

**STATE OF CALIFORNIA  
REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL COAST REGION**

**STAFF REPORT FOR REGULAR MEETING OF MAY 11-12, 2006**

Prepared on April 19, 2006

**ITEM NUMBER: 10**

**SUBJECT: Status Report, Scotts Valley Dry Cleaners, 272-A Mount Herman Road,  
Scotts Valley, Santa Cruz County**

**KEY INFORMATION**

Type of Discharge: Unauthorized Release of Tetrachloroethene (PCE)  
Existing Orders: Cleanup or Abatement Order (CAO) No. R3-2005-0081  
Waste Discharge Requirements Order No. 01-134 National Pollutant  
Discharge Elimination System (NPDES) Permit No. CAG993002 General  
Permit for Discharges of Highly Treated Groundwater to Surface Waters  
Monitoring and Reporting Program (MRP) No. R3-2005-0086  
MRP No. R3-2005-0082

**This Action: Status Report Only**

**DISCUSSION**

New information is shown in italics. For additional background information, please refer to the Water Board's May 13, 2005 staff report and supplemental sheet and September 9, 2005 staff report.

Water Board staff provides regulatory oversight of the Scotts Valley Dry Cleaners (Dry Cleaners) in Santa Cruz County, one of many high priority Spills, Leaks, Investigation, and Cleanup cases in the region.

**Background**

The Dry Cleaners started site remediation of dry cleaning solvent discharges in 1996. The Dry Cleaners initially performed excavation (trenching) and vapor extraction in the source area. In March 1998, Water Board staff required the Dry Cleaners to submit a corrective action plan. Since 1998, the Dry Cleaners conducted several remediation pilot tests/interim remedial actions, including air sparging, aquifer pump testing, and injection of hydrogen releasing compounds and cheese whey. The Dry Cleaners revised the corrective action plan several times based on pilot test results.

The Dry Cleaners implemented high vacuum, dual-phase extraction in March 2004 for plume containment, while they continued to evaluate other remedial alternatives for plume control. In July 2004, the Dry Cleaners submitted a revised Interim Remedial Action Plan proposing installation of three monitoring and groundwater extraction wells downgradient of MW-9, and a permanent groundwater extraction and treatment system.

The Water Board permitted the treated groundwater discharge from the proposed system under the General National Pollutant Discharge Elimination System (NPDES) Permit for Discharge of Highly Treated Groundwater to Surface Waters on May 5, 2005. The pump and treat system was fully operational by August 10, 2005.

On May 25, 2005 the Water Board issued Cleanup or Abatement Order No. R3-2005-0081 (CAO) and Monitoring and Reporting Program No. R3-2005-0082 to the responsible parties. The Dry Cleaners have met the date-specific requirements of CAO No. R3-2005-0081.

The Dry Cleaners submitted a work plan to install two shallow wells rather than deep-zone monitoring wells on July 31, 2005. Water Board staff responded requiring a workplan for installation of deep-zone monitoring wells in addition to or instead of the two proposed shallow monitoring wells unless the responsible parties could demonstrate that they are financially unable to do so.

Water Board staff received a work plan from the Dry Cleaner's consultant, SECOR International (Secor), for deep-well installations on November 30, 2005. The Scotts Valley Water District submitted a technical memorandum commenting on Secor's work plan from their consultant ETIC Engineering on December 29, 2005. Water Board staff reviewed both the work plan and technical memorandum. Water Board staff discussed the proposed work with the Santa Cruz County Environmental Health Agency geologist and Water Resources hydrologist on January 12, 2006, Secor on January 13, 2006, and the Scotts Valley Water District with Secor on January 18, 2006.

