

ATTACHMENT C

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD COLORADO RIVER BASIN REGION

MONITORING AND REPORTING PROGRAM NO. R7-2019-0016-XX FOR IN-SITU GROUNDWATER REMEDIATION

NOTE: THIS MONITORING AND REPORTING PROGRAM SHALL BE CUSTOMIZED TO FIT THE SITE-SPECIFIC NEEDS OF THE PROJECT. CONSTITUENTS TO BE SAMPLED AS WELL AS SAMPLING AND REPORTING FREQUENCY NEED TO BE SPECIFIED FOR THE PROJECT. THE TABLES PROVIDE TEMPLATES AND LIKELY CONSTITUENT LISTS THAT MAY NEED TO BE MODIFIED TO MEET SITE-SPECIFIC NEEDS.

This Monitoring and Reporting Program (MRP) describes requirements for monitoring a groundwater remediation system for **NAME OF SITE AND LOCATION**. This MRP is issued pursuant to Water Code section 13267, and the reports required herein are necessary to ensure that the Discharger complies with the Order R7-2019-0016. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. As appropriate, staff for the California Regional Water Quality Control Board, Colorado River Basin Region (Regional Water Board) shall approve specific sample station locations prior to implementation of sampling activities.

A. MONITORING REQUIREMENTS

1. The collection, preservation, and holding times of all samples shall be in accordance with United States Environmental Protection Agency (USEPA)-approved procedures. Unless otherwise approved by the Regional Water Board's Executive Officer, all analyses shall be conducted by a laboratory certified by the State Water Resources Control Board, Division of Drinking Water's Environmental Laboratory Accreditation Program (ELAP). All analyses shall be conducted in accordance with the latest edition of the *Guidelines Establishing Test Procedures for Analysis of Pollutants* (40 C.F.R. part 136), promulgated by the USEPA.
2. All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each sample shall be recorded on the sample chain of custody form. If composite samples are collected, the basis for sampling (time or flow weighted) shall be approved by Regional Water Board staff.
3. Laboratory data must quantify each constituent down to the approved reporting levels for specific constituents. All analytical data shall be reported with method detection limits (MDLs) and with either the reporting level or limits of quantitation (LOQs) according to 40 Code of Federal Regulations part 136, Appendix B. Any internal quality control data associated with the sample must be reported when requested by the Executive Officer. The Regional Water Board will reject the quantified laboratory data if quality control data is unavailable or unacceptable.
4. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. If continuous monitoring equipment is out of service for a period greater than 24 hours, the Discharger shall obtain representative grab samples each day the equipment is out of service. The Discharger shall correct the cause(s) of failure of the continuous monitoring equipment as soon as practicable. The Discharger shall report the

period(s) during which the equipment was out of service, and if the problem has not been corrected, shall identify the steps which the Discharger is taking or proposes to take to bring the equipment back into service and the schedule for these actions.

5. Field test instruments (such as those used to test pH, dissolved oxygen, and electrical conductivity) may be used provided that:
 - a. The user is trained in proper use and maintenance of the instruments;
 - b. The instruments are field calibrated prior to monitoring events at the frequency recommended by the manufacturer;
 - c. Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
 - d. Field calibration reports are submitted as described in the "Reporting" section of this MRP.

6. The Discharger shall maintain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for the duration of cleanup activities and a minimum of at least five (5) years from the date of the sample, measurement, report or application. This period of retention may be extended by request of the Executive Officer at any time. Records of monitoring information shall include:
 - a. The date, exact place, and time of sampling or measurements;
 - b. The individual(s) who performed the sampling and/or measurements;
 - c. The methods used for groundwater purging/sampling;
 - d. The date(s) analyses were performed;
 - e. The individual(s) who performed the analyses;
 - f. The analytical techniques or method used; and
 - g. All sampling and analytical results, including:
 - i. units of measurement used;
 - ii. minimum reporting limit for the analysis (minimum level);
 - iii. results less than the reporting limit but above the method detection limit (MDL);
 - iv. data qualifiers and a description of the qualifiers;
 - v. quality control test results (and a written copy of the laboratory quality assurance plan);
 - vi. dilution factors, if used; and
 - vii. sample matrix type.

