

**PM<sub>10</sub> SIP/Maintenance Plan Evaluation Report:**  
**Central Valley Water Reclamation**

**Salt Lake County Nonattainment Area**

**Utah Division of Air Quality**

**Major New Source Review Section**

**October 1, 2015**

# PM<sub>10</sub> SIP/MAINTENANCE PLAN EVALUATION REPORT

## Central Valley Water Reclamation

### 1.0 Introduction

This evaluation report (report) provides Technical Support for Section IX, Part H.1 and Section IX, Part H.2 of the Utah Maintenance Plan (the Plan); to address the Salt Lake County PM<sub>10</sub> Nonattainment Area. This document specifically serves as an evaluation of Central Valley Water Reclamation.

Note on document identification: The intention of the Utah Division of Air Quality is to develop a Maintenance Plan to address PM<sub>10</sub>. As part of this effort, SIP Subsections IX.H.1 Emission Limits and Operating Practices – General Requirements, IX.H.2 Source-Specific Particulate Emission Limitations in Salt Lake and Davis Counties and IX.H.3 Source-Specific Particulate Emission Limitations for Utah County will be repealed and replaced. Subsection IX.H.4 will be repealed and replaced with Interim Emission Limits and Operating Practices. This subsection provides interim limits, consistent with the limits codified in the PM<sub>2.5</sub> SIP, until future controls have been implemented within timeframes identified in Section IX Part H.2.

This evaluation report references the SIP version originally dated June 28, 1991 and made effective by EPA on August 8, 1994. This SIP version is often referred to as the “original SIP.” Additional SIP revisions were adopted by the Air Quality Board on July 6, 2005 and became state law on August 1, 2005. However, this version of the SIP was not adopted by EPA and therefore never became federal law. In order to distinguish between the various documents in this report, the following coding scheme will be used:

- Since Section IX.H of the 2005 State-only SIP will be repealed entirely, there is no need to refer to that document version within this report.
- When referencing the original SIP with an effective date of August 8, 1994 the qualifier <sup>{OS}</sup> will follow any citation from that document.
- When referencing any new Maintenance Plan/SIP condition or requirement, the citation will be left blank.

Therefore, a particular sentence of this document might read as follows:

*SIP Subsection IX.H.1.c – Stack Testing supersedes 2.a.A<sup>{OS}</sup> from the original SIP.*

### 2.0 Facility Identification

*Name:* Central Valley Water Reclamation Facility

*Address:* 800 West Central Valley Road, Salt Lake City, Utah, Salt Lake County

*Owner/Operator:* Central Valley Water Reclamation

*UTM coordinates:* 422,600 Easting 4,506,500 Northing Zone 12

### 3.0 Facility Process Summary

Central Valley Water Reclamation Facility (CVWRF) is a municipal wastewater treatment facility located in Salt Lake City. The primary SIC Code for the facility is 4952-Sewage Systems.

The facility operates under Utah DAQ AO DAQE-AN0104140011-09, dated August 18, 2009. The facility is subject to 40 CFR 60 Subparts A-General Provisions and Subpart IIII regulations – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. Additionally, Title V of the 1990 Clean Air Act applies to this facility. CVWRF is a major source for NO<sub>x</sub> and CO.

### 4.0 Facility Criteria Air Pollutant Emissions Sources

The facility consists of the following emission sources

- Five (5) Waukesha Engine Generators (3-1340 kW and 2-1150 kW)
- One (1) Water-wash Paint Spray Booth
- Four (4) Emergency generators (1186 hp, 2-896 hp, 349 hp)
- Digesters
- Biological Process
- Two (2) Digester Flares
- Composting

### 5.0 Facility 2011 Baseline Actual Emissions and Current PTE

CVWRF actual emissions are lower than its Potential to Emit for all pollutants.

**Table 1: Comparison of Actual and Potential Emissions**

Pollutant	Actual Emissions (Tons/Year) <sup>1</sup>	Potential to Emit (Tons/Year) <sup>2</sup>
PM <sub>10</sub>	1.75	2.23
SO <sub>2</sub>	0.58	5.09
NO <sub>x</sub>	25.79	150.00

<sup>1</sup> CVWRF's 2011 actual emissions

<sup>2</sup> PTE's for CVWRF's AO issued DAQE-AN0104140011-09, dated August 18, 2009

## 6.0 Projected Emissions for 2019

The 2019 projected emissions were estimated from the actual emissions inventory submitted for 2011 and emissions from composting, emergency generator engines, and two flares.