#### Recent Progress

*Groundwater samples taken in February 2006 showed a decrease in concentrations in most monitoring wells. In February 2006, MW-18 exhibited an increase in PCE concentration compared to the last sample taken and MW-13 exhibited a decrease in concentration to 0.53 ppb PCE, just above the detection limit. In addition, two monitoring wells (MW-7 and MW-15) did not contain any groundwater this quarter. Please refer to Attachment 1: February 2006 PCE Concentration Site Map. The onsite remediation system seems to be effectively extracting and "draining" portions of the perched zone groundwater on-site. The pump and treat system has extracted and treated about 180,000 gallons of impacted groundwater since interim remediation began in January 2005. The consultant estimates the system has removed over 1.3 pounds of PCE from the groundwater.*

*The Scotts Valley Water District continues to sample its Municipal Well No. 10 (Well 10) on a weekly basis. A sample taken on January*

*31, 2006, contained Freon 113 (trichlorotrifluoroethane) at 0.6 ppb. Groundwater analyses of Well 10 have not observed Freon 113 or any other contaminants above the reporting limit except for the sample taken on January 31, 2006. Freon 113 has a primary maximum contaminant level (MCL) for drinking water of 1,200 ppb. The Dry Cleaners monitoring well MW-13A contained Freon 113 in low concentrations in November 2005, December 2005, and January 2006 (1.7 ppb, 1.3 ppb, and 0.71 ppb respectively). No monitoring wells on the Dry Cleaner site have observed Freon 113. The Dry Cleaners are required to continue analyzing groundwater samples for Freon 113. It is not known at this time if the Freon 113 observed in groundwater in MW-13A and Well 10 is a trace contaminant from the Dry Cleaners, from a potential off-site source, or a laboratory error.*

*Following the February 10, 2006 Board meeting, Water Board staff met with Secor on February 21, 2006, to discuss the appropriate next steps in investigation. As a result of stakeholder discussions, Water Board staff emailed a draft letter to stakeholders outlining our requirements for source area investigation, deep well and sentry well installation, and corrective action plan submittal. Water Board staff met via teleconference with all stakeholders on March 23, 2006, to discuss the draft letter. Those participating in the teleconference included Water Board staff, the Scotts Valley Water District, Scotts Valley Water District's consultants ETIC Engineering, Discharger's consultants Secor Engineering, and Santa Cruz County Environmental Health Agency. Santa Cruz County Water Resources hydrologist Mike Cloud was unable to participate in the teleconference due to a conflict in schedule. Water Board staff issued a final letter (Attachment 2) to responsible parties on March 28, 2006, which requires a work plan to further investigate the source area and off-site area due by May 1, 2006, a corrective action plan due by August 1, 2006, an update on missing/damaged wells in their next monitoring report, and adjustments to the monitoring requirements. Please refer to*

*Attachment 3 for Secor's proposed timeline for assessment tasks.*

### **Board concerns**

*At the February 10, 2006 Board Meeting in Salinas, the Board expressed concern regarding the potential presence of dense non-aqueous phase liquid (DNAPL) PCE in the subsurface. More specifically, the concern was that DNAPL contamination is continuing to move vertically into deeper aquifers (i.e. through the Santa Margarita and into the northeast sloped Lompico aquifer). DNAPL is defined as an organic liquid that is heavier than water and only slightly soluble in water. The understanding of DNAPL and its transport in the subsurface is complicated and is dependant on many factors. Only recently (last 20 years), has the technical community become aware of DNAPLs and their characteristics in the subsurface.*

*When DNAPL enters the subsurface, it can vaporize into the air, attach (sorb) onto soil particles (above and below the groundwater table), dissolve into the groundwater, and even volatilize from the groundwater into air. If enough DNAPL is released, the DNAPL will travel down with gravity and may pool on top of low permeable zones (i.e., bottom of an aquifer). The dissolved portion of contamination in groundwater forms a dissolved phase plume that will not sink like DNAPL but rather will follow the flow of groundwater.*

