



Department of Toxic Substances Control



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From: Thomas M. Seckington, C. HG.^{Je.}
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Date: May 12, 2006

Re: Filtering Requirements for Ground-water sample collection procedures,
Water Quality Sampling, Santa Susana Field Laboratory, Ventura County

As part of ongoing corrective action activities, the Geological Services Unit (GSU) of the Geology, Permitting, and Corrective Action Branch (GPCAB) has evaluated the current ground-water sampling procedures including sample filtration for metals in groundwater. The purpose of this evaluation is to ensure that data quality objectives are currently being met and to evaluate future data quality objectives and make recommendations, as necessary. This evaluation is being conducted as the RCRA Facility Investigation (RFI) at portions of the site are nearing completion and work is beginning to assess the current and future risk associated with the site conditions.

PAST AND CURRENT RFI CHARACTERIZATION ACTIVITIES

The majority of the metals ground-water data from the site were collected using field filtering procedures, which is currently followed under the *Site Wide Sampling and Analysis Plan (SAP)* for SSFL (dated May 1995) approved by DTSC in 1995.

It is useful to understand the history of the groundwater monitoring system at the site. The ground-water conceptual model for SSFL was not developed until the late 1990s. This was after the development of the current SAP and after the installation of the majority of the ground-water monitoring wells at the site. In the 1950s and 1960s, several water supply wells with very long-screened were installed at the site. Between the mid-1980s and late 1990s, both deep and shallow monitoring wells were installed at SSFL to characterize the movement of ground water and the distribution of contaminants at the site. These wells were located and constructed based on a sand and gravel aquifer

Gerard Abrams
May 12, 2006
Page 2 of 2

model. In recent years, numerous wells and coreholes have been installed at SSFL to better refine the current understanding of the ground-water conditions including the fate of transport of chemicals at the site through a fractured sandstone aquifer.

As a result of this long evolving history, the ground-water monitoring system consists of ground-water monitoring wells of variable construction. These differences: between screened and non-screened wells; between shallow wells and deep wells; and between wells screened within alluvium versus wells screened within sandstone can result in artifactual variations in turbidity and colloidal load between samples collected from different wells and between samples collected within the same well at different times. This variability in turbidity and colloidal load has a direct and significant effect on the reported concentrations and obscures the temporal and spatial relationships of the reported metals concentrations making identification of contaminant releases to groundwater difficult. Under these conditions, DTSC believes field filtering of the ground-water samples removes these artificial variations in the reported metal concentrations present in the ground water and is therefore the appropriate approach for identification and characterization of metals contamination in groundwater.

FUTURE RFI RISK ASSESSMENT ACTIVITIES

The data quality objectives during the risk assessment are different than the objectives for characterization. By relying on the filtered data, it is acknowledged that the mobile fraction consisting of colloids greater than 0.45 microns is removed and not accounted for. It is reasonable, when evaluating potential exposure, to consider the total mass of a contaminant that is potentially mobile via the ground-water pathway. Therefore, in order to conservatively assess the risk to the human health and the environment from inorganic constituents in the ground water, the GSU recommends that the current SAP be modified to require the collection of both filtered and unfiltered ground-water metal data to meet the data objectives of both characterization (filtered data) and risk assessment activities (both unfiltered and filtered data).

It should be noted that the additional mass of metals that is present from colloids greater than 0.45 microns (i.e. removed via field filtering) is unknown at the site and likely varies between the wells depending on the metal, as noted earlier. The GSU recommends that the facility collect both filtered/unfiltered samples on a quarterly basis for five quarters in all ground-water monitoring wells in which metals are a contaminant of potential concern. The revised Water Quality SAP should include procedures that ensure that well purging is conducted at a rate that does not create significant drawdown. After one-year, field filtered/unfiltered groundwater results should be compared and evaluated. Based on the data, sampling frequencies may be adjusted with DTSC concurrence.

If you have any questions, please contact me at (714) 484-5424.

Peer Review: Jose Marcos

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