California Regional Water Quality Control Board
North Coast Region

ORDER NO. R1-2003-085

WASTE DISCHARGE REQUIREMENTS

FOR

IN-SITU HEXAVALENT CHROMIUM SOIL AND GROUNDWATER TREATMENT

WILLITS ENVIRONMENTAL REMEDIATION TRUST
Former Remco Hydraulics Facility
934 South Main Street
Willits, California

Mendocino County

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

1. The Willits Environmental Remediation Trust (WERT) (hereinafter the discharger) submitted a report of waste discharge on March 12, 2003, June 18, 2003, August 20, 2003, August 22, 2003, August 28, 200, and September 3, 2003, proposing to conduct in-situ treatment of groundwater predominantly contaminated with hexavalent chromium. The discharger proposes to reduce hexavalent chromium in groundwater by injecting a reductant, pesticide-free food grade molasses, to convert hexavalent chromium to trivalent chromium. Trivalent chromium is a less toxic form of chromium, and tends to adsorb onto soil particles.

2. A pilot study was conducted in 2000 to convert hexavalent chromium to trivalent chromium using two reducing processes: calcium polysulfide and molasses. The results of the pilot study show decreases in hexavalent chromium concentrations in the calcium polysulfide and molasses pilot study areas. In addition, decreasing concentrations of volatile organic compounds (VOCs) in the molasses study area were documented.

3. The former Remco Hydraulics Facility (hereinafter the site) is located at 934 South Main Street in Willits, California, and was a former machine shop and chrome plating facility (Figure 1). The facility began operations as a machine shop in 1945, and the first chrome-plating tank was constructed in 1963. The facility ceased operations in 1995. Soil and groundwater at the site are contaminated with chromium, VOCs, and other wastes.

4. On December 29, 1995, the City of Willits served both a Notice of Violation and a Notice of Endangerment to Remco Hydraulics and the previous owners of the site. Subsequently, on December 10, 1996, the City of Willits filed its Second Amended Complaint against those same parties for, among other things, the abatement of imminent and substantial endangerment pursuant to the provisions of the federal Resource Conservation and Recovery Act (RCRA), injunctive relief and abatement pursuant to RCRA, nuisance per se pursuant to the City of Willits Municipal Code, abatement of a public nuisance pursuant to California Civil Code Section 731 and recovery of nuisance abatement costs, and negligence.

   The outcome was a Final Consent Decree, Final Order and Final Judgment; Order Establishing The Willits Environmental Remediation Trust; And Order Of Reference to Special Master (Consent Decree) as entered by the Federal District Court for the Northern District of California between the City of Willits, the owners, and previous owners of the site (Case No. C96-0283 FMS). The Consent Decree established the Willits Environmental Remediation Trust on August 22, 1997 upon entry of the Consent Decree, to investigate and remediate the site. Through operation of the Consent Decree, the discharger acquired ownership of the site.

5. The site, approximating seven acres, is bordered on the east by South Main Street (Highway 101), on the south by railroad lines, with residential homes and Baechtel Grove School to the south of the railroad line, on the west by horse corrals, residential homes and commercial structures, and on the north by residential homes.

6. The site is located on the western margin of the north-northwest trending Little Lake Valley. The Little Lake Valley consists of a thick sequence of fine-textured lake sediments (silts and clays) interlaced with sand and gravel. The site is situated on a sequence of stratified unconsolidated sediments consisting primarily of sands, silts, and clays of alluvial origin.

7. The direction of groundwater flow at the site is predominately to the east-northeast, while in the lower aquifers a more north-northeasterly trend exists. There are three groundwater bearing zones at the site where permeable lenses of sands and gravels have been identified. The A-zone exists from the water table to a depth of approximately 15 to 25 feet below ground surface (bgs), the B-zone from 20 to 40 feet bgs, and the C-zone which begins at 35 to 60 feet bgs. The A-zone is largely unconfined. However, the B- and C-zones are largely confined.

