CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2017-XXXX
FOR
CALIFORNIA DEPARTMENT OF CORRECTIONS AND REHABILITATION
DEUEL VOCATIONAL INSTITUTION
CLASS II SURFACE IMPOUNDMENTS
CONSTRUCTION, OPERATION, CLOSURE, AND CORRECTIVE ACTION
SAN JOAQUIN COUNTY

This monitoring and reporting program (MRP) is issued to California Department of Corrections and Rehabilitation (Discharger) pursuant to California Water Code section 13267 and incorporates requirements for groundwater, and unsaturated zone monitoring and reporting; facility monitoring, maintenance, and reporting; and financial assurances reporting contained in California Code of Regulations, title 27, section 20005, et seq. (hereafter Title 27), Waste Discharge Requirements (WDRs) Order R5-2017-XXXX, and the Standard Provisions and Reporting Requirements dated April 2016 (SPRRs). Compliance with this MRP is ordered by the WDRs and the Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Central Valley Water Board or the Executive Officer. Failure to comply with this MRP, or with the SPRRs, constitutes noncompliance with the WDRs and with Water Code Section 13267, which can result in the imposition of civil monetary liability.

A. MONITORING

The Discharger shall comply with the detection monitoring program provisions of Title 27 for groundwater, and the unsaturated zone in accordance with Standard Monitoring Specifications in Section I of the SPRRs. All monitoring shall be conducted in accordance with the approved April 2007 *Sample Collection and Analysis Plan* or more recent approved revisions, which includes quality assurance/quality control standards.

All compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard (WQPS). The Discharger shall use the same WQPS method for all groundwater monitoring wells. All detection monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, leachate (LCRS), surface impoundments, and other groundwater monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern (COCs) as indicated and listed in Tables 1 through 5.

The Discharger shall use USEPA test methods with the lowest achievable detection limit for that constituent taking any matrix interferences into account. The reporting limit shall be no higher than the practical quantitation limit. The Discharger shall report all trace concentrations that are between the detection limit and the practical quantitation limit. All metals analyses shall be for dissolved metals.

The monitoring program of this MRP includes:

Section	Monitoring Program
A.1	Groundwater Monitoring
A.2	Unsaturated Zone Monitoring
A.3	Surface Water Monitoring (Not Applicable)
A.4	Surface Impoundment Monitoring
A.5	LCRS Monitoring, Action Leakage Rate, and Annual LCRS Testing
A.6	Waste Discharge Monitoring (Not Applicable)
A.7	Facility Monitoring
A.8	Corrective Action Monitoring

1. Groundwater Monitoring

The Discharger shall operate and maintain a groundwater detection monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. The detection monitoring system shall be certified by a California-licensed professional civil engineer or geologist as meeting the requirements of Title 27. The current groundwater detection monitoring system meets the applicable requirements of Title 27 for four 1-acre Class II surface impoundments P-1, P-2, P-3, and P-4. After clean closure and rehabilitation of Class II surface impoundments P-1 through P-4, the Discharger will construct two new 1.7-acre Class II surface impoundments P-01 and P-02 as replacements. The existing groundwater detection monitoring network will continue to meet the applicable requirements of Title 27 for Class II surface impoundments P-01 and P-02. The Discharger proposed one groundwater monitoring well for groundwater detection monitoring of two new 1.7-acre Class II surface impoundments designated as P-03 and P-04. However, the groundwater detection monitoring system for P-03 and P-04 does not comply with Title 27 sections 20415(b)(1)(B) and 21760(a)(3). Therefore, prior to construction and use of two new 1.7-acre Class II surface impoundments designated as P-03 and P-04, the Discharger shall install an appropriate groundwater detection monitoring network and establish water quality protection standards (WQPS) for the P-03 and P-04 Class II surface impoundments.