*Another important consideration is that "once the release of DNAPL into the subsurface ceases, subsurface movement of DNAPL also ceases soon thereafter, perhaps within weeks or months at solvent sites. The resulting immobile DNAPL then exists in the DNAPL source zone as 'residual' non-aqueous liquid and also possible as 'free-product' accumulations ponded on lower permeability layers within aquifers, or on the tops of aquitards."<sup>1</sup> "Residual" DNAPL is the portion sorbed onto soil particles and*

*considered immobile. "Free product" pools are areas of DNAPL immobilized by semi-impermeable layers in the subsurface.*

*Given this understanding of DNAPL, Water Board staff believes that DNAPL movement is no longer occurring in the subsurface since the Dry Cleaners reportedly took actions to abate the discharge of PCE in 1993 (when they discovered the contamination). Furthermore, the Dry Cleaners purchased a new machine and discontinued using PCE as a solvent in 2001.*

*Regarding residual contamination, Water Board staff believes that most of it is present below the groundwater table since a soil vapor extraction system was operated in the source area (above the groundwater table) in 1996 (see Background section).*

*Based on the available data, Water Board staff does not believe large pools of free-product are present at this site. The solubility of PCE into water is about 200,000 micrograms/liter ( $\mu\text{g/L}$  or ppb). The highest concentration of PCE in groundwater observed at the site is 44,000 ppb (November 1993 grab sample from boring B-1). Currently the PCE concentration observed in MW-2 (near B-1's location) is at about 400 ppb. A low permeable layer is located under the site starting at about 50 feet below ground surface. Pooled DNAPL would most likely be present on top of this layer; however, the 15 monitoring wells located above this layer have never exhibited concentrations anywhere near 200,000 ppb. Based on this data, Water Board staff has no technical reason to believe a large amount of free product or DNAPL is present at this site.*

*Water Board staff is concerned about the low detections of dissolved contaminants observed in MW-13B. The highest concentration of PCE observed in MW-13B was in 12 ppb in May 2005. As discussed in the Recent Progress section, the PCE concentration currently observed (0.53 ppb) is only slightly above the detection limit. Based on the discussion above and from the available data, it appears only low dissolved phase contamination exists in that area. We do not know how much dissolved phase*

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<sup>1</sup> Pankow, James F. and Cherry, John A. Dense Chlorinated Solvents and other DNAPLs in Groundwater. Portland: Waterloo Press. 1996.

contamination is present in the deeper groundwater or the exact pathway it took to get there.

Thus, we are requiring further investigation in the source area and in deeper aquifers in order to develop a better site conceptual model. The required investigation will help to confirm or refute our current understanding and site conceptual model for this site and fill in some missing data gaps. In order to evaluate the "worst-case-scenario" situation where we believe the release occurred, we are requiring soil and groundwater investigation vertically in the source area (Attachment 2). Soil and groundwater samples taken will help evaluate the extent of residual DNAPL present. In turn, this information will help to form a site conceptual model to better understand why MW-13B has contained dissolved phase contamination.

Also at the February 2006 Board Meeting, a possible corrective action recommended to the Board was to pump ahead of the dissolved phase contaminants discovered in MW-13B and before the municipal well to "cut-off" contamination. It is not standard practice to pump ahead of low dissolved phase contamination because this might pull the plume closer to the municipal well rather than

pull it away. Instead, experts recommend containing the source (highest concentration) area's groundwater to prevent further contamination to deeper and down-gradient groundwater. In particular, for the Dry Cleaner site, a typical extraction well designed for cleanup placed between MW-13B and Well 10 would most likely not "compete" with Well 10's high pumping rate and thus would have little effectiveness. Water Board staff believes an onsite pump and treat system is best to contain the contamination and prevent further spread of the dissolved phase plume. The additional investigation that will take place will aid in designing a cleanup method to target any residual DNAPL in the source area and the dissolved phase plume.

#### ATTACHMENTS

1. February 2006 PCE Concentration Site Map
2. Central Coast Water Board's March 28, 2006 Letter
3. Approximate Timeline of Assessment Tasks

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