**Table 3: 2019 Projected Emission Values or Modeled Emission Values**

Pollutant	Potential to Emit (Tons/Year)
PM <sub>10</sub>	1.83
SO <sub>2</sub>	0.61
NO <sub>x</sub>	29.28

## 7.0 Comparison of Requirements – Original SIP and New Maintenance Plan

CVWRF is a previously listed SIP source. In the original PM<sub>10</sub> SIP document for Salt Lake County<sup>{OS}</sup>. Requirements for CVWRF are found in IX.2.2.E<sup>{OS}</sup>.

Although a specific application of new RACT is not a requirement of the maintenance plan, the limitations found within this maintenance plan are based on the most recent PM<sub>2.5</sub> Section of the SIP. This section of the SIP required the application of RACT above and beyond the existing controls already required of most listed PM<sub>10</sub> SIP sources. The conditions, requirements and emission limitations contained within this maintenance plan are based on those in Sections IX.H.11, IX.H.12 and IX.H.13 – which comprise the PM<sub>2.5</sub> sections of the SIP, and include this additional RACT application. All requirements from the original PM<sub>10</sub> SIP that have not been superseded or replaced, and which are still necessary, will also be retained. By necessary, meaning: needed in the demonstration of attainment of the 24-hour standard, or in demonstrating that no backsliding in the application of RACT has taken place.

All limits in this maintenance plan are based on the limits in the PM<sub>2.5</sub> SIP; either in the general requirements of subsection IX.H.11 or the source specific requirements of IX.H.12.k. Therefore, a comparison between the original SIP requirements, and those found in this new maintenance plan can be found below.

### 7.1 SIP General Requirements

The following is a list of the requirements from the Salt Lake County<sup>{OS}</sup> SIP and a discussion of each of the requirement including current relevance and expected changes.

#### IX.H.2.a General Requirements<sup>{OS}</sup>

The original SIP was a divided document, having two separate sets of General Requirements. The requirements found at IX.H.1.a<sup>{OS}</sup> applied to the listed sources found in Utah County, while those found at IX.H.2.a<sup>{OS}</sup> applied to the listed sources found in Salt Lake and Davis County.

2.a.A. Stack Testing<sup>{OS}</sup> – this subsection covered the general methods and procedures for conducting stack testing, including the establishment of a pretest protocol, pretest conference, and the use of specific EPA test methods. This subsection has since been updated and superseded by SIP subsection IX.H.1.e which incorporates equivalent language.

2.a.B. Visible Emissions<sup>{OS}</sup> – covered the establishment of designated opacity limitations for specified process units and/or process equipment. This subsection has since been superseded by SIP subsection IX.H.1.f which incorporates equivalent language.

2.a.C. Visible Emissions (cont.)<sup>{OS}</sup> – covered the procedure by which visible emission observations would be conducted. This subsection has since been superseded by SIP subsection IX.H.1.f which serves incorporates equivalent language.

2.a.D. Annual Emission Limitations<sup>{OS}</sup> – established that annual emissions would be determined on a rolling 12-month basis, and that a new 12 month emission total would be calculated on the first day of each month using the previous 12 months data. This subsection is no longer needed as the annual PM<sub>10</sub> standard no longer exists, and no source-specific annual SIP Caps appear in either IX.H.2 or IX.H.3 of the new maintenance plan.

2.a.E. Recordkeeping Requirements<sup>{OS}</sup> – established that records need to be kept for all periods that the plant is in operation, for a period of at least two years, and provided upon request. This subsection has since been superseded by SIP subsection IX.H.1.c which incorporates equivalent language.

2.a.F. Approval Orders (AOs)<sup>{OS}</sup> – established that this subsection of the SIP superseded any previously issued AOs. No longer applicable, as this subsection of the SIP will be superseded, and no previously issued AOs are still in existence.

2.a.G. Proper Maintenance<sup>{OS}</sup> – established that all facilities need to be adequately and properly maintained. The requirement is not needed, as this is inherent in the NSR permitting program, under R307-401-4(1).

2.a.H. Future Modifications<sup>{OS}</sup> – established that future modifications to the approved facilities were also subject to the NSR permitting requirements. The requirement is not needed, as this is inherent in the NSR permitting program, under R307-401-3(1)(b).

2.a.I. Unpaved Operational Areas<sup>{OS}</sup> – established rules for treating fugitive dust with water sprays or chemical dust suppression. This requirement has been superseded by the nonattainment area fugitive dust control requirements of R307-309.

2.a.J. Actual Emissions<sup>{OS}</sup> – established that the actual emissions included for each listed source in subsection IX.H.2.b would not be used for compliance purposes. This subsection is no longer needed as a listing of individual source actual emissions are no longer included in the requirements of subsection IX.H of the SIP.

2.a.K. Test if Directed<sup>{OS}</sup> – established a definition of this term. No longer needed as this term is no longer used and the condition itself no longer applies. UDAQ has a minimum test frequency established under R307-165-2. This same rule also allows for (and requires) any additional testing to demonstrate compliance status as deemed necessary by the Director.

