

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2015-0012-074 Rev. 1
FOR
IN-SITU GROUNDWATER REMEDIATION
AND DISCHARGE OF TREATED GROUNDWATER TO LAND

FOR
ORLAND DRY CLEANERS SITE
726 5TH STREET, ORLAND
GLENN COUNTY, CALIFORNIA

This Monitoring and Reporting Program (MRP) describes requirements for monitoring a groundwater remediation injection program at the Orland Dry Cleaners Site. This MRP is issued to the Department of Toxic Substances Control (DTSC or Discharger) pursuant to Water Code section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer. As appropriate, California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board) staff shall approve specific sample station 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 grab sample shall be recorded on the sample chain of custody form.

REVISION

During the baseline groundwater sampling conducted in December 2024, the existing background well (MW-22) was found to contain concentrations of tetrachloroethylene (PCE) higher than other project wells. Due to the PCE detection in MW-22, a portion of the injection locations will be relocated to 5th Street along the Orland Cleaners storefront to more effectively target the PCE plume in groundwater. To comply with the MRP issued by the Central Valley Water Board on 30 May 2022 an additional monitoring well has been installed and sampled to serve as a background well for the injections.

This revised MRP includes the following updates which address the Discharger's initial findings or add clarity, along with minor formatting updates:

- New designation for monitoring well MW-22 and the addition of a separate upgradient monitoring well, MW-24;
- Simplification of Tables 1 and 2;
- Addition of Table 5 , Amendment Analytical Requirements

GROUNDWATER MONITORING

Monitoring wells associated with the enhanced in-situ bioremediation groundwater remediation at the Site are shown on Figure 1 and listed in Table 1 below. Groundwater monitoring well MW-22 was originally identified as the upgradient well for the in-situ

remediation work that started in 2022; however, the Discharger now states MW-22 is within the plume. Newly installed monitoring well MW-24 is now the upgradient monitoring well and will be used for monitoring upgradient background groundwater quality conditions prior to injections. The Discharger will use twelve (12) temporary injection points to inject the amendments in the treatment zone. Wells MW-19 and MW-22 are the treatment zone performance monitoring wells. Well MW-18 is the transition zone monitoring well, and wells MW-21 and MW-23 are the downgradient compliance monitoring wells. All monitoring wells must also be sampled for baseline conditions. 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. Sample collection and analysis shall follow standard EPA protocol, and sample analyses shall be conducted by an ELAP-certified laboratory.

Monitoring wells shall be sampled for tetrachloroethene (PCE), and its degradation products trichloroethene (TCE), congeners of di-chloroethene (DCE), and chloroethene (vinyl chloride or VC) along with specific additional indicator species including total dissolved solids (TDS), metals (arsenic, iron, and manganese), total organic carbon (TOC) and biologics according to the schedule in Table 1. The samples shall be analyzed by the methods in Table 2. Any additional sampling done shall be reported in the groundwater monitoring reports.

If concentrations of salts, total dissolved solids, or metals are detected more than 20% greater than their respective baseline/background concentrations at the Compliance Zone wells, the Discharger shall immediately submit one or more contingency measures for Central Valley Water Board staff approval to revert the groundwater conditions to the baseline conditions as proposed in the Corrective Action Work Plan, and as deemed necessary by Central Valley Water Board staff. Once approved by Board staff, the Discharger shall immediately implement the contingency plan.

Table 1 Sampling Frequency and Constituents

| Well ID | Constituent | Frequency | Monitoring Objective |
|----------------|---|---|--|
| MW-24 | PCE, TCE, DCE, VC, Nitrate, Sulfate, TDS, metals, TOC | Baseline (pre-injections); Quarterly for one year after injections; annually thereafter | Evaluation of Background (upgradient) concentrations. |
| MW-19, MW-22 | PCE, TCE, DCE, VC, Nitrate, Sulfate, TDS, metals, TOC, biologics (qPCR) | Quarterly for one year after injections; annually thereafter | Evaluation of in-situ remediation progress inside the Treatment Zone . |
| MW-18 | PCE, TCE, DCE, VC, Nitrate, Sulfate, TDS, metals, TOC | Quarterly for one year after injections; semi-annually thereafter | Evaluation of pollutant migration from the treatment zone through the Transition Zone . |
| MW-21, MW-23 | PCE, TCE, DCE, VC, TDS, Nitrate, Sulfate, metals, TOC | Quarterly for one year after injections; semi-annually thereafter | Evaluation of Compliance with groundwater limitations. |