8. Groundwater at the site is contaminated with several compounds: hexavalent chromium; volatile organic compounds; total petroleum hydrocarbons as gasoline, diesel, and motor oil; and semivolatile organic compounds. Hexavalent chromium has been detected in onsite groundwater at concentrations up to 450,000 parts per billion (ppb) in the immediate vicinity of the former chrome plating tanks,

exceeding the water quality objective of 21 ppb and impairing the beneficial uses of groundwater.

9. The discharger proposes to perform an interim remedial action designed to reduce hexavalent chromium to trivalent chromium in-situ using a carbohydrate solution of molasses. Groundwater in the treatment area is also contaminated with chlorinated VOCs. The discharger is proposing to inject diluted molasses solution (hereinafter sometimes referred to together as "food grade carbohydrates") at 50 injection points into the A-zone. In addition, six injection points will be installed into the B-zone. Reinjections of molasses may be necessary. The treatment mechanism involves the injection of readily degradable molasses that is consumed by microorganisms in the aquifer. As the microorganisms degrade the carbohydrates, the available dissolved oxygen in groundwater is depleted, producing a reducing environment. Under the reducing conditions, biotic and abiotic processes occur that reduce hexavalent chromium to trivalent chromium. For chlorinated volatile organic compounds, it is expected that the reducing environment created by the carbohydrate injection will promote and enhance the dechlorination of VOCs. The proposed treatment area is shown on Figure 2, and the proposed injection points are shown on Figure 3.

10. Groundwater monitoring of the interim remedial action will be accomplished by sampling 23 groundwater-monitoring wells in the A-zone, 7 wells in the B-zone, and five wells in the C-zone. No treatment is proposed for the C-zone during the first injection. Monitoring will determine any impacts to groundwater quality in the C-zone. Based on the monitoring data, injection of molasses into the C-zone may occur at a later date. The groundwater monitoring well locations are depicted on Figure 3.

11. The discharger has indicated that the interim remedial action may temporarily mobilize iron, manganese, arsenic, and/or antimony. In addition, the interim remedial action may create a temporary increase in the concentration of vinyl chloride in the injection area as part of this interim remedial action. If an upward trend in the concentrations of metals and vinyl chloride occur, a contingency plan to add an oxygen source to groundwater will be implemented. The contingency plan consists of injecting a dilute solution of hydrogen peroxide upgradient and downgradient of the contingency zone to prevent migration of metals and vinyl chloride beyond the contingency zone.

12. The discharger proposes to perform a pilot study to enhance the bioremediation of volatile organic compounds. The pilot study will be conducted under a separate Regional Water Board Order, Waste Discharge Requirements Order No. R1-2003-086.

13. The proposed interim remedial action is consistent with the antidegradation provisions of State Water Resources Control Board Resolution No. 68-16.

14. The Regional Water Board's Water Quality Control Plan for the North Coast Region includes water quality objectives and receiving water limitations.

15. Surface water in the Little Lake Valley flows to the Eel River. The beneficial uses of the Eel River and its tributaries include:

    a. municipal and domestic supply
    b. agricultural supply
    c. industrial service supply
    d. groundwater recharge
    e. navigation
    f. hydropower generation
    g. water contact recreation
    h. noncontact water recreation
    i. commercial and sport fishing
    j. warm freshwater habitat
    k. cold freshwater habitat
    l. wildlife habitat
    m. preservation of areas of special biological significance
    n. preservation of rare and endangered species
    o. migration of aquatic organisms
    p. spawning reproduction, and/or early development

16. Beneficial uses of groundwater include: municipal, domestic, industrial process and service supply, and agricultural water supply as identified in the Water Quality Control Plan for the North Coast Region.

17. Drinking water for the Remco facility and nearby residents is provided by the City of Willits municipal water system. The City of Willits water supply is located south of town, and is tested regularly to assure compliance with State of California drinking water standards. Individual water supply wells exist in the City limits and are used predominantly for irrigation.

