MODULE IV - GROUNDWATER MONITORING

IV.A. APPLICABILITY AND GENERAL CONDITIONS

IV.A.1. The Permittee shall monitor groundwater in the uppermost aquifer, as described in Attachment 1 and as described below, in a manner that will monitor the release of hazardous constituents from the RWMA and the LWMA in compliance with R315-8-6, Groundwater Protection, and R315-101, Cleanup Action and Risk-Based Closure Standards, of the Utah Admin. Code and as defined by the conditions of this permit.

IV.A.2. Solid waste management units (SWMUs) including operating groundwater recovery systems (i.e. Northwest Tank Farm and Southwest Plume) or other systems constructed to recover groundwater from the Groundwater Waste Management Area (GWMA) may be subject to provisions of this Module. The Director shall determine which SWMUs are subject to some or all of the provisions of this Module. The Permittee shall comply with the provisions of R315-8-6.12 and R315-101 of the Utah Admin. Code.

IV.A.3. The Permittee shall follow all of the provisions as defined by the conditions of this permit. For the purposes of this permit, groundwater protection shall apply to the RWMA, the GWMA, and the LWMA.

IV.A.4. The Area of Compliance is defined as the monitoring wells located within the impacted aquifer.

IV.A.5. The monitoring wells for each Area of Compliance are listed in Attachment 1, Table 3-1. The locations of the monitoring wells are depicted on Figures 3-1 through 3-5 of Attachment 1.

IV.A.6. The Permittee shall annually evaluate the groundwater monitoring systems, including the number, location, depth, and integrity of monitoring wells, to ensure that all requirements of R315-8-6.8 and R315-101 of the Utah Admin. Code are met. The Permittee may need to add monitoring wells or modify the groundwater monitoring system in accordance with Condition IV.F.6.

IV.B. POST-CLOSURE GROUNDWATER MONITORING AT THE RWMA HAZARDOUS WASTE LANDFILL

IV.B.1. The Point of Compliance for the RWMA is a vertical surface located at the hydraulically downgradient boundary of the RWMA landfill cell. The compliance point monitoring wells are listed in Condition IV.B.2. The maps showing the location of the compliance monitoring wells for the RWMA are provided in this Module as Figure IV-1 and as Figures 3-1 and 3-2 in Attachment 1. All maps shall be updated if any well locations change in accordance with Condition I.D.2.

IV.B.2. Monitoring well RWMA-1 shall be considered hydraulically up-gradient of the RWMA and shall serve as the background water quality and monitoring point. Monitoring wells RWMA-2A and 3 shall serve as compliance point monitoring wells along the western boundary of the RWMA. RWMA-4 shall serve as the compliance point monitoring well along the southern boundary of the RWMA.

IV.B.3. The Permittee shall evaluate the groundwater monitoring systems including the number, location, depth, and integrity of the monitoring wells annually to ensure that all requirements of R315-8-6.8 and R315-101 of the Utah Admin. Code are met. The Permittee may need to add monitoring wells or modify the groundwater monitoring system in accordance with Condition IV.F.6.

IV.C. GROUNDWATER MONITORING AT THE LWMA AND THE GWMA,

IV.C.1 The Permittee shall monitor groundwater in the uppermost aquifer, and lower aquifer if the upper aquifer is perched, as described in Attachment 1 and below, in a manner that will monitor for a release of hazardous constituents from each of the waste management areas detailed in this section.

IV.C.2 The LWMA - Monitoring Well LWMA-1 shall be considered hydraulically up-gradient of the LWMA and shall serve as the background water quality monitoring point. Monitoring wells LWMA-2 and 3 shall serve as compliance point monitoring wells along the western boundary of the LWMA. LWMA-4 shall serve as the compliance point monitoring wells for the southern boundary of the LWMA. These wells shall be sampled in accordance with the conditions and guidelines in this Module. The LWMA monitoring well system identifying each well location is presented on Figure IV-1 in this Module and on Figures 3.2-1 and 3.2-2 in Attachment 1.

