

Initial Study/Checklist
And Mitigated Negative Declaration

Prepared for and by

*North Coast Regional
Water Quality Control Board*

Waste Discharge Requirements General Order
For *In Situ Soil and Groundwater Remediation for Volatile
Organic Compounds and/or Metal Impacted Sites within
the North Coast Region*

September 30, 2009

North Coast Regional Water Quality Control Board
5550 Skylane Boulevard, Suite A
Santa Rosa, California 95403

Initial Study/Checklist and Mitigated Negative Declaration

This Initial Study/Checklist and Mitigated Negative Declaration have been prepared in accordance with Public Resources Code section 21000 et seq. (California Environmental Quality Act), and sections 15000 et seq. of Title 14 of the California Code of Regulations (CEQA Guidelines). The Mitigated Negative Declaration is proposed for adoption at a meeting of the California Regional Water Quality Control Board, North Coast Region on December 10, 2009.

Project Title

General Waste Discharge Requirements (WDRs) Order No. R1-2009-0105 for *In Situ Soil and Groundwater Remediation for Volatile Organic Compounds and Metal Impacted Sites within the North Coast Region.*

Project Location

The WDRs are intended for the injection of amendments within the soil and groundwater within the North Coast Region to remediate contamination from unauthorized discharges of volatile organic compounds, and metals including hexavalent chromium.

Lead Agency

California Regional Water Quality Control Board, North Coast Region
5550 Skylane Boulevard, Suite A, Santa Rosa, CA 95403

The lead agency prepares an Initial Study to determine if a project may have a significant effect on the environment. In accordance with the CEQA Guidelines, section 15064, an Environmental Impact Report (EIR) must be prepared if the Initial Study indicates that the proposed project under review may have a potentially significant impact on the environment. A Negative Declaration may be prepared instead if the lead agency prepares a written statement describing the reasons why a proposed project would not have a significant effect on the environment, and, therefore, why it does not require the preparation of an EIR (CEQA Guidelines Section 15371). According to CEQA Guidelines Section 15070, a Negative Declaration shall be prepared for a project subject to CEQA when either:

1. The Initial Study shows there is no substantial evidence, in light of the whole record before the agency, that the proposed project may have significant effect on the environment, or
2. The Initial Study identified potentially significant effects, but:
 - a. Revisions to the project plans or proposal made by or agreed to by the applicant before the proposed negative declaration is released for public review would

avoid the effects or mitigate the effects to a point where clearly no significant impacts would occur, and

- b. There is no substantial evidence, in light of the whole record before the agency, that the proposed project as revised may have a significant effect on the environment.

If revisions are adopted into the proposed project in accordance with the CEQA Guidelines Section 15070(b), a Mitigated Negative Declaration is prepared. The document includes such revisions in the form of mitigation measures. This document is a Mitigated Negative Declaration and incorporates all of the elements of an Initial Study.

Decision Making Body

California Regional Water Quality Control Board, North Coast Region

Proposed Project

The proposed project is the adoption of general WDRs for *In Situ* soil and groundwater remediation projects using reductive dechlorination and reductive processes for cleanup projects within the North Coast Region. Volatile organic compounds (VOCs), and metals, including hexavalent chromium have impacted soil and groundwater, and occasionally surface water, at numerous sites within the North Coast Region and cause or threaten adverse impacts to existing and potential beneficial uses of groundwater, and occasionally surface water, resources. The responsible parties for these sites are being required to cleanup the pollution, and protect and restore the beneficial uses of the waters of the state.

The adoption of General WDRs for *in situ* soil and groundwater remediation using reductive processes has a number of benefits, including:

- a. Simplifying the application process for dischargers;
- b. Preventing regulatory delays to soil and groundwater remediation activities, and thereby expedite the cleanup of contaminated sites;
- c. Reducing time needed for Regional Water Board staff to prepare and the Regional Water Board to adopt WDRs for common remedial activities; and
- d. Providing a comparable level of water quality protection to individual, site specific WDRs.