The current groundwater detection monitoring network shall consist of the following:

Well	Status	Zone	Units Being Monitored
MW-1	Detection	Shallow	P-1 through P-4, P-01 and P-02
MW-1A	Monitoring Point	Shallow	P-1 through P-4, P-01 and P-02
MW-2	Detection	Shallow	P-1 through P-4, P-01 and P-02
MW-3	Background	Shallow	P-1 through P-4, P-01 and P-02
MW-4	Monitoring Point	Shallow	P-1 through P-4, P-01 and P-02

Groundwater samples shall be collected semiannually from the background wells, detection monitoring wells, monitoring points, corrective action monitoring wells (if any), and any additional wells added as part of the approved groundwater monitoring system. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan. Depth to groundwater shall be measured to the nearest 0.01 feet. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in the following table:

Table 1. Groundwater Monitoring

Parameters	Units	Monitoring Frequency	Reporting Frequency
Field Parameters			
Groundwater Elevation	feet & hundredths, MSL	Quarterly[1]	Semiannually
Temperature	^{o}F	Semiannually	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Turbidity	NTU	Semiannually	Semiannually
Monitoring Parameters			
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Carbonate	mg/L	Semiannually	Semiannually
Bicarbonate	mg/L	Semiannually	Semiannually
Nitrate – Nitrogen	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Calcium	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Sodium	mg/L	Semiannually	Semiannually
Iron	mg/L	Semiannually	Semiannually
Barium	mg/L	Semiannually	Semiannually
Strontium	mg/L	Semiannually	Semiannually
Aluminum	mg/L	Semiannually	Semiannually
Manganese	mg/L	Semiannually	Semiannually
Boron	mg/L	Semiannually	Semiannually
Volatile Organic Compounds per USEPA Method 8260B	ug/L	Annually	Annually

[1] The Discharger shall measure the groundwater elevation in each well **quarterly**, determine groundwater flow direction, and estimate groundwater flow rates in the uppermost aquifer and in any zones of perched water and in any additional portions of the zone of saturation monitored. The results shall be reported semiannually, including the times of expected highest and lowest elevations of the water levels in the wells, pursuant to Title 27, section 20415(e)(15).

2. Unsaturated Zone Monitoring

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of Title 27, sections 20415 and 20420. The current unsaturated zone detection monitoring system for existing surface impoundments P-1 through P-4 meets the applicable requirements of Title 27. The Discharger shall install unsaturated zone monitoring devices (after review and approval by Central Valley Water Board staff) each time a new Class II waste management unit is constructed. The Discharger proposed in its ROWD one suction (vacuum type) lysimeter under each LCRS sump for unsaturated zone detection monitoring of four new 1.7-acre Class II surface impoundments designated as P-01 through P-04. However, the unsaturated zone detection monitoring system for P-01 through P-04 does not comply with Title 27 sections 20415(d)(2)(B) and 21760(a)(3). Therefore, prior to construction and use of the four new 1.7-acre Class II surface impoundments designated as P-01 through P-04, the Discharger shall install an appropriate unsaturated zone detection monitoring network and establish water quality protection standards (WQPS) for the P-01 through P-04 Class II surface impoundments.

The current unsaturated zone monitoring network consists of:

Mon Pt.	Status	Units Being Monitored
PL-1	Detection	P-1
PL-2	Detection	P-2
PL-3	Detection	P-3
PL-4	Detection	P-4

Unsaturated zone samples shall be collected from the applicable monitoring network listed above and shall be analyzed for the parameters and constituents listed in the following table in accordance with the specified methods and frequencies (pan lysimeters need only be sampled when liquid is present). Lysimeters shall be inspected for the presence of liquid **monthly**. If liquid is detected in a previously dry lysimeter, the Discharger shall follow the procedures in the WDRs under "B. Discharge Specifications" and shall **immediately** sample and test the liquid for Field and Monitoring Parameters listed in the following table.