B. MONITORING PLAN

As shown on Figure 1, there are **xx** monitoring wells, **xx** extraction wells, and **xx** injection wells/trenches associated with the site. The groundwater monitoring program for these wells and any treatment system wells installed subsequent to the issuance of this MRP shall follow the schedule below. Monitoring wells with free phase petroleum product or visible sheen shall

be monitored, at a minimum, for product thickness and depth to water. The volume of extracted groundwater, if applicable, shall also be provided in quarterly monitoring reports. Sample collection and analysis shall follow standard EPA protocol.

The monitoring wells, extraction wells, and/or injection wells shall be sampled according to the schedule in Table 1 and the samples analyzed by the methods in Table 2, as follows:

Table 1: Site Well Information and Monitoring Objective

Well ID	Longitude ¹	Latitude	Elevation (feet amsl ²)	Monitoring Objective
				Compliance ³
				Treatment Zone ⁴
				Transition Zone ⁵
				Background ⁶

1. Longitude and latitude coordinates and surface elevations for amendment injection points have been estimated and are approximate.
2. amsl: above mean sea level
3. Wells used to determine compliance with groundwater limitations.
4. Wells sampled to evaluate *in-situ* bioremediation progress inside the treatment zone.
5. Wells sampled to evaluate migration of pollutants within the treatment zone.
6. Wells used to develop background concentrations of constituents.

NOTE: ADD OR DELETE CONSTITUENTS AND METHODS AS NEEDED IN TABLE 2. TABLE 2 PROVIDES THE GENERAL LIST OF CONSTITUENTS THAT ARE MOST LIKELY TO BE SAMPLED AT AN IN-SITU REMEDIATION SITE

Table 2: Monitoring Parameters and Frequency¹

Sampling parameter ²	Parameter Type	Units	Method of Analysis	Sampling Location	Sampling Frequency					
					Baseline ³	Week 1	Month 1	Month 2	Month 3 (Quarter 1)	Month 6 (Quarter 2)
Volatile Organic Compounds ⁴	Contaminant of Concern	µg/L	EPA 8260B		x	x	x	x	x	x
Total Dissolved Solids	General Groundwater Parameters	mg/L	SM 2540C		x		x		x	x
Alkalinity	General Groundwater Parameters	mg/L	SM 2320B		x		x		x	x
Anions – Chlorides, nitrates, sulfates, bromates, phosphorus	General Groundwater Parameters	mg/L	EPA 300		x		x		x	x

Cations – Calcium, magnesium, manganese, potassium & sodium	General Groundwater Parameters	mg/L	EPA 200.7/6010B		x		x		x	x
Metals (arsenic, barium, cadmium, chromium, copper, iron, lead & selenium)	Dissolved Metals	mg/L	EPA 200.7/6010B		x		x		x	x
Sampling parameter	Parameter Type/ Type of Sample	Units	Method of Analysis	Sampling Location	Sampling Frequency²					
					Baseline³	Week 1	Month 1	Month 2	Month 3 (Quarter 1)	Month 6 (Quarter 2)
Ferrous and Ferric Iron	Dissolved Metals	mg/L	EPA 200, 6020, OR SM 3000		x		x		x	x
Hexavalent Chromium	Potential contaminant	µg/L	EPA 7199		x		x	x	x	x
Total Organic Carbon	General Groundwater Parameters	mg/L	EPA 415.1		x		x		x	x
Chemical Oxygen Demand	General Groundwater Parameters	mg/L	EPA 410.1		x		x		x	x
Biochemical Oxygen Demand	General Groundwater Parameters	mg/L	EPA 405.1		x		x		x	x
Methane, ethane, ethene	Dissolved gas in water	µg/L	AM20GAX		x		x		x	x
Dissolved Carbon Dioxide/Hydrogen Sulfide	General Groundwater Parameters	µg/L	SM4500		x		x		x	x
Dissolved Oxygen	Electron acceptor	mg/L	Field meter		x	x	x	x	x	x
Oxidation Reduction Potential	General Groundwater Parameters	mV	Field meter		x	x	x	x	x	x
Specific Conductivity	General Groundwater Parameters	µS/cm	Field meter		x	x	x	x	x	x
Turbidity	General Groundwater Parameters	NTU	Field meter		x	x	x	x	x	x
Temperature	General Groundwater Parameters	°C	Field meter		x	x	x	x	x	x
pH	General Groundwater Parameters	Std. unit	Field meter		x	x	x	x	x	x

