

California Regional Water Quality Control Board
North Coast Region

Monitoring and Reporting Program No. R1-2011-0111

WDID No. 1B10043RSON

FOR

THE CARRINGTON COMPANY

And

JAMES W. CODDING

For

BENNETT VALLEY CLEANERS
2753 Yulupa Avenue
Santa Rosa, California

Case No. 1NSR404

Sonoma County

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code Section 13267(b) to the responsible parties and requires monitoring and reporting for activities associated with the continued implementation of remedial activities under General Waste Discharge Requirements Order No. R1-2009-0105 (Order 0105). This MRP also specifies contingency monitoring and reporting requirements and identifies the threshold conditions for their implementation. The objectives of monitoring conducted under this MRP are to provide the Dischargers and Regional Water Board staff with information concerning volatile organic compound (VOC) contaminant trends in groundwater, soil vapor, and indoor air, and to demonstrate compliance with the provisions of Order 0105. The groundwater and soil vapor monitoring requirements specified below are also summarized in Appendix 1 of this MRP.

Under the authority of the California Water Code Section 13267, the Dischargers named above are required to comply with the following:

GROUNDWATER AND SOIL VAPOR MONITORING

General Requirements

1. The depth to groundwater shall be measured to the nearest 0.01-foot prior to monitoring well purging and sampling. Groundwater elevations shall be reported in tabular form indicating the surveyed elevations of each well reference point, depth to groundwater from the reference point, and the actual groundwater elevation. The data generated from the elevation readings must be referenced to mean sea level.
2. All monitoring wells shall be purged of least three casing volumes of water, or until dry, prior to sampling. Monitoring wells shall be allowed to recharge to at least 80% of the initial casing volume prior to sampling. All purge water shall be impounded pending analysis for proper disposal. An alternative well-purging protocol may be used upon the written approval of the Executive Officer.
3. The procedures used for soil vapor and indoor air sampling shall be consistent with current and subsequent revisions of sampling guidance issued by the California Department of Toxic Substances Control. Soil vapor probe sampling procedures shall include leak detection testing and shall include the use of a tracer gas and containment shroud during the sample collection. Analytical results for vapor samples shall be reported in micrograms per cubic meter.
4. Chemical analyses required by this MRP shall be conducted by laboratories certified for those analyses by the California Department of Health Services.
5. Analyses for volatile organic compounds (VOCs) shall include the full list of VOCs quantified by EPA Method 8260B (VOCs), as published in "*Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*" (SW-846) by the U.S. Environmental Protection Agency. The VOC list is incorporated as Appendix 2 of this MRP.

Baseline Monitoring Requirements

6. Prior to the second phase of sub-surface chemical injections, groundwater samples from BVC-1, BVC-2, BVC-4, BVC-5, BVC-6, BVC-7, BVC-8, BVC-9, BVC-10-I, BVC-11-I, BVC-12-I, BVC-13, EX-1, EX-2, and EX-3 shall be analyzed for VOCs.
7. Prior to the second phase of sub-surface chemical injections, monitoring wells BVC-2, BVC-4, BVC-5, BVC-7, BVC-8, BVC-9, BVC-10-I, BVC-11-I, BVC-12-I, EX-1, EX-2, and EX-3 shall be sampled and tested for the water quality parameters: alkalinity, chemical oxygen demand, total organic carbon, dissolved oxygen, oxidation-reduction potential, pH, and temperature.
8. Prior to the second phase of sub-surface chemical injections, monitoring wells BVC-2, BVC-4, BVC-5, BVC-7, BVC-8, BVC-9, BVC-10-I, BVC-11-I, BVC-12-I, EX-1, EX-2, and EX-3 shall be sampled and tested for the dissolved metals arsenic, iron, manganese, mercury, and vanadium.

9. Prior to the second phase of sub-surface chemical injections, vapor samples from monitoring probes VM-1, VM-4, VM-5, VM-6, VM-7, VM-8, VM-9, and VM-9-SS shall be collected and analyzed VOCs.
10. Prior to the second phase of sub-surface chemical injections, a vapor sample from monitoring probe VM-9-SS shall be tested for hydrogen sulfide.

Post-Injection Monitoring Requirements

11. Groundwater monitoring wells, BVC-4, BVC-5, BVC-7, BVC-8, BVC-9, BVC-12-I, EX-1, EX-2, and EX-3 shall be sampled within one month following the second phase of chemical injections, then quarterly for two sampling events and semi-annually thereafter. The groundwater samples shall be tested for the following parameters:
 - a. VOCs
 - b. Dissolved metals arsenic, iron, and manganese; and
 - c. Water quality parameters alkalinity, chemical oxygen demand, total organic carbon, dissolved oxygen, oxidation-reduction potential, pH, and temperature.
12. Vapor samples from monitoring probes VM-1, VM-4, VM-5, VM-6, VM-7, VM-8, VM-9, and VM-9-SS shall be sampled within one month following the second phase of chemical injections, then quarterly for two sampling events, and semi-annually thereafter. The vapor samples shall be tested for VOCs.
13. A sample from vapor probe VM-9-SS shall be sampled within one month following the second phase of chemical injections, then quarterly for two sampling events and tested for hydrogen sulfide.