IV.C.3. The GWMA - Monitoring wells S-4A, S-35 and S-5 shall be considered hydraulically upgradient and shall serve as the background water quality monitoring points. Monitoring wells S-1, S-24 and PCP-1 through PCP-5 shall be considered as hydraulically downgradient monitoring wells. The GWMA wells shall be sampled in accordance with the conditions and guidelines in this Module. The downgradient well locations shall be considered as the point of compliance to properly monitor for a release of hazardous constituents that are protective of potential off-site migration.

IV.C.3.a. The Northwest Tank Farm (NWTF) Groundwater Recovery System and all of its monitoring points shall be considered part of the GWMA and will be subject to the same monitoring and reporting requirements as the GWMA. The boundary of the NWTF Groundwater Recovery System is shown on Figure IV-1.

IV.C.3.b. The Southwest Plume (SW Plume) Groundwater Recovery System and all of its monitoring points shall be considered part of the GWMA and will be subject to the same monitoring and reporting requirements as the GWMA. The boundary of the SW Plume area is shown on Figure IV-1.

IV.C.5 The Permittee shall evaluate the groundwater monitoring systems including the number, location, depth, and integrity of monitoring wells annually to ensure that all requirements of R315-8-6.8 and R315-101 of the Utah Admin. Code are met. The Permittee may need to add monitoring wells in accordance with Condition IV.F.6.

IV.D. REQUIRED PROGRAM

IV.D.1 In accordance withR315-8-6.8 of the Utah Admin. Code, the Permittee shall install and maintain a groundwater monitoring system as specified below:

IV.D.1.a. Construction and maintenance of all monitoring wells shall be in accordance with the Technical Enforcement Guidance Document, 1986, or the most recent edition, and Attachment 1 of the Permit; and

IV.D.1.b. All monitoring wells abandoned and no longer in use with respect to the monitoring program shall be plugged and abandoned in accordance with the well plugging and abandonment section of the most recent Administrative Rules for Water Well Driller's, Division of Water Rights, R655-4-414 .Well plugging and abandonment methods and verification shall be submitted to the Director within

sixty (60) days from the date the monitoring wells are removed from the monitoring program.

IV.D.2. As indicated by R315-8-7 of the Utah Admin. Code, the post-closure care period for the RWMA and the LWMA is 30 years from the September 2, 1997, the effective date of this permit. If the groundwater protection standard in Condition IV.E is exceeded after 30 years, the Permittee shall continue corrective action as specified in Condition V.B.

IV.E. INDICATOR PARAMETERS AND CONSTITUENTS

IV.E.1. The Permittee shall sample RWMA monitoring wells RWMA-1 through RWMA-4, LWMA monitoring wells LWMA-1 through 4, and all GWMA monitoring wells as described in Attachment 1. Samples will be analyzed for the parameters and constituents identified on Tables IV-2 and IV-2A as detailed below.

IV.E.1.a. As shown on Table IV-1, on a five-year cycle that coincides with the Permit review and renewal periods, samples from the RWMA, the LWMA and the GWMA shall be analyzed for the parameters and constituents listed in Table IV-2.

IV.E.1.b. The Permitee may be required to continue the groundwater monitoring beyond the year listed in Table IV-1 as required by the Director.

IV.E.1.c. During the four-year period between the Permit review and renewal, samples from the same monitoring wells described in Condition IV.E.1.a shall be analyzed for the parameters and constituents listed in Table IV-2A, and any constituents detected in accordance with Condition IV.E.1.a.

IV.E.2. The Permittee shall sample groundwater for the required parameters or constituents using the analytical methods listed in Tables IV- 2 and IV-2A. Other than the use of an equivalent, updated method, if an alternate test method is to be proposed for use, the procedures in Condition I.F.13.b shall be followed. The Permittee shall also follow procedures specified in Condition I.D.2 for permit modifications.