Table 2. Unsaturated Zone Monitoring

Parameters	Units	Monitoring Frequency	Reporting Frequency
Field Parameters			
Presence of liquid	observation	Monthly	Semiannually
Flow Rate	gallons/day	Monthly	Semiannually
Electrical Conductivity	umhos/cm	Monthly	Semiannually
pH	pH units	Monthly	Semiannually
Monitoring Parameters			
Total Dissolved Solids	mg/L	When liquid is present	Immediately
Chloride	mg/L	"	"
Carbonate	mg/L	"	"
Bicarbonate	mg/L	"	"
Nitrate – Nitrogen	mg/L	"	"
Sulfate	mg/L	"	"
Calcium	mg/L	"	"
Magnesium	mg/L	"	"
Potassium	mg/L	"	"
Sodium	mg/L	"	"
Iron	mg/L	"	"
Barium	mg/L	"	"
Strontium	mg/L	"	"
Aluminum	mg/L	"	"
Manganese	mg/L	"	"
Boron	mg/L	"	"
Volatile Organic Compounds per USEPA Method 8260B	ug/L	"	"

The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in the approved Sample Collection and Analysis Plan.

Monitoring results for the unsaturated zone shall be included in monitoring reports and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

In the event of any non-functional lysimeter suction (vacuum type) lysimeter (if used) e.g., clogged, broken, unable to hold vacuum etc., the Discharger shall notify Central Valley Water Board staff within 7 days and report any needed repairs or replacement within 14 days of completion of the repairs, including photographs of the problem and the repairs or replacement performed.

3. Surface Water Monitoring and Table 3. (Not Applicable)

4. Surface Impoundment Monitoring

For each operating surface impoundment samples shall be collected from each Class II surface impoundment in accordance with the following table:

Table 4. Surface Impoundment Monitoring

Parameters	Units	Monitoring Frequency	Reporting Frequency
Field Parameters			
Freeboard	feet and tenths	Weekly[1]	Semiannually
Remaining Capacity (each surface impoundment)	gallons	Monthly	Semiannually
Discharge Flow[2]	gallons/day	Monthly	Semiannually
pH	pH units	Semiannually	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
Temperature	^{o}F	Semiannually	Semiannually
Monitoring Parameters			
Total Dissolved Solids	mg/L	Semiannually	Semiannually
Chloride	mg/L	Semiannually	Semiannually
Carbonate	mg/L	Semiannually	Semiannually
Bicarbonate	mg/L	Semiannually	Semiannually
Nitrate – Nitrogen	mg/L	Semiannually	Semiannually
Sulfate	mg/L	Semiannually	Semiannually
Calcium	mg/L	Semiannually	Semiannually
Magnesium	mg/L	Semiannually	Semiannually
Potassium	mg/L	Semiannually	Semiannually
Sodium	mg/L	Semiannually	Semiannually
Iron	mg/L	Semiannually	Semiannually
Barium	mg/L	Semiannually	Semiannually
Strontium	mg/L	Semiannually	Semiannually
Aluminum	mg/L	Semiannually	Semiannually
Manganese	mg/L	Semiannually	Semiannually

Table 4. Surface Impoundment Monitoring			
Boron	mg/L	Semiannually	Semiannually
Volatile Organic Compounds per USEPA Method 8260B	ug/L	Annually	Annually

[1] Freeboard shall be measured weekly and within 24 hours after onsite rainfall of greater than two inches in a 24 hour period. Freeboard shall be measured from the top of the surface impoundment down to the water level in the impoundment and can be measured using markings on the primary geomembrane liner or a free-standing gauge.

[2] Flow of wastewater into Class II surface impoundment as measured and recorded at totalizing meter. Discharge flow shall also be reported as the sum of discharge to all surface impoundments.

Freeboard Monitoring: If weekly monitoring of freeboard shows less than 2.4 feet of freeboard remaining in any surface impoundment the Discharger shall follow the procedures in the WDRs under "C. Facility Specifications". Weekly freeboard levels shall be included in the semiannual monitoring reports.

5. LCRS Monitoring, Action Leakage Rate, and Annual LCRS Testing

LCRS Monitoring: The Discharger shall operate and maintain leachate collection and removal system (LCRS) sumps, record and calculate monthly leakage rates, and conduct annual testing of each LCRS in accordance with Title 27 and this monitoring program.

