Remedial Action Fact Sheet
In-Situ Thermal Treatment (ISTT) Construction and Operation

Grants Chlorinated Solvents Plume Superfund Site
Grants, New Mexico **January 2012**

The purpose of this Fact Sheet is to provide the community with:

- A review of the EPA Superfund remedial action activities completed to date.
- An overview of the operation of the in situ thermal treatment system.
- A list of activities that are planned for 2012.

Introduction

The U.S. Environmental Protection Agency (EPA), with support from the New Mexico Environment Department (NMED), is continuing the Remedial Action (RA) phase of the Superfund process at the Grants Chlorinated Solvents Plume (GCSP) Site (Site). The RA is the process by which the cleanup is performed. The remedy was presented in EPA's Record of Decision (ROD) and defined by the Remedial Design (RD).

The GCSP Site consists of an area of contaminated groundwater containing chlorinated solvents at concentrations greater than EPA drinking water standards or maximum contaminant levels (MCLs). The presence of chlorinated solvents in groundwater at the Site is a result of past releases from nearby dry cleaning operations.

Groundwater within the GCSP Site is shallow, around 6 to 8 feet below ground surface (bgs). As shown in Figure 1, chlorinated solvents, primarily tetrachloroethene (PCE), are present in Site groundwater at concentrations up to 50,000 micrograms per liter (µg/L), which is 10,000-times the MCL of 5 µg/L. While shallow Site groundwater has been degraded by this contamination, it is not used as a source of municipal drinking water. However, cleanup of the groundwater is still required.

Remedial Action Activities Completed to Date

As presented in previous fact sheets and community meetings, the EPA has completed the following remedial action activities since the RA phase began in 2009:

- **Installation of vapor intrusion mitigation systems (VIMS)** in 15 residences within the footprint of the PCE plume. The VIMS do not treat indoor air, but rather prevent vapor intrusion. These systems will operate until the groundwater remedy reduces chlorinated solvent concentrations such that vapor intrusion is not occurring.
- **Installation of 573 injection wells** throughout the PCE plume. The wells were installed primarily within the public rights-of-way and private property where necessary.
- **Injection of emulsified vegetable oil** into a portion of the injection wells to stimulate the biodegradation of the chlorinated solvents. Groundwater and soil vapor monitoring has been conducted weekly to quarterly to assess treatment effectiveness.
- **Demolition of residential structures** to allow for the safe installation and operation of the in situ thermal treatment (ISTT) system.
- **Construction of the ISTT system**, which uses the movement of electricity through soil to heat the subsurface. The increased temperatures help mobilize the chlorinated solvents so that they can be extracted and treated.

  As shown in Figure 2 and Photos 1 and 2, the system includes 251 buried electrodes that transmit electrical current into and through the ground, groundwater and vapor extraction wells, temperature sensors, piping, control panels, temperature control equipment, and groundwater and vapor treatment equipment. All of the aboveground elements are located within two fenced compounds on either side of First Street. Because the PCE plume and the ISTT system extend across First Street, a portion of the system was buried to allow normal traffic flow during operation.
- **Testing and start-up of the ISTT system.** This included measuring step- and touch-potentials throughout the treatment area to verify that the system was safe for the operators and the community and ramping up the operation of the groundwater and vapor extraction and treatment system.

Remedial Action Activities in 2012

As summarized in Figure 3, the RA activities in 2012 will include operation of the ISTT system, additional groundwater sampling in support of the in situ bioremediation system, additional emulsified vegetable oil injections, and the final phase of injection well installation.