TABLE IV-1 SAMPLE DATES AND RESPECTIVE ANALYTE LIST

YEAR	TABLE IV-2 FULL ANALYTE LIST	TABLE IV-2A REDUCED ANALYTE LIST
2013		X
2014		X
2015		X
2016		X
2017	X	
2018		X
2019		X
2020		X
2021		X
2022	X	
2023		X
2024		X
2025		X
2026		X
2027	X	

Table IV-2
GROUNDWATER MONITORING PARAMETERS AND CONSTITUENTS
(Full Analyte List To be Used During the Five-Year Permit Review and Renewal Intervals)

Parameter or Constituent	Test Method[a]	Reporting Limit (µg/l) ppb
General Parameters		
Calcium	3010A/6010C	100
Magnesium	3010A/6010C	100
Potassium	3010A/6010C	300
Sodium	3010A/6010C	300
Sulfate	300.0	100,000
Chloride	300.0	5,000
Alkalinity	310.1	2,000
Nitrate + Nitrite as N	300.0	80
Fluoride	300.0	500
Sulfide	376.1	10,000
pH	SM 4500	Report Measured Value
Specific Conductance	120.1	Report Measured Value
Total Dissolved Solids	160.1	3000
RCRA Metals - Analyzed by EPA SW-846 Method 6010C		
Antimony	200.7 or 3010A/6010C	6.0
Arsenic	200.7 or 3010A/6010C	10
Barium	200.7 or 3010A/6010C	20
Beryllium	200.7 or 3010A/6010C	4.0
Cadmium	200.7 or 3010A/6010C	5.0
Chromium	200.7 or 3010A/6010C	100
Lead	200.7 or 3010A/6010C	15
Mercury	200.7 or 3010A/6010C	2.0
Nickel	200.7 or 3010A/6010C	50
Selenium	200.7 or 3010A/6010C	10
Silver	200.7 or 3010A/6010C	50
Volatile Organics - (40 CFR §264 Appendix IX Analyte List) Analyzed by EPA SW-846 Method 8260Cor the most recent method, with ranges of hydrocarbon fractionation as specified by the Director.		
Semi-Volatile Organics – (40 CFR §264 Appendix IX Analyte List) Analyzed by EPA SW-846, Methods 3510C, Method 8270D, or the most recent method, with ranges of hydrocarbon fractionation as specified by the Director.		

[a] - The Permittee shall use the most current, equivalent EPA method (I.F.13b).

[b] - Both the Method Detection Limit (MDL) and Method Reporting Limit (MRL) will be provided in the data report with unit of μg/L unless noted. Data will be qualified between the Method Detection Limit (MDL) and Reporting limit (RL). The reporting limit must be below the regulatory limit.

Table IV-2A
GROUNDWATER MONITORING PARAMETERS AND CONSTITUENTS
(Short Analyte List To Be Used During the Four-Years Between Permit Renewal and Review Periods)

Parameter or Constituent	Test Method[a]	Reporting Limits
Metals		
Arsenic	200.7 or 3010A/6010C	10
Cadmium	200.7 or 3010A/6010C	5
Chromium	200.7 or 3010A/6010C	50
Lead	200.7 or 3010A/6010C	15
Volatile Organics		
Benzene	8260C	5
Ethylbenzene	8260C	5
Toluene	8260C	5
Total Xylenes	8260C	5
TPH-GRO (C6-C10)	8260C	250
TPH-DRO[c] (C10-C28)	8015D modified	500
TPH-ORO[c] (C28-C40)	8015D modified	500

[a] - The Permittee shall use the most current, equivalent EPA method (I.F.13b).
[b] - Both the Method Detection Limit (MDL) and Method Reporting Limit (MRL) will be provided in the data report with unit of μg/L unless noted. Data will be qualified between the Method Detection Limit (MDL) and Reporting limit (RL). The reporting limit must be below the regulatory limit.
[c] - Analysis using both with and without Silica Gel Treatment for initial three years, starting 2014.

IV.E.3. For those parameters and constituents in Condition IV.E.2. for which no concentration limit is established at the time the Permit is issued, the Permittee shall establish background values in accordance with R315-8-6.8(g) of the Utah Admin. Code. Background water quality is defined as the groundwater quality immediately upgradient and within the RWMA boundary at the time the project was completed. The use of background water quality upgradient of the Chevron property is not relevant in this permit because the RWMA, itself, lies within the operating area of the Facility and is therefore not surrounded by soil and groundwater that are representative of naturally occurring, non-impacted conditions. The RWMA, along with the entire facility, falls within the GWMA, whichis subject to separate groundwater monitoring.

IV.F. GROUNDWATER MONITORING REQUIREMENTS

IV.F.1. All monitoring wells shall be constructed in accordance with the provisions in Condition IV.E.1.a.

