
Central Valley Regional Water Quality Control Board

MONITORING AND REPORTING PROGRAM NO. R5-2015-0012-0075

FOR
IN-SITU GROUNDWATER REMEDIATION
AND DISCHARGE OF TREATED GROUNDWATER TO LAND

FOR
FULL STOP MARKET
1675 NORTH BEALE ROAD, LINDA, CA
YUBA COUNTY
LUST CASE #580239
GEOTRACKER GLOBAL ID #T0611556877

This Monitoring and Reporting Program (MRP) describes requirements for monitoring the effects on groundwater quality from the injection of Deep Earth Technologies, Inc.'s Cool-Ox proprietary peroxygen in-situ chemical oxidation (ISCO) formula into the subsurface at 1675 North Beale Road in Linda (Site). Rajinder Gill (herein referred to as "the Discharger"), is the current Responsible Party for the Site. This MRP is issued pursuant to Water Code Section 13267 and has been prepared based on Attachment C of General Order R5-2015-0012. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer of the Central Valley Regional Water Quality Control Board (Central Valley Water Board). As appropriate, Central Valley Water Board staff shall approve specific sample locations prior to implementation of sampling activities.

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 legal chain of custody form.

GROUNDWATER MONITORING

As shown on Figure 6, there are currently 11 monitoring wells associated with this Site. The groundwater monitoring program for Site wells in the MRP shall follow the schedules 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 in the MRP shall be sampled according to the schedule in Table 1 and the samples analyzed by the methods in Table 2, as follows:

Table 1: Sampling Frequency and Constituent Suite

Well Number¹	Constituent²	Frequency³	Monitoring Objective
MW-1 through MW-11	Suite A	Quarterly	Compliance ⁴
MW-1 through MW-11	Suites A & B	Prior to Injection Event	Baseline ⁵
MW-1, MW-4, MW-11	Suites A & B	Prior to Injection Event	Background ⁶
MW-2, MW-3, MW-5 through MW-11	Suites A & B	30-, 60-, 90-Days Post Injection	Treatment Monitoring ⁷
MW-8	Suite A	90-Days Post Injection	Transition Zone ⁸
MW-1 through MW-11	Suite A	90-Days Post Injection	Post-Treatment ⁹

¹ Well numbers and locations as shown on Figure 6.

² Constituent analytical methods are listed in Table 2.

³ i.e., weekly, monthly, quarterly, semi-annually, annually, other. Semi-annual sampling occurs 2nd and 4th quarters, annual sampling occurs in the 4th quarter, biennial sampling occurs every two years in the 4th quarter, with the first sample during year two.

⁴ Wells used to determine compliance with water groundwater limitations.

⁵ Wells used to determine concentrations prior to in-situ chemical oxidation/bioremediation.

⁶ Wells used to develop background concentrations.

⁷ Wells sampled to evaluate in-situ chemical oxidation/bioremediation progress inside the treatment zone.

⁸ Wells sampled to evaluate the migration of pollutants in the treatment zone.

⁹ Wells sampled to evaluate in-situ chemical oxidation/bioremediation success.

Table 2: Analytical Methods

Constituent	Method ¹	Maximum Practical Quantitation Limit (µg/L) ²
Suite A		
GRO, DRO	EPA 8015	50
BTEX, MTBE	EPA 8260	0.5
TBA	EPA 8260	10
TAME, DIPE, 1,2-DCA, ETBE	EPA 8260	1
EBD, Naphthalene	EPA 8260	2.0
Suite B		
Acetone	EPA 8260	31
Hexavalent chromium	EPA 218.6	1.0
Total dissolved solids	EPA 2540	10,000
Ferrous iron	SM 3500-Fe	50
Metals, dissolved ³	EPA 200.8	10
Chloride, bromide, nitrate, sulfate	EPA 300.0	100
Bromate	EPA 300.1	1.0

GRO: Gasoline-range organics

DRO: Diesel-range organics

BTEX: Benzene, ethylbenzene, toluene, xylenes

MTBE: Methyl tertiary butyl ether

TBA: Tertiary butyl alcohol

TAME: tert-Amyl methyl ether

DIPE: Diisopropyl ether

1,2-DCA: 1,2-Dichloroethane

ETBE: Ethyl tertiary butyl ether

EBD: Ethylene dibromide

µg/L: micrograms per liter

¹ Or an equivalent EPA Method that achieves the maximum Practical Quantitation Limit.

² All concentrations between the Method Detection Limit and the Practical Quantitation Limit shall be reported as an estimated value.

³ Metals include: arsenic, barium, calcium, chromium, total iron, magnesium, manganese, molybdenum, and vanadium.

FIELD SAMPLING

In addition to the above sampling and laboratory analyses, field sampling and analysis shall be conducted each time a monitoring well or extraction well is sampled. The sampling and analysis of field parameters shall be as specified in Table 3.

