

California Regional Water Quality Control Board
North Coast Region

Order No. R1-2009-0105

GENERAL WASTE DISCHARGE REQUIREMENTS
FOR

IN SITU SOIL AND GROUNDWATER REMEDIATION

FOR VOLATILE ORGANIC COMPOUND

And/or METAL IMPACTED SITES WITHIN THE NORTH COAST REGION

The California Regional Water Quality Control Board, North Coast Region, (hereinafter Regional Water Board) finds that:

1. Pursuant to Section 13263, subdivision (i) of the California Water Code, the Regional Water Board may prescribe general waste discharge requirements (WDRs) for a category of discharges if the Regional Water Board finds or determines that the discharges are produced by the same or similar operations, involve the same or similar types of wastes, require the same or similar treatment standards, and are more appropriately regulated under general requirements than individual discharge requirements.
2. Unauthorized discharges of volatile organic compounds (VOCs) and/or metals (including hexavalent chromium), have degraded groundwater quality at numerous sites within the North Coast Region and, cause or threaten to cause pollution or nuisance and adversely affect existing and potential beneficial uses of groundwater resources.
3. Regardless of the type of discharge, procedures and policies applicable to investigations, and cleanup and abatement activities are similar. Remediation of soil and groundwater contaminated with VOCs and heavy metals can include reductive processes. These processes may include the injection of amendments. The treatment of VOC and heavy metal sites can use the same process for *in situ* treatment, the reducing process to dechlorinate VOCs and reduce heavy metals to a less toxic form. Reducing agents can include, but is not limited to: cheese whey, molasses, corn syrup, lactose, ethanol, emulsified oils, hydrogen releasing compounds, calcium polysulfide, sodium dithionite, sodium metabisulfite, zero valent iron, and others. These compounds are hereafter referred to as "reducing agents", in some cases, *in situ* applications may be combined with *ex situ* cleanup technologies, such as groundwater extraction, which may be used for hydraulic control, recirculation/reinjection, and/or as a contingency plan component.
4. *In situ* applications can be effective treatment alternatives capable of reducing and/or eliminating the levels of contaminants in soil and groundwater.

5. Adoption of General Waste Discharge Requirements Order No. R1-2009-0105 (Order) for *in situ* treatment processes would: a) simplify the application process, b) prevent regulatory delays, c) expedite soil and groundwater remediation activities, d) reduce time needed for Regional Water Board staff to prepare and the Regional Water Board to adopt WDRs for common remedial activities in the North Coast Region, e) enable the extension of coverage for sites with groundwater impacts from multiple contaminant types, enabling multiple *in situ* treatment methods under one permit, and f) provide a comparable level of water quality protection to individual, site-specific WDRs.
6. This Order regulates the use and application of *in situ* biological, chemical, and physical treatments to cleanup waste constituents in soil and groundwater. The Dischargers regulated by this Order are more appropriately regulated by General WDRs than individual WDRs because the Regional Water Board regulates many sites using these types of processes, the cleanup of these types of sites is of high priority, and the issuance of individual WDRs is time-consuming without providing additional water quality benefit. *In situ* treatment techniques have similar potential water quality effects that can reasonably be regulated with General WDRs. This Order does not preclude the adoption of individual WDRs where appropriate.
7. Pilot tests may be necessary to evaluate the technical feasibility of an *in situ* cleanup alternative prior to the design and implementation of a full-scale remediation. The injection of amendments, are covered under this Order for pilot tests if site specific conditions and pilot test specifications meet the criteria.
8. This Order is intended for use and application to remediate soil and groundwater impacts from volatile organic compounds, and metals, including hexavalent chromium, that may have been discharged and can effectively be treated using *in situ* reductive applications.
9. The Regional Water Quality Control Plan for the North Coast Region (Basin Plan) designates the beneficial uses of groundwater as:
 - a. Municipal and domestic water supply (MUN);
 - b. Agricultural water supply (AGR);
 - c. Industrial service supply (IND); and
 - d. Industrial process supply (PRO).
10. State Water Board Resolution No. 92-49 (Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304) requires the Regional Water Board to require actions for cleanup and abatement of discharges that cause or threaten to cause pollution or nuisance to conform to the provisions of Resolution No. 68-16 and the Basin Plan. Pursuant to Resolution No. 92-49, the Regional Water Board shall ensure that dischargers are required to clean up and abate the effects of discharges in

a manner that promotes attainment of either background water quality, or if background levels of water quality cannot be restored, the best water quality which is reasonable and which complies with the Basin Plan, including applicable WQOs.