IV.F.2. The groundwater monitoring program shall include sampling and analysis procedures defined in R315-8-6.8(d) and (e) of the Utah Admin. Code. Any modifications shall be submitted to the Director for review and approval in accordance with Condition I.D.2.

IV.F.3. The Permittee shall follow the requirements of R315-8-6.8 (f) of the Utah Admin. Code for measurement of the groundwater surface elevation.

IV.F.4. If the Director receives information indicating that the surveyed well apron elevations of the wells in the groundwater system(s) as specified in Condition IV.A. and Attachment 1 are inadequate, the Director shall require the Permittee to resurvey any or all of these well apron elevations.

IV.F.5. The Permittee shall notify the Director in writing at least fifteen (15) working days prior to any sampling event required under this permit.

IV.F.6. The Permittee may add new monitoring wells as part of the monitoring well system only upon approval or request of the Director. Changes to the monitoring well system shall constitute a permit modification (except when replacing damaged monitoring wells already identified in the permit). The Permittee shall follow the procedures specified in Condition I.D.2 for modification of the permit.

IV.F.7. The Permittee must at all times maintain a monitoring well system as specified in Condition IV.A. These compliance point monitoring wells may not be removed from the monitoring well system without submitting a permit modification as outlined in Condition I.D.2.

IV.F.8. The Permittee shall properly dispose of contaminated groundwater generated during groundwater monitoring well sampling and during the development of any new monitoring well. Purge and development water shall be placed into labeled drums and disposed of as outlined in Attachment 1.

IV.F.9. The Permittee shall monitor and sample all groundwater monitoring wells for the presence of hazardous constituents identified in Condition IV.E. The

monitoring wells shall be sampled at a frequency and in a manner consistent with Conditions IV.E and IV.H.2.

IV.F.10. The Permittee shall locate, install, construct, and maintain new groundwater monitoring wells as specified in the Technical Enforcement Guidance Document (TEGD), OSWER-9950.1, September 1986, or the most recent version. All monitoring wells shall be cased in a manner that maintains the integrity of the monitoring well bore hole. The casing shall be screened, slotted or perforated and packed with gravel or sand where necessary, to enable collection of accurate groundwater samples. The annular space above the sand pack must be sealed to the surface to prevent the potential for a contamination pathway from surface sources. For each monitoring well, the Permittee shall prepare a geologic and monitoring well completion log. The Permittee shall survey and record on the log the top of casing elevation for each monitoring well as it is installed. This elevation shall become the reference for determining the groundwater surface elevation at each respective monitoring well. The Salt Lake Refinery plant grid (Public Land System) shall be the basis for horizontal coordinates with elevations tied to 1927 North American Datum (NAD 27).

IV.F.11. monitoring wellmonitoring wellThe Permittee shall follow the procedures specified in Condition I.D.2 for permit modifications when constructing new monitoring wells.

IV.F.12. Additional groundwater monitoring wells shall be installed if subsurface conditions significantly change after permit issuance. Such changes may include, but are not limited to, water level elevation or apparent flow direction changes, or detection of one of the hazardous constituents in a monitoring well. If hazardous waste constituents exceeding the groundwater protection standard concentration limits, as defined in Condition IV.E, are detected in the furthermost hydraulically downgradient monitoring well, the Permittee shall install additional groundwater monitoring wells further downgradient.

IV.F.13. Upon written notification by the Director or as a result of a compliance action, the Permittee may be required to install and sample additional monitoring wells at any time during the post-closure or compliance period if new information or unforeseen circumstances reveal a need for additional monitoring to protect human health and the environment.

IV.F.14. The Permittee shall submit monitoring well completion reports which include boring logs, all analytical tests performed on soils, water level elevations,

groundwater contour maps, monitoring well development results, cross-sections or fence diagrams as well as all other data, to be submitted within ninety (90) days after completion of the monitoring wells.