- Parameters and frequencies listed are required to evaluate changes in groundwater chemistry resulting from *in-situ* remediation activities and/or determine permit compliance and may not be inclusive of all requirements issued by the lead oversight agency.
- Depending on site conditions, specific monitoring parameters may be increased, reduced, or eliminated by the Executive Officer, if appropriate. Based on site conditions, changes to the monitoring program may be proposed for future applications and/or full-scale implementation.
- Baseline monitoring/sampling data for identified parameters was already previously collected from a representative well set to document pre-injection site conditions.
- Quantification of volatile organic compounds must be performed by EPA Method 8260B and report the entire suite of constituents (full-scan).

C. REPORTING REQUIREMENTS

- Monitoring reports shall include all data collected during the monitoring period, and shall be submitted on a quarterly basis to Regional Water Board staff in accordance with the following schedule:

Monitoring Period	Report Due
January - March	May 1 st
April - June	August 1 st
July - September	November 1 st
October - December	February 1 st

The Executive Officer has the authority to change the report submittal schedule, if deemed necessary, based on changes to the site conditions. If there is no discharge or injection during any reporting period, the report shall so state. By **March 1** of each year, the Discharger shall submit an annual summary report to the Regional Water Board.

2. Discharge monitoring data shall be arranged in a manner that clearly demonstrates compliance and/or noncompliance with this Order. Monitoring results shall be reported in a tabulated format which identifies all applicable chemical constituents required to be analyzed under the monitoring program and presents the associated sample collection dates and analytical detections for each compound in relation to waste discharge limitations and requirements established by the Order.
3. For every item where the requirements are not met, the Discharger shall submit a statement of the actions undertaken or proposed that will bring the discharge into full compliance with requirements at the earliest time, and submit a timetable for corrective actions.
4. The results of any analysis taken more frequently than required at the locations specified in this MRP shall be reported to the Regional Water Board.
5. The Discharger shall report immediately any failure in the *in-situ* remediation system as specified in Standard Provisions Section E.7. Results of any sampling or other analysis performed as a result of a failure of the system shall be provided within fourteen (14) days after receipt.
6. Whenever wastes associated with the discharge under this Order are transported to a different disposal site, the following shall be reported in the monitoring report: type and quantity of wastes; name and address of the hauler (or method of transport if other than by hauling); and location of the final point(s) of disposal.
7. The monitoring reports shall be certified under penalty of perjury to be true and correct. Each report shall contain the following completed declaration:

“I certify under penalty of perjury that this document, including all attachments and supplemental information, was prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

Executed on the _____ day of _____ at _____
 _____(Signature)_____ (Title)

8. The reports and any other information requested by Regional Water Board shall be signed by a principal executive officer or ranking elected official. A duly-authorized representative of the Discharger may sign the documents if:
 - a. The authorization is made in writing by the person described above;
 - b. The authorization specified an individual or person having responsibility for the overall operation of the regulated disposal system; and
 - c. The written authorization is submitted to the Regional Water Board's Executive Officer.

9. As specified in Standard Provisions Section E.14, all reports, plans, and documents required shall be prepared under the direction of appropriately qualified professionals. The lead professional performing engineering and geologic evaluations and judgments shall sign and affix their professional geologist or civil engineering license stamp to all technical reports, plans, or documents submitted to the Regional Water Board.