CONTINGENCY MONITORING AND REPORTING FOR GROUNDWATER

Contingency groundwater monitoring and reporting shall be implemented at the direction of Regional Water Board staff in response to the conditions identified below:

14. If post injection analytical results for either well EX-1, EX-2, EX-3, BVC-4, BVC-5, BVC-7 or BVC-8 exceed baseline levels for dissolved iron, manganese, or arsenic, then samples from the elevated well(s) and from off-site down-gradient wells BVC-7, BVC-8, and BVC-12-I shall be analyzed within three months of receipt of the laboratory data, and at least semiannually thereafter, for the dissolved metals arsenic, iron, manganese, mercury, and vanadium.
15. If analytical results for either well BVC-7, BVC-8, or BVC-12-I exceed baseline levels for dissolved arsenic, iron, manganese, mercury, or vanadium, all subsequent groundwater samples from that well shall be analyzed for dissolved arsenic, iron, manganese, mercury, and vanadium until concentrations of these dissolved metals have returned to background levels for two consecutive sampling events.
16. If post injection analytical results for dissolved metals in either well BVC-7, BVC-8, or BVC-12-I exceed background water quality levels for two consecutive sampling

events, then a plan for implementing contingency actions to mitigate the mobilization of the constituents of concern must be submitted within sixty days of receipt of the laboratory data.

AIR AND SOIL VAPOR CONTINGENCY MONITORING AND REPORTING

17. Sub-slab vapor results from monitoring probe VM-9-SS shall be compared to the screening levels identified in "*Table 2. California Human Health Screening Levels for Indoor Air and Soil Gas*" in the guidance document: *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties* (CalEPA Office of Environmental Health Hazard Assessment, January 2005). The Dischargers shall submit written notification to Regional Water Board staff within ten days of receipt of the laboratory results if the results for sub-slab vapor from probe VM-9-SS for hydrogen sulfide and/or a VOC exceed the CHHSL for that constituent in indoor air after application of the default attenuation factor of 0.005 for sub-slab vapor, as specified in the October 2011 "*Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air*" (Vapor Intrusion Guidance) by the California Department of Toxic Substances Control.
18. The Dischargers shall submit written notification to Regional Water Board staff within ten days of receipt of the laboratory results if any VOC in samples from soil vapor monitoring probes VM-1 through VM-9 exceeds the CHHSL for that constituent in indoor air after application of the default attenuation factor of 0.001 for soil vapor, as specified in the Vapor Intrusion Guidance referenced above.
19. If VOC levels in any sample from soil vapor or the sub-slab vapor monitoring probes exceed the CHHSLs after application of the above-specified attenuation factors, the sampling point shall be re-sampled and tested within three months of receipt of the analytical results, and quarterly thereafter. Sampling frequency for vapor monitoring may return to semi-annual if the results from the latest two consecutive monthly analyses show that the constituents of concern are below screening levels.
20. If the sub-slab or soil vapor analytical results exceed screening levels for any constituent of concern one year after the second phase of subsurface chemical injections, a workplan for conducting a site specific human health risk assessment shall be submitted within thirty days of receipt of the laboratory data. The workplan shall include indoor air sampling in all commercial units overlying soil vapor impacted by VOCs.

REPORTING

Monitoring reports for Order 0105 compliance shall be submitted semi-annually in paper format to the Regional Water Board according to the following schedule:

<u>Report</u>	<u>Monitoring Period</u>	<u>Report Due Date</u>
First Semi-annual	January through March	April 30 th
Second Semi-annual	July through September	October 31 st

All reports, workplans, and laboratory analytical data submitted for the site shall also be submitted in electronic format to the State Water Resources Control Board's Geographic Environmental Information Management System database (GeoTracker) as specified in Title 23, Division 3, Chapter 30, Article 2, Sections 3890-3895 of the California Code of Regulations.

Each semi-annual monitoring report shall include the following elements:

- A. Groundwater elevation maps for each monitored water-bearing zone showing groundwater elevations relative to the locations of monitoring wells, vapor monitoring points, former and current underground tanks, and other significant features.
- B. Analytical data tables summarizing the current and historical analytical results for all permanent groundwater and vapor monitoring points.
- C. Copies of the following: well purging and sampling field logs; chain of custody documentation showing the time and date of collection and person collecting; and signed laboratory reports including quality control data and explanations of analytical anomalies, if any. Monitoring reports shall identify the type of instruments that were used for field-measured data, and shall include copies of the pre and post-calibration records or provide other assurance for field data quality. These supporting documents may be included as appendices in the report.
- D. A discussion of the soil vapor and sub-slab vapor analytical results and the assessment of potential vapor intrusion to indoor air, including recommendations for additional investigation or mitigation measures to address any concerns about indoor air quality.