IV.F.15. The existing monitoring wells shall be maintained in a fully operational condition for the duration of this permit. The Permittee shall notify the Director within seven (7) days when a monitoring well is no longer properly functioning or providing credible data. Causes for these problems could include, but are not limited to, the presence of sediment, cracked or damaged well casing, protective steel casing, damaged concrete apron, etc. monitoring well

IV.F.16. The Permittee shall measure and record the depth to the bottom of each RWMA, LWMA and GWMA groundwater monitoring well to the nearest one-tenth (0.1) feet in accordance with the full analyte list in Table IV-1. If a problem with the monitoring well is discovered, the Permittee shall follow the procedures described in Condition IV.F.15 regarding notification and corrective procedures.

IV.F.17. The Director shall approve the permanent removal of any monitoring well listed in Conditions IV.A.4 and IV.A.3 as well as in Attachment 1, monitoring wellin accordance with Condition I.D.2.

IV.F.18. The Permittee shall use the following techniques and procedures when obtaining samples and analyzing samples to ensure reliable monitoring results from the groundwater monitoring wells as required in R315-8-6.8(d) of the Utah Admin. Code:

IV.F.18.a. Collect samples from all monitoring wells in the order and by the techniques described in the Water Data Collection Quality Assurance Plan provided as Attachment 1.

IV.F.18.b. Preserve all samples in accordance with theapplicable EPA Method. Transport all samples under chain-of-custody to the analytical laboratory in accordance with the approved Water Data Collection Quality Assurance Plan in Attachment 1; and

IV.F.18.c. Analyze all samples in accordance with test methods identified in Condition IV.E, Tables IV-2 or IV-2A.

IV.F.18.d. Establish and implement for each sampling event under the groundwater monitoring program, a Level 2 QA Quality Assurance and Quality Control (QA/QC) procedure in accordance with the approved Water Data Collection Quality Assurance Plan in Attachment 1.

IV.F.19. The Director may request at any time all laboratory QA/QC documentation and supporting data on any sampling event. The Permittee shall retain raw organics data for required sampling and analysis, including organics gas chromatographic printouts, mass spectral analyses, and QA/QC surrogate and spike results throughout the post-closure care period.

IV.F.20. In case of the loss of sample integrity (e.g., breakage, loss), re-sampling shall take place within seven days of notification of the loss and be conducted as outlined in Attachment 1.

IV.F.21. The Permittee shall determine the elevation of the groundwater surface at each monitoring well within seven (7) days prior to of the sampling of each monitoring well. Water levels shall be collected within twenty four (24) hours from measuring the first monitoring well to measuring the last monitoring well.

IV.G. STATISTICAL ANALYSIS OF GROUNDWATER DATA

IV.G.1. Within 60 days of completing the annual sampling of the wells at the LWMA and the RWMA, the Permittee shall evaluate groundwater data using the Mann-Kendall statistical method as described in Attachment 4. The Permittee may propose an alternative statistical method for approval by the Director.

IV.G.2. Trends will be determined using a two-sided 95% confidence level (alpha = 0.05).

IV.G.3. For closure procedures, statistical trend tests will use a one-sided 95% confidence level to evaluate the upper limit.

IV.G.4. If the number of groundwater monitoring events used to construct the Mann-Kendall trend statistic "S" is less than or equal to 22 for a given well, the exact critical values for the Mann-Kendall test shall be used. If the number of groundwater monitoring events is greater than 22 for a given well, the normal approximation to the Mann-Kendall "S" statistic shall be used.

IV.H. MONITORING PROGRAM AND DATA EVALUATION

IV.H.1. The Permittee shall collect, preserve, and analyze samples pursuant to Condition IV.F.18.

IV.H.2. The Permittee shall determine groundwater quality at each monitoring well at the compliance point annually during the post-closure care period of the RWMA, the LWMA, and the GWMA. The Permittee shall express the groundwater quality at each monitoring well in a form necessary for the determination of statistically significant increases in trends using the methods outlined in Condition IV.J.

IV.H.3. The Permittee shall determine and update annually the groundwater flow direction at the GWMA in the uppermost aquifer that incorporates the RWMA, the LWMA, and other SWMUs requiring groundwater monitoring as required by R315-8-6.9(e) of the Utah Admin. Code. This information shall be included in the annual report specified in Condition IV.K.3.

