SOMA
ENVIRONMENTAL ENGINEERING, INC.
6620 Owens Drive, Suite A • Pleasanton, CA 94588
TEL (925)734-6400 • FAX (925)734-6401
www.somaenv.com

October 28, 2011

Mr. Jerry Wickham
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: Workplan for Further Soil and Groundwater Investigation at 2844 Mountain Boulevard, Oakland, California Fuel Leak Case No. RO0000276

Dear Mr. Wickham:

SOMA Environmental Engineering, Inc. (SOMA) submits this letter in response to your request for a brief workplan for further soil and groundwater investigation at the subject property referenced above. The following provides a description and methodology for proposed investigation and summarizes proposed sampling.

According to historical site records, minimum groundwater depth was reported at 5.3 feet below ground surface (bgs) and a maximum depth at 22.11 feet bgs with groundwater exhibiting southwesterly flow. The maximum depth previously explored (sampled) at the site was reported at 28 feet bgs. Four monitoring wells, RS-1 through RS-4, were installed on-site in 1990 and screened from 5 to 25 feet bgs or from 5 to 30 feet bgs. Free product was reported in RS-1 in 1996. No recent monitoring data exist for this site. According to Alameda County Environmental Health Services (ACEHS) correspondence dated February 28, 2011 and Aqua Science report dated May 24, 2000, fuel hydrocarbons including methyl tertiary-butyl ether (MtBE) and fuel oxygenates occur at elevated concentrations in soil and groundwater at the site and have migrated to off-site areas. MtBE has been detected at levels up to 410,000 micrograms per liter (µg/L) in groundwater samples at the edge of the property, indicating that the lateral and vertical extent of contamination originating from the subject site has not been fully defined.

Between July 29 and August 18, 2011 two underground storage tanks (USTs), one 10,000-gallon and one 3,000-gallon capacity, were excavated and disposed of off-site. During this event, associated fuel piping was also excavated and disposed of off-site. Depth to the bottom of excavation pit was recorded at 11.5 feet bgs. The UST pit and trenches were not backfilled to grade with clean (imported) fill material or resurfaced because the owner indicated he intends to install new USTs and piping in the near future. The UST pit was lined and backfilled with existing material and concrete rubble. The site is currently fenced in, which limits public access to the property. Confirmation soil samples were collected from beneath removed USTs and associated piping. Two groundwater samples were collected from the UST pit. It appeared that soil and groundwater contamination still exists in the area of removed

USTs, as illustrated by levels of chemicals of concern (COCs) in excess of Environmental Screening Levels (ESLs). Lesser soil contamination exists in the area beneath the removed fuel piping.

SOMA's report dated September 14, 2011 summarized UST removal activities. Based on above findings, SOMA is preparing this workplan for further soil and groundwater investigation. Upon delineation of existing soil and groundwater contamination, an appropriate remedial action will be proposed and implemented in order to remove residual contamination and move the site toward closure.

In order to evaluate site hydrogeology for preparation of the site conceptual model (SCM), SOMA will utilize a cone penetration test (CPT) equipped with membrane interface probe (MIP) in this proposed investigation. SOMA will advance and sample four soil boring clusters, CPT/MIP/GS-1 through CPT/MIP/GS-4, using CPT and a Geoprobe drilling rig. Figure 1 shows proposed boring locations. In order to delineate the extent of soil and groundwater contamination, SOMA proposes to advance borings to a depth of 50 feet bgs, beyond the previously explored depth of 28 feet bgs at RS-1. As seen from the attached figure, proposed borings will be positioned near the former USTs and the residual soil and groundwater contamination on-site as well as the downgradient areas (near the existing storm water line) where contamination has been indicated in the past.

Before initiating field activities, SOMA will obtain required drilling permit from Alameda County Public Works and excavation and obstruction permits from the City of Oakland. A minimum 72-hour notice will be given to ACEHS and the City of Oakland prior to start of any field work. As part of the City of Oakland permitting requirements, SOMA will prepare and execute a traffic control plan for proposed drilling activities.