10. Monitoring reports are required to be submitted electronically via the Internet into the State Water Board's GeoTracker database. To comply with state regulations, the update to the GeoTracker database must include the following minimum information:
 - a. The elevation of groundwater in any permanent monitoring well relative to the surveyed elevation.
 - b. A site map or maps showing the location of all sampling points referred to in the report.
 - c. The depth to the screened interval and the length of screened interval of any permanent monitoring well.
 - d. Boring logs, in PDF format.
 - e. Laboratory analytical data from any soil testing and/or groundwater monitoring shall be reported in Electronic Deliverable Format (EDF) in accordance with Water Code section 13195 et seq. requirements, if applicable.
 - f. A complete copy of the report, in PDF format, which includes the signed transmittal letter and professional certification.

Once the information has been uploaded to GeoTracker, Regional Water Board staff should be notified that information required under MRP No. R7-2019-0016-XX has been uploaded to GeoTracker on MM-DD-YYYY (date of GeoTracker upload).

The GeoTracker website address is <https://geotracker.waterboards.ca.gov>. Deadlines for GeoTracker submittals coincide with deadlines for the report submittals.

Ordered by: _____
 Paula Rasmussen
 Executive Officer

Date: _____

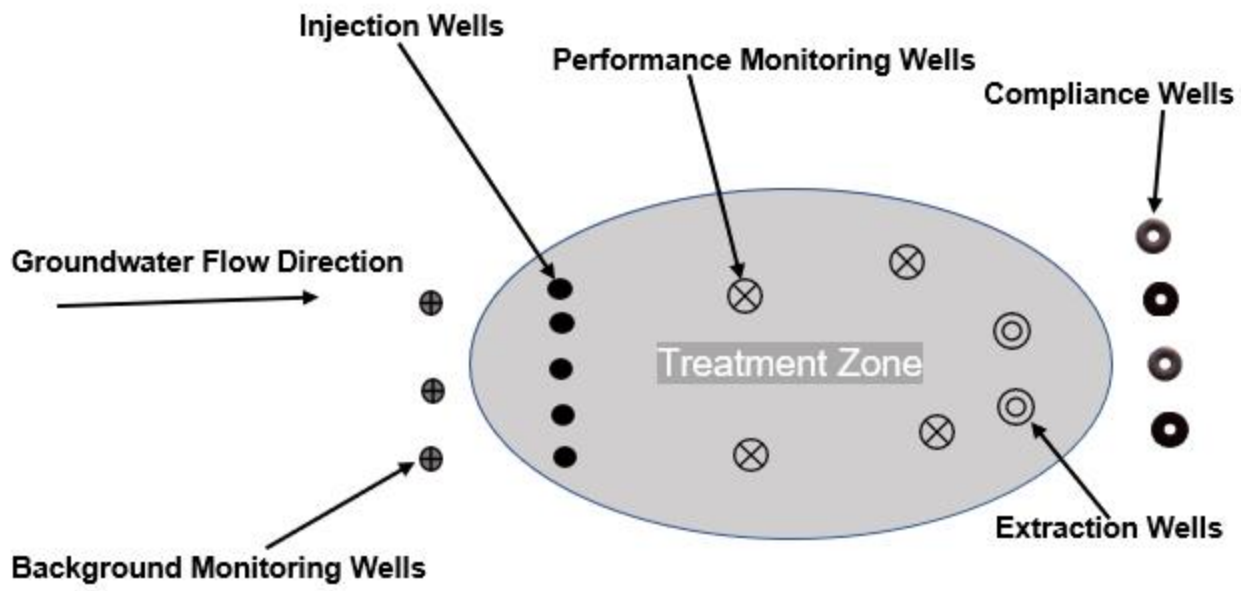


Figure 1: Generalized Monitoring Well Network Diagram