000.00, 1393.12, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00006b	ON 09012124:	AT (425800.00, 4523800.00, 1400.43, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00012	ON 09102824:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00002m	ON 09072224:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00002m	ON 09072224:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00001	ON 09122324:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00001m	ON 09022724:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00001	ON 09122324:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

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68H13    HIGH   1ST HIGH VALUE IS       0.00001  ON 09122324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        18:47:44
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                 ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of          802 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            9 Calm Hours Identified

 A Total of          793 Missing Hours Identified (  9.05 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

*** MODEL SETUP OPTIONS SUMMARY ***

- -

**Model Is Setup For Calculation of Average CONCentration Values.

-- DEPOSITION LOGIC --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION. DRYDPLT = F
**Model Uses NO WET DEPLETION. WETDPLT = F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
1. Stack-tip Downwash.
2. Model Accounts for ELEVated Terrain Effects.
3. Use Calms Processing Routine.
4. Use Missing Data Processing Routine.
5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates 3 Short Term Average(s) of: 1-HR 8-HR 24-HR

**This Run Includes: 15 Source(s); 16 Source Group(s); and 10024 Receptor(s)

**The Model Assumes A Pollutant Type of: FORMALDE

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE: The Following Flags May Appear Following CONC Values: c for Calm Hours
m for Missing Hours
b for Both Calm and Missing Hours

**Misc. Inputs: Base Elev. for Pot. Temp. Profile (m MSL) = 1308.00 ; Decay Coef. = 0.000 ; Rot. Angle = 0.0
Emission Units = GRAMS/SEC ; Emission Rate Unit Factor = 0.10000E+07
Output Units = MICROGRAMS/M**3

**Approximate Storage Requirements of Model = 18.0 MB of RAM.

**Input Runstream File: Holly_HAPS_2006_FORMALDE.DTA
**Output Print File: Holly_HAPS_2006_FORMALDE.LST

**File for Summary of Results: C:\beast\Holly\HAPs\Holly_HAPS_2006_FORMALDE.SUM

*** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
(1=YES; 0=NO)

```
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,

**MODELOPTs: RegDFAULT CONC ELEV

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: SY2006.SFC Met Version: 11059
Profile file: SY2006.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2006 Year: 2006

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
06	01	01	1	01	-11.8	0.241	-9.000	-9.000	-999.	273.	91.0	0.09	0.28	1.00	3.20	185.	10.0	276.0	10.0
06	01	01	1	02	-11.9	0.244	-9.000	-9.000	-999.	277.	93.0	0.01	0.28	1.00	4.60	248.	10.0	276.5	10.0
06	01	01	1	03	-24.7	0.504	-9.000	-9.000	-999.	824.	399.2	0.01	0.28	1.00	9.00	269.	10.0	277.0	10.0
06	01	01	1	04	-40.4	0.427	-9.000	-9.000	-999.	646.	146.0	0.02	0.28	1.00	7.00	290.	10.0	276.9	10.0
06	01	01	1	05	-15.9	0.324	-9.000	-9.000	-999.	430.	164.1	0.04	0.28	1.00	4.80	301.	10.0	276.4	10.0
06	01	01	1	06	-18.0	0.366	-9.000	-9.000	-999.	508.	209.4	0.02	0.28	1.00	5.90	298.	10.0	276.4	10.0
06	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.02	0.28	1.00	6.30	289.	10.0	275.9	10.0
06	01	01	1	08	-34.7	0.381	-9.000	-9.000	-999.	540.	122.8	0.02	0.28	1.00	6.30	282.	10.0	275.4	10.0
06	01	01	1	09	-21.0	0.324	-9.000	-9.000	-999.	425.	124.8	0.01	0.28	0.51	6.00	268.	10.0	275.1	10.0
06	01	01	1	10	10.5	0.195	0.315	0.005	92.	206.	-54.3	0.01	0.28	0.30	3.20	249.	10.0	276.1	10.0
06	01	01	1	11	27.6	0.203	0.649	0.005	307.	211.	-23.6	0.01	0.28	0.22	3.20	248.	10.0	277.5	10.0
06	01	01	1	12	38.6	0.170	0.825	0.005	450.	161.	-9.8	0.01	0.28	0.19	2.50	249.	10.0	278.4	10.0
06	01	01	1	13	42.5	0.283	0.942	0.005	608.	346.	-41.1	0.09	0.28	0.19	3.00	207.	10.0	279.2	10.0
06	01	01	1	14	32.3	0.382	0.913	0.005	729.	543.	-133.3	0.12	0.28	0.19	4.00	168.	10.0	279.9	10.0
06	01	01	1	15	4.8	0.338	0.487	0.005	746.	452.	-623.1	0.07	0.28	0.22	4.20	148.	10.0	279.8	10.0
06	01	01	1	16	0.4	0.444	0.218	0.005	747.	681.	-8888.0	0.12	0.28	0.29	4.90	155.	10.0	279.4	10.0
06	01	01	1	17	-17.9	0.410	-9.000	-9.000	-999.	605.	298.0	0.12	0.28	0.49	4.70	161.	10.0	278.4	10.0
06	01	01	1	18	-25.2	0.339	-9.000	-9.000	-999.	457.	119.9	0.12	0.28	1.00	4.10	163.	10.0	277.4	10.0
06	01	01	1	19	-21.1	0.284	-9.000	-9.000	-999.	349.	83.7	0.07	0.28	1.00	4.00	149.	10.0	276.6	10.0
06	01	01	1	20	-9.3	0.189	-9.000	-9.000	-999.	192.	55.7	0.07	0.28	1.00	2.80	124.	10.0	276.0	10.0
06	01	01	1	21	-18.7	0.381	-9.000	-9.000	-999.	540.	227.2	0.07	0.28	1.00	5.00	140.	10.0	276.9	10.0
06	01	01	1	22	-12.9	0.262	-9.000	-9.000	-999.	316.	108.2	0.12	0.28	1.00	3.20	165.	10.0	277.1	10.0
06	01	01	1	23	-14.5	0.296	-9.000	-9.000	-999.	371.	138.0	0.07	0.28	1.00	4.00	134.	10.0	277.2	10.0
06	01	01	1	24	-18.2	0.372	-9.000	-9.000	-999.	522.	218.0	0.07	0.28	1.00	4.90	133.	10.0	277.8	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
06	01	01	01	10.0	1	185.	3.20	276.1	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID		AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH 1ST HIGH VALUE IS	0.56192	ON 06082720:	AT (423950.00, 4526300.00, 1306.66, 2867.37, 0.00)	DC
20H3	HIGH 1ST HIGH VALUE IS	0.02079	ON 06022420:	AT (427000.00, 4526400.00, 1388.10, 2867.37, 0.00)	DC
24H1	HIGH 1ST HIGH VALUE IS	0.02121	ON 06022420:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
25H1	HIGH 1ST HIGH VALUE IS	0.01736	ON 06022420:	AT (427000.00, 4526800.00, 1382.27, 2867.37, 0.00)	DC
26H1	HIGH 1ST HIGH VALUE IS	0.01006	ON 06022420:	AT (426600.00, 4526800.00, 1356.70, 2867.37, 0.00)	DC
27H1	HIGH 1ST HIGH VALUE IS	0.02718	ON 06022420:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
33H1	HIGH 1ST HIGH VALUE IS	0.03347	ON 06022420:	AT (427400.00, 4526400.00, 1420.32, 2867.37, 0.00)	DC
BOILER11	HIGH 1ST HIGH VALUE IS	0.03823	ON 06022420:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
68H6	HIGH 1ST HIGH VALUE IS	0.00502	ON 06092904:	AT (424000.90, 4526759.50, 1304.00, 2867.37, 0.00)	DC
68H7	HIGH 1ST HIGH VALUE IS	0.00531	ON 06120622:	AT (424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC
68H10	HIGH 1ST HIGH VALUE IS	0.00233	ON 06110718:	AT (425000.00, 4525800.00, 1331.29, 2867.37, 0.00)	DC
68H11	HIGH 1ST HIGH VALUE IS	0.00236	ON 06022420:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH 1ST HIGH VALUE IS	0.00248	ON 06022420:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC

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68H13    HIGH   1ST HIGH VALUE IS       0.00241  ON 06110718: AT (  425000.00,  4525700.00,  1332.22,  2867.37,    0.00)  DC

FLARES   HIGH   1ST HIGH VALUE IS       0.10116  ON 06022420: AT (  427200.00,  4526800.00,  1397.26,  2867.37,    0.00)  DC

FUGITIVE HIGH   1ST HIGH VALUE IS       0.56190  ON 06082720: AT (  423950.00,  4526300.00,  1306.66,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        13:02:04
                                                                                                                       PAGE   5
 **MODELOPTs:  RegDFAULT CONC                                                  ELEV


                                                    *** THE SUMMARY OF HIGHEST  8-HR RESULTS ***


                                        ** CONC OF FORMALDE IN MICROGRAMS/M**3                           **

                                                          DATE
NETWORK
GROUP ID                              AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS       0.10704  ON 06120824: AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC

20H3     HIGH   1ST HIGH VALUE IS       0.00370  ON 06120824: AT (  425400.00,  4523800.00,  1381.29,  2867.37,    0.00)  DC

24H1     HIGH   1ST HIGH VALUE IS       0.00358  ON 06120824: AT (  425400.00,  4523800.00,  1381.29,  2867.37,    0.00)  DC

25H1     HIGH   1ST HIGH VALUE IS       0.00331  ON 06120824: AT (  425400.00,  4523800.00,  1381.29,  2867.37,    0.00)  DC

26H1     HIGH   1ST HIGH VALUE IS       0.00161  ON 06120824: AT (  425200.00,  4524400.00,  1356.99,  2867.37,    0.00)  DC

27H1     HIGH   1ST HIGH VALUE IS       0.00514  ON 06120824: AT (  425600.00,  4523600.00,  1398.25,  2867.37,    0.00)  DC

33H1     HIGH   1ST HIGH VALUE IS       0.00625  ON 06120824: AT (  425600.00,  4523400.00,  1407.26,  2867.37,    0.00)  DC

BOILER11 HIGH   1ST HIGH VALUE IS       0.00802  ON 06122816: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC

68H6     HIGH   1ST HIGH VALUE IS       0.00251  ON 06092508: AT (  424021.30,  4526781.80,  1304.07,  2867.37,    0.00)  DC

68H7     HIGH   1ST HIGH VALUE IS       0.00258m ON 06090408: AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00066  ON 06021908: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00081  ON 06022008: AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00066  ON 06021908: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00071  ON 06021908: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

FLARES   HIGH   1ST HIGH VALUE IS       0.01812  ON 06120824: AT (  425400.00,  4523600.00,  1388.65,  2867.37,    0.00)  DC

FUGITIVE HIGH   1ST HIGH VALUE IS       0.10695  ON 06120824: AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        13:02:04
                                                                                                                       PAGE   6
 **MODELOPTs:  RegDFAULT CONC                                                  ELEV


                                                    *** THE SUMMARY OF HIGHEST 24-HR RESULTS ***


                                        ** CONC OF FORMALDE IN MICROGRAMS/M**3                           **

                                                          DATE
NETWORK
GROUP ID                              AVERAGE CONC     (YYMMDDHH)             RECEPTOR  (XR, YR, ZELEV, ZHILL, ZFLAG)    OF TYPE
GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- -

ALL      HIGH   1ST HIGH VALUE IS       0.04806  ON 06010624: AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC

20H3     HIGH   1ST HIGH VALUE IS       0.00125m ON 06123024: AT (  426200.00,  4524800.00,  1384.77,  2867.37,    0.00)  DC

24H1     HIGH   1ST HIGH VALUE IS       0.00128m ON 06123024: AT (  426400.00,  4525000.00,  1388.52,  2867.37,    0.00)  DC

25H1     HIGH   1ST HIGH VALUE IS       0.00111  ON 06120824: AT (  425400.00,  4523800.00,  1381.29,  2867.37,    0.00)  DC

26H1     HIGH   1ST HIGH VALUE IS       0.00102  ON 06122824: AT (  423825.30,  4526311.60,  1304.00,  2867.37,    0.00)  DC
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27H1     HIGH   1ST HIGH VALUE IS       0.00172  ON 06120824: AT (  425600.00,  4523600.00,  1398.25,  2867.37,    0.00)  DC

33H1     HIGH   1ST HIGH VALUE IS       0.00222m ON 06100824: AT (  427000.00,  4526200.00,  1385.51,  2867.37,    0.00)  DC

BOILER11 HIGH   1ST HIGH VALUE IS       0.00627  ON 06122824: AT (  423800.80,  4526311.60,  1303.75,  2867.37,    0.00)  DC

68H6     HIGH   1ST HIGH VALUE IS       0.00102m ON 06093024: AT (  424021.80,  4526830.80,  1304.02,  2867.37,    0.00)  DC

68H7     HIGH   1ST HIGH VALUE IS       0.00125  ON 06110624: AT (  424022.10,  4526855.30,  1304.00,  2867.37,    0.00)  DC

68H10    HIGH   1ST HIGH VALUE IS       0.00040m ON 06121624: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H11    HIGH   1ST HIGH VALUE IS       0.00046m ON 06121624: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00041m ON 06121624: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00041m ON 06121624: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

FLARES   HIGH   1ST HIGH VALUE IS       0.00614m ON 06123024: AT (  426400.00,  4524800.00,  1394.52,  2867.37,    0.00)  DC

FUGITIVE HIGH   1ST HIGH VALUE IS       0.04730  ON 06010624: AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR
```



```
 **MODELOPTs:  RegDFAULT CONC                                                ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            2 Warning Message(s)
 A Total of          525 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of          525 Missing Hours Identified (  5.99 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305       2 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
 CN W305      13 WAKFLG:Stack height > or = EPA formula height for SRCID:                33H1
```

```
                                        ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     15 Source(s);      16 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  FORMALDE

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                               m for Missing Hours
                                                               b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                              ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     18.0 MB of RAM.

**Input Runstream File:          Holly_HAPS_2007_FORMALDE.DTA
**Output Print File:             Holly_HAPS_2007_FORMALDE.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2007_FORMALDE.SUM
```



```
                                        *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                  *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                        (METERS/SEC)

                                               1.54,   3.09,   5.14,   8.23,  10.80,
```



```
                                    *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

  Surface file:   SY2007.SFC                                                                          Met Version:  11059
  Profile file:   SY2007.PFL
  Surface format: FREE
  Profile format: FREE
```

Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2007 Year: 2007

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
07	01	01	1	01	-2.0	0.051	-9.000	-9.000	-999.	27.	5.4	0.01	0.28	1.00	1.80	267.	10.0	270.4	10.0
07	01	01	1	02	-1.2	0.042	-9.000	-9.000	-999.	20.	4.6	0.02	0.28	1.00	1.30	295.	10.0	270.9	10.0
07	01	01	1	03	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	93.	10.0	270.6	10.0
07	01	01	1	04	-0.8	0.036	-9.000	-9.000	-999.	16.	4.4	0.07	0.28	1.00	0.90	141.	10.0	270.6	10.0
07	01	01	1	05	-2.4	0.063	-9.000	-9.000	-999.	37.	8.4	0.12	0.28	1.00	1.40	172.	10.0	270.4	10.0
07	01	01	1	06	-1.8	0.053	-9.000	-9.000	-999.	28.	6.4	0.05	0.28	1.00	1.40	114.	10.0	270.4	10.0
07	01	01	1	07	-0.5	0.029	-9.000	-9.000	-999.	11.	3.3	0.04	0.28	1.00	0.80	87.	10.0	270.0	10.0
07	01	01	1	08	-0.5	0.026	-9.000	-9.000	-999.	9.	2.7	0.01	0.28	1.00	0.90	262.	10.0	269.5	10.0
07	01	01	1	09	-4.5	0.099	-9.000	-9.000	-999.	71.	16.8	0.09	0.28	0.51	1.90	347.	10.0	269.0	10.0
07	01	01	1	10	9.0	0.139	0.572	0.017	655.	119.	-23.4	0.04	0.28	0.30	1.70	315.	10.0	271.0	10.0
07	01	01	1	11	22.7	0.145	0.787	0.018	677.	128.	-10.7	0.06	0.28	0.22	1.50	14.	10.0	272.8	10.0
07	01	01	1	12	31.5	0.186	0.891	0.018	707.	184.	-16.0	0.06	0.28	0.19	2.00	13.	10.0	272.9	10.0
07	01	01	1	13	34.6	0.222	0.934	0.018	740.	241.	-25.0	0.06	0.28	0.19	2.50	5.	10.0	273.4	10.0
07	01	01	1	14	38.8	0.298	0.985	0.018	777.	374.	-53.6	0.09	0.28	0.19	3.20	359.	10.0	273.9	10.0
07	01	01	1	15	28.3	0.138	0.898	0.018	805.	136.	-7.3	0.04	0.28	0.22	1.50	64.	10.0	275.4	10.0
07	01	01	1	16	11.6	0.177	0.671	0.018	816.	171.	-37.4	0.05	0.28	0.29	2.10	111.	10.0	275.1	10.0
07	01	01	1	17	-7.2	0.120	-9.000	-9.000	-999.	96.	18.8	0.07	0.28	0.49	2.30	134.	10.0	273.6	10.0
07	01	01	1	18	-4.8	0.077	-9.000	-9.000	-999.	49.	7.5	0.12	0.28	1.00	1.70	152.	10.0	272.0	10.0
07	01	01	1	19	-2.1	0.045	-9.000	-9.000	-999.	22.	3.4	0.01	0.28	1.00	1.50	221.	10.0	271.0	10.0
07	01	01	1	20	-0.8	0.029	-9.000	-9.000	-999.	11.	2.4	0.01	0.28	1.00	1.00	242.	10.0	270.4	10.0
07	01	01	1	21	-6.2	0.083	-9.000	-9.000	-999.	55.	7.3	0.07	0.28	1.00	2.10	128.	10.0	269.8	10.0
07	01	01	1	22	-8.2	0.095	-9.000	-9.000	-999.	68.	8.4	0.07	0.28	1.00	2.40	136.	10.0	269.4	10.0
07	01	01	1	23	-9.6	0.103	-9.000	-9.000	-999.	76.	9.1	0.07	0.28	1.00	2.60	142.	10.0	268.8	10.0
07	01	01	1	24	-5.1	0.075	-9.000	-9.000	-999.	48.	6.6	0.07	0.28	1.00	1.90	148.	10.0	269.0	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
07	01	01	01	10.0	1	267.	1.80	270.5	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.54382	ON 07020507:	AT (423976.40, 4526296.50, 1307.98, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.02266	ON 07012406:	AT (427000.00, 4526400.00, 1388.10, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.02271	ON 07012406:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.01947	ON 07012406:	AT (427000.00, 4526800.00, 1382.27, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.01148	ON 07011618:	AT (426000.00, 4525800.00, 1353.21, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.02971	ON 07012406:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.03603	ON 07012406:	AT (427400.00, 4526400.00, 1420.32, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.04083	ON 07012406:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00499	ON 07102424:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00578	ON 07012618:	AT (424250.00, 4526850.00, 1307.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00253	ON 07012401:	AT (425300.00, 4526200.00, 1331.56, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00251	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00269	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00262	ON 07012406:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.11129	ON 07012406:	AT (427200.00, 4526800.00, 1397.26, 2867.37, 0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	0.54378	ON 07020507:	AT (423976.40, 4526296.50, 1307.98, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.12216	ON 07120724:	AT (423950.00, 4526300.00, 1306.66, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00442	ON 07102608:	AT (426600.00, 4526200.00, 1369.60, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00477	ON 07042024:	AT (426600.00, 4525600.00, 1382.42, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00423	ON 07042024:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00233	ON 07042024:	AT (425800.00, 4525800.00, 1348.50, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00645	ON 07102608:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00700	ON 07120724:	AT (426200.00, 4524000.00, 1419.65, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.01005	ON 07041908:	AT (424141.30, 4526621.40, 1308.11, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00236m	ON 07102424:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00250	ON 07110308:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00066	ON 07021408:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00077m	ON 07090924:	AT (423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00065	ON 07021408:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00079	ON 07021408:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.02278	ON 07102608:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	0.12146	ON 07120724:	AT (423950.00, 4526300.00, 1306.66, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.05977m	ON 07120724:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00209m	ON 07102624:	AT (426600.00, 4526200.00, 1369.60, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00204m	ON 07102624:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00197m	ON 07102624:	AT (426800.00, 4526600.00, 1371.13, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00106m	ON 07122824:	AT (423538.80, 4527067.90, 1294.00, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00308m	ON 07102624:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00332m	ON 07102624:	AT (427200.00, 4526200.00, 1406.81, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00511	ON 07041524:	AT (423800.80, 4526311.60, 1303.75, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00159m	ON 07102424:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00156m	ON 07110324:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00033	ON 07011124:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

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68H11    HIGH   1ST HIGH VALUE IS       0.00041m ON 07121424: AT (  423703.10,  4526311.50,  1302.74,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00034  ON 07021324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00037  ON 07011124: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

FLARES   HIGH   1ST HIGH VALUE IS       0.01068m ON 07102624: AT (  427000.00,  4526600.00,  1385.23,  2867.37,    0.00)  DC

FUGITIVE HIGH   1ST HIGH VALUE IS       0.05933m ON 07120724: AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC

 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        16:11:38
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                  ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of           0 Fatal Error Message(s)
 A Total of           2 Warning Message(s)
 A Total of        2026 Informational Message(s)

 A Total of        8760 Hours Were Processed

 A Total of           0 Calm Hours Identified

 A Total of        2026 Missing Hours Identified ( 23.13 Percent)

 CAUTION!:  Number of Missing Hours Exceeds 10 Percent of Total!
            Data May Not Be Acceptable for Regulatory Applications.
            See Section 5.3.2 of "Meteorological Monitoring Guidance
            for Regulatory Modeling Applications" (EPA-454/R-99-005).