11. The Basin Plan contains narrative and numerical water quality objectives (WQOs) to protect the beneficial uses, including a General Objective that incorporates State Water Resources Control Board Resolution No. 68-16, the Statement of Policy with Respect to Maintaining High Quality Waters in California. Resolution No. 68-16 states that the highest water quality consistent with the maximum benefit to the people of the state must be maintained, that any discharge will not reasonably affect present and anticipated beneficial uses of such water, and will not result in water quality less than that prescribed in state policies. Water quality objectives based on the narrative requirements specified in the Basin Plan, are selected from numerical water quality standards established by the United States Environmental Protection Agency, the California Department of Public Health, the California Environmental Protection Agency, the California Office of Environmental Health Hazard Assessment, and other agencies charged with determining safe levels of constituents in groundwater for the protection of human health, and the environment. Groundwater shall also not contain taste or odor producing substances that cause nuisance or adversely affect beneficial uses.
12. The application of any amendment to groundwater may result in unintended adverse effects to groundwater quality due to changes in groundwater chemistry and subsurface biological conditions; changes in groundwater chemistry may liberate metals naturally occurring in the formation, or result in the formation of subsurface vapors. To comply with this Order, any potential adverse water quality effects that may occur must be localized, of short-term duration, and may not affect existing or potential beneficial uses of groundwater beyond the treatment area, nor affect the environment, human health or safety. Groundwater quality and as appropriate, air quality, will be monitored before and after addition of any amendments to verify the effectiveness of the remediation and ensure no long-term adverse affects on the beneficial uses of groundwater, the environment, human health and safety.
13. Section 13260(a) of the California Water Code requires that all persons discharging waste or proposing to discharge waste that could affect the quality of waters of the state file a Report of Waste Discharge (ROWD) with the Regional Water Board. Under these General WDRs, a Notice of Intent to Comply (NOI) serves as the equivalent of a ROWD.
14. Section 13260(a) also requires that the appropriate filing fee must be submitted with the NOI. For the purposes of determining the appropriate filing fee, discharges regulated by these General WDRs are considered to have a threat

to water quality rating of 3, and a complexity rating of A, as defined in section 2200 of Title 23 of the California Code of Regulations (CCR).

15. The Regional Water Board is the lead agency for this project under the California Environmental Quality Act (CEQA; Public Resources Code, Section 21000 *et seq.*). An Initial Study/Checklist and Mitigated Negative Declaration were prepared in accordance with Title 14, California Code of Regulations, Section 15063. On October 1, 2009, the Regional Water Board provided a notice of intent to adopt a Mitigated Negative Declaration (State Clearing House No.2009102012) for the project (California Code of Regulations, Title 14, § 15072). The Mitigated Negative Declaration reflects the Regional Water Board's independent judgment and analysis. After considering the Initial Study/Checklist, the Regional Water Board hereby determines that the proposed project, with implementation of the mitigation measures set forth in the Mitigated Negative Declaration, and incorporated as terms of this Order, will not have a significant impact on the environment.
16. The Regional Water Board has notified the public and interested agencies of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations.
17. The Regional Water Board, at a public meeting on December 10, 2009, heard and considered all comments pertaining to these General WDRs.