General WDRs or General NPDES permits for cleanup activities that were previously adopted by the North Coast Regional Water Board include:

- WDRs for Addition of Oxygen Releasing Compounds to Groundwater (R1-2000-51);
- WDRs for Soil Bioremediation and/or Aeration Activities (Order No. 92-66)
- WDRs for Addition of Hydrogen Peroxide, Acid and Iron Catalyst to Groundwater (R1-2004-0020),

- WDRs for *In Situ*, Bioremediation of Petroleum Hydrocarbons by the Addition of Nutrients, Microorganisms, and/or an Oxygen Source to Groundwater and/or Soil (R1-2004-0021); and
- WDRs for Addition of Chemical Oxidants to Soils and/or Groundwater (R1-2006-0107).
- General NPDES Permit No. CAG91101, Order No. R1-2006-0048, Waste Discharge Requirements for Discharges of Highly Treated Groundwater to Surface Waters Following Extraction and Cleanup of Groundwater Polluted with Petroleum Hydrocarbons and Volatile Organic Compounds

In situ remediation of soil and groundwater pollution from sites contaminated with volatile organic compounds and metals can be biological, chemical, physical, and/or a combination of these treatment processes. The reductive dechlorination process requires the creation of a reducing atmosphere, where chlorine ions are replaced by hydrogen, reducing chlorinated hydrocarbon molecules, such as cleaning solvents, eventually to non-toxic compounds (carbon dioxide and water). There are several different organic and inorganic compounds that will create a reducing condition. They include:

Organic: cheese whey, acetate, molasses, corn syrup, yeast extract, lactose, ethanol, propanol, sodium lactate, emulsified oils, hydrogen releasing compounds, and others.

Inorganic: calcium polysulfide, hydrogen sulfide gas, sodium sulfide, ferrous sulfate, sulfur dioxide gas, sodium metabisulfite, sodium dithionite, and zero valent iron.

Amendments, which are materials that will enable a reducing environment, are injected into soil and/or groundwater through soil borings, injection wells, trenches, and/or into open excavations. In some cases, groundwater is extracted, amended and reinjected through a recirculation and injection system. Amendments proposed for *in situ* treatment are analyzed to determine the suitability of the materials to be used for *in situ* remediation.

Changes in soil and groundwater chemistry can occur during these processes resulting in localized exceedances of water quality objectives that are generally limited in duration and/or in a relatively small portion of the aquifer. These waste discharge requirements allow exceedances of water quality objectives to occur while these reductive processes are taking place, but only within the treatment zone, and for a limited period of time. In the reductive dechlorination process, parent VOC compounds, tetrachloroethene (PCE) and trichloroethene (TCE) breakdown to more toxic intermediary VOCs (i.e., vinyl chloride). However, this is temporary and the dechlorination of vinyl chloride continues to occur.

Once the treatment process is terminated, water quality conditions are required to comply with State Water Board Resolution 92-49. This means that the site is cleaned up to background levels, or if that is not feasible, the water quality at the site must be the best which is reasonable and which comply with the *Water Quality Control Plan for the North Coast Region* (Basin Plan) water quality objectives.

The proposed WDRs recognize that water quality objectives for some parameters may be exceeded temporarily within the treatment zone. A monitoring well network is required, including downgradient of the treatment zone, and implementation of a site specific monitoring and sampling program is a condition of the permit coverage. The monitoring wells are used to measure the effectiveness of the treatment process and compliance with water quality objectives. The proposed WDRs also include discharge specifications requiring that when the remedial action is completed, amendments and byproduct measurements shall not exceed pre-injection (background) concentrations within or outside the treatment area.

