

Former Remco Hydraulics, Inc. Site  
Willits, California  
**Interim Remedial Action  
for Chromium-Affected Groundwater**

Fact Sheet No. 14

March 2003

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### Introduction

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This Fact Sheet summarizes the rationale and plan for implementing an *Interim Remedial Action (IRA)* to clean up groundwater containing *hexavalent chromium* that lies beneath the former *Remco Facility*, located at 934 S. Main Street in Willits. The *IRA* involves injecting food-grade carbohydrate solution to create reducing conditions in the subsurface. Results from a pilot study implemented at the *Facility* in 2000 indicate that this is a successful technology for the remediation of *hexavalent chromium* in groundwater beneath the *Site*. The *IRA* will be implemented in an area identified on Figure 1.

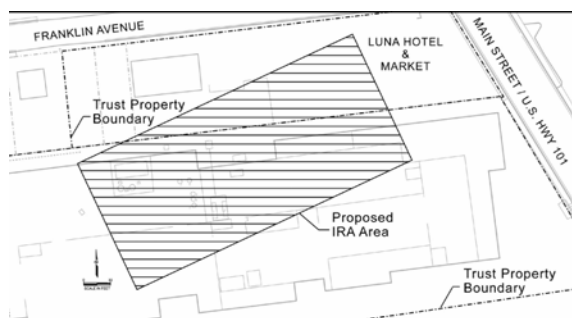


Figure 1

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### Site Background

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The former *Remco Facility* is an elongated, fenced parcel of approximately seven acres, located immediately adjacent to and west of U.S. Highway 101 (Main Street) in the southern portion of the City of Willits. In approximately 1945, a machine shop (the Harrah Brothers Machine Works) was built on the property and commenced manufacturing operations. An industrial machining and manufacturing business was operated under various owners at the *Remco Facility* from approximately 1945 until 1996. The last owners, Remco Hydraulics, Inc. and its parent company, MC Industries, both declared bankruptcy in 1995 and the *Facility* was closed in 1996.

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### Chemicals in Groundwater at the *Remco Facility*

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Three groundwater-bearing zones have been identified at the *Site* and are referred to, from shallowest to deepest, as the A-, B-, and C-Zones. The horizontal

direction of groundwater flow in the three water-bearing zones is generally toward the northeast. (For a more detailed description of the *Site* setting and features, please refer to Fact Sheet 11, which is available at the *Document Depository*.)

As reported in the *Final RI Report*, elevated concentrations of *hexavalent chromium* have been found in groundwater samples collected from the A-, B-, and C-zones beneath the proposed *IRA* location. The *IRA* will address the A- and B-zones first, as groundwater with elevated *hexavalent chromium* concentrations in the C-zone cover only a small area. Monitoring *hexavalent chromium* concentrations in the C-zone will be conducted to determine what, if any, impact might result from A- and B-zone treatment. Depending on monitoring results, injection of carbohydrate into the C-zone may be implemented at a later stage of the *IRA*.

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### In-Situ Reduction

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Injecting a carbohydrate solution (food-grade molasses for example) can promote *in-situ* reduction of soluble *hexavalent chromium* to insoluble *trivalent chromium*. The carbohydrates, once in the subsurface, are readily consumed by microorganisms in the soil, depleting available dissolved oxygen in the process. This produces a reducing environment under which conditions *hexavalent chromium* is reduced to *trivalent chromium*. *Trivalent chromium* in the form of chromium hydroxide ( $\text{Cr}(\text{OH})_3$ ) readily precipitates out of groundwater and is immobilized in aquifer soils. Additionally, study results have shown that the reverse reaction (the oxidation of *trivalent* to *hexavalent chromium*) in a natural-aquifer system is very unlikely given the subsurface conditions observed at the *Site*.

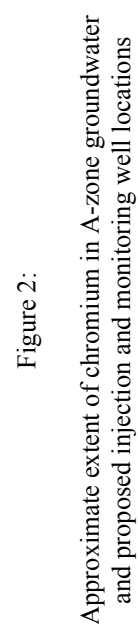
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### IRA Objectives

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The objectives of the proposed *IRA* are to reduce *hexavalent chromium* concentrations in groundwater to levels cleaner than drinking water standards, defined by total chromium levels below the *Maximum Contaminant Level (MCL)* of 50 micrograms per liter ( $\mu\text{g/L}$ ) in the A-, B-, and C-zones. Another objective is to reduce the time for *Site* cleanup. The approximate extent of *chromium* in groundwater is shown on Figures 2, 3, and 4.

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Figure 3:  
Approximate extent of chromium in B-zone groundwater  
and proposed injection and monitoring well locations

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Figure 4:  
Approximate extent of chromium in C-zone groundwater

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**IRA Layout**

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Food-grade molasses will be injected into the A-zone via twenty-four *injection points* and into the B-zone via eight *injection points*. Thirteen existing and three new monitoring wells in the A-zone, three new monitoring wells and seven existing monitoring wells in the B-zone, and four existing monitoring wells in the C-zone will be used to evaluate the effectiveness of molasses injection to reduce *hexavalent chromium* to *trivalent chromium*. The three new monitoring wells in the A-zone and three in the B-zone will be used to monitor for the potential mobilization of naturally-occurring metals.