    ******** FATAL ERROR MESSAGES ********
              ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305       1 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

```
                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     15 Source(s);      16 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  FORMALDE

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                              ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     18.0 MB of RAM.

**Input Runstream File:          Holly_HAPS_2008_FORMALDE.DTA
**Output Print File:             Holly_HAPS_2008_FORMALDE.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2008_FORMALDE.SUM
```



```
                                          *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                  *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                        (METERS/SEC)

                                               1.54,   3.09,   5.14,   8.23,  10.80,
```



```
                                    *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

  Surface file:   SY2008.SFC                                                                      Met Version:  11059
  Profile file:   SY2008.PFL
  Surface format: FREE
  Profile format: FREE
```

Surface station no.: 24127 Upper air station no.: 24127
Name: SALT_LAKE_CITY,UT Name: SALT_LAKE_CITY,UT
Year: 2008 Year: 2008

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
08	01	01	1	01	-24.3	0.228	-9.000	-9.000	-999.	250.	38.8	0.07	0.28	1.00	3.60	144.	10.0	264.2	10.0
08	01	01	1	02	-9.9	0.103	-9.000	-9.000	-999.	85.	8.9	0.07	0.28	1.00	2.60	130.	10.0	263.6	10.0
08	01	01	1	03	-3.8	0.064	-9.000	-9.000	-999.	37.	5.5	0.07	0.28	1.00	1.60	127.	10.0	263.0	10.0
08	01	01	1	04	-10.3	0.109	-9.000	-9.000	-999.	82.	10.0	0.12	0.28	1.00	2.40	153.	10.0	263.6	10.0
08	01	01	1	05	-8.5	0.095	-9.000	-9.000	-999.	68.	8.2	0.07	0.28	1.00	2.40	123.	10.0	263.1	10.0
08	01	01	1	06	-7.9	0.091	-9.000	-9.000	-999.	63.	7.6	0.05	0.28	1.00	2.40	93.	10.0	262.9	10.0
08	01	01	1	07	-7.2	0.086	-9.000	-9.000	-999.	58.	7.0	0.04	0.28	1.00	2.40	63.	10.0	262.6	10.0
08	01	01	1	08	-11.6	0.116	-9.000	-9.000	-999.	91.	10.9	0.05	0.28	1.00	2.90	30.	10.0	261.4	10.0
08	01	01	1	09	-13.2	0.185	-9.000	-9.000	-999.	184.	38.9	0.06	0.28	0.51	3.00	24.	10.0	262.9	10.0
08	01	01	1	10	10.3	0.229	0.258	0.005	54.	252.	-94.0	0.06	0.28	0.30	2.80	26.	10.0	264.2	10.0
08	01	01	1	11	27.2	0.247	0.447	0.005	105.	283.	-44.5	0.06	0.28	0.22	2.90	23.	10.0	265.8	10.0
08	01	01	1	12	31.4	0.256	0.518	0.005	142.	298.	-43.0	0.06	0.28	0.19	3.00	24.	10.0	267.2	10.0
08	01	01	1	13	34.5	0.201	0.582	0.007	183.	208.	-18.9	0.05	0.28	0.19	2.30	54.	10.0	268.6	10.0
08	01	01	1	14	31.7	0.255	0.602	0.005	220.	296.	-41.7	0.05	0.28	0.19	3.10	37.	10.0	267.6	10.0
08	01	01	1	15	23.3	0.252	0.565	0.005	247.	291.	-55.2	0.06	0.28	0.22	3.00	3.	10.0	267.8	10.0
08	01	01	1	16	-0.3	0.246	-9.000	-9.000	-999.	281.	4710.6	0.06	0.28	0.29	3.20	17.	10.0	267.4	10.0
08	01	01	1	17	-8.9	0.196	-9.000	-9.000	-999.	200.	68.0	0.06	0.28	0.49	2.90	13.	10.0	266.1	10.0
08	01	01	1	18	-13.0	0.244	-9.000	-9.000	-999.	277.	88.9	0.06	0.28	1.00	3.50	8.	10.0	264.5	10.0
08	01	01	1	19	-5.5	0.104	-9.000	-9.000	-999.	90.	16.1	0.05	0.28	1.00	2.20	35.	10.0	264.2	10.0
08	01	01	1	20	-2.6	0.056	-9.000	-9.000	-999.	31.	5.3	0.05	0.28	1.00	1.50	48.	10.0	264.2	10.0
08	01	01	1	21	-2.5	0.062	-9.000	-9.000	-999.	35.	7.4	0.06	0.28	1.00	1.60	17.	10.0	263.4	10.0
08	01	01	1	22	-2.9	0.066	-9.000	-9.000	-999.	39.	7.9	0.06	0.28	1.00	1.70	26.	10.0	263.9	10.0
08	01	01	1	23	-8.6	0.160	-9.000	-9.000	-999.	147.	38.2	0.06	0.28	1.00	2.60	24.	10.0	263.0	10.0
08	01	01	1	24	-26.9	0.273	-9.000	-9.000	-999.	327.	60.1	0.06	0.28	1.00	4.10	15.	10.0	262.9	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
08	01	01	01	10.0	1	144.	3.60	264.3	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.56890	ON 08111907:	AT (423976.40, 4526296.50, 1307.98, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.02218	ON 08102707:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.02178	ON 08111421:	AT (426800.00, 4525800.00, 1386.05, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.01955	ON 08012607:	AT (427000.00, 4527200.00, 1378.30, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.01087	ON 08101523:	AT (426000.00, 4525800.00, 1353.21, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.03021	ON 08012607:	AT (427200.00, 4527200.00, 1393.45, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.03336	ON 08012607:	AT (427400.00, 4526800.00, 1412.69, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.04080	ON 08012607:	AT (426800.00, 4527000.00, 1364.47, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00508	ON 08101819:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00552	ON 08042320:	AT (424231.00, 4526870.60, 1306.99, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00246	ON 08111624:	AT (424800.00, 4525850.00, 1326.46, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00237	ON 08111702:	AT (424750.00, 4525600.00, 1326.88, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00249	ON 08081220:	AT (424800.00, 4525850.00, 1326.46, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00242	ON 08102721:	AT (425000.00, 4525700.00, 1332.22, 2867.37, 0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.10038	ON 08012607:	AT (427200.00, 4527200.00, 1393.45, 2867.37, 0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	0.56884	ON 08111907:	AT (423976.40, 4526296.50, 1307.98, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.09430	ON 08011324:	AT (424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00535	ON 08111924:	AT (425200.00, 4523800.00, 1372.25, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00511	ON 08111924:	AT (425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00395	ON 08111924:	AT (425200.00, 4523800.00, 1372.25, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00214	ON 08111924:	AT (425000.00, 4524400.00, 1350.15, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00713	ON 08111924:	AT (425400.00, 4523600.00, 1388.65, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00938	ON 08111924:	AT (425400.00, 4523400.00, 1398.40, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00876	ON 08111924:	AT (425000.00, 4524200.00, 1354.78, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00222	ON 08090208:	AT (424021.30, 4526781.80, 1304.07, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00225	ON 08080508:	AT (424021.60, 4526806.30, 1304.09, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00058m	ON 08022824:	AT (423678.60, 4526311.50, 1302.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00089m	ON 08022824:	AT (423678.60, 4526311.50, 1302.00, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00061	ON 08022016:	AT (423727.50, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00071	ON 08110824:	AT (423629.70, 4526311.40, 1301.93, 2867.37, 0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.02268	ON 08111924:	AT (425200.00, 4523600.00, 1379.15, 2867.37, 0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	0.09430	ON 08011324:	AT (424000.00, 4526450.00, 1307.00, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.06610	ON 08111924:	AT (423923.00, 4526311.70, 1306.13, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00216	ON 08111924:	AT (425200.00, 4523800.00, 1372.25, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00219	ON 08111924:	AT (425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00165	ON 08111924:	AT (425400.00, 4523800.00, 1381.29, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00093	ON 08111924:	AT (425000.00, 4524400.00, 1350.15, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00282	ON 08111924:	AT (425400.00, 4523600.00, 1388.65, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00374	ON 08111924:	AT (425400.00, 4523400.00, 1398.40, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00469	ON 08031624:	AT (423776.40, 4526311.50, 1303.07, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00092	ON 08011124:	AT (424022.60, 4526904.20, 1303.05, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00121m	ON 08021224:	AT (424022.60, 4526904.20, 1303.05, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00038	ON 08030224:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

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68H11    HIGH   1ST HIGH VALUE IS       0.00042  ON 08030224: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00040  ON 08030224: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00041  ON 08031624: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

FLARES   HIGH   1ST HIGH VALUE IS       0.00918  ON 08111924: AT (  425400.00,  4523600.00,  1388.65,  2867.37,    0.00)  DC

FUGITIVE HIGH   1ST HIGH VALUE IS       0.06592  ON 08111924: AT (  423923.00,  4526311.70,  1306.13,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        18:17:36
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                  ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            2 Warning Message(s)
 A Total of          146 Informational Message(s)