IV.H.4. During data analysis from each sampling event, the Permittee shall determine whether there is a statistically significant increase in the trend in each individual monitoring well for the parameters or constituents identified in Condition IV.E. In determining whether such an increase has occurred, the Permittee must compare the groundwater quality at each monitoring well specified in Condition IV.A. to the background value at each respective monitoring well using the method specified in Condition IV.G.3. An upward trend indicated by a single detection of a Table IV-2 parameter or constituent shall first be re-validated to confirm if there were sampling or laboratory errors that may have resulted in an invalid result. Depending on those findings, the following conditions shall apply:

IV.H.4.a. If errors are confirmed, or are suspected to have occurred in the lab or field, all related QA/QC information shall be reviewed to determine if an accurate value for the parameters or constituents in question can be obtained. If a new valuecan be obtained, it shall be incorporated into the same data set. If an upward trend is observed and if the data suggest that an exceedance of a Permit-listed parameter or constituent action level may develop before the next annual sampling event, the Permittee shall immediately resample the well. If the analysis demonstrates an upward trend, but the concentration is still well below this limit, the trend shall be monitored annually to develop a history compared to background.

IV.H.4.b. If a monitoring well is re-sampled, the new sample(s) shall be analyzed for those Table IV-2 parameters or constituents that are in question. The new sample results shall supersede the original sample results. If an exceedance appears likely before the next sampling event, the Permittee shall take appropriate action in accordance with Condition IV.J.

IV.H.5. The Permittee shall perform the evaluations described in Condition IV.H.4 within 60 days after completion of the original sampling event. If re-sampling is required pursuant to Condition IV.H.4.b, the Permittee shall notify the Director at least seven days prior to the planned re-sampling event. Additionally, the reporting schedule in Table IV-3 will be delayed by 60 days due to the additional sampling, analytical and data evaluation time involved in the re-sampling.

IV.I. DATA VALIDATION

IV.I.1. All groundwater samples and the quality control data collected from compliance monitoring wells during the Annual Groundwater Sampling event defined in this Module shall be subjected to a Level 2 Data Validation to assess the quality of the groundwater samples for use in technical reports and for decision making purposes. Data validation shall follow *the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, June 2009* and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data, January 2010, or the most recent editions*.

IV.J. SPECIAL REQUIREMENTS IF SIGNIFICANT INCREASES OCCUR IN VALUES FOR PARAMETERS OR CONSTITUENTS

IV.J.1. If the Permittee determines, pursuant to Condition IV.G., that there is a statistically significant increase above background values at the RWMA and LWMA for any of the Table IV-2 or Table IV-2A parameters or constituents specified in Condition IV.E, the Permittee shall:

IV.J.1.a. Notify the Director in writing within seven days;

IV.J.1.b. Within seven days after the written notification, sample the groundwater in all RWMA and LWMA wells and determine the concentration of all potential constituents identified in R315-50-14 of the Utah Admin. Code (40 CFR 264, Appendix IX), ; and

IV.J.1.c. Within 90 days, submit to the Director an application for a permit modification to establish a compliance monitoring program . The application shall include the following information:

IV.J.1.c.i. An identification of the concentration of all applicable Appendix IX constituents found in the groundwater at each monitoring well at the compliance point ;

IV.J.1.c.ii. Any proposed changes to the groundwater monitoring system at the facility necessary to meet the requirements of compliance monitoring as described in R315-8-6.10, of the Utah Admin. Code ;

IV.J.1.c.iii. Any proposed changes to the monitoring frequency, sampling and analysis procedures, or methods or statistical procedures used at the facility necessary to meet the requirements of R315-8-6.10 of the Utah Admin. Code;

IV.J.1.c.iv. For each hazardous constituent detected at the compliance point, a proposed concentration limit from existing background data under R315-8-6.10 (a)(1) or (2) or a notice of intent to seek an alternate concentration limit under R315-8-6.5(b) of the Utah Admin. Code.

IV.J.2. Within 180 days of the submission of alternate concentration limits for the hazardous constituents, the Permittee shall submit all data to support the alternate concentration limit proposed under R315-8-6.5(b) and a corrective action feasibility plan that meets the requirements of R315-8-6.11 of the Utah Admin. Code.