Table 2 Analytical Methods

| Constituent | Method (note 1) | Maximum Practical Quantitation Limit (µg/L) (note 2) |
|---|----------------------------|---|
| Volatile Organic Compounds (PCE, TCE, DCE, VC) | EPA 8260B | 0.5 |
| Total Dissolved Solids (TDS) | EPA 160.1 | 10,000 |
| Nitrate, sulfate | EPA 300.0 | Various |
| Metals, total and dissolved (note 3) | EPA 200.7 | 100 |
| Total Organic Carbon (TOC) | SM 5310B | 200 |
| qPCR analytes: BVC, <i>Dhc</i> , VCR, and tceA Reductase (note 4) | CENSUS-DNA | NA |

Table 2 notes:

1. Analytical method substitutions may be made with Central Valley Water Board staff concurrence, provided the method achieves the Maximum Practical Quantitation Limit (PQL).
2. All concentrations between the Method Detection Limit (MDL) and the PQL shall be reported as an estimated value.
3. Metals include arsenic, iron, and manganese.
4. Biologics include BAV1 vinyl chloride reductase (BVC), *Dehalococcoides (Dhc)*, vinyl chloride reductase (VCR), and tceA reductase.

FIELD SAMPLING

In addition to the above sampling and laboratory analyses, field sampling and analysis shall be conducted each time a monitor 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 above Mean Sea Level (ft MSL) | 0.01 ft | Measurement |
| Oxidation-Reduction Potential (ORP) | millivolts (mV) | 10 mV | Field Meter |
| Electrical Conductivity (EC) | microsiemens per centimeter (µS/cm) | 50 µS/cm | Field Meter |
| Dissolved Oxygen (DO) | milligrams per liter (mg/L) | 0.2 mg/L | Field Meter |

| Parameters | Units | Practical Quantitation Limit | Analytical Method |
|---------------|----------------|------------------------------|-------------------|
| pH | standard units | 0.1 units | Field Meter |
| Temperature | degrees F (°F) | 0.1 °F | Field Meter |
| Volume purged | gallons (gal) | 0.1 gal | Measurement |

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.

IN-SITU DISCHARGE MONITORING

The Discharger shall monitor daily the discharge of water and amendments that are injected into the groundwater according to the requirements specified in Table 4. Each amendment addition shall be recorded individually, along with information regarding the time period over which the amendment was injected into the aquifer.

Table 4 Discharge Monitoring Requirements

| Parameters | Units | Type of Sample |
|--------------------|--------------------------|------------------|
| Injected volume | gallons per day (gpd) | Totalizing meter |
| Injection rate | gallons per minute (gpm) | Metered |
| Injection duration | hours (h) | Measured |
| Amendment(s) added | pounds per day | Measured |

AMENDMENT ANALYSIS

Prior to use, amendments shall be analyzed for the constituents listed in Table 5 using the listed method or an equivalent EPA Method that achieves the maximum Practical Quantitation Limit. The analysis should be done on a mixture of the amendment and deionized water at the estimated concentration that would be injected during the remediation project. All concentrations between the Method Detection Limit and the

Practical Quantitation Limit shall be reported, and reported as an estimated value. NA indicates not applicable.

Table 5 Amendment Analytical Requirements

| Constituent | Method (note 1) | Maximum PQL (µg/L) |
|--------------------------------------|------------------------|---------------------------|
| Volatile Organic Compounds (VOCs) | EPA 8260B | 0.5 |
| General Minerals (note 2) | | NA |
| Metals, total and dissolved (note 3) | EPA 200.7, 200.8 | Various |
| Total Dissolved Solids | EPA 160.1 | 10,000 |
| pH | meter | NA |
| Electrical Conductivity | meter | NA |

Table 5 notes:

1. An equivalent EPA Method may be used that achieves the maximum Practical Quantitation Limit (PQL).
2. General minerals for amendment analysis include alkalinity, bicarbonate, potassium, chloride, sulfate, total hardness, nitrate, nitrite, and ammonia.
3. Metals for amendment analysis include arsenic, barium, cadmium, calcium, total chromium, copper, iron, lead, manganese, magnesium, mercury, molybdenum, nickel, selenium, and silica.