 A Total of         8784 Hours Were Processed

 A Total of            0 Calm Hours Identified

 A Total of          146 Missing Hours Identified (  1.66 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305       5 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
 CN W305       7 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
```

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                                          ***     MODEL SETUP OPTIONS SUMMARY       ***
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

**Model Is Setup For Calculation of Average CONCentration Values.

  --  DEPOSITION LOGIC  --
**NO GAS DEPOSITION Data Provided.
**NO PARTICLE DEPOSITION Data Provided.
**Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
**Model Uses NO WET DEPLETION.  WETDPLT  =  F

**Model Uses RURAL Dispersion Only.

**Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.

**Model Assumes No FLAGPOLE Receptor Heights.

**Model Calculates  3 Short Term Average(s) of:   1-HR   8-HR  24-HR

**This Run Includes:     15 Source(s);      16 Source Group(s); and   10024 Receptor(s)

**The Model Assumes A Pollutant Type of:  FORMALDE

**Model Set To Continue RUNning After the Setup Testing.

**Output Options Selected:
         Model Outputs Tables of Highest Short Term Values by Receptor (RECTABLE Keyword)
         Model Outputs External File(s) of High Values for Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked Values (SUMMFILE Keyword)

**NOTE:  The Following Flags May Appear Following CONC Values:  c for Calm Hours
                                                                m for Missing Hours
                                                                b for Both Calm and Missing Hours

**Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =  1308.00 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                 Emission Units = GRAMS/SEC                                ;  Emission Rate Unit Factor =   0.10000E+07
                 Output Units   = MICROGRAMS/M**3

**Approximate Storage Requirements of Model =     18.0 MB of RAM.

**Input Runstream File:          Holly_HAPS_2009_FORMALDE.DTA
**Output Print File:             Holly_HAPS_2009_FORMALDE.LST

**File for Summary of Results:   C:\beast\Holly\HAPs\Holly_HAPS_2009_FORMALDE.SUM
```



```
                                          *** METEOROLOGICAL DAYS SELECTED FOR PROCESSING ***
                                                           (1=YES; 0=NO)

           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
           1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

               NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.


                                  *** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***
                                                         (METERS/SEC)

                                               1.54,   3.09,   5.14,   8.23,  10.80,
```



```
                                    *** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

  Surface file:   SY2009.SFC                                                                      Met Version:  11059
  Profile file:   SY2009.PFL
  Surface format: FREE
  Profile format: FREE
```

Surface station no.: 24127 Upper air station no.: 72572
Name: SALT_LAKE_CITY,UT Name: UNKNOWN
Year: 2009 Year: 2009

First 24 hours of scalar data

YR	MO	DY	JDY	HR	H0	U*	W*	DT/DZ	ZICNV	ZIMCH	M-O LEN	Z0	BOWEN	ALBEDO	REF WS	WD	HT	REF TA	HT
09	01	01	1	01	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.00	127.	10.0	267.9	10.0
09	01	01	1	02	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	1.80	120.	10.0	268.0	10.0
09	01	01	1	03	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	3.00	106.	10.0	269.1	10.0
09	01	01	1	04	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	3.10	132.	10.0	270.2	10.0
09	01	01	1	05	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.80	141.	10.0	269.8	10.0
09	01	01	1	06	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	1.00	2.50	148.	10.0	269.4	10.0
09	01	01	1	07	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.05	0.28	1.00	1.90	96.	10.0	269.2	10.0
09	01	01	1	08	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.12	0.28	1.00	0.80	178.	10.0	269.6	10.0
09	01	01	1	09	-999.0	-9.000	-9.000	-9.000	-999.	-999.	-99999.0	0.07	0.28	0.51	2.70	149.	10.0	270.9	10.0
09	01	01	1	10	9.0	0.274	0.144	0.005	10.	330.	-177.5	0.12	0.28	0.30	2.90	154.	10.0	271.9	10.0
09	01	01	1	11	22.7	0.173	0.298	0.012	36.	169.	-17.8	0.09	0.28	0.22	1.70	190.	10.0	273.9	10.0
09	01	01	1	12	31.6	0.109	0.420	0.018	73.	84.	-3.2	0.05	0.28	0.19	1.00	46.	10.0	275.6	10.0
09	01	01	1	13	34.8	0.258	0.504	0.005	114.	301.	-38.1	0.12	0.28	0.19	2.50	163.	10.0	277.0	10.0
09	01	01	1	14	32.1	0.113	0.539	0.013	151.	102.	-3.5	0.12	0.28	0.19	0.80	154.	10.0	277.9	10.0
09	01	01	1	15	4.7	0.155	0.288	0.013	157.	141.	-62.0	0.07	0.28	0.22	1.80	124.	10.0	278.8	10.0
09	01	01	1	16	0.4	0.334	0.124	0.005	158.	444.	-7805.0	0.07	0.28	0.29	4.20	143.	10.0	278.6	10.0
09	01	01	1	17	-14.1	0.342	-9.000	-9.000	-999.	460.	219.8	0.07	0.28	0.49	4.50	146.	10.0	277.9	10.0
09	01	01	1	18	-26.4	0.354	-9.000	-9.000	-999.	485.	130.6	0.07	0.28	1.00	4.80	146.	10.0	277.4	10.0
09	01	01	1	19	-35.5	0.392	-9.000	-9.000	-999.	564.	131.3	0.12	0.28	1.00	4.70	169.	10.0	277.4	10.0
09	01	01	1	20	-28.1	0.311	-9.000	-9.000	-999.	402.	82.5	0.12	0.28	1.00	3.90	150.	10.0	277.6	10.0
09	01	01	1	21	-29.8	0.330	-9.000	-9.000	-999.	437.	93.6	0.07	0.28	1.00	4.60	129.	10.0	278.5	10.0
09	01	01	1	22	-14.1	0.288	-9.000	-9.000	-999.	356.	130.9	0.07	0.28	1.00	3.90	131.	10.0	278.8	10.0
09	01	01	1	23	-23.6	0.320	-9.000	-9.000	-999.	416.	107.0	0.07	0.28	1.00	4.40	122.	10.0	278.9	10.0
09	01	01	1	24	-24.9	0.337	-9.000	-9.000	-999.	450.	118.7	0.07	0.28	1.00	4.60	130.	10.0	278.4	10.0

First hour of profile data

YR	MO	DY	HR	HEIGHT	F	WDIR	WSPD	AMB_TMP	sigmaA	sigmaW	sigmaV
09	01	01	01	10.0	1	127.	3.00	267.9	99.0	-99.00	-99.00

F indicates top of profile (=1) or below (=0)

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 1-HR RESULTS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.44508	ON 09110920:	AT (423962.20, 4526296.80, 1306.98, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.02130	ON 09112608:	AT (426400.00, 4525600.00, 1373.63, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.02186	ON 09012102:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.01992	ON 09012102:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.01080	ON 09110119:	AT (426400.00, 4526400.00, 1357.10, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.03041	ON 09012102:	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.03512	ON 09110218:	AT (427000.00, 4525800.00, 1404.56, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.04093	ON 09012102:	AT (426800.00, 4526800.00, 1365.89, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00493	ON 09012021:	AT (424021.10, 4526757.30, 1305.00, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00583	ON 09012102:	AT (424242.70, 4526812.50, 1308.00, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00241	ON 09100821:	AT (424750.00, 4525700.00, 1326.84, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00235	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00245	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00233	ON 09111522:	AT (425400.00, 4526500.00, 1330.75, 2867.37, 0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.10238	ON 09012102:	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	0.44505	ON 09110920:	AT (423962.20, 4526296.80, 1306.98, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 8-HR RESULTS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.14441	ON 09012008:	AT (423900.00, 4526300.00, 1306.00, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00507c	ON 09012108:	AT (427000.00, 4526600.00, 1385.23, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00502c	ON 09012108:	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00424c	ON 09012108:	AT (427000.00, 4527000.00, 1380.98, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00223c	ON 09012108:	AT (426600.00, 4527000.00, 1353.33, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00659c	ON 09012108:	AT (427400.00, 4527000.00, 1410.95, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00789c	ON 09012108:	AT (427400.00, 4526600.00, 1416.24, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00855c	ON 09012108:	AT (426800.00, 4526800.00, 1365.89, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00221m	ON 09020908:	AT (424001.20, 4526784.40, 1303.92, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00245c	ON 09011024:	AT (424022.30, 4526879.70, 1303.97, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00090m	ON 09011624:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H11	HIGH	1ST HIGH VALUE IS	0.00092m	ON 09013024:	AT (423703.10, 4526311.50, 1302.74, 2867.37, 0.00)	DC
68H12	HIGH	1ST HIGH VALUE IS	0.00087m	ON 09011624:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H13	HIGH	1ST HIGH VALUE IS	0.00093m	ON 09011624:	AT (423750.00, 4526300.00, 1303.46, 2867.37, 0.00)	DC
FLARES	HIGH	1ST HIGH VALUE IS	0.02451c	ON 09012108:	AT (427200.00, 4527000.00, 1395.57, 2867.37, 0.00)	DC
FUGITIVE	HIGH	1ST HIGH VALUE IS	0.14417	ON 09012008:	AT (423900.00, 4526300.00, 1306.00, 2867.37, 0.00)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