IV.J.3. If the Permittee determines, pursuant to Condition IV.H., using the Mann-Kendall Trend Analysis, or equivalent, that there is a statistically significant increase above RWMA and LWMA monitoring well background values for the parameters or constituents specified in Condition IV.E., the Permittee may demonstrate that a source other than a regulated unit caused the increase or that the increase resulted from an error in sampling, analysis, or evaluation. In such cases, the Permittee shall:

IV.J.3.a. Notify the Director in writing within seven days that he intends to make a demonstration;

IV.J.3.b. Within 90 days, submit a report to the Director which demonstrates that a source other than a regulated unit caused the increase, or that the increase resulted from an error in sampling, analysis, or evaluation ;

IV.J.3.c. Within 90 days, submit to the Director an application for a permit modification to make any appropriate changes to the detection monitoring program at the facility ;and

IV.J.3.d. Continue to monitor in accordance with the detection monitoring program at the facility.

IV.K. RECORD KEEPING AND REPORTING

IV.K.1. The Permittee shall enter all monitoring, testing, and analytical data obtained in accordance with Condition IV.F in the operating record. The data shall include all computations, calculated means and results of all statistical tests required by Condition IV.G.

IV.K.2. The established background values and the computations necessary to determine background values shall be submitted to the Director. A record of data and trends in each well for the relative constituents in Table IV-2 shall also be maintained.

IV.K.3. The Permittee shall submit the analytical results developed under Conditions IV.F.18 through 20 and evaluated in accordance with Conditions IV.G and IV.H. The Permittee shall submit the information in accordance with the following schedule:

TABLE IV-3
SCHEDULE OF COMPLIANCE

Annual Duration	Annual Sampling Event	Report Due Date to Director
January – December	July or August	October 31
January – December	Re-Sample Under Condition IV.H.4.	December 31

IV.L. DEVELOPMENT AND CALIBRATION OF FACILITY GROUNDWATER MODEL

IV.L.1. The Permittee shall develop and maintain a numerical groundwater flow model for the Facility.

IV.L.2. The Permittee shall develop and maintain a numerical, advective-dispersive-reactive, solute transport model for areas where releases of hazardous constituents to the groundwater have been detected. The transport model shall be based on the calibrated groundwater flow model and be contaminant(s) - specific.

IV.L.3. The Permittee shall submit a summary report with all electronic input and output files for the groundwater flow and contaminant transport modeling runs including the 2012 recalibration runs and new runs simulating the re-routed canal by December 31, 2014.

IV.L.4. The Permittee shall refine and recalibrate the groundwater flow and groundwater solute transport model every five years starting in 2017.

IV.L.5. The Permittee shall submit a report of the refining and recalibration effort required by Condition IV.M.4. to the Director for approval by December 1st of each five year cycle. The report shall describe refinements and recalibrations made to both groundwater flow and contaminant transport models. The Permittee shall include all electronic input and output files as appendices to the report.