ESTABLISHMENT OF BACKGROUND CONCENTRATION VALUES

The Discharger shall develop background values for concentrations of general minerals, dissolved metals, total dissolved solids, and electrical conductivity in groundwater following the procedures found in California Code of Regulations, Title 27, section 20415(e)(10). The Discharger shall complete a baseline monitoring event to establish background concentrations prior to implementation of the remediation event.

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 compliance with this Order. The results of any monitoring done more frequently than required at the locations specified in this Monitoring and Reporting Program 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 registered professional Civil Engineer or Geologist or their subordinate and signed by the registered 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.

The quarterly reports shall be submitted electronically by the 1st day of the second month following the end of each calendar quarter by **1 February, 1 May, 1 August, and 1 November** until such time as the Executive Officer determines that the reports are no longer necessary.

Each quarterly 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) a table showing well construction details such as well number, groundwater zone being monitored, coordinates (longitude and latitude), ground surface elevation, reference elevation, elevation of screen, elevation of bentonite, elevation of filter pack, and elevation of well bottom;
- (f) a table and rose diagram showing historical lateral and vertical (if applicable) flow directions and gradients;
- (g) cumulative data tables containing the water quality analytical results and depth to groundwater;
- (h) a copy of the laboratory analytical data report; and
- (i) the status of any ongoing remediation, including an estimate of amendments injected, an estimate of the cumulative mass of pollutant removed from the subsurface, the effectiveness of the remediation, and any field notes pertaining to the injection events.

An Annual Report shall be submitted electronically to the Central Valley Water Board by **1 February** of each year. This report shall contain an evaluation of the effectiveness and progress of the investigation and remediation. The Annual Report may be substituted for the fourth quarter monitoring report as long as it contains all of the information required for that report plus that required for the Annual Report. The Annual Report shall contain the following minimum information:

- (a) both tabular and graphical summaries of all data obtained during the year;
- (b) groundwater contour maps and pollutant concentration maps containing all data obtained during the previous year;
- (c) a discussion of the long-term trends in the concentrations of the pollutants in the groundwater monitoring wells;
- (d) an analysis of whether the pollutant plume is being effectively treated;
- (e) a description of all remedial activities conducted during the year, an analysis of their effectiveness in removing the pollutants, and plans to improve remediation effectiveness;
- (f) an identification of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program; and
- (g) if desired, a proposal and rationale for any revisions to the groundwater sampling plan frequency and/or list of analytes.