**MODELOPTs: RegDFAULT CONC ELEV

*** THE SUMMARY OF HIGHEST 24-HR RESULTS ***

** CONC OF FORMALDE IN MICROGRAMS/M**3 **

NETWORK GROUP ID GRID-ID			AVERAGE CONC	DATE (YYMMDDHH)	RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG)	OF TYPE
ALL	HIGH	1ST HIGH VALUE IS	0.07511	ON 09122824:	AT (423849.70, 4526311.60, 1305.00, 2867.37, 0.00)	DC
20H3	HIGH	1ST HIGH VALUE IS	0.00182b	ON 09012124:	AT (425600.00, 4524200.00, 1376.93, 2867.37, 0.00)	DC
24H1	HIGH	1ST HIGH VALUE IS	0.00196b	ON 09012124:	AT (425800.00, 4524400.00, 1379.76, 2867.37, 0.00)	DC
25H1	HIGH	1ST HIGH VALUE IS	0.00162m	ON 09012024:	AT (425800.00, 4524600.00, 1374.94, 2867.37, 0.00)	DC
26H1	HIGH	1ST HIGH VALUE IS	0.00094m	ON 09012024:	AT (425500.00, 4525000.00, 1352.18, 2867.37, 0.00)	DC
27H1	HIGH	1ST HIGH VALUE IS	0.00251b	ON 09012124:	AT (425800.00, 4524000.00, 1393.12, 2867.37, 0.00)	DC
33H1	HIGH	1ST HIGH VALUE IS	0.00319b	ON 09012124:	AT (425800.00, 4523800.00, 1400.43, 2867.37, 0.00)	DC
BOILER11	HIGH	1ST HIGH VALUE IS	0.00644	ON 09102824:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC
68H6	HIGH	1ST HIGH VALUE IS	0.00105m	ON 09072224:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H7	HIGH	1ST HIGH VALUE IS	0.00120m	ON 09072224:	AT (424021.80, 4526830.80, 1304.02, 2867.37, 0.00)	DC
68H10	HIGH	1ST HIGH VALUE IS	0.00038	ON 09122324:	AT (423751.90, 4526311.50, 1303.00, 2867.37, 0.00)	DC

```
68H11    HIGH   1ST HIGH VALUE IS       0.00044m ON 09022724: AT (  423727.50,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H12    HIGH   1ST HIGH VALUE IS       0.00039  ON 09122324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

68H13    HIGH   1ST HIGH VALUE IS       0.00043  ON 09122324: AT (  423751.90,  4526311.50,  1303.00,  2867.37,    0.00)  DC

FLARES   HIGH   1ST HIGH VALUE IS       0.00890b ON 09012124: AT (  425800.00,  4524200.00,  1385.06,  2867.37,    0.00)  DC

FUGITIVE HIGH   1ST HIGH VALUE IS       0.07346  ON 09122824: AT (  423849.70,  4526311.60,  1305.00,  2867.37,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION  12060 ***   *** Holly Refinery Source Modifications - Hazardour Air Pollutants       ***        05/09/12
                                   *** 5-years Met Data - KSLC 2006-2010                                    ***        21:11:58
                                                                                                                       PAGE   7
 **MODELOPTs:  RegDFAULT CONC                                                ELEV


 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            2 Warning Message(s)
 A Total of          802 Informational Message(s)

 A Total of         8760 Hours Were Processed

 A Total of            9 Calm Hours Identified

 A Total of          793 Missing Hours Identified (  9.05 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:          33H1
 CN W305      11 WAKFLG:Stack height > or = EPA formula height for SRCID:        FLARES
```

Appendix M
Soils and Vegetation Analysis

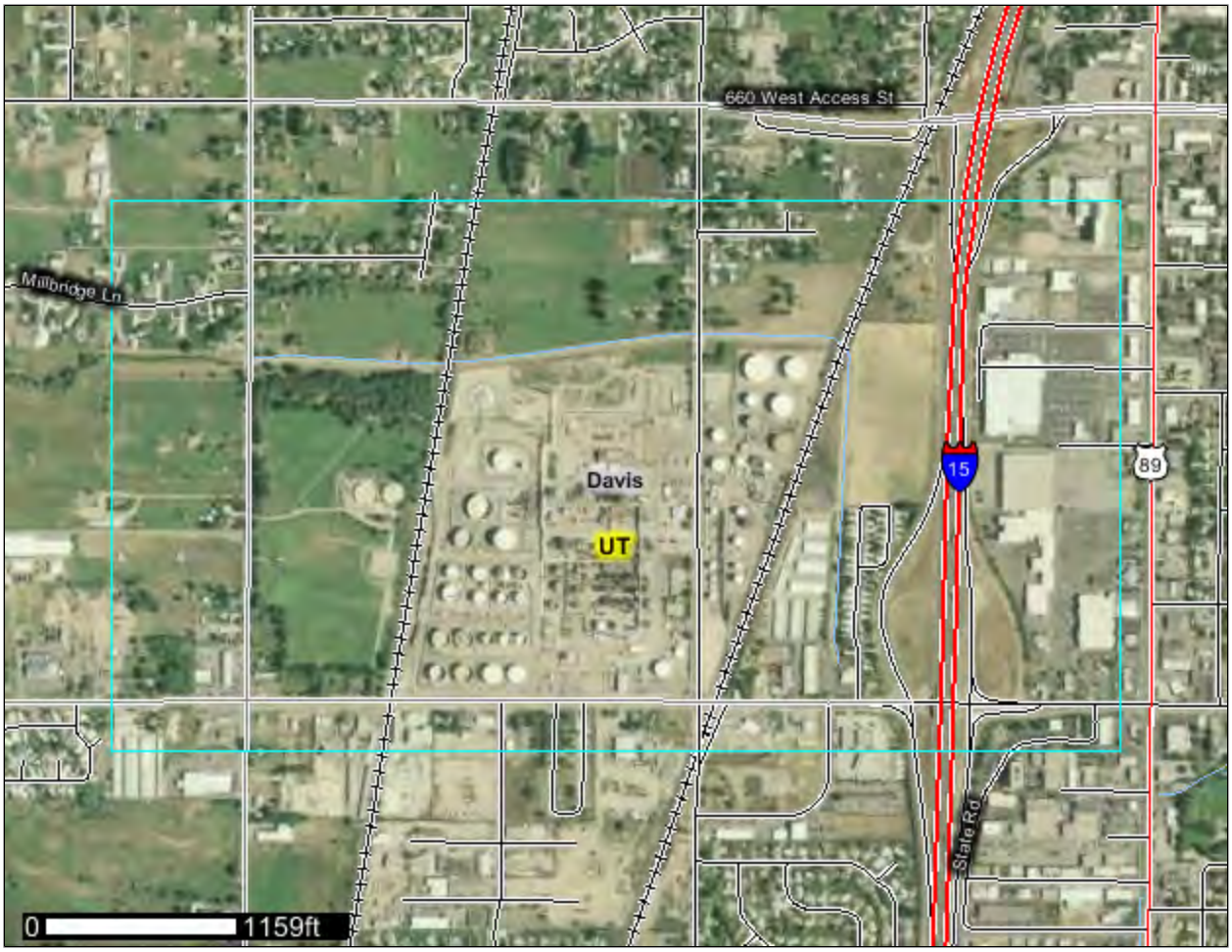
United States Department of Agriculture

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Davis-Weber Area, Utah



February 21, 2012

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:10,100 if printed on A size (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 500 1,000 2,000 3,000

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Units

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Gully

Short Steep Slope

Other

Political Features

Cities

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

MAP INFORMATION

Map Scale: 1:10,100 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 12N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Davis-Weber Area, Utah
Survey Area Data: Version 6, Mar 3, 2011

Date(s) aerial images were photographed: 8/10/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Davis-Weber Area, Utah (UT607)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
AbB	Ackmen loam, 1 to 3 percent slopes	45.4	10.0%
CaA	Chance loam, 0 to 3 percent slopes	7.3	1.6%
CuA	Cudahy silt loam, 0 to 1 percent slopes	0.7	0.1%
DrA	Draper loam, drained, 0 to 1 percent slopes	130.7	28.8%
DrB	Draper loam, drained, 1 to 3 percent slopes	12.2	2.7%
IaB	Ironton silt loam, 1 to 3 percent slopes	7.9	1.7%
IaC	Ironton silt loam, 3 to 6 percent slopes	2.9	0.6%
KgB	Kilburn gravelly sandy loam, 1 to 3 percent slopes	27.6	6.1%
Lt	Logan silty clay loam, 0 to 3 percent slopes	20.9	4.6%
Lw	Logan silty clay loam, shallow water table, 0 to 3 percent slopes	3.2	0.7%
Rs	Roshe Springs silt loam, drained, 0 to 3 percent slopes	28.3	6.2%
Rw	Roshe Springs silt loam, 0 to 3 percent slopes	30.6	6.7%
Wt	Woods Cross silty clay loam, drained, 0 to 3 percent slopes	136.8	30.1%
Totals for Area of Interest		**454.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be

made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Davis-Weber Area, Utah

AbB—Ackmen loam, 1 to 3 percent slopes

Map Unit Setting

Elevation: 4,400 to 5,300 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 120 to 150 days

Map Unit Composition

Ackmen and similar soils: 100 percent

Description of Ackmen

Setting

Landform: Alluvial fans
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Slope alluvium

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability (nonirrigated): 3s
Ecological site: Upland Loam (Mountain Big Sagebrush) (R028AY310UT)
Other vegetative classification: Upland Loam (Mountain Big Sagebrush) (028AY310UT)

Typical profile

0 to 6 inches: Loam
6 to 32 inches: Loam
32 to 60 inches: Loam

CaA—Chance loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 4,200 to 4,500 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F

Frost-free period: 160 to 180 days

Map Unit Composition

Chance and similar soils: 100 percent

Description of Chance

Setting

Landform: Depressions on lake terraces
Landform position (three-dimensional): Tread, dip
Down-slope shape: Concave, linear
Across-slope shape: Concave, linear
Parent material: Alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 10 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Available water capacity: Moderate (about 6.9 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability (nonirrigated): 7w
Ecological site: Wet Fresh Meadow (R028AY020UT)

Typical profile

0 to 3 inches: Loam
3 to 8 inches: Loam
8 to 19 inches: Silt loam
19 to 41 inches: Loamy fine sand
41 to 57 inches: Loamy fine sand
57 to 72 inches: Fine sandy loam

CuA—Cudahy silt loam, 0 to 1 percent slopes

Map Unit Setting

Elevation: 4,200 to 4,450 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 180 days

Map Unit Composition

Cudahy and similar soils: 100 percent

Description of Cudahy

Setting

Landform: Lake terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Lacustrine deposits

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: 20 to 40 inches to petrocalcic
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)
Depth to water table: About 0 to 24 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 75 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water capacity: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability (nonirrigated): 7w
Ecological site: Wet Fresh Meadow (R028AY020UT)

Typical profile

0 to 6 inches: Silt loam
6 to 16 inches: Silt loam
16 to 23 inches: Silt loam
23 to 31 inches: Indurated
31 to 44 inches: Indurated
44 to 60 inches: Silty clay loam

DrA—Draper loam, drained, 0 to 1 percent slopes

Map Unit Setting

Elevation: 4,250 to 5,000 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 130 to 175 days

Map Unit Composition

Draper and similar soils: 95 percent
Minor components: 5 percent

Description of Draper

Setting

Landform: Flood plains

Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Alluvium

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability (nonirrigated): 4w
Ecological site: Semiwet Fresh Meadow (R028AY012UT)

Typical profile

0 to 8 inches: Loam
8 to 21 inches: Loam
21 to 30 inches: Loam
30 to 53 inches: Loam
53 to 60 inches: Loam

Minor Components

Poorly drained soils

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear
Across-slope shape: Concave