18. An Initial Study/Checklist and Negative Declaration was prepared and approved by the Regional Water Board on September 24, 2003, to satisfy the requirements of the California Environmental Quality Act. The Regional Water Board has considered the Initial Study/Checklist and Negative Declaration, and has determined that compliance with this Order will have no significant environmental impact.

19. The Regional Water Board has notified the discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit written comments and recommendations.

20. The Regional Water Board, at a public meeting, heard and considered all comments pertaining to the discharge.

THEREFORE, IT IS HEREBY ORDERED that the discharger, 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. DISCHARGE PROHIBITIONS

1. The discharge of any waste not specifically regulated by this Order is prohibited.

2. Creation of pollution, contamination, or nuisance, as defined by Section 13050 of the California Water Code (CWC) is prohibited. [Health and Safety Code, Section 5411]

3. The discharge of treatment additives to land, surface waters or to groundwater in areas other than that proposed for the interim remedial action is prohibited. The treatment area proposed for the interim remedial action is identified on Figure 2.

4. The migration of any metal mobilized by the interim remedial action or vinyl chloride or other byproducts produced as part of the treatment process is prohibited beyond the boundaries of the property owned or controlled by the discharger.

5. The discharge of waste to property not owned or controlled by the discharger is prohibited.

B. DISCHARGE SPECIFICATIONS

1. The injection of food grade carbohydrates shall not impart taste, odor, or color to, or otherwise degrade the beneficial uses of areal groundwater, except for temporary taste and odor changes in the immediate vicinity of the study area.

2. The injection of food grade carbohydrates shall not impart taste, odor, or color to or otherwise degrade the beneficial uses of areal groundwater beyond the boundaries of the property owned or controlled by the discharger.

3. The methods for injection and reinjection of food grade carbohydrates in the proposed areas shall be conducted as described in the Report of Waste Discharge dated March 12, 2003, June 18, 2003, August 20, 2003, August 22, 2003, August 28, 2003, and September 3, 2003. 30-day notification to the public and all involved agencies shall be provided when reinjections are planned.

4. The injection of food grade carbohydrates shall not produce airborne hydrogen sulfide concentrations which exceed 0.03 parts per million by volume (ppmv) for protection of public health beyond the boundaries of the property owned or controlled by the discharger.

5. The injection of food grade substances shall not produce detectable levels of airborne vinyl chloride at the boundaries of the property owned or controlled by the discharger.

C. PROVISIONS

1. A copy of this Order shall be maintained at the discharge facility 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.

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 or waste discharge facilities presently owned or controlled by the discharger, the discharger must notify the succeeding owner or operator of the following items by letter, in advance of the transfer of ownership or control, and a copy of the notice must be forwarded to the Regional Water Board:

   a. existence of this Order, and
   b. the status of the dischargers' annual fee account.

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 Contingency Planning and Notification Requirements Order No. 74-151 and the Monitoring and Reporting Program No. R1-2003-085 any modifications to these documents as specified by the Executive Officer. Such documents are attached to this Order and incorporated herein. Chemical, bacteriological, and bioassay analyses must be conducted at a laboratory certified for such analysis by the State Department of Health Services.

8. Inspections

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

a. entry upon premises in which an effluent source is located or in 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 of any discharge.

9. 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 equipment;
b. accidents caused by human error or negligence; or
c. other causes such as acts of nature;

The discharger must notify the Executive Officer by telephone as soon as he or his 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.

10. Revision of Requirements

This Regional Water Board requires the discharger to file a report of waste discharge at least 120 days before making any material change or proposed change in the character, location or volume of the discharge.

11. Expiration

These waste discharge requirements expire 48 months after issuance and no further recision action is necessary.

Certification

I, Catherine E. 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 September 24, 2003.

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Catherine E. Kuhlman
Executive Officer

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