The current LCRS monitoring points are:

Mon Pt.	Unit Where Sump is Located
LCRS-1	P-1
LCRS-2	P-2
LCRS-3	P-3
LCRS-4	P-4

Once surface impoundments P-01 through P-04 are constructed, the LCRS leachate sump monitoring points will be:

Mon Pt.	Unit Where Sump is Located
LCRS-01	P-01
LCRS-02	P-02
LCRS-03	P-03
LCRS-04	P-04

All LCRS sumps shall be inspected monthly for the presence of leachate, and flow shall be recorded in accordance with the following table. If leachate is detected in a previously dry sump, the Discharger shall verbally notify Central Valley Water Board staff within **seven days** and shall immediately sample and test the leachate for Field and Monitoring Parameters listed in the following

table. Leachate in the LCRS sump shall then be sampled for all parameters and constituents in accordance with the frequencies listed in the following table whenever liquid is present.

Table 5. LCRS Monitoring

Parameters	Units	Monitoring Frequency	Reporting Frequency
Field Parameters			
Presence of leachate	observation	Monthly	Semiannually
Flow Rate[1]	gallons/day	Monthly	Semiannually
Electrical Conductivity	umhos/cm	Semiannually	Semiannually
pH	pH units	Semiannually	Semiannually
Monitoring Parameters			
Total Dissolved Solids	mg/L	Annually	Annually
Chloride	mg/L	Annually	Annually
Carbonate	mg/L	Annually	Annually
Bicarbonate	mg/L	Annually	Annually
Nitrate – Nitrogen	mg/L	Annually	Annually
Sulfate	mg/L	Annually	Annually
Calcium	mg/L	Annually	Annually
Magnesium	mg/L	Annually	Annually
Potassium	mg/L	Annually	Annually
Sodium	mg/L	Annually	Annually
Iron	mg/L	Annually	Annually
Barium	mg/L	Annually	Annually
Strontium	mg/L	Annually	Annually
Aluminum	mg/L	Annually	Annually
Manganese	mg/L	Annually	Annually
Boron	mg/L	Annually	Annually
Volatile Organic Compounds per USEPA Method 8260B	ug/L	Annually	Annually

[1] Flow in gallons per day from LCRS sump back to surface impoundment.

Action Leakage Rate: If monthly monitoring of the flow rate into the LCRS shows an exceedance of the Action Leakage Rate required by the WDRs, the Discharger shall follow the procedures in the WDRs under “C. Facility Specifications”. Tabulated monthly leakage rates shall be included in the semiannual monitoring reports.

Annual LCRS Testing: All LCRSs shall be tested annually pursuant to Title 27, section 20340(d) to demonstrate proper operation. The results of these tests shall be reported to the Central Valley Water Board in the Annual Monitoring Report and shall include comparisons with earlier tests made under comparable conditions.

6. Waste Discharge Monitoring (Not Applicable)

7. Facility Monitoring

a. Annual Facility Inspection

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess repair and maintenance needed for liner systems; LCRS pumps, piping and control systems; drainage control systems; groundwater monitoring wells; unsaturated zone monitoring systems; and shall assess preparedness for winter conditions including but not limited to the required surface impoundment capacity and erosion and sedimentation control. The Discharger shall take photos of any problems areas before and after repairs. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. Annual facility inspection reporting shall be submitted as required in Section B.3 of this MRP.

b. Major Storm Events

The Discharger shall inspect all precipitation, diversion, and drainage facilities and all waste management unit berms for damage **within 7 days** following major storm events capable of causing damage or significant erosion. Freeboard in Class II surface impoundments shall be measured and recorded within 24 hours after onsite rainfall of greater than two inches in a 24 hour period. The Discharger shall take photos of any problems areas before and after repairs. Necessary repairs shall be completed **within 30 days** of the inspection. Notification and reporting requirements for major storm events shall be conducted as required in Section B.4 of this MRP.

c. Rainfall Monitoring

The Discharger shall monitor and record onsite rainfall data using an automated rainfall gauge. Data shall be used in establishing the severity of storm events and wet seasons for comparison with design parameters used for waste management unit design and conveyance and drainage design. Daily data and onsite observation shall be used for establishing the need for inspection and repairs after major storm events. Rainfall data shall be reported in the semiannual monitoring reports as required by this MRP under “Reporting”.