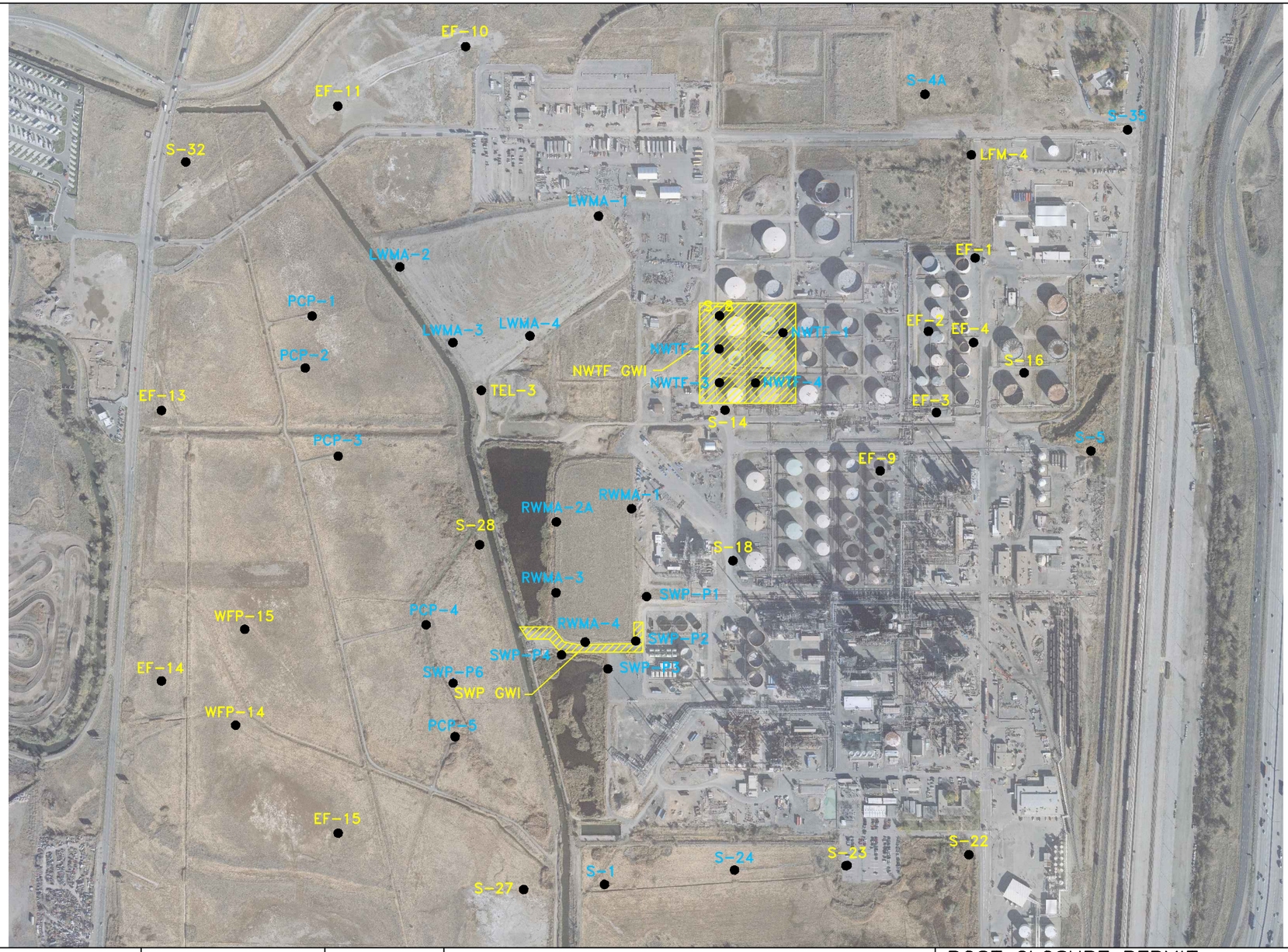
IV.L.6. The Permittee shall perform a one-time Monte Carlo-type uncertainty analysis of predictive simulations for contaminants based on the transient calibration of the groundwater flow model to be submitted with the 2017 annual report. A work plan outlining the scope and methods to be employed shall be submitted to the Director for approval by September 30, 2016.

IV.M. ASSURANCE OF COMPLIANCE

IV.M.1. The Permittee shall assure the Director that groundwater monitoring and corrective action measures necessary to achieve compliance with the groundwater protection standard under R315-8-6.3 of the Utah Admin. Code are taken during the term of the Permit.

IV.N. REQUEST FOR PERMIT MODIFICATION

IV.N.1. If the Permittee or the Director determines that the detection monitoring program no longer satisfies the requirements or intent of the regulations, the Permittee shall, within ninety (90) days of the determination, submit an application for a permit modification to make any appropriate changes to the program that will satisfy the regulations required to R315-8-6.9(h) of the Utah Admin. Code.



KEY

- ○ RWMA-1 COMPLIANCE MONITOR WELL
- ○ LFM-4 MONITOR WELL TO REMAIN IN PLACE
- GROUNDWATER RECOVERY SYSTEM MONITORED AS PART OF GWMA. WELL LOCATIONS TO BE DETERMINED

DR GW CH. GW
DR APP.
ENGR.
OPR'G. DEPT. APPROVED
ENG'R. DEPT.

EarthFax

Chevron Products Company
Salt Lake Refinery

SCALE 1" = 600' DATE 02-28-2013

POST CLOSURE PERMIT
MONITOR WELL NETWORK
SHOWING THE RWMA, LWMA AND GWMA WITH THE
NWTF AND SW PLUME RECOVERY SYSTEMS

C.C.
S.O.

FIGURE IV-1 DRAFT