Ordered by Original Signed By: Luis G. Rivera
Catherine Kuhlman
Executive Officer

December 14, 2011

WDR Compliance Sampling and Analysis Plan

MONITORING POINT	BASELINE ¹	POST-INJECTION ²	CONTINGENCY MONITORING ³
BVC-1	VOCs only	Sampling Not Required	Sampling Not Required
BVC-2	Up-gradient Monitoring Point ¹	Sampling Not Required	Sampling Not Required
BVC-3	Sampling Not Required	Sampling Not Required	Sampling Not Required
BVC-4	Shallow-zone On-site Sentry Well ¹	Shallow-zone On-site Sentry Well ²	Shallow-zone On-site Sentry Well ³
BVC-5	Shallow-zone On-site Sentry Well ¹	Shallow-zone On-site Sentry Well ²	Shallow-zone On-site Sentry Well ³
BVC-6	VOCs Only	Sampling Not Required	Sampling Not Required
BVC-7	Down-gradient Monitoring Point ¹	Down-gradient Monitoring Point ²	Down-gradient Monitoring Point ³
BVC-8	Down-gradient Monitoring Point ¹	Down-gradient Monitoring Point ²	Down-gradient Monitoring Point ³
BVC-9	Impacted Area Well ¹	Impacted Area Well ²	Impacted Area Well ³
BVC-10-I	Intermediate Zone Sentry Well ¹	Intermediate Zone Sentry Well ²	Intermediate Zone Sentry Well ³
BVC-11-I	Intermediate Zone Sentry Well ¹	Intermediate Zone Sentry Well ²	Intermediate Zone Sentry Well ³
BVC-12-I	Down-gradient Monitoring Point ¹	Down-gradient Monitoring Point ²	Down-gradient Monitoring Point ³
BVC-13	Impacted Area Well ¹	Sampling Not Required	Sampling Not Required
EX-1	Shallow-zone On-site Sentry Well ¹	Shallow-zone On-site Sentry Well ²	Shallow-zone On-site Sentry Well ³
EX-2	Shallow-zone On-site Sentry Well ¹	Shallow-zone On-site Sentry Well ²	Shallow-zone On-site Sentry Well ³
EX-3	Shallow-zone On-site Sentry Well ¹	Shallow-zone On-site Sentry Well ²	Shallow-zone On-site Sentry Well ³
VM-1	Vapor Phase VOCs Only	Quarterly for two events, Semi-annually thereafter	Quarterly sampling if VOCs exceed Screening Levels
VM-2	Monitoring Probe Not Functional	Monitoring Probe Not Functional	Monitoring Probe Not Functional
VM-3	Monitoring Probe Not Functional	Monitoring Probe Not Functional	Monitoring Probe Not Functional
VM-4	Vapor Phase VOCs Only	Quarterly for two events, Semi-annually thereafter	Quarterly sampling if VOCs exceed Screening Levels
VM-5	Vapor Phase VOCs Only	Quarterly for two events, Semi-annually thereafter	Quarterly sampling if VOCs exceed Screening Levels
VM-6	Vapor Phase VOCs Only	Quarterly for two events, Semi-annually thereafter	Quarterly sampling if VOCs exceed Screening Levels
VM-7	Vapor Phase VOCs Only	Quarterly for two events, Semi-annually thereafter	Quarterly sampling if VOCs exceed Screening Levels
VM-8	Vapor Phase VOCs Only	Quarterly for two events, Semi-annually thereafter	Quarterly sampling if VOCs exceed Screening Levels
VM-9	Vapor Phase VOCs Only	Quarterly for two events, Semi-annually thereafter	Quarterly sampling if VOCs exceed Screening Levels
VM-9-SS	Vapor Phase VOCs and hydrogen sulfide ⁴	Quarterly for two events, Semi-annually thereafter	Quarterly sampling if VOCs exceed Screening Levels

- (1) Baseline monitoring for groundwater shall include: a) VOCs; b) Dissolved metals: arsenic, iron, manganese, mercury, and vanadium; and C) Water quality parameters: alkalinity, chemical oxygen demand, total organic carbon, dissolved oxygen, oxidation-reduction potential, pH, and temperature. Baseline monitoring for vapor points includes VOC analyses.
- (2) Post-injection monitoring for groundwater shall include a) Dissolved metals: arsenic, iron, and manganese; and b) Water quality parameters: alkalinity, chemical oxygen demand, total organic carbon, dissolved oxygen, oxidation-reduction potential, pH, and temperature. Post injection monitoring for vapor points includes VOC analyses.
- (3) Contingency Monitoring for groundwater shall include a) VOCs; b) Dissolved metals: arsenic, iron, manganese, mercury, and vanadium; and C) Water quality parameters: alkalinity, chemical oxygen demand, total organic carbon, dissolved oxygen, oxidation-reduction potential, pH, and temperature. Contingency monitoring for vapor shall include the full list of volatile organic compounds quantified by EPA Method 8260B.
- (4) Sub-Slab Vapor samples shall be analyzed for hydrogen sulfide and for VOCs. Hydrogen sulfide analyses may be suspended if it is not present after two quarterly sampling events.