8. Corrective Action Monitoring

As corrective action, the Discharger is hauling wastewater that normally would be discharged to surface impoundments P-1 through P-4 until the surface impoundments can be clean closed and replaced with new surface impoundments P-01 through P-04. Until the date when the Discharger is authorized to place waste in surface impoundments P-01 through P-04, the Discharger shall monitor all wastes diverted from and/or removed from the Class II surface impoundments and exported from the facility for disposal on a daily basis and report the results in monthly corrective action monitoring reports. The monthly report shall include copies of the haul receipts and location of disposal:

Table 6. Corrective Action Monitoring

Parameters	Units	Reporting Frequency
Quantity Discharged	gallons/day	Monthly

B. REPORTING

The Discharger shall submit the following reports in accordance with the required schedule:

Reporting Schedule

Section	Report	End of Reporting Period	Due Date
B.1	Semiannual Monitoring Report	30 June, 31 December	**1 August, 1 February**
B.2	Annual Monitoring Report	31 December	**1 February**
B.3	Annual Facility Inspection Report	31 October	**15 November**
B.4	Major Storm Event Reporting	Continuous	**7 days from damage discovery**
B.5	Financial Assurances Report	31 December	**1 June**
B.6	Corrective Action Report	Last day of Month	**1st day of following month**

Reporting Requirements

The Discharger shall submit monitoring reports **semiannually** with the data and information as required in this Monitoring and Reporting Program and as required in WDRs Order R5-2017-XXX and the Standard Provisions and Reporting Requirements (particularly Section I: "Standard Monitoring Specifications" and Section J: "Response to a Release"). In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Data shall also be submitted in a digital format, such as a computer disk.

Field and laboratory tests shall be reported in each monitoring report. Semiannual and annual monitoring reports shall be submitted to the Central Valley Water Board in accordance with the above schedule for the calendar period in which samples were taken or observations made. In addition, the Discharger shall enter all monitoring data and monitoring reports into the online Geotracker database as required by Division 3 of Title 27.

The results of **all monitoring** conducted at the site shall be reported to the Central Valley Water Board in accordance with the reporting schedule above for the calendar period in which samples were taken or observations made.

The Discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained throughout the life of the facility. Such records shall be legible and shall show the following for each sample:

a) Sample identification and the monitoring point or background monitoring point from which it was taken, along with the identity of the individual who obtained the sample;

b) Date, time, and manner of sampling;

c) Date and time that analyses were started and completed, and the name of the personnel and laboratory performing each analysis;

d) Complete procedure used, including method of preserving the sample, and the identity and volumes of reagents used;

e) Calculation of results; and

f) Results of analyses, and the MDL and PQL for each analysis. All peaks shall be reported.

Required Reports

1. **Semiannual Monitoring Report:** Monitoring reports shall be submitted semiannually and are due on **1 August** and **1 February**. Each semiannual monitoring report shall contain at least the following:

   a) For each groundwater monitoring point addressed by the report, a description of:

      1) The time of water level measurement;

      2) The type of pump - or other device - used for purging and the elevation of the pump intake relative to the elevation of the screened interval;

      3) The method of purging used to stabilize water in the well bore before the sample is taken including the pumping rate; the equipment and methods used to monitor field pH, temperature, and conductivity during purging; results of pH, temperature, conductivity, and turbidity testing; and the method of disposing of the purge water;

      4) The type of pump - or other device - used for sampling, if different than the pump or device used for purging; and

      5) A statement that the sampling procedure was conducted in accordance with the approved Sample Collection and Analysis Plan.

   b) A map or aerial photograph showing the locations of observation stations, monitoring points, and background monitoring points.