The General WDRs require background groundwater quality information at groundwater monitoring and sampling points located upgradient, within, and downgradient of the contaminant plume or plumes. The General WDRs also require a site-specific monitoring and reporting program, and a contingency plan designed to address violations of the order resulting from unintentional and unacceptable concentrations of remediation by-products at groundwater monitor points established for each individual site. In addition, the contingency plan must address conditions at the site before violations occur.

Sites using this treatment technology may have potential impacts on air quality and cause nuisance conditions. The site specific NOI must identify the potential impacts and include an air quality monitoring program, a contingency plan, and potentially a human health risk assessment. These requirements are specified in detail in the Mitigation Measures, Appendix G, and the Notice of Intent (NOI) contained in the General WDRs. These air quality mitigation measures are designed to protect human health and safety from the *in situ* treatment process.

Federal, State and Local Agency Regulatory Requirements

To obtain coverage under the General WDRs, the cleanup project proponent must submit an NOI, which is an application for enrollment under the WDRs. These cleanup projects may also require various types of construction activities and waste treatment processes, requiring compliance with other Federal, State and local agency regulatory requirements that may range from permit acquisition to project specific CEQA compliance.

Compliance with other Federal, State and local agency regulatory requirements and the California Environmental Quality Act, if necessary, must be completed before the extension of coverage under these General WDRs can be granted.

Environmental Finding

The staff of the Regional Water Board has determined, on the basis of the attached Initial Study/Checklist and the documents and sources referenced therein, the project described above will not have a significant adverse impact on the environment, with implementation of the mitigation measures identified in the Initial Study/Checklist and

Negative Declaration. In addition, because the project is designed to accelerate the permitting process for cleanup projects to restore and protect groundwater quality, the project will actually result an overall benefit to the environment.

Mitigation Measures

Mitigation measures are included in the attached Initial Study/Checklist and will become an enforceable condition for the extension of coverage under General Waste Discharge Requirements Order No. R1-2009-0105. The mitigation measures are as follows:

Air Quality Mitigation Measures

Coverage under General Waste Discharge Requirements for *In Situ* Soil and Groundwater Remediation Projects in the North Coast Region will be extended on projects throughout the Region in several air quality districts. Not all *in situ* remediation projects have the potential to result in air quality impacts. For those sites that may have potential impacts to air quality and/or nuisance conditions because of their proximity to sensitive receptors, as described in 3b, c, d, and e of Appendix G, the site specific NOI must include an air quality monitoring program that addresses pre-treatment, during treatment and post treatment monitoring, and a contingency plan to protect sensitive receptors from any potential temporary air quality violations and exposure to toxic vapors or objectionable odors. The project proponent shall comply with the site specific monitoring and reporting program, and implement the contingency plan as needed. Impacts to air quality from the proposed cleanup project must be less than significant in order to be enrolled under the General Waste Discharge Requirements Order No. R1-2009-0105.

Hazardous Materials Mitigation Measure

Enrollment under General Waste Discharge Requirements for *In Situ* Soil and Groundwater Remediation Projects in the North Coast Region will be provided on projects throughout the Region located in various land use settings and zoning classifications. The site specific contaminants and the site specific amendments for injection will also vary from site to site. Therefore, not all *in situ* remediation projects have the potential to result in the creation of a potential significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment, or be located within ¼ mile of an existing or proposed school. However, if the potential exists, mitigation measures are required that demonstrate proper amendment and chemical management, application and storage practices to prevent any significant impact from a discharge of the amendments, breakdown products or byproducts of the treatment process. Mitigation measures must also include provisions for safety, such as automatic system shutdown when chemicals are present in ambient air, and provisions for proper operation and maintenance of equipment. The injection process is required to be in sealed containers and closed piping, and the injections are beneath the surface of the ground. A monitoring program and a contingency plan that prevents any significant impact from the potential release of the amendments, breakdown products,

or byproducts of the treatment process are a condition for enrollment under the General Waste Discharge Requirements Order No. R1-2009-0105 (General Order). Compliance with all federal, state, and local agency permit requirements are also requirements of the Order. "Less than significant impacts with Mitigation Incorporated" are a condition for enrollment under General Waste Discharge Requirements Order No. R1-2009-0105.