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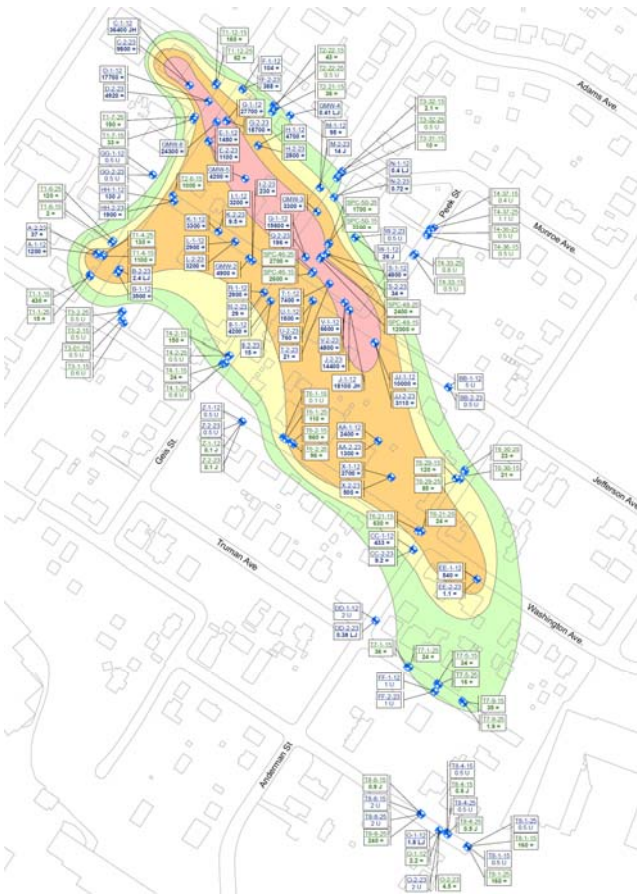

Figure 1 PCE Plume

ISTT Operation

After four months of construction, the ISTT system was started on December 7. Following the establishment of hydraulic and pneumatic control with the groundwater and vapor extraction system, electricity began flowing through all 251 electrodes to begin the heating process as follows:

1. **The soil slows the flow of electricity.** This friction or resistance creates heat. Over several months the soil and groundwater heats up to 212°F, the temperature that boils water.
2. **Steam is created.** The steam helps move the solvents to extraction wells that pump steam, air, and groundwater from the ground. A vacuum is applied to the wells to help capture the solvents.
3. **The steam, air, and water are treated.** The solvents are removed from the steam, air, and groundwater and carried to a treatment system across First Street through a series of above and below ground piping. Clean water is returned to the treatment area or pumped to the sewer.

The treatment process is expected to take about six months to complete. During ISTT operations, routine monitoring of electrical potential, temperature, and water quality will be measured to confirm that the system is safely and correctly operating. Confirmation samples will be collected from the treatment zone before the system is ready to be turned off and decommissioned (see below).

Pre-Injection Groundwater Sampling

Approximately 50 of the monitoring wells located throughout the PCE plume will be sampled in February before the next round of emulsified vegetable oil is injected. This effort is expected to last three weeks and may involve some street closures or adjustment of traffic patterns so that the workers can complete the task safely. The sampling results will be used to assess the latest PCE concentrations and groundwater quality before the injections.

Emulsified Vegetable Oil Injections

Similar to previous injections conducted at the Site, emulsified vegetable oil will be injected into more than 400 wells in March and April 2012. Two trailer-mounted injection systems pulled by pick-up trucks will be used to deliver the vegetable oil to the subsurface.

During work activities, traffic control will be implemented in the vicinity of the injection area for the protection of the public, workers, and series of hoses that convey potable water and injection fluid. Traffic control will include partial lane closures to safely direct vehicular and pedestrian traffic around or away from the active work zone during injection in the roadway. Access to businesses and residences will be maintained during construction. CH2M HILL will work directly with property owners to limit, to the extent possible, the impact and duration of any such restrictions.

ISTT Decommissioning and Injection Well Installation

In July 2012, after ISTT system operation is complete, the infrastructure installed in 2011 will be removed and First Street and the rest of the disturbed area restored. Similar to the construction process, traffic will be temporarily disrupted as the below-grade components are removed from beneath the street.

Following the heating process, the final phase of injection well installation will be completed. This includes new wells in the Holiday Cleaners parking lot and within the 700-block of First Street. These wells are located in the area that is currently being heated. Because the wells are made of plastic, they would have been damaged during the heating process.