DrB—Draper loam, drained, 1 to 3 percent slopes

Map Unit Setting

Elevation: 4,250 to 5,000 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 130 to 175 days

Map Unit Composition

Draper and similar soils: 100 percent

Description of Draper

Setting

Landform: Flood plains, alluvial fans
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear, concave
Across-slope shape: Concave, convex
Parent material: Alluvium

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability (nonirrigated): 4w
Ecological site: Semiwet Fresh Meadow (R028AY012UT)

Typical profile

0 to 8 inches: Loam
8 to 21 inches: Loam
21 to 30 inches: Loam
30 to 53 inches: Loam
53 to 60 inches: Loam

IaB—Ironton silt loam, 1 to 3 percent slopes

Map Unit Setting

Elevation: 4,200 to 4,750 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 180 days

Map Unit Composition

Ironton and similar soils: 90 percent
Minor components: 10 percent

Description of Ironton

Setting

Landform: Lake terraces, flood plains
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear

Across-slope shape: Linear, concave
Parent material: Alluvium and/or lacustrine deposits

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water capacity: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 2w
Land capability (nonirrigated): 4w
Ecological site: Semiwet Fresh Meadow (R028AY012UT)

Typical profile

0 to 6 inches: Silt loam
6 to 16 inches: Silt loam
16 to 21 inches: Loam
21 to 36 inches: Loam
36 to 48 inches: Silt loam
48 to 60 inches: Silt loam

Minor Components

Poorly drained soils, hydric, not correlated

Percent of map unit: 10 percent
Landform: Lake terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

IaC—Ironton silt loam, 3 to 6 percent slopes

Map Unit Setting

Elevation: 4,200 to 4,750 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 180 days

Map Unit Composition

Ironton and similar soils: 100 percent

Description of Ironton

Setting

Landform: Lake terraces, flood plains
Landform position (three-dimensional): Tread, talf, dip
Down-slope shape: Linear
Across-slope shape: Linear, concave
Parent material: Alluvium and/or lacustrine deposits

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 24 to 36 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 40 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water capacity: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability (nonirrigated): 4w
Ecological site: Semiwet Fresh Meadow (R028AY012UT)

Typical profile

0 to 6 inches: Silt loam
6 to 16 inches: Silt loam
16 to 21 inches: Loam
21 to 36 inches: Loam
36 to 48 inches: Silt loam
48 to 60 inches: Silt loam

KgB—Kilburn gravelly sandy loam, 1 to 3 percent slopes

Map Unit Setting

Elevation: 4,400 to 5,300 feet
Mean annual precipitation: 14 to 18 inches

Map Unit Composition

Kilburn and similar soils: 100 percent

Description of Kilburn

Setting

Landform: Alluvial fans
Down-slope shape: Concave
Across-slope shape: Convex
Parent material: Lacustrine deposits

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 3.1 inches)

Interpretive groups

Land capability classification (irrigated): 3s
Land capability (nonirrigated): 7s
Ecological site: Upland Gravelly Loam (Bonneville Big Sagebrush) (R028AY306UT)

Typical profile

0 to 5 inches: Gravelly sandy loam
5 to 11 inches: Gravelly sandy loam
11 to 24 inches: Very cobbly sandy loam
24 to 60 inches: Very gravelly loamy coarse sand

Lt—Logan silty clay loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 4,200 to 4,650 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 180 days

Map Unit Composition

Logan and similar soils: 95 percent
Minor components: 5 percent

Description of Logan

Setting

Landform: Lake terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and/or lacustrine deposits

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 12 to 30 inches
Frequency of flooding: Rare
Frequency of ponding: None
Calcium carbonate, maximum content: 60 percent

Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water capacity: High (about 9.5 inches)

Interpretive groups
Land capability classification (irrigated): 3w
Land capability (nonirrigated): 5w
Ecological site: Wet Fresh Meadow (R028AY020UT)

Typical profile
0 to 5 inches: Silty clay loam
5 to 12 inches: Silty clay loam
12 to 29 inches: Silty clay loam
29 to 46 inches: Silt loam
46 to 60 inches: Stratified fine sand to silty clay

Minor Components

Peat surface soils
Percent of map unit: 5 percent
Landform: Lake terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Lw—Logan silty clay loam, shallow water table, 0 to 3 percent slopes

Map Unit Setting
Elevation: 4,200 to 4,650 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 180 days

Map Unit Composition
Logan and similar soils: 95 percent
Minor components: 5 percent

Description of Logan

Setting
Landform: Lake terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and/or lacustrine deposits

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: Frequent
Frequency of ponding: None
Calcium carbonate, maximum content: 60 percent
Maximum salinity: Slightly saline to moderately saline (8.0 to 16.0 mmhos/cm)
Sodium adsorption ratio, maximum: 30.0
Available water capacity: Moderate (about 7.1 inches)

Interpretive groups
Land capability (nonirrigated): 7w
Ecological site: Wet Fresh Meadow (R028AY020UT)

Typical profile
0 to 5 inches: Silty clay loam
5 to 12 inches: Silty clay loam
12 to 29 inches: Silty clay loam
29 to 46 inches: Silt loam
46 to 60 inches: Stratified fine sand to silty clay

Minor Components

Peat surface soils
Percent of map unit: 5 percent
Landform: Lake terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Rs—Roshe Springs silt loam, drained, 0 to 3 percent slopes

Map Unit Setting
Elevation: 4,200 to 4,500 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 180 days

Map Unit Composition
Roshe springs, drained, and similar soils: 95 percent
Minor components: 5 percent

Description of Roshe Springs, Drained

Setting
Landform: Lake terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and/or lacustrine deposits

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 20 to 36 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 80 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water capacity: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability (nonirrigated): 7w
Ecological site: Wet Fresh Meadow (R028AY020UT)

Typical profile

0 to 7 inches: Silt loam
7 to 12 inches: Loam
12 to 33 inches: Loam
33 to 52 inches: Loam
52 to 80 inches: Sandy loam

Minor Components

Roshe springs, shallow water table

Percent of map unit: 5 percent
Landform: Lake terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Wet Fresh Meadow (R028AY020UT)

Rw—Roshe Springs silt loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 4,200 to 4,600 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 180 days

Map Unit Composition

Roshe springs, shallow water table, and similar soils: 100 percent

Description of Roshe Springs, Shallow Water Table

Setting

Landform: Lake terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium and/or lacustrine deposits

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: About 0 to 10 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 80 percent
Gypsum, maximum content: 2 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum: 13.0
Available water capacity: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 4w
Land capability (nonirrigated): 7w
Ecological site: Wet Fresh Meadow (R028AY020UT)

Typical profile

0 to 7 inches: Silt loam
7 to 12 inches: Loam
12 to 33 inches: Loam
33 to 52 inches: Loam
52 to 80 inches: Sandy loam

Wt—Woods Cross silty clay loam, drained, 0 to 3 percent slopes

Map Unit Setting

Elevation: 4,250 to 4,500 feet
Mean annual precipitation: 14 to 18 inches
Mean annual air temperature: 48 to 52 degrees F
Frost-free period: 160 to 180 days

Map Unit Composition

Woods cross, drained, and similar soils: 95 percent
Minor components: 5 percent

Description of Woods Cross, Drained

Setting

Landform: Flood plains

Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Alluvium

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 30 to 48 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum content: 3 percent
Maximum salinity: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water capacity: High (about 10.2 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability (nonirrigated): 7w

Typical profile

0 to 6 inches: Silty clay loam
6 to 37 inches: Silty clay loam
37 to 72 inches: Silty clay

Minor Components

Poorly drained soils, hydric, not correlated

Percent of map unit: 5 percent
Landform: Flood plains
Landform position (three-dimensional): Talf, dip
Down-slope shape: Linear
Across-slope shape: Concave

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Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition

In areas that have similar climate and topography, differences in the kind and amount of rangeland or forest understory vegetation are closely related to the kind of soil. Effective management is based on the relationship between the soils and vegetation and water.

This table shows, for each soil that supports vegetation, the ecological site, plant association, or habitat type; the total annual production of vegetation in favorable, normal, and unfavorable years; the characteristic vegetation; and the average percentage of each species. An explanation of the column headings in the table follows.

An *ecological site, plant association, or habitat type* is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of the site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site, plant association, or habitat type is typified by an association of species that differs from that of other ecological sites, plant associations, or habitat types in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service (NRCS). Descriptions of plant associations or habitat types are available from local U.S. Forest Service offices.

Total dry-weight production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, normal, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Characteristic vegetation (the grasses, forbs, shrubs, and understory trees that make up most of the potential natural plant community on each soil) is listed by common name. Under *rangeland composition and forest understory*, the expected percentage of the total annual production is given for each species making up the characteristic vegetation. The percentages are by dry weight for rangeland. Percentages for forest understory are by either dry weight or canopy cover. The amount that can be used as forage depends on the kinds of grazing animals and on the grazing season.

Range management requires knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in the "National Range and Pasture Handbook," which is available in local offices of NRCS or on the Internet.

The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service, National range and pasture handbook.