THEREFORE, IT IS HEREBY ORDERED that persons filing a Notice of Intent to Comply (hereinafter the Discharger) with the provisions of these General Waste Discharge Requirements Order No. R1-2009-0105, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

A. CONDITIONS OF ELIGIBILITY

To obtain coverage under these General Waste Discharge Requirements, a Discharger shall submit a complete NOI that includes:

1. A completed and signed Form 200.
2. The appropriate filing fee. The check or money order shall be made payable to "State Water Resources Control Board".
3. An acceptable Remedial Action Plan, Corrective Action Plan, Work Plan, and/or Work Plan Addendum that establishes the technical feasibility and effectiveness of the selected remedy or remedies, or an acceptable Pilot Test Work Plan to establish the technical feasibility and effectiveness, and the proposed soil and groundwater amendments.

4. The plan(s) must include a description of all amendment management, storage, mixing, and application methods.
5. For all plans, lead agency approval must be current within 12 months of the date of the Notice of Intent.
6. A description of the amendment or amendments including but not limited to:

Reducing agents - zero valent iron, easily degradable carbon sources (such as glucose, cheese whey, molasses, and others), and slowly degradable carbon sources (such as edible oils, poly-lactate, other hydrogen release compounds, sulfur and nitrogen compounds and polysulfides).
7. Background water quality conditions, including concentrations of contaminant types which may include: total dissolved solids, chemical oxygen demand, dissolved oxygen, dissolved carbon dioxide, metals, pH, temperature, and oxygen reduction potential.
8. The proposed treatment process including specific impurities, the breakdown reactions, potential by-products, and description of the nature and volume of any chemical products to be added to the vadose zone and/or groundwater.
9. A discussion regarding the compatibility of multiple treatments, amendment interactions, and potential by-products if more than one treatment method and multiple amendment types are proposed.
10. The characterization of the nature and extent of the groundwater plume, hydraulic conductivity, groundwater gradient direction, description of the hydrogeology, complete definition of all preferential pathways and buried utilities.
11. A description of the engineered remediation and/or treatment system, including the delivery system, injection point(s) and/or well spacing to ensure adequate coverage; injection well construction details; concentrations and rate of injections; description of any needed safety features such as automatic system shutdown when chemicals are present in ambient air, a description of chemical storage facilities, including sealed containers and closed piping for chemicals and amendments stored and injected at the site, and provisions for proper operation and maintenance of equipment.
12. A remediation system design document signed and stamped by a California licensed professional engineer or geologist.
13. A description of all equipment necessary for system installation, operation and maintenance, the duration of equipment operation, and an evaluation

- regarding the potential for site specific noise level increases. If the potential exists that the project will create excessive noise, noise suppression methods must be identified in the NOI. All projects must comply with all local agency regulatory requirements, including limitations on noise and cannot create conditions of nuisance.
14. Information on the possibility of any adverse impacts to groundwater quality, and whether the impacts will be localized and short-term, and potential adverse affects of any current or projected uses of the water during the time that impacts are being realized.
 15. Information on the possibility of any adverse impacts to human health or safety, and the environment from the proposed *in situ* treatment.
 16. Identification of all land uses within 1500 feet of the treatment area. The information shall include a map depicting the land uses surrounding the site and plume, along with all water supply wells, utilities, surface water bodies, and other sensitive receptors including, but not limited to, schools, hospitals, day care centers, or other areas where the protection of human health and the environment needs to be addressed.
 17. A proposed monitoring and reporting plan to monitor the treatment area, the area down gradient of the treatment area and the treatment process. The monitoring plan must demonstrate the effectiveness of the treatment method, the protection of human health and the environment, and groundwater quality. The plan must include, at a minimum, an upgradient sampling point, a down gradient sampling point, and sampling points within the contaminated area. The plan must be designed to collect data for all applicable constituents for the proposed treatment technology. The plan will be incorporated into a site specific monitoring and reporting program issued by the Executive Officer of the Regional Water Board.
 18. An evaluation regarding potential air quality impacts (ambient air and/or vapor intrusion), human health and safety impacts or nuisance conditions during amendment mixing, injection, treatment, and post-treatment. The evaluation shall include an air monitoring plan and a contingency plan if potential air quality standards, adverse impacts to human health and safety and/or nuisance conditions have the potential to occur. A human health risk assessment may be required when there is a potential for indoor air intrusion to cause an excess cancer risk of 1×10^{-6} or a health hazard index of greater than 1. The site specific air quality district must be identified, including pertinent air quality standards for that district.
 19. A Contingency Plan to be implemented to correct any potential adverse water quality impacts, or adverse impacts to human health or the environment. The

contingency plan must prevent migration of chemicals beyond the treatment area, and prevent in-door air intrusion and adverse exposures.