   c) The estimated quarterly groundwater flow rate and direction in the uppermost aquifer, in any zones of perched water, and in any additional zone of saturation monitored based upon water level elevations taken prior to the collection of the water quality data submitted in the report [Title 27, section 20415(e)(15)].

   d) Cumulative tabulated monitoring data for all monitoring points and constituents for groundwater, LCRS/leachate, unsaturated zone, and the surface impoundments. Concentrations below the laboratory reporting limit shall not be reported as “ND” unless the reporting limit is also given in the table. Otherwise they shall be reported “<” the reporting limit (e.g., <0.10). Units shall be as required in Tables 1 through 6 unless specific justification is given to report in other units. Refer to the SPRRs Section I “Standard Monitoring Specifications” for requirements regarding MDLs and PQLs.

   e) Laboratory statements of results of all analyses evaluating compliance with requirements.

   f) An evaluation of the concentration of each monitoring parameter as compared to the current concentration limits, and the results of any required verification testing for constituents exceeding a concentration limit. Report any actions taken under Section J: Response to a Release in the SPRRs for verified

exceedances of a concentration limit for wells/constituents not already in corrective action monitoring.

g) Tabulated weekly freeboard levels in the Class II surface impoundment with comparison to the freeboard requirement in the Facility Specifications of the WDRs.

h) Tabulated monthly leakage rates into the LCRS sump with comparison to the Action Leakage Rate in the Facility Specifications of the WDRs, and a discussion of required response if ALR was exceeded.

i) A summary of all waste discharge monitoring required in Section A.6 of this MRP.

j) A summary of all Facility Monitoring including onsite rainfall data for the reporting period required in Section A.7 of this MRP.

k) A summary of all Corrective Action Program monitoring required in Section A.8 of this MRP if applicable.

l) A discussion about any solids that were removed from the Class II surface impoundment during the reporting period to regain capacity.

m) Tabulated reporting of any monitoring requirements specified in section A of this MRP on a semiannual basis not specifically identified to be reported in this section B.1.

n) A tabulated summary and graphical display of the results of the Shewhart-Cusum analysis for determining exceedance of the WQPS for each monitoring parameter. The tabulated summary shall show current and historical laboratory results in the units specified in the tables in Section A along with corresponding calculated S and Z values. Exceedances of the concentration limits h=5, and SCL= 4.5 shall be highlighted in bold in the tabular summary. The tabulated summary shall be displayed on a time series plots for the laboratory results, and the S and Z values along with the concentration limits h and SCL. A time series shall show identified outliers for each monitoring parameter and each outlier shall be clearly indicated. Each monitoring report transmittal cover letter shall clearly indicate whether the monitoring period being reported contained exceedances of the Shewart-Cusum concentration limits.

2. **Annual Monitoring Report:** The Discharger shall submit an Annual Monitoring Report to the Central Valley Water Board by **1 February** covering the reporting period of the previous monitoring year. If desired, the Annual Monitoring Report may be combined with the second semiannual report, but if so, shall clearly state that it is both a semi-annual and annual monitoring report in its title. Each Annual Monitoring Report shall contain the following additional information beyond what is required for semiannual monitoring reports:

a) All monitoring parameters shall be graphed to show historical trends at each monitoring point and background monitoring point, for all samples taken within at least the previous five calendar years. Each such graph shall plot the concentration of one or more constituents for the period of record for a given monitoring point or background monitoring point, at a scale appropriate to show trends or variations in water quality. The graphs shall plot each datum, rather than plotting mean values. Graphical analysis of monitoring data may be used to provide significant evidence of a release.

b) An evaluation of the monitoring parameters with regards to the cation/anion balance, and a graphical presentation using a Stiff diagram, a Piper graph, or a Schoeller plot.

c) All historical monitoring data for which there are detectable results, including data for the previous year, shall be submitted in tabular form in a digital file format such as a computer disk. The Central Valley Water Board regards the submittal of data in hard copy and in digital format as "...the form necessary for..." statistical analysis [Title 27, section 20420(h)], that facilitates periodic review by the Central Valley Water Board.

d) Hydrographs of each well showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.