Report—Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year		Rangeland	Forest understory	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
AbB—Ackmen loam, 1 to 3 percent slopes								
Ackmen	Upland Loam (Mountain Big Sagebrush) (R028AY310UT); Upland Loam (Mountain Big Sagebrush) (028AY310UT)	1,400	1,200	700	bluebunch wheatgrass	20	—	—
					Indian ricegrass	15	—	—
					mountain big sagebrush	15	—	—
					other shrubs	10	—	—
					other perennial forbs	10	—	—
					antelope bitterbrush	5	—	—
					arrowleaf balsamroot	5	—	—
					bottlebrush squirreltail	5	—	—
					other perennial grasses	5	—	—
					Sandberg bluegrass	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year		Rangeland	Forest understory	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
AbC—Ackmen loam, 3 to 6 percent slopes								
Ackmen	Upland Loam (Mountain Big Sagebrush) (R028AY310UT); Upland Loam (Mountain Big Sagebrush) (028AY310UT)	1,400	1,200	700	bluebunch wheatgrass	20	—	—
					Indian ricegrass	15	—	—
					mountain big sagebrush	15	—	—
					other shrubs	10	—	—
					other perennial forbs	10	—	—
					antelope bitterbrush	5	—	—
					arrowleaf balsamroot	5	—	—
					bottlebrush squirreltail	5	—	—
					other perennial grasses	5	—	—
					Sandberg bluegrass	5	—	—
Ac—Airport silt loam, 0 to 2 percent slopes								
Airport	Alkali Bottom (Alkali Sacaton) (R028AY001UT)	2,600	1,850	1,100	inland saltgrass	25	—	—
					alkali sacaton	20	—	—
					black greasewood	10	—	—
					Sandberg bluegrass	10	—	—
					basin wildrye	5	—	—
					Douglas' sedge	5	—	—
					mountain rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
Ad—Airport silty clay loam, 0 to 1 percent slopes								
Airport	Alkali Bottom (Alkali Sacaton) (R028AY001UT)	2,600	1,850	1,100	inland saltgrass	25	—	—
					alkali sacaton	20	—	—
					black greasewood	10	—	—
					Sandberg bluegrass	10	—	—
					basin wildrye	5	—	—
					Douglas' sedge	5	—	—
					mountain rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year		Rangeland	Forest understory	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
Ae—Airport complex, shallow water table, 0 to 1 percent slopes								
Airport, shallow water table, sil	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	Arctic rush	15	—	—
Airport, shallow water table, sicl	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	Arctic rush	15	—	—
Airport, shallow water table, sil	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	inland saltgrass	15	—	—
Airport, shallow water table, sicl	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	inland saltgrass	15	—	—
Airport, shallow water table, sil	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	Sandberg bluegrass	15	—	—
Airport, shallow water table, sicl	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	Sandberg bluegrass	15	—	—
					other perennial forbs	10	—	—
Airport, shallow water table, sil	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	other perennial forbs	10	—	—
					alkali muhly	5	—	—
Airport, shallow water table, sicl	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	alkali muhly	5	—	—
					clustered field sedge	5	—	—
Airport, shallow water table, sil	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	clustered field sedge	5	—	—
					meadow barley	5	—	—
Airport, shallow water table, sicl	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	meadow barley	5	—	—
					Nebraska sedge	5	—	—
Airport, shallow water table, sil	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	Nebraska sedge	5	—	—
					other shrubs	5	—	—
Airport, shallow water table, sicl	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	other shrubs	5	—	—
					other perennial grasses	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
Airport, shallow water table, sil	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	other perennial grasses	5	—	—
					saltmarsh alkaligrass	5	—	—
Airport, shallow water table, sicl	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	saltmarsh alkaligrass	5	—	—
					weeping alkaligrass	5	—	—
Airport, shallow water table, sil	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	weeping alkaligrass	5	—	—
AS—Arave-Saltair complex, 0 to 1 percent slopes								
Arave	Alkali Bottom (Alkali Sacaton) (R028AY001UT)	2,600	1,850	1,100	inland saltgrass	25	—	—
					alkali sacaton	20	—	—
					black greasewood	10	—	—
					Sandberg bluegrass	10	—	—
					basin wildrye	5	—	—
					Douglas' sedge	5	—	—
					mountain rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
Saltair	Desert Salty Silt (Iodinebush) (R028AY132UT)	250	200	100	iodinebush	50	—	—
					inland saltgrass	30	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year		Rangeland	Forest understory	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
CaA—Chance loam, 0 to 3 percent slopes								
Chance	Wet Fresh Meadow (R028AY020UT)	4,500	3,000	1,500	Nebraska sedge	40	—	—
					clustered field sedge	20	—	—
					Arctic rush	5	—	—
					Baltic rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					woolly sedge	5	—	—
CuA—Cudahy silt loam, 0 to 1 percent slopes								
Cudahy	Wet Fresh Meadow (R028AY020UT)	6,500	5,000	3,500	Nebraska sedge	40	—	—
					clustered field sedge	20	—	—
					Arctic rush	5	—	—
					Baltic rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					woolly sedge	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year		Rangeland	Forest understory	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
DaA—Draper loam, 0 to 1 percent slopes								
Draper	Semiwet Fresh Meadow (R028AY012UT)	2,500	2,000	1,000	Kentucky bluegrass	35	—	—
					clustered field sedge	15	—	—
					Arctic rush	10	—	—
					basin wildrye	5	—	—
					field horsetail	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					western wheatgrass	5	—	—
DrA—Draper loam, drained, 0 to 1 percent slopes								
Draper	Semiwet Fresh Meadow (R028AY012UT)	2,500	2,000	1,000	Kentucky bluegrass	35	—	—
					clustered field sedge	15	—	—
					Arctic rush	10	—	—
					basin wildrye	5	—	—
					field horsetail	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					western wheatgrass	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year		Rangeland	Forest understory	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
DrB—Draper loam, drained, 1 to 3 percent slopes								
Draper	Semiwet Fresh Meadow (R028AY012UT)	2,500	2,000	1,000	Kentucky bluegrass	35	—	—
					clustered field sedge	15	—	—
					Arctic rush	10	—	—
					basin wildrye	5	—	—
					field horsetail	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					western wheatgrass	5	—	—
Fa—Ford loam, 0 to 1 percent slopes								
Ford	Alkali Bottom (Alkali Sacaton) (R028AY001UT)	2,600	1,850	1,100	inland saltgrass	25	—	—
					alkali sacaton	20	—	—
					black greasewood	10	—	—
					Sandberg bluegrass	10	—	—
					basin wildrye	5	—	—
					Douglas' sedge	5	—	—
					mountain rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
FcC—Francis loamy fine sand, 3 to 6 percent slopes								
Francis	Upland Sand (Indian Ricegrass) (R028AY330UT)	1,400	900	700	Indian ricegrass	20	—	—
					needleandthread	15	—	—
					antelope bitterbrush	10	—	—
					other perennial forbs	10	—	—
					western wheatgrass	10	—	—
					arrowleaf balsamroot	5	—	—
					Louisiana sagewort	5	—	—
					other shrubs	5	—	—
					other perennial grasses	5	—	—
					rubber rabbitbrush	5	—	—
					sand dropseed	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
FcE2—Francis loamy fine sand, 10 to 20 percent slopes, eroded								
Francis	Upland Sand (Indian Ricegrass) (R028AY330UT)	1,400	900	700	Indian ricegrass	20	—	—
					needleandthread	15	—	—
					antelope bitterbrush	10	—	—
					other perennial forbs	10	—	—
					western wheatgrass	10	—	—
					arrowleaf balsamroot	5	—	—
					Louisiana sagewort	5	—	—
					other shrubs	5	—	—
					other perennial grasses	5	—	—
					rubber rabbitbrush	5	—	—
					sand dropseed	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year		Rangeland	Forest understory	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
IaA—Ironton silt loam, 0 to 1 percent slopes								
Ironton	Semiwet Fresh Meadow (R028AY012UT)	2,500	2,000	1,000	Kentucky bluegrass	35	—	—
					clustered field sedge	15	—	—
					Arctic rush	10	—	—
					basin wildrye	5	—	—
					field horsetail	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					western wheatgrass	5	—	—
IaB—Ironton silt loam, 1 to 3 percent slopes								
Ironton	Semiwet Fresh Meadow (R028AY012UT)	2,500	2,000	1,000	Kentucky bluegrass	35	—	—
					clustered field sedge	15	—	—
					Arctic rush	10	—	—
					basin wildrye	5	—	—
					field horsetail	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					western wheatgrass	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year		Rangeland	Forest understory	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
IaC—Ironton silt loam, 3 to 6 percent slopes								
Ironton	Semiwet Fresh Meadow (R028AY012UT)	2,500	2,000	1,000	Kentucky bluegrass	35	—	—
					clustered field sedge	15	—	—
					Arctic rush	10	—	—
					basin wildrye	5	—	—
					field horsetail	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					western wheatgrass	5	—	—
KaB—Kidman fine sandy loam, 1 to 3 percent slopes								
Kidman	Upland Loam (Mountain Big Sagebrush) (R028AY310UT); Upland Loam (Mountain Big Sagebrush) (028AY310UT)	1,400	1,200	700	bluebunch wheatgrass	20	—	—
					Indian ricegrass	15	—	—
					mountain big sagebrush	15	—	—
					other shrubs	10	—	—
					other perennial forbs	10	—	—
					antelope bitterbrush	5	—	—
					arrowleaf balsamroot	5	—	—
					bottlebrush squirreltail	5	—	—
					other perennial grasses	5	—	—
					Sandberg bluegrass	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
KFG2—Kilburn-Francis association, 30 to 50 percent slopes, eroded								
Kilburn	Upland Gravelly Loam (Bonneville Big Sagebrush) (R028AY306UT)	1,000	800	400	bluebunch wheatgrass	25	—	—
					mountain big sagebrush	20	—	—
					Sandberg bluegrass	15	—	—
					other shrubs	10	—	—
					other perennial grasses	10	—	—
					antelope bitterbrush	5	—	—
					needleandthread	5	—	—
					other perennial forbs	5	—	—
Francis	Upland Sand (Indian Ricegrass) (R028AY330UT)	1,400	900	700	Indian ricegrass	20	—	—
					needleandthread	15	—	—
					antelope bitterbrush	10	—	—
					other perennial forbs	10	—	—
					western wheatgrass	10	—	—