2.a.L. Definitions<sup>{OS}</sup> – established that the definitions contained in R307 apply to Section IX.H.2. This subsection has since been superseded by SIP subsection IX.H.1.b which incorporates equivalent language.

2.a.N. Specific Fuel Requirements for Coal and/or Oil<sup>{OS}</sup> – established that specific rules for the sulfur content of these fuels also existed and applied. This subsection has since been superseded by the individual source requirements found in IX.H.2 and IX.H.3 (see specifically the sources Kennecott and BYU). This requirement is now largely irrelevant as few sources have the ability or authority to burn coal, and the rules on the sulfur content of fuel oil have been updated with lower sulfur requirements – specifically the requirements on the sulfur content allowed in diesel fuel found under 40 CFR 80.510(c) for off-highway diesel and 40 CFR 80.520(a) for on-highway diesel. None of the listed sources have the ability to burn any other fuel oils

## **7.2 SIP Source Specific Requirements**

The requirements and limits specific to CVWRF were extensive and will not be added to this document. Rather a summary of the requirements and highlights of the requirements will be discussed.

The equipment list included one (1) 1135 kW generator engine set and four (4) 625 kW generator engine set. The new 1135 kW generator engine set to be installed was to achieve a reduction in NO<sub>x</sub> emissions with a clean burn configuration. NO<sub>x</sub> and CO emissions rates and concentrations were given for the 1135 kW generator engine set.

In addition to the equipment list and emission rates, compliance was determined by submitting a quarterly report with the measured oxygen, CO and NO<sub>x</sub> concentrations in the exhaust stream prior to passing and after passing through the catalyst. The concentrations were measured with a portable meter on a monthly basis.

The Original SIP<sup>{OS}</sup> limited CVWRF to the use of natural gas or digester gas to fuel the engines. Finally, the engine use was limited to 13.35 X 10<sup>3</sup> MW-hr/yr for the uncontrolled engines and 5.475 MW-hr/yr for the engine burning natural gas with the catalytic converter.

The NO<sub>x</sub> emissions since the 1994 SIP have decreased from 203.7 to 150 tons per year with the removal of the one (1) 1135 kW and four (4) 625 kW generator engine sets and the addition of three (3) 1340 kW and two (2) 1150 kW generator engines sets. The entire SIP for CVWRF needs to be updated to the equipment that is currently installed.

### 7.3 New Maintenance Plan – General Requirements

The general requirements for all listed sources are found in SIP Subsection IX.H.1. These serve as a means of consolidating all commonly used and often repeated requirements into a central location for consistency and ease of reference. As specifically stated in subsection IX.H.1.a below, these general requirements apply to all sources subsequently listed in either IX.H.2 (Salt Lake County) or IX.H.3 (Utah County), and are in addition to (and in most cases supplemental to) any source-specific requirements found within those two subsections.

IX.H.1.a. This paragraph states that the terms and conditions of Subsection IX.H.1 apply to all sources subsequently addressed in the following subsections IX.H.2 and IX.H.3. It also clarifies that should any inconsistency exist between the general requirements and the source specific requirements, then the source specific requirements take precedence.

IX.H.1.b States that the definitions found in State Rule 307-101-2, Definitions, apply to SIP Section IX.H. Since this is stated for the Section (IX.H), it applies equally to IX.H.1, IX.H.2 and IX.H.3.

IX.H.1.c This is a recordkeeping provision. Information used to determine compliance shall be recorded for all periods the source is in operation, maintained for a minimum period of five (5) years, and made available to the Director upon request. As the general recordkeeping requirement of Section IX.H, it will often be referred to and/or discussed as part of the compliance demonstration provisions for other general or source specific conditions.

IX.H.1.d Statement that emission limitations apply at all times that the source or emitting unit is in operation, unless otherwise specified in the source specific conditions listed in IX.H.2 or IX.H.3.

This is the definitive statement that emission limits apply at all times – including periods of startup or shutdown. It may be that specific sources have separate defined limits that apply during alternate operating periods (such as during startup or shutdown), and these limits will be defined in the source specific conditions of either IX.H.2 or IX.H.3.

Conditions 1.a, 1.b and 1.d are declaratory statements, and have little in the way of compliance provisions. Rather, they define the framework of the other SIP conditions. As condition 1.c is the primary recordkeeping requirement, it shall be further discussed under item 4.2 below.

IX.H.1.e This is the main stack testing condition, and outlines the specific requirements for demonstrating compliance through stack testing. Several subsections detailing Sample Location, Volumetric Flow Rate, Calculation Methodologies and Stack Test

Protocols are all included – as well as those which list the specific accepted test methods for each emitted pollutant species (PM<sub>10</sub>, NO<sub>x</sub>, or SO<sub>2</sub>). Finally, this subsection also discusses the need to test at an acceptable production rate, and that production is limited to a set ratio of the tested rate.