e) A comprehensive discussion of the compliance record, and the result of any corrective actions taken or planned which may be needed to bring the Discharger into full compliance with the waste discharge requirements.

f) A written summary of the monitoring results, indicating any changes made or observed since the previous Annual Monitoring Report.

g) The results of the annual testing of the LCRS.

h) Updated concentration limits for each monitoring parameter at each monitoring well based on the new background data set.

i) If applicable a comprehensive discussion of any Corrective Action Program required by this MRP under Section A.8 including a discussion of long-term trends in the concentrations of the pollutants in the groundwater monitoring wells and an analysis of whether the pollutants are being effectively treated.

3. **Annual Facility Inspection Reporting:** By **15 November** of each year, the Discharger shall submit a report describing the results of the inspection and the repair measures implemented, preparations for winter, and include photographs of any problem areas and the repairs. Refer to Section A.7.a of this MRP, above.

4. **Major Storm Event Reporting:** The Discharger shall notify Central Valley Water Board staff within 24 hours after a storm event of greater than two inches in

24 hours as to the status of freeboard in any Class II surface impoundment. The Discharger shall also notify Central Valley Water Board staff within **7 days** after major storm events of any damage or significant erosion and report any needed repairs within **14 days** of completion of the repairs, including photographs of the problem and the repairs. Refer to Section A.7.b of this MRP above for requirements for performing the inspection and conducting the repairs.

5. **Financial Assurances Report:** By **30 April** of each year, the Discharger shall submit a report to the Central Valley Water Board that reports the balance of both the closure and corrective action funds or the amounts of the Guarantees and the adjustments to account for inflation in accordance with Title 27 Section 22236. Refer to Financial Assurances Specifications F.1 through F.3 of the WDRs.

6. **Corrective Action Report:** By the 1st of the month following the end of a corrective action reporting period the Discharger shall submit a report to the Central Valley Water Board that reports all wastes diverted from and/or removed from the Class II surface impoundments and exported from the facility for disposal. The monthly report shall include copies of the haul receipts and location of disposal.

C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD

1. Water Quality Protection Standard Report

For each waste management unit, the Water Quality Protection Standard shall consist of all COCs, the concentration limit for each constituent of concern, the verification retesting procedure to confirm measurably significant evidence of a release, the point of compliance, and all water quality monitoring points for each monitored medium.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the COCs, the concentration limits, and the point of compliance and all monitoring points. Any proposed changes to the Water Quality Protection Standard other than annual update of the concentration limits shall be submitted in a report for review and approval.

The report shall:

a. Identify **all distinct bodies of surface and ground water** that could be affected in the event of a release from a waste management unit or portion of a unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.

b. Include a map showing the monitoring points and background monitoring points for the groundwater monitoring program, and the

unsaturated zone monitoring program. The map shall include the point of compliance in accordance with Title 27, section 20405.

c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

d. Include a proposed statistical method for calculating concentration limits for monitoring parameters and constituents of concern that are detected in 10% or greater of the background data (naturally-occurring constituents) using a statistical procedure from Title 27, section 20415(e)(8)(A-D)] or section 20415(e)(8)(E).

e. Include a retesting procedure to confirm or deny measurably significant evidence of a release pursuant to Title 27, section 20415(e)(8)(E) and section 20420(j)(1-3).

The Water Quality Protection Standard shall be certified by a California-registered civil engineer or geologist as meeting the requirements of Title 27. If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

The Discharger proposed the methods for calculating concentration limits in the June 2008 *Water Quality Protection Standard Report*. The control limits are calculated using the Shewhart-CUSUM method.

The Water Quality Protection Standard shall be updated annually for each monitoring well using new and historical monitoring data.

2. Monitoring Parameters

Monitoring parameters are a select group of constituents that are monitored during each monitoring event that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a waste management unit. The monitoring parameters for all waste management units are those listed in the tables in Section A of this MRP specified monitored medium.