					arrowleaf balsamroot	5	—	—
					Louisiana sagewort	5	—	—
					other shrubs	5	—	—
					other perennial grasses	5	—	—
					rubber rabbitbrush	5	—	—
					sand dropseed	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
KgB—Kilburn gravelly sandy loam, 1 to 3 percent slopes								
Kilburn	Upland Gravelly Loam (Bonneville Big Sagebrush) (R028AY306UT)	1,000	800	400	bluebunch wheatgrass	25	—	—
					mountain big sagebrush	20	—	—
					Sandberg bluegrass	15	—	—
					other shrubs	10	—	—
					other perennial grasses	10	—	—
					antelope bitterbrush	5	—	—
					needleandthread	5	—	—
					other perennial forbs	5	—	—
KgC—Kilburn gravelly sandy loam, 3 to 6 percent slopes								
Kilburn	Upland Gravelly Loam (Bonneville Big Sagebrush) (R028AY306UT)	1,000	800	400	bluebunch wheatgrass	25	—	—
					mountain big sagebrush	20	—	—
					Sandberg bluegrass	15	—	—
					other shrubs	10	—	—
					other perennial grasses	10	—	—
					antelope bitterbrush	5	—	—
					needleandthread	5	—	—
					other perennial forbs	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
KgD—Kilburn gravelly sandy loam, 6 to 10 percent slopes								
Kilburn	Upland Gravelly Loam (Bonneville Big Sagebrush) (R028AY306UT)	1,000	800	400	bluebunch wheatgrass	25	—	—
					mountain big sagebrush	20	—	—
					Sandberg bluegrass	15	—	—
					other shrubs	10	—	—
					other perennial grasses	10	—	—
					antelope bitterbrush	5	—	—
					needleandthread	5	—	—
					other perennial forbs	5	—	—
KgE2—Kilburn gravelly sandy loam, 10 to 20 percent slopes, eroded								
Kilburn	Upland Gravelly Loam (Bonneville Big Sagebrush) (R028AY306UT)	1,000	800	400	bluebunch wheatgrass	25	—	—
					mountain big sagebrush	20	—	—
					Sandberg bluegrass	15	—	—
					other shrubs	10	—	—
					other perennial grasses	10	—	—
					antelope bitterbrush	5	—	—
					needleandthread	5	—	—
					other perennial forbs	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
Lt—Logan silty clay loam, 0 to 3 percent slopes								
Logan	Wet Fresh Meadow (R028AY020UT)	4,500	3,000	1,500	Nebraska sedge	40	—	—
					clustered field sedge	20	—	—
					Arctic rush	5	—	—
					Baltic rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					woolly sedge	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
Lu—Logan silty clay loam, saline, sodic, 0 to 1 percent slopes								
Logan	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	Arctic rush	15	—	—
					inland saltgrass	15	—	—
					Sandberg bluegrass	15	—	—
					other perennial forbs	10	—	—
					alkali muhly	5	—	—
					clustered field sedge	5	—	—
					meadow barley	5	—	—
					Nebraska sedge	5	—	—
					other shrubs	5	—	—
					other perennial grasses	5	—	—
					saltmarsh alkaligrass	5	—	—
					weeping alkaligrass	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
Lw—Logan silty clay loam, shallow water table, 0 to 3 percent slopes								
Logan	Wet Fresh Meadow (R028AY020UT)	4,500	3,000	1,500	Nebraska sedge	40	—	—
					clustered field sedge	20	—	—
					Arctic rush	5	—	—
					Baltic rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					woolly sedge	5	—	—
PaB—Parleys loam, 1 to 3 percent slopes								
Parleys	Upland Loam (Mountain Big Sagebrush) (R028AY310UT); Upland Loam (Mountain Big Sagebrush) (028AY310UT)	1,400	1,200	700	bluebunch wheatgrass	20	—	—
					Indian ricegrass	15	—	—
					mountain big sagebrush	15	—	—
					other shrubs	10	—	—
					other perennial forbs	10	—	—
					antelope bitterbrush	5	—	—
					arrowleaf balsamroot	5	—	—
					bottlebrush squirreltail	5	—	—
					other perennial grasses	5	—	—
					Sandberg bluegrass	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
PaC—Parleys loam, 3 to 6 percent slopes								
Parleys	Upland Loam (Mountain Big Sagebrush) (R028AY310UT); Upland Loam (Mountain Big Sagebrush) (028AY310UT)	1,400	1,200	700	bluebunch wheatgrass	20	—	—
					Indian ricegrass	15	—	—
					mountain big sagebrush	15	—	—
					other shrubs	10	—	—
					other perennial forbs	10	—	—
					antelope bitterbrush	5	—	—
					arrowleaf balsamroot	5	—	—
					bottlebrush squirreltail	5	—	—
					other perennial grasses	5	—	—
					Sandberg bluegrass	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year		Rangeland	Forest understory	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
PNA—Payson-Warm Springs complex, 0 to 3 percent slopes								
Payson	Alkali Bottom (Alkali Sacaton) (R028AY001UT)	2,600	1,850	1,100	inland saltgrass	25	—	—
					alkali sacaton	20	—	—
					black greasewood	10	—	—
					Sandberg bluegrass	10	—	—
					basin wildrye	5	—	—
					Douglas' sedge	5	—	—
					mountain rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
Warm Springs, deep over clay	Alkali Bottom (Alkali Sacaton) (R028AY001UT)	2,600	1,850	1,100	inland saltgrass	25	—	—
					alkali sacaton	20	—	—
					black greasewood	10	—	—
					Sandberg bluegrass	10	—	—
					basin wildrye	5	—	—
					Douglas' sedge	5	—	—
					mountain rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
PvB—Pleasant View loam, 1 to 3 percent slopes								
Pleasant View	Upland Loam (Mountain Big Sagebrush) (R028AY310UT); Upland Loam (Mountain Big Sagebrush) (028AY310UT)	1,400	1,200	700	bluebunch wheatgrass	20	—	—
					Indian ricegrass	15	—	—
					mountain big sagebrush	15	—	—
					other shrubs	10	—	—
					other perennial forbs	10	—	—
					antelope bitterbrush	5	—	—
					arrowleaf balsamroot	5	—	—
					bottlebrush squirreltail	5	—	—
					other perennial grasses	5	—	—
					Sandberg bluegrass	5	—	—
Rs—Roshe Springs silt loam, drained, 0 to 3 percent slopes								
Roshe Springs, drained	Wet Fresh Meadow (R028AY020UT)	4,500	3,000	1,500	Nebraska sedge	40	—	—
					clustered field sedge	20	—	—
					Arctic rush	5	—	—
					Baltic rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					woolly sedge	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year		Rangeland	Forest understory	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
Rw—Roshe Springs silt loam, 0 to 3 percent slopes								
Roshe Springs, Shallow Water Table	Wet Fresh Meadow (R028AY020UT)	4,500	3,000	1,500	Nebraska sedge	40	—	—
					clustered field sedge	20	—	—
					Arctic rush	5	—	—
					Baltic rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					woolly sedge	5	—	—
TbB—Timpanogos loam, 1 to 3 percent slopes								
Timpanogos	Upland Loam (Mountain Big Sagebrush) (R028AY310UT); Upland Loam (Mountain Big Sagebrush) (028AY310UT)	1,400	1,200	700	bluebunch wheatgrass	20	—	—
					Indian ricegrass	15	—	—
					mountain big sagebrush	15	—	—
					other shrubs	10	—	—
					other perennial forbs	10	—	—
					antelope bitterbrush	5	—	—
					arrowleaf balsamroot	5	—	—
					bottlebrush squirreltail	5	—	—
					other perennial grasses	5	—	—
					Sandberg bluegrass	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
TbC—Timpanogos loam, 3 to 6 percent slopes								
Timpanogos	Upland Loam (Mountain Big Sagebrush) (R028AY310UT); Upland Loam (Mountain Big Sagebrush) (028AY310UT)	1,400	1,200	700	bluebunch wheatgrass	20	—	—
					Indian ricegrass	15	—	—
					mountain big sagebrush	15	—	—
					other shrubs	10	—	—
					other perennial forbs	10	—	—
					antelope bitterbrush	5	—	—
					arrowleaf balsamroot	5	—	—
					bottlebrush squirreltail	5	—	—
					other perennial grasses	5	—	—
					Sandberg bluegrass	5	—	—
UL—Urban land								
Urban land	—	—	—	—	—	—	—	—
W—Water								
Water	—	—	—	—	—	—	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
WaA—Warm Springs fine sandy loam, 0 to 1 percent slopes								
Warm Springs	Alkali Bottom (Alkali Sacaton) (R028AY001UT)	2,600	1,850	1,100	inland saltgrass	25	—	—
					alkali sacaton	20	—	—
					black greasewood	10	—	—
					Sandberg bluegrass	10	—	—
					basin wildrye	5	—	—
					Douglas' sedge	5	—	—
					mountain rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
WdA—Warm Springs fine sandy loam, clayey substratum, 0 to 1 percent slopes								
Warm Springs, deep over clay	Alkali Bottom (Alkali Sacaton) (R028AY001UT)	2,600	1,850	1,100	inland saltgrass	25	—	—
					alkali sacaton	20	—	—
					black greasewood	10	—	—
					Sandberg bluegrass	10	—	—
					basin wildrye	5	—	—
					Douglas' sedge	5	—	—
					mountain rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
WhA—Warm Springs fine sandy loam, saline, sodic, 0 to 1 percent slopes, channeled								
Warm Springs, strongly alkali	Alkali Bottom (Alkali Sacaton) (R028AY001UT)	2,600	1,850	1,100	inland saltgrass	25	—	—
					alkali sacaton	20	—	—
					black greasewood	10	—	—
					Sandberg bluegrass	10	—	—
					basin wildrye	5	—	—
					Douglas' sedge	5	—	—
					mountain rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	**Ecological Site, Plant Association, or Habitat Type**	**Total dry-weight production**			**Characteristic rangeland or forest understory vegetation**	**Composition**		
		Favorable year	**Normal year**	**Unfavorable year**		**Rangeland**	**Forest understory**	**Forest understory**
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
Ws—Woods Cross silty clay loam, 0 to 3 percent slopes								
Woods Cross	Wet Saline Meadow (R028AY024UT)	4,000	3,000	2,000	Arctic rush	15	—	—
					inland saltgrass	15	—	—
					Sandberg bluegrass	15	—	—
					other perennial forbs	10	—	—
					alkali muhly	5	—	—
					clustered field sedge	5	—	—
					meadow barley	5	—	—
					Nebraska sedge	5	—	—
					other shrubs	5	—	—
					other perennial grasses	5	—	—
					saltmarsh alkaligrass	5	—	—
					weeping alkaligrass	5	—	—

Rangeland and Forest Vegetation Classification, Productivity, and Plant Composition– Davis-Weber Area, Utah								
Map unit symbol and soil name	Ecological Site, Plant Association, or Habitat Type	Total dry-weight production			Characteristic rangeland or forest understory vegetation	Composition		
		Favorable year	Normal year	Unfavorable year		Rangeland	Forest understory	Forest understory
		Lb/ac	*Lb/ac*	*Lb/ac*		*Pct dry wt*	*Pct dry wt*	*Pct cover*
Wt—Woods Cross silty clay loam, drained, 0 to 3 percent slopes								
Woods Cross, drained	—	4,500	3,000	1,500	Nebraska sedge	40	—	—
					clustered field sedge	20	—	—
					Arctic rush	5	—	—
					Baltic rush	5	—	—
					other shrubs	5	—	—
					other perennial forbs	5	—	—
					other perennial grasses	5	—	—
					redtop	5	—	—
					woolly sedge	5	—	—

Data Source Information

Soil Survey Area: Davis-Weber Area, Utah
Survey Area Data: Version 6, Mar 3, 2011