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**Contingency Plans**

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It is possible that the molasses injection may result in a temporary mobilization of naturally-occurring trace metals such as arsenic and antimony. However, it is not anticipated that there will be any significant increases in metal concentrations resulting from the *IRA*. A contingency response would be implemented should a significant increase in the concentrations of certain trace metals occur. As research has shown that mobilized metals rapidly precipitate out in the presence of oxygen, the contingency response would be to create an *in-situ* oxygenated zone by injecting dilute hydrogen peroxide solution approximately 5-feet upgradient and 5 feet downgradient of the contingency wells. This oxygenated zone would immobilize the metals, thus preventing any further migration of metals.

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**Schedule**

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The *Willits Trust* has submitted a Work Plan for this *IRA* to the Regional Water Quality Control Board (RWQCB) and requested that a permit to conduct this work be issued. We anticipate that the installation of the monitoring well network will take place in May 2003. Data obtained during the installation will be analyzed, and the detailed design completed, during the month of June 2003. The injection of the molasses is anticipated to be conducted in July 2003. The monthly monitoring program would begin after injection.

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**Continuing Opportunities for Public Involvement**

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The formal public comment period regarding the *IRA* Work Plan commenced March 12, 2003, and will conclude April 25, 2003, as indicated on the notice published in the *Willits News* and the *San Francisco Chronicle*. The *Willits Trust* will respond to all written comments received during the comment period. The *IRA* Work Plan and other important *Site*-related documents are located at the *Document Depository*. The *Document Depository* is currently located at 390 East Commercial Street in Willits, California. The library hours are Tuesday, Wednesday, and Thursday from 10:00 am to 6:00 p.m. and Saturday from 10:00 a.m. to 4:00 p.m. However, it is anticipated that the *Document Depository* will be relocated to a dedicated location sometime later in late March or early April 2003. Notice will be provided to the public upon completion of this move.

To have your name placed on the mailing list to receive future Fact Sheets concerning the *Remco Site* investigation and cleanup, please call the following toll-free information number:

(800) 307-8181

You may also submit questions in writing by contacting any of the following individuals:

For questions relating to the progress of the work at the *Site* contact the *Willits Trust's Site* Project Manager:

Dr. Anne Farr  
Farr Associates  
6016 Princeton Reach Way  
Granite Bay, CA 95746

For legal questions relating to the *Site*, contact the Remedial Counsel for the *Willits Environmental Remediation Trust*:

Mr. A.J. Birkbeck  
Fulcrum Law Group  
2093 Robinson Road, 1st Floor  
Grand Rapids, MI 49506

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For questions regarding local regulatory oversight:

Mr. David Madrigal  
City of Willits  
111 East Commercial Street  
Willits, CA 95490

For questions regarding state regulatory oversight:

Regional Water Quality Control Board:

Ms. Janice Goebel  
5550 Skylane Blvd., Suite A  
Santa Rosa, CA 95403

California Department of Toxic Substances  
Control:

Mr. Rick Robison  
700 Heinz Avenue, #210  
Berkeley, CA 94710-2737

Every attempt will be made to respond to written correspondence to the *Willits Trust* or their representatives within one week. Attempts will also be made to respond to hotline comments within 48 hours.

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**Glossary**

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*Document Depository* – Mendocino County Public Library, Willits Branch, located at 390 East Commercial Street, Willits, California. Efforts are currently underway to relocate the *Document Depository* to a convenient downtown location in closer proximity to the *Site*. Public notice will be provided with respect to the planned move.

*Final RI Report* – Final Remedial Investigation Report, prepared by MWH Americas, Inc. for the Willits Trust, dated April 17, 2002.

*Hexavalent Chromium ( $Cr^{VI}$ )* – The highest oxidation state of chromium.

*Trivalent Chromium ( $Cr^{III}$ )* – A low oxidation state of chromium. Trivalent chromium normally precipitates as chromium hydroxide under typical groundwater conditions.

*Injection Point* – A locations where food-grade substance will be dispersed into subsurface soils using specialized drilling equipment.

*Interim Remedial Actions (IRA's)* – A discrete set of planned actions, required to prevent, reduce, or retard the impact of a release of regulated substances. IRA's may be conducted from the time a release is confirmed until the time a formal long-term remedial action plan is implemented. *Interim remedial actions* may also help maintain or restore public health and safety.

*In-situ* – in the natural or original place

*Maximum Contaminant Level (MCL)* – The maximum level of a contaminant that is allowed in drinking water.

*Remco Facility* – “*Remco Facility*,” or “*Facility*” as used in the *Final RI Report*, refers to the boundaries of the former *Remco Hydraulics, Inc.* property, located at 934 South Main Street in Willits, California.

*Remco Site* – The term “*Remco Site*,” or “*Site*” as used in this fact sheet and the *Final RI Report*, refers to the *Remco Facility* and areas contiguous to the *Remco Facility* where *hazardous substances* associated with *Facility* operations have come to be located.

*Willits Environmental Remediation Trust* or *Willits Trust* – the independent entity established by Order of the Federal Court to completely, timely, and cost-effectively conduct all investigatory and remedial work at the *Site*. That work is to be conducted in a manner consistent with the controlling orders, the NCP and applicable law. As an instrumentality of the Federal Court, the *Willits Trust's* primary purpose is to address and fully and appropriately resolve any alleged endangerments to human health or the environment.