20. A description of the investigation conducted to determine if any cultural resources are existing at the site. If historical, archaeological, or paleontological resources exist on a site specific basis, they must be described in the site specific remedial action plan or plans, supported with documentation from the authorities. Areas that will be prohibited from remediation would be identified in the Notice of Intent. If cultural resources are discovered during remediation, work will stop to allow for proper notification of the authorities, and areas determined to have cultural resources will be excluded from remediation.
21. The identification of all federal, state and local agency permit requirements associated with the proposed *in situ* treatment method. A condition of eligibility is compliance with federal, state and local agency permit requirements.

B. NOTIFICATION OF COVERAGE

Project coverage under these General Waster Discharge Requirements shall not take effect until the Executive Officer notifies the discharger in writing that coverage has been provided. The Executive Officer shall not issue a notification of project coverage under the General Waste Discharge Requirements prior to the submittal of a complete NOI and the completion of a 30-day public notice and comment period on the proposed extension of coverage. Regional Water Board staff will provide the Discharger with a public notice form and provide instructions regarding the site specific noticing requirements upon determination of the NOI as complete. Notification of project coverage shall not be issued if the Executive Officer finds that there may be significant impacts to water quality, or adverse impacts to human health, safety or the environment from the provision of project coverage by these General Waste Discharge Requirements.

C. DISCHARGE PROHIBITIONS

1. The discharge of any amendments other than those identified and concurred with in the NOI is prohibited.
2. Creation of a pollution, contamination, or nuisance, as defined by Water Code section 13050, subdivision (m), is prohibited (Health and Safety Code, section 5411).
3. The discharge of amendments that may result in an adverse impact to any sensitive receptor identified in the NOI is prohibited.

4. The discharge of amendments to land or groundwater in areas other than that approved for remediation is prohibited.
5. The injection of amendments to soil and/or groundwater beneath property that is not owned by the Discharger is prohibited unless access agreements have been secured.
6. The migration of any byproducts produced as part of the treatment process beyond the boundaries of the treatment zone identified in the NOI is prohibited.
7. The discharge of amendments that create fugitive emissions in excess of federal, state, and/or local air quality standards is prohibited.
8. The discharge of chemicals that create fugitive air emissions that result in indoor air vapor intrusion threatening human health and the environment is prohibited as determined by a human health risk assessment.
9. The discharge of chemicals that produce groundwater temperatures above 50° C is prohibited.
10. The creation of adverse levels of noise in violation of local regulatory requirements is prohibited.

D. DISCHARGE SPECIFICATIONS

1. The addition of amendments to the subsurface shall not impart taste, odor, or color to, or otherwise degrade the beneficial uses of areal groundwater, except for temporary changes within the treatment area.
2. The unwanted migration of amendments or byproducts shall be mitigated as specified in the Contingency Plan upon detection.
3. When the remedial action is completed, amendments and byproduct measurements shall not exceed pre-injection (background) concentrations within or outside the treatment area.

E. PROVISIONS

1. A copy of this Order shall be maintained at the project site and be available at all times to operating personnel.
2. Severability:

Provisions of these waste discharge requirements are severable. If any provision of these requirements is found invalid, the remainder of these requirements shall not be affected.

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3. Operation and Maintenance:

The Discharger must maintain in good working order and operate as efficiently as possible any facility or control system installed by the Discharger to achieve compliance with the waste discharge requirements.

