

US EPA ARCHIVE DOCUMENT

**RCRA Showcase Pilot  
Region 8**

**NAPL Cleanup RTDF Technology Demonstration and Evaluation**

Contacts:

Randall Breeden  
EPA Region 8  
(303) 312-6522  
[Breeden.randy@epa.gov](mailto:Breeden.randy@epa.gov)

Randy Jewett  
Texaco  
(816) 736-5562  
[jewetrw@texaco.com](mailto:jewetrw@texaco.com)

Ali Tavelli  
Wyoming DEQ  
(307) 777-5447  
[Atavel@state.wy.us](mailto:Atavel@state.wy.us)

Greg Fletcher  
Conoco  
303 286 5889  
[gregory.p.fletcher@usa.conoco.com](mailto:gregory.p.fletcher@usa.conoco.com)

Robert Beierle  
Colorado DPHE  
303 692 3360  
[Rdbeierl@smtpgate.dphe.co.us](mailto:Rdbeierl@smtpgate.dphe.co.us)

Diane Johnson  
Ultramar Diamond Shamrock  
303 227 2405

Background Information:

In the spring of 2001 a new Remediation Technology Demonstration Forum (RTDF) was formed to address the complex problems associated with cleaning up sites with petroleum hydrocarbon NAPL contamination. These types of sites typically include operating and closed refineries, pipelines, shipping terminals, and tank farms that have allowed releases of petroleum hydrocarbons into the subsurface environment. The formation of the RTDF is a direct result of follow-up activities from the National RCRA Refinery Workshop that was sponsored by Region 8 in September 1998. Participants of that workshop included over 175 representatives from the petroleum refining industry, state and federal regulatory agencies, and private consulting firms representing the petroleum industry. The RTDF is a formal organization operating under a Memorandum of Understanding (MOU) signed by all parties involved. The MOU signatories include representatives from ExxonMobil, Chevron, Texaco, BP Amoco, Conoco, the Naval Facilities Engineering Center, TriHydro Corporation, ThermoRetec Inc., the Defense Energy Support Center, the State of Wyoming Department of Environmental Quality, Sierra Environmental Services, Inc., EPA Region 8, and EPA HQ Technology Innovation Office.

Description of Project:

The purpose of this RTDF is to establish a collaborative, information sharing alliance among interested and experienced industrial, governmental, and academic entities

so as to accomplish Corrective Action goals in a more cost efficient, faster, and environmentally friendly manner. The RTDF's overall goal is to develop an improved scientific and technical approach to remediation of groundwater and soils at petroleum contaminated sites. It will create and test an improved decision-making framework built upon scientific principles and the utilization of cost-effective and appropriate technologies to attain specific cleanup goals that will be acceptable to the relevant regulatory agencies, the public, and any other interested stakeholder that will result in meeting Environmental Indicators (EI), Intermediate Performance Goals, and Final Corrective Action Goals in a timely and cost effective means. Through the collective experience of its members, the RTDF will encourage cooperation via information sharing, building upon lessons learned from previously completed projects, to develop an improved approach to site remediation. A critical component of the Alliance's activities will involve the evaluation of new innovative technologies that can contribute significantly to the improved approach to site remediation. This will be accomplished through several pilot projects at various petroleum contaminated sites throughout the country. This represents the first time that representatives from the petroleum industry and government regulatory agencies have worked together to develop methodologies to meet Corrective Action Goals in a cooperative and collaborative manner.

In order to evaluate new innovative technologies and develop the faster and more cost effective methods to address petroleum contaminated soils and ground water, a series of pilots will be employed at several different sites exhibiting different geology, hydrology, hydrogeology, soils, and NAPL characteristics. Each pilot will be designed to provide data and information relevant to it's application to other sites where it would be appropriate and cost effective to use. It is anticipated that at least one to two pilots will be developed for each of the petroleum companies that are signatories on the MOU.

#### Pilot 1:

There are two pilot projects in Region 8 scheduled to begin operations within the calendar year 2001. The first is at two adjacent refineries located in Denver, Colorado; Conoco, and Ultramar Diamond Shamrock. Both refineries are currently completing the RCRA RFI process. At the Conoco refinery several interim measures have been installed including: a hanging HDPE engineered barrier, a slurry wall, cement lining of a reach of an irrigation supply ditch, and a ground water extraction system. However, significant quantities of free phase hydrocarbon remain over a large portion of both refineries. No interim measures have been installed at the Diamond Shamrock refinery.

The pilot test will use a water flood technology to enhance the removal of free phase hydrocarbons from both refineries. This technology has commonly been used in the deep petroleum reservoir extraction industry, but has not been used for remediation purposes in a shallow unconsolidated aquifer environment. It will be evaluated on it's ability to lower the cost of free phase removal, shorten the time needed to meet the mobility end-points, and it's overall performance. The pilot consists of a full-scale operational module designed on a dual five-spot, closed system extraction and reinjection system. Construction began May

16<sup>th</sup>, 2001 and is expected to continue through July. The system should be on-line and fully operational by the fall of 2001. Preliminary results are expected within six months of start up. The participants in this pilot are the U.S. EPA Region 8, the Colorado Department of Health and Environment, Conoco, and Ultramar Diamond Shamrock. Progress status updates will be provided to EPA on a monthly basis until the pilot is complete, at which time a final Evaluation Report will be drafted at approximately nine months after start-up.

#### Pilot 2:

The second pilot will take place at the now closed Texaco Refinery located in Casper, Wyoming. Texaco has proposed evaluating two different technologies at this site. The first is to employ the use of microwaves to enhance NAPL removal, a truly innovative approach that has only been tried at few small sites around the country and never in a shallow unconsolidated aquifer where the hydrocarbons range from C4 - C30. The second technology under consideration will most likely be some method of an in-situ thermal technology. It should be noted however, that at this time, the specific technologies have yet to be selected but are expected to be sometime during the summer 2001. System start-up is expected by late fall 2001. The participants include: Wyoming Department of Environmental Quality, U.S. EPA Region 8, Texaco, and TriHydro, Inc.. The technology evaluation will be prepared within approximately one year after start-up. Three months after initiation of the pilot at Texaco, the groups will begin evaluating the effectiveness of the innovative technology. Progress reports for this pilot will be prepared on a quarterly basis.

#### Progress Reports:

For these two pilots, progress reports will be faxed to HQ at the end of each quarter throughout the duration of the project(s). Linda Bowling will meet with the EPA Project Manager, Randall Breeden to prepare the progress reports. The EPA Project Manager will consult with the State and industry, as needed, to obtain current project status. This information will be provided to the EPA HQ and will also be posted to the EPA Region 8 RCRA Corrective Action website.

#### Reporting Format:

- Title
- “Updated as of \_\_\_\_\_”
- General Background Facility Information
- Summary of the Innovative Pilot Project/Expected Benefits
- Agency and/or Facility Contacts
- Impediments Encountered During the Quarter
- Lessons Learned