In situ remediation projects generally include the injection of amendments into soil and groundwater, which stimulate or enhance biological and/or chemical reactions, including reduction processes. The addition of amendments may cause concentrations of constituents other than the pollutant(s) targeted by the remediation to occur above acceptable levels due to the change in soil and/or groundwater chemistry. Under General Water Discharge Requirements Order No. R1-2009-0105, the potential degradation to water quality as the result of the remediation project is permitted only in the treatment zone with the condition that it is of limited duration and, before the remediation project is completed, water quality returns to background conditions, or at a minimum, results in higher water quality conditions than what existed prior to the cleanup project.

Hydrology and Water Quality Mitigation Measure

The remediation projects conducted under the proposed General Order will be subjected to all of the requirements and limitations of the General Order. The remediation projects are usually conducted in response to a Regional Water Board staff directive, or an enforcement order issued by the Regional Water Board Executive Officer. Prior to enrollment under the General Order, a complete Notice of Intent must be filed, including the mandatory items under Section A (Conditions of Eligibility), which include, an acceptable remedial action plan, corrective action plan, work plan, and/or work plan addendum that establishes the technical feasibility of the selected remedy, and the proposed soil and groundwater amendments, a description of the amendments, background conditions, breakdown products, and the potential for constituents to temporarily degrade water quality. An acceptable plan must be able to demonstrate that the proposed treatment will be technologically feasible and effective at the project site, and limited to the proposed treatment area. Also mandatory is an effective groundwater monitoring network and site specific monitoring and reporting program to ensure treatment effectiveness, any and all degraded groundwater conditions are limited in duration and limited spatially, and groundwater quality conditions have returned to background prior to deeming the remediation project complete. If background is not feasible, the water quality at the site must be the best which is reasonable and which complies with the Basin Plan.

Need for the Project

Currently, general waste discharge requirements do not exist for the *in situ* treatment of groundwater contaminated with VOCs and metals (primarily hexavalent chromium) using a reductive treatment process. Therefore, sites using *in situ* treatment for VOC dechlorination and metals reduction require the preparation and adoption of individual permits. Preparing individual Orders for each project is time consuming and can take

several months to review the proposal and the CEQA environmental analysis, draft the appropriate CEQA documents, public notices, Waste Discharge Requirement Orders, and Monitoring and Reporting Program Order. Since VOC and metals sites have similar treatment processes and monitoring requirements, adoption of the proposed General Waste Discharge Requirements Order No. R1-2009-0105 is appropriate. Enrollment in the General Order for these *in situ* treatment technologies will benefit the Discharger, the lead agency, and the public by expediting the soil and groundwater cleanup process and is expected to have direct positive long-term effects to water quality and the environment.

Initial Study/Checklist

The attached checklist is taken from Appendix G of the State CEQA Guidelines. For each item, one of four responses is given:

- No Impact: The project will not have the impact described.
- Less Than Significant Impact: The project will have the impact described but the impact will not be significant. Mitigation is not required, although the project applicant may choose to include mitigation measures to reduce the impacts.
- Less than Significant Impact With Mitigation Incorporated: The project will have the impact described and the impact will be significant. One or more mitigation measures have been identified that will reduce the impact to a less than significant level.
- Potentially Significant Impact: The project may have the impact described, and the impact is significant. The impact cannot be reduced to a less than significant level by incorporating mitigation measures. An environmental impact report must be prepared for this project.

Each question on the checklist was answered by evaluating the proposed project without considering the effect of any added mitigation measures. As proposed in the General Waste Discharge Requirements, the project includes various constraints and conditions that will reduce all potentially significant impacts to a level that is less than significant. The checklist includes a discussion of the impacts and mitigation measures that have been identified. Sources used are numbered and incorporated into the checklist.

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