Table 3: Field Sampling Requirements

Parameters	Units	Practical Quantitation Limit	Analytical Method
Groundwater Elevation	Feet, Mean Sea Level	0.01 feet	Measurement
Oxidation-Reduction Potential	Millivolts	10 millivolts	Field Meter
Electrical Conductivity	mS/cm	0.001 mS/cm	Field Meter
Dissolved Oxygen	mg/L	0.2 mg/L	Field Meter
Turbidity	NTU	0.1 units	Field Meter
pH	pH Units (to 0.01 units)	0.01 units	Field Meter
Temperature	°F	0.1 °F	Field Meter

mS/cm: millisiemens per centimeter
 mg/L: milligrams per liter

NTU: Nephelometric Turbidity Unit
 °F: degrees Fahrenheit

All wells that are purged shall be purged until pH, temperature, conductivity, and dissolved oxygen are within 10% of the previous value.

Field test instruments (such as those used to test pH and dissolved oxygen) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are calibrated prior to each monitoring event;
3. Instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in item (b) of the "Reporting" section of this MRP.

ACTION LEVELS

Following collection of baseline groundwater samples collected prior to commencement of ISCO injection, Action Levels will be issued in a subsequent Central Valley Water Board staff directive for Suite B constituents listed in Table 2 above. Action Levels will be 120% of the maximum baseline concentrations of these constituents. Should concentrations of these constituents exceed Action Levels in Compliance wells, the Contingency Plan is to be implemented. Action Levels may be revised by Central Valley Water Board staff should background concentrations change significantly over the course of remediation.

CONTINGENCY PLAN

The Contingency Plan is to be implemented if concentrations of potential deleterious remedial byproducts exceed established Action Levels in Compliance Zone wells. The Contingency Plan is to consist of the following steps:

- (1) Report exceedance to Central Valley Water Board staff within 48 hours.
- (2) Collect confirmation samples from Compliance wells 30 days following initial exceedance of Action Levels.
- (3) If exceedances remain in Compliance wells after 30 days, a batch groundwater extraction up to a total of 2,000 gallons (or a total effort of 5 days, whichever occurs first) shall be performed in Compliance wells exceeding Action Levels.
- (4) Confirmation samples shall be collected from Compliance wells exceeding Action Levels 30 days after the completion of the batch extraction event.
- (5) If exceedances remain in Compliance wells 30 days after completion of batch extraction, repeat Steps 3 and 4 as needed.

IN-SITU DISCHARGE MONITORING

The Discharger shall monitor and record the discharge of ISCO that is injected into the subsurface according to the requirements specified in Table 5.

Table 5: Discharge Monitoring Requirements

Parameters	Units	Type of Sample
Injected Volume	Gallons per day	Meter
Amendment(s) Added	Pounds per day	Measured

REPORTING

When reporting the data, the Discharger shall arrange the information in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner as to clearly illustrate the compliance with this MRP. The results of any monitoring done more frequently than required at the locations specified in this MRP shall also be reported to the Central Valley Water Board.

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all reports shall be prepared by a professional Civil Engineer or Geologist or their subordinate and signed by the licensed professional.

The Discharger shall submit quarterly electronic data reports, which conform to the requirements of the California Code of Regulations, Title 23, Division 3, Chapter 30. All reports shall be submitted electronically over the internet to the GeoTracker database system. Quarterly reports shall be submitted by the 1st day of the second month following the end of each calendar quarter: **1 May, 1 August, 1 November, and 1 February**. Semi-annual reports shall be submitted by the 1st day of the second month following each calendar semi-annual period: **1 May and 1 November**.

Each quarterly or semi-annual report shall include the following minimum information:

- (a) a description and discussion of the groundwater sampling event and results, including trends in the concentrations of pollutants and groundwater elevations in the wells, how and when samples were collected, and whether the pollutant plume(s) is delineated;
- (b) field logs that contain, at a minimum, water quality parameters measured before, during, and after purging, method of purging, depth of water, volume of water purged, etc.;
- (c) groundwater contour maps for all groundwater zones;
- (d) pollutant concentration maps for all groundwater zones;
- (e) cumulative data tables containing the water quality analytical results and depth to groundwater;
- (f) a copy of the laboratory analytical data report, which may be submitted in an electronic format;
- (g) information as required by Table 5 of this MRP;
- (h) tabular and graphical summaries of all data obtained;
- (i) a discussion of the long-term trends in the concentrations of the pollutants in the groundwater monitoring wells;
- (j) an analysis of whether the pollutant plume is being effectively treated;
- (k) a description of all remedial activities conducted, an analysis of their effectiveness in removing the pollutants, and plans to improve remediation system effectiveness;

- (l) discussion of any exceedances of established Action Levels and/or the implementation of the Contingency Plan, and recommendations for modifications to limit breakdown/byproduct production if necessary;
- (m) an identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and
- (n) as desired, a proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes.

A letter transmitting the monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3.

The Discharger shall implement the above monitoring program on the first day of the month following adoption of this MRP.

Ordered by: 
for PATRICK PULUPA, Executive Officer

10/30/2022

(Date)

