

Cascade Corporation Troutdale Gravel Aquifer Cleanup Progress Update March 2011

Cascade Corporation is in the final stages of cleaning up contaminated groundwater in the Troutdale Gravel Aquifer. DEQ anticipates the cleanup to be completed by 2013. This fact sheet details cleanup progress since the contamination was detected in 1986 and plans for the next three years.

Background

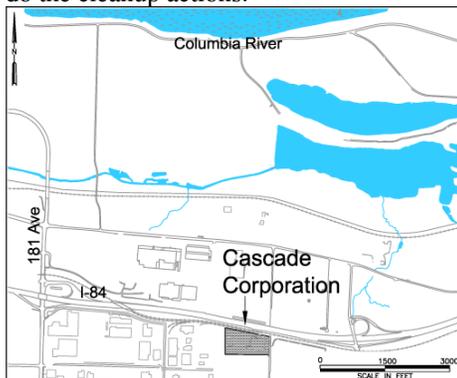
Cascade Corporation manufactures lift truck attachments at 2201 Northeast 201st Ave. in Fairview, Oregon. Through its past use of chlorinated solvents, the facility released trichloroethene (TCE) into the ground and contaminated the Troutdale Gravel Aquifer. The primary sources of solvent releases were past metal degreasing operations and overfilling of waste oil and waste coolant underground storage tanks. Chromium was also detected in groundwater near the facility's historical chrome plating operations.

Historically, TCE migrated downward from the Troutdale Gravel Aquifer into the Troutdale Sandstone Aquifer.

Since the contamination was detected in 1986, Cascade Corporation has carried out extensive investigations and a series of interim, final and additional remedial actions. Soil and surface water remediation goals have been met and Troutdale Gravel Aquifer groundwater remediation is nearly complete.

DEQ selected cleanup actions

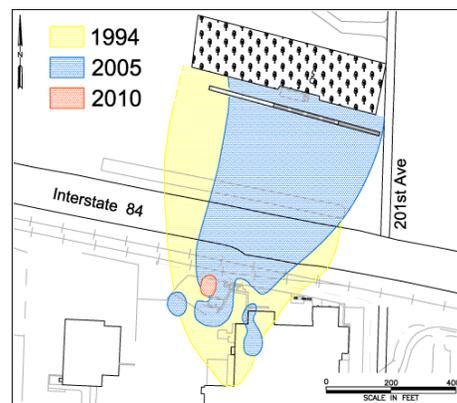
DEQ selected final cleanup actions for the Cascade Corporation site in 1996, and outlined them in a record of decision. DEQ issued a consent order requiring Cascade Corporation to do the cleanup actions.



Cascade Corporation Location

The cleanup includes pump and treat and vapor extraction technologies to remove volatile organic compounds (VOCs) over an estimated 30 year period to achieve cleanup.

By using adaptive measures additional to those required in the record of decision, site cleanup has progressed ahead of schedule. As shown below, the 1994 TCE plume has contracted to a localized area.



1996 to 2010 TGA Plume Shrinkage

Adaptive treatment approach 1988 to 1997

Remedial actions began in 1988, before the DEQ issued the record of decision, and included:

- Decommissioning Cascade's industrial supply well and two underground storage tanks,
- Excavating and treating approximately 190 cubic yards of source area soil,
- Containing and treating the on-site plume through perimeter pump and treat actions,
- Testing soil vapor extraction for VOC removal, and
- Constructing and operating a 300-foot long, 40-foot deep, off-site groundwater interception and extraction trench to stop TCE migration.

By 1995, these actions had eliminated historical migration pathways to the Troutdale Sandstone Aquifer, contained the on- and off-site Troutdale Gravel Aquifer plume areas, and achieved significant contaminant reduction. Removal of about one third of all Troutdale Gravel Aquifer contaminants using pump and treat actions occurred through 1997.



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1998-2006 cleanup actions

In 1998, Cascade Corporation implemented the cleanup actions outlined in the record of decision including:

- Continued groundwater extraction of on-site perimeter wells and the off-site interception trench, and
- Additional groundwater, contaminant and soil vapor extraction in key source locations, using closely spaced well clusters.

The additional groundwater and soil vapor extraction wells sharply accelerated the rate of contaminant removal. By 2002, source area cleanup had been achieved for chromium, VOCs in soil vapor, and free product. Source area TCE concentrations in groundwater had declined by 71 to 98 percent.

Cascade Corporation implemented cyclical groundwater pumping to remobilize stagnation zones and enhance VOC removal. By 2006, a cumulative total of approximately 1,200 pounds of VOC mass had been removed from the ground.

Passive, biological measures

DEQ and Cascade collaborated to transition the remedy from mechanical pump and treat technologies to passive, biological approaches and implemented the following site specific solutions:

- Planted 800 poplar tree cuttings to intercept and uptake groundwater and surface water seepage,



- Converted the interception extraction trench into a 300-foot long, 30-foot deep, passive, mulch biowall to enhance natural TCE biodegradation upgradient of the poplar tree field, and



- Injected a total of 506,000 gallons of emulsified soybean oil and sodium lactate solutions into TGA wells to accelerate

biodegradation through long-term stationary and fast-acting mobile treatment approaches, where needed.

Cascade Corporation planted the poplar tree field in 2000 and 2001 and brought it into active use following construction of the mulch biowall in 2006. Source area bioremediation testing and full scale substrate injection treatments were performed in 2004 and 2006.

Current conditions

VOC concentrations have declined significantly since application of the passive, biological measures and now range from non-detectable to below remedy cleanup levels at most well locations.

As a direct result of Troutdale Gravel Aquifer groundwater cleanup, natural spring discharge along the exposed margin of the Troutdale Gravel Aquifer has also been restored to levels below both surface water remedy cleanup levels and EPA's drinking water standards.

A series of sodium lactate and emulsified oil injections were completed from 2004 through early 2010. The most recent injections were performed to further stimulate biodegradation in areas where localized, low level VOCs persist. Additionally, the mulch biowall and phytoremediation tree field continue to provide ongoing passive, biological treatment.

Moving toward cleanup approval

Based on significant cleanup progress made during the last 20 years and compliance with remedy cleanup levels at most locations, the remedy for the Cascade Corporation site and the Troutdale Gravel Aquifer is projected for DEQ approval by 2013. A pre-closure plan was submitted to DEQ on October 6, 2009, presenting milestones and actions including:

- Continue mulch biowall and poplar tree remedial actions
- Do supplemental sodium lactate and emulsified oil injections in ten Troutdale Gravel Aquifer wells to accelerate cleanup
- Redirect Shepard Spring discharge to the stormwater system.
- Begin public notification and outreach
- Submit request to DEQ for consent order termination and certificate of completion.

When cleanup is complete in about 2013, Cascade Corporation will prepare a report certifying that all work under the existing Consent Order is complete. DEQ will review the

report and solicit public comments on a proposed approval of the cleanup. If DEQ approves the cleanup, then no further action would be required.

For more information

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DEQ intends to update this fact sheet periodically. For more information about this site and other East Multnomah County groundwater cleanup sites go to

<http://www.deq.state.or.us/lq/cu/nwr/emult/>.

Or go to the DEQ Environmental Cleanup Site Information database (ECSI #635)

(<http://www.deq.state.or.us/lq/ECSI/ecsdetail.asp?seqnbr=635>)

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