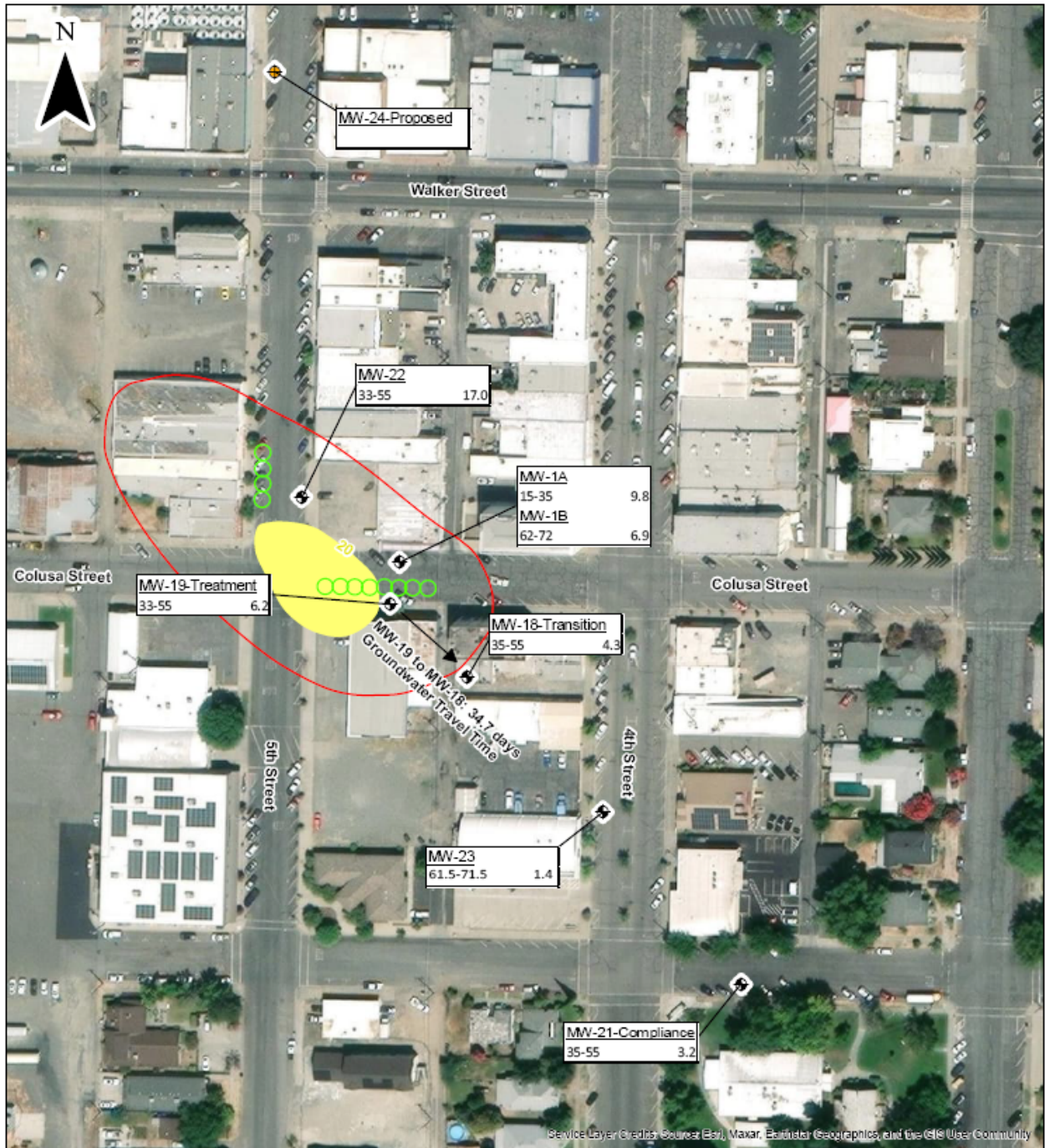
A letter transmitting the monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger 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 and Reporting Requirements (SPPRs) for Waste Discharge Requirements, 1 March 1991 edition, Section B.3. The Standard Provisions are available on the Central Valley Regional Water Boards' [Standard Provisions webpage](https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/std_provisions/wdr-mar1991.pdf) (https://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/std_provisions/wdr-mar1991.pdf).

This monitoring and reporting program is effective upon signature of the Executive Officer.

Original ordered on 30 May 2022 by John J. Baum
for PATRICK PULUPA, Executive Officer

Original Digitally Signed by John J. Baum
Date: 2025.02.25 15:36:38 -08'00'

Ordered by: _____
for PATRICK PULUPA, Executive Officer



- Legend**
- Groundwater Flow and Travel Time
 - ⊕ Proposed Monitoring Well Location
 - ⊕ Monitoring Well
 - Injection 7.5 ft ROI
- December 2018 PCE Isoconcentration Contour**
- Approximate Extent of PCE (>5.0 µg/L)
 - Approximate Extent of PCE (>20 µg/L)
- µg/L Micrograms per liter
PCE Tetrachloroethene



AECOM

To be established.

| |
|------------------|
| Job: 60422374 |
| Prepared by: CB |
| Checked by: CS |
| Date: 2025-01-28 |

FIGURE 1
Proposed Molasses Injection Map
Department of Toxic Substances Control
Orland, California