These stack testing requirements supersede those found in IX.H.1.a.A<sup>{OS}</sup> and IX.H.2.a.A<sup>{OS}</sup> of the original SIP.

IX.H.1.f This condition covers the use of CEMs and opacity monitoring. While it specifically details the rules governing the use of continuous monitors (both emission monitors and opacity monitors), it also covers visible opacity observations through the use of EPA reference method 9.

These requirements specifically supersede those found in IX.H.1.a.C<sup>{OS}</sup> and IX.H.2.a.C<sup>{OS}</sup> of the original SIP. The original SIP requirements of IX.H.1.a.B<sup>{OS}</sup> and IX.H.2.a.B<sup>{OS}</sup>, both of which addressed individual equipment opacity, will be superseded as necessary by the particular source specific limitations found in IX.H.2 or IX.H.3.

Both conditions 1.e and 1.f serve as the mechanism through which sources conduct monitoring for the verification of compliance with a particular emission limitation.

#### **7.4 New Maintenance Plan – Central Valley Specific Requirements**

IX.H.2. c Central Valley Water Reclamation Facility: Wastewater Treatment Plant

i NO<sub>x</sub> emissions from the operation of all engines at the plant shall not exceed 0.648 tons per day.

ii. Compliance with the emission limitation shall be determined by summing the emissions from all the engines. Emission from each engine shall be calculated from the following equation:

$$\text{Emissions (tons/day)} = (\text{Power production in kW-hrs/day}) \times (\text{Emission factor in grams/kW-hr}) \times (1 \text{ lb}/453.59 \text{ g}) \times (1 \text{ ton}/2000 \text{ lbs})$$

A. The NO<sub>x</sub> emission factor for each engine shall be derived from the most recent stack test. Stack tests shall be performed in accordance with IX.H.1.e. Each engine shall be tested at least every three years from the previous test.

B. NO<sub>x</sub> emissions shall be calculated on a daily basis.

C. A day is equivalent to the time period from midnight to the following midnight.

- D. The number of kilowatt hours generated by each engine shall be determined by examination of electrical meters, which shall record electricity production on a continuous basis.

Discussion – The SIP has been updated with new emission limits to correspond to equipment with lower emission rates. Central Valley Water reclamation is limited to 0.648 tons per day of NO<sub>x</sub> with stack testing every three years to verify emission factors. Stack testing has already been completed and emission factors determined from this sampling will be used in place of an initial stack test. The condition also includes the definition of a day as being from midnight until the following midnight.

### **8.0 Monitoring, Recordkeeping and Reporting**

Compliance monitoring of the limits is given in IX.H.2.e.i.c. CVWRF monitors its compliance with daily limits through examination of power generation records and emission factors measured by stack testing. Stack testing occurs at least every three years per engine.

All common recordkeeping and reporting provisions have been consolidated under IX.H.1.c.

### **9.0 Discussion of Attainment Demonstration**

The general requirements act as a framework that the other requirements can build. Second, they demonstrate a prevention of backsliding. Through the use of general requirements that are either the same as or functionally equivalent to those in the 1994 Original SIP, backsliding has been prevented. Finally, when a general requirement has been removed, careful consideration was given as to its specific need, and whether its retention would in any way aid in the demonstration of attainment with the 24-hr standard. If no argument could be made in that regard, the requirement was simply removed.

Source specific limits are equivalent to or more restrictive than the requirements from the 1994 Original SIP. NO<sub>x</sub> emissions have decreased since the 1994 SIP and more efficient engines have been installed. Further, a daily emission cap has been set for CVWRF.

### **10.0 Implementation Schedule**

The requirements imposed on the CVWRF are effective immediately. It did not have any required RACT modifications to undertake from the PM<sub>2.5</sub> SIP RACT requirements. Therefore, the daily emission limits in IX.H.3.g can be applied immediately. Similarly, the general requirements, IX.H.1.a-f, can also be applied immediately.

## 11.0 Daily Emissions

**Table 4: Yearly Emission Estimates and Potential Daily Emissions**

All values in tons	Original SIP NO <sub>x</sub>	NO <sub>x</sub>
Annual Emissions	203.70 <sup>OS}</sup>	150.00 <sup>**</sup>
Daily (24-hr)	0.56 <sup>*</sup>	0.648 <sup>***</sup>

\* Assumes NO<sub>x</sub> annual emission estimates divided by 365 days per year.

\*\* PTE from AO DAQE-AN0104140011-09, dated August 18, 2009

\*\*\* PM<sub>10</sub> SIP Limit

## 12.0 References

**PM<sub>10</sub> SIP/Maintenance Plan Evaluation Report:**  
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**Supporting Information**