During work activities, which will generally be limited to between 7:00 AM to 5:00 PM daily for several weeks, traffic control will be used in the construction area for the protection of the public and workers. Traffic control will include partial lane closures of First Street to safely direct vehicle and pedestrian traffic around or away from the active work zone during construction in the roadway. The lane closures will be in effect on First Street between Washington Avenue and Monroe Avenue. Access to businesses and residences will be maintained during construction. CH2M HILL will work directly with property owners to limit, to the extent possible, the impact and duration of any such restrictions.

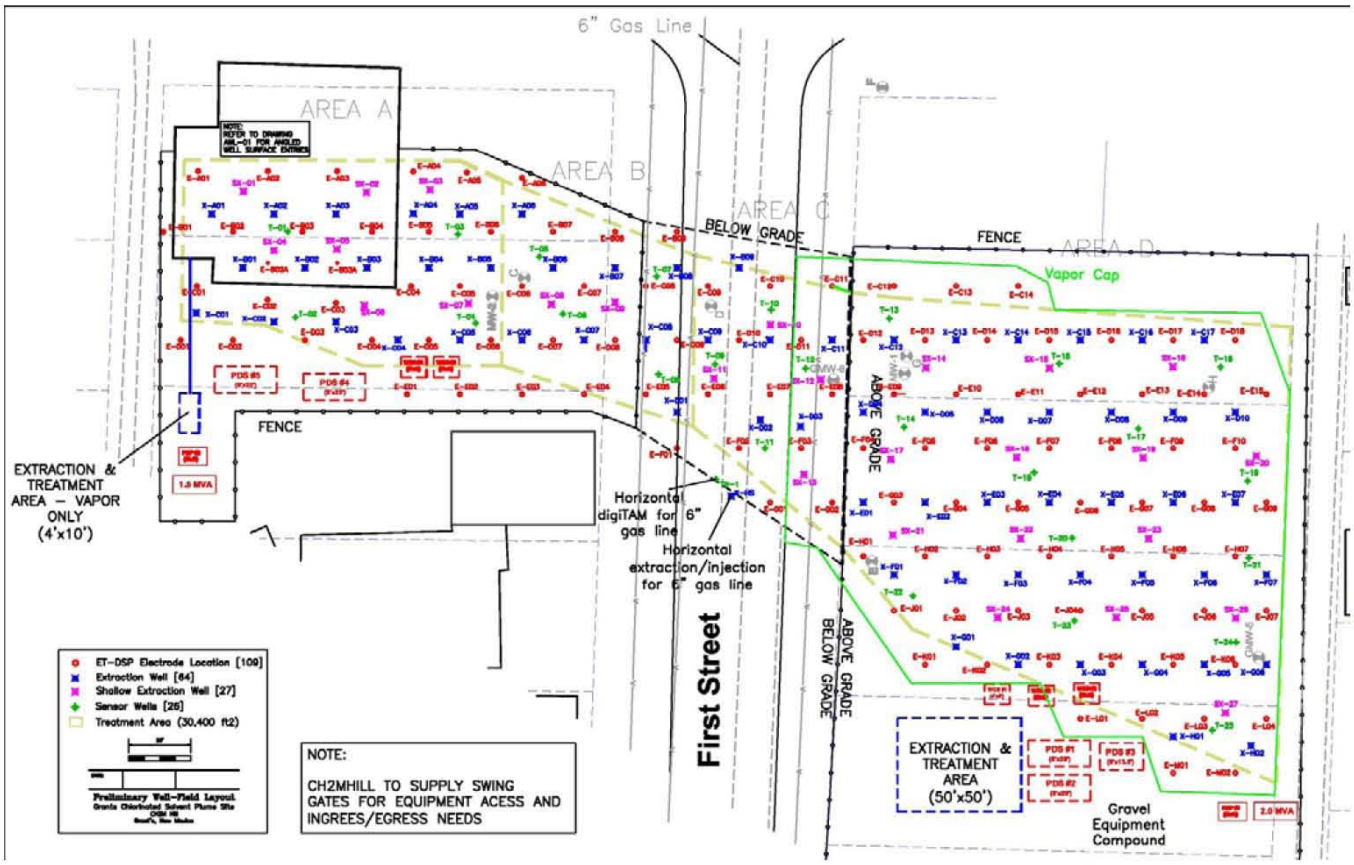

Figure 2 ISTT System Layout

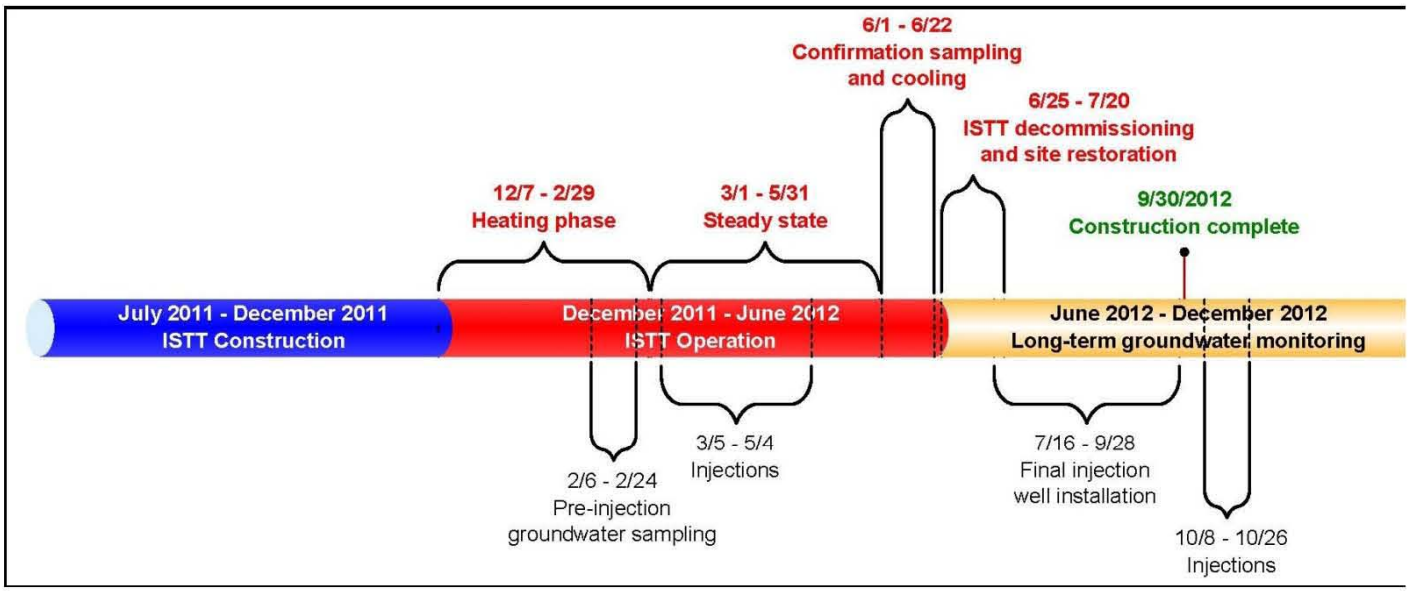

Figure 3 Schedule of Remedial Action Activities 2011-2012

Figure Photo 1 ISTT piping and equipment

Photo 2 ISTT control equipment

For a complete source of information on the history of the GCSP Site, please refer to the documents within the Administrative Record (AR) File. The EPA encourages the public to review these documents in order to gain a more comprehensive understanding of the GCSP Site, the Superfund activities that have been conducted there, and the various alternatives that have been developed and evaluated to address the contamination at the GCSP Site. The AR File is available at the following information repository:

University of New Mexico, Grants Campus Library
1500 Third Street
Grants, New Mexico 87020

For questions or requests for additional information regarding proposed field activities at the GCSP Site, please contact the EPA Remedial Project Manager:

Sai Appaji
EPA Region 6 (6SF-LT)
1445 Ross Avenue
Dallas, Texas 75202-2733
(214) 665-3126 or toll free (800) 533-3508

Or the Community Involvement Coordinator
Jason McKinney
EPA Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733
Toll free (800) 533-3508

EPA
United States
Environmental Protection
Agency

Region 6
1445 Ross Ave. (6SF-VO)
Dallas, TX 75202