3. Concentration Limits

For a naturally occurring constituent of concern, the concentration limit for each constituent of concern shall be determined as follows:

a. By calculation in accordance with a statistical method pursuant to Title 27, section 20415(e)(8); or

b. By an alternate statistical method meeting the requirements of Title 27, section 20415(e)(8)(E).

The methods for calculating concentration limits were included in the June 2008 *Water Quality Protection Standard (WQPS) Report*. The approved method uses **intrawell** background data from each monitoring well to establish control limits for each monitoring parameter using the Shewhart-CUSUM method. The method uses the following equations to determine compliance:

$$Z_i = (\overline{X_i} - \mu)\left(\sqrt{n_i}/\sigma\right)$$

where:

Z_i = the standardized mean for the i^{th} time period

$\overline{X_i}$ = the mean of the n measurements of the i^{th} time period, if only one sample is collected in the i^{th} time period, the mean is the value itself

μ = the baseline sample mean

n_i = the number of baseline measurements for the i^{th} time period, if only one sample is collected in the I^{th} time period, n = 1

σ = the baseline sample standard deviation; and

$$S_i = \max[0, (Z_i - k) + S_{i-1}]$$

where:

S_i = the cumulative sum of the i^{th} time period

k = the reference value recommended by the EPA, equal to 1

The Shewhart-CUSUM method uses three user-defined values that include a decision internal value (h), a reference value (k), and a Shewhart-CUSUM Control Limit (SCL) to determine earliest detection of a release. The Discharger's WQPS Report established these values to be h=5, k=1, and SCL=4.5 in units of standard deviation. The data analysis compares the standardized mean (Z) and the cumulative sum (S) for each sampling date with the established values h and SCL and any points plotted on a control chart where S>h or Z>SCL the data indicates an exceedance indicating evidence of a release.

The most recent concentration limits for select parameters as reported in the *2015 Annual Monitoring Report* dated 18 January 2016 were as follows:

Monitoring Wells	Analysis Type	Monitoring Parameters	Concentration Limit (Standardized Concentration)		
			H	k	SCL
MW-01, MW-02, MW-1A, MW-4	Intrawell	Monitoring Parameters in Section A.1 except VOCs	5	1	4.5
MW-01, MW-02,	Intrawell	VOCs in Section A.1	Nondetect		

MW-1A, MW-4			
MW-03	Intrawell	Monitoring Parameters in Section A.1	Not Applicable, Upgradient Well

4. Retesting Procedures for Confirming Evidence of a Release

If monitoring results indicate measurably significant evidence of a release, as described in Standard Monitoring Specification I.43 of the SPRRs, then:

a. For analytes that are detected in less than 10% of the background samples (such as non-naturally occurring constituents), the Discharger shall use the non-statistical retesting procedure required in Standard Monitoring Specification I.44 of the SPRRs.

b. For analytes that are detected in 10% or greater of the background samples (naturally occurring constituents), the Discharger shall use one of the statistical retesting procedure as required in Standard Monitoring Specification I.45 of the SPRRs.

5. Point of Compliance

The point of compliance for the water standard at each waste management unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the unit. The following are monitoring locations at the point of compliance:

Cell or Module	Point of Compliance Monitoring Wells
P-01 and P-02	MW-1 and MW-2

6. Compliance Period

The compliance period for each waste management unit shall be the number of years equal to the active life of the unit plus the closure period. The compliance period is the minimum period during which the Discharger shall conduct a water quality monitoring program subsequent to a release from the waste management unit. The compliance period shall begin anew each time the Discharger initiates an evaluation monitoring program [Title 27, section 20410].

7. Monitoring Points

A monitoring point is a well, device, or location specified in the waste discharge requirements, which monitoring is conducted and at which the water quality protection standard applies. The monitoring points for each monitored medium are listed in Section A of this MRP.

D. TRANSMITTAL LETTER FOR ALL REPORTS

A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report. The transmittal letter shall contain a statement by the discharger, or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate, and complete.

The Discharger shall implement the above monitoring program on the effective date of this Program.

Ordered by: _____
PAMELA C. CREEDON, Executive Officer

_____
(Date)

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