4. Change in Discharge:

The Discharger must promptly report to the Regional Water Board any material change in the character, location, or volume of the discharge.

5. Change in Ownership:

In the event of any change in control or ownership of land presently owned or controlled by the Discharger, the Discharger must notify the succeeding owner of the existence of this Order.

6. Vested Rights:

This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, nor protect the discharger from his liability under federal, State, or local laws, nor create a vested right for the discharger to continue the waste discharge.

7. Monitoring:

The Discharger must comply with the site specific monitoring and reporting program issued for the specific discharge, or discharges, as proposed in the NOI and Conditions of Eligibility.

8. Signatory Requirements:

- a. All reports, NOI, or other documents required by these General WDRs, and other information requested by the Regional Water Board shall be signed by a person described below or by a duly authorized representative of that person.
 - i. For a corporation: by a responsible corporate officer such as: (a) a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function; (b) any other person who performs similar policy or decision making functions for the corporation; or

- ii. The manager of one or more manufacturing, production, municipality, or operating facilities if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- b. Reports required by this Order, other information requested by the Regional Water Board, and NOI's may be signed by a duly authorized representative provided:
 - i. The authorization is made in writing by a person described in paragraph (a) of this provision;
 - ii. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company; and
 - iii. The written authorization is submitted to the Regional Water Board prior to or together with any reports, information, or applications signed by the authorized representative.
- c. Any person signing a document under paragraph (a) or (b) of this provision shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage 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 fine and imprisonment for knowing violations."

9. Inspections

The Discharger shall permit authorized staff of the Regional Water Board:

- a. Entry upon the project site covered by these General Waste Discharge Requirements or upon any site at which any required records are kept;
- b. Access to copy any records required to be kept under terms and conditions of this Order;
- c. Inspection of monitoring equipment or records; and

- d. Sampling as needed including air, soil, soil gas, groundwater, amendments, influent, effluent and/or any discharge.

10. Noncompliance

In the event the discharger is unable to comply with any of the conditions of this Order due to:

- a. Breakdown of waste treatment or monitoring equipment;
- b. Accidents caused by human error or negligence;
- c. Site construction or development operations; or
- d. Other causes such as acts of nature.

The Discharger must notify the Executive Officer by telephone as soon as the Discharger, or his or her agents, have knowledge of the incident and confirm this notification in writing within two weeks of the telephone notification. The written notification shall include pertinent information explaining reasons for the noncompliance and shall indicate the steps taken to correct the problem and the dates thereof, and the steps being taken to prevent the problem from recurring.

11. The Discharger must notify the Executive Officer by telephone as soon as the Discharger or his or her agents have knowledge, and in writing within one week of the telephone notification, that steps need to be taken to implement any portion of the contingency plan for reasons, including but not limited to:

- a. Prevent in-door air intrusion exposures;
- b. Prevent migration of chemicals beyond the treatment area;
- c. Protect human health and safety;
- d. Prevent nuisance conditions; or
- e. Changes in groundwater monitoring locations or water quality parameters.

12. Revision of Requirements

The Regional Water Board may review this Order periodically and may revise requirements when necessary. In addition, the Discharger shall file a NOI in compliance with Section A of this Order with the Executive Officer at least 120 days before making any material change or proposed change in the character, location, or volume of the discharge. Coverage for such changes in the discharge will follow the process outlined above in Section B, Notification of Coverage.

13. Termination of Coverage

Project coverage under these General Waste Discharge Requirements will automatically terminate five calendar years from the date of the notice of project coverage issued by the Executive Officer unless the Discharger requests, in writing, an extension of coverage. The written request for extension of coverage shall clearly describe the reason for the request, and include such other information as deemed appropriate by the Executive Officer. The Discharger may request termination of coverage prior to the completion of the five year period, subject to concurrence by the Executive Officer. Project coverage may also be terminated by the Executive Officer at any time upon giving reasonable notice to the Discharger.

Certification

I, Catherine Kuhlman, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, North Coast Region, on December 10, 2009.

Catherine Kuhlman
Executive Officer