Before initiating field activities, SOMA will prepare a site-specific Health and Safety Plan (HASP). The HASP is a requirement of the Occupational Safety and Health Administration (OSHA), "Hazardous Waste Operation and Emergency Response" guidelines (29 CFR 1910.120) and the California Occupational Safety and Health Administration (Cal/OSHA) "Hazardous Waste Operation and Emergency Response" guidelines (CCR Title 8, section 5192). The HASP is designed to address safety provisions during field activities and protect the field crew from physical and chemical hazards resulting from drilling and sampling. It establishes personnel responsibilities, general safe work practices, field procedures, personal protective equipment standards, decontamination procedures, and emergency action plans. The HASP will be reviewed and signed by field staff and contractors prior to beginning field operations.

SOMA will contact Underground Service Alert (USA) to ensure that drilling areas are clear of underground utilities before the start of field activities. Following USA clearance, SOMA will retain a private utility locator to survey proposed drilling areas and locate any additional subsurface conduits.

To evaluate the site hydrogeologic conditions, SOMA proposes using combined CPT and direct push technology (DPT) to continuously log subsurface lithology and stratigraphy up to 50 feet bgs in the vicinity of the former UST pit and downgradient areas and collect pertinent soil and groundwater samples. Drilling to this target depth will help generate a comprehensive representation of WBZs, subsurface lithology and stratigraphy, and contaminant distribution. The target depth may be increased if MIP data and/or field observations indicate presence of elevated concentrations of fuel hydrocarbons in the deeper WBZs.

CPT is a process for determining subsurface soil characteristics employing a cone penetrometer attached to a data acquisition system, which is pushed into the subsurface using a hydraulic ram. Generally, the soundings are conducted using a 20-ton capacity cone with a tip area of 15 cm^2 and a friction sleeve area of 225 cm^2. The cone takes measurements of cone bearing (q_c), sleeve friction (f_s) and dynamic pore water pressure (u_2) at 5-centimeter intervals during penetration to provide a nearly continuous hydrogeological log. In addition, the cone also contains a porous filter element located directly behind the cone tip (u_2). The filter element is used to obtain dynamic pore pressure as the cone is advanced. By qualitatively integrating these parameters, CPT provides a rapid means of determining relative soil lithology and hydrogeologic information. CPT data reduction and interpretation is performed in real time, facilitating on-site decision making by a field geologist. The hydrogeologic information gathered is used to identify different WBZs using pore pressure data, as well as any confining layers beneath the site.

Concurrent with the CPT study, SOMA proposes utilizing MIP to evaluate presence and vertical extent of petroleum hydrocarbons. The MIP is a high-resolution, direct-sensing downhole screening tool capable of providing information regarding residual levels of petroleum hydrocarbons that may exist at different depth intervals. The MIP uses a thin film fluorocarbon polymer membrane, which stays in direct contact with the soil during MIP logging. The downhole membrane serves as an interface to a detector at the surface. Volatiles in the subsurface are transferred across the membrane and partition into a stream of carrier gas where they are swept to the detector. Most commonly used detectors include photoionization detector (PID), electron capture detector (ECD) and the flame ionization detector (FID). Each detector is designed for sensitivity to a group or type of contaminant. The ECD is used for chlorinated contaminant (trichloroethylene [TCE], perchloroethylene [PCE]) detection; the PID is best used for the detection of aromatic hydrocarbons (benzene, toluene, ethylbenzene, total xylenes [BTEX] compounds); the FID is best used for straight-chained hydrocarbons (methane, butane). As the MIP module collects information on contaminant characteristics, the CPT characterizes sediment types (e.g., clay, silt, silty clay) in the subsurface. Therefore, at each CPT location an integrated vertical profile of approximate soil/sediments stratigraphy, contaminant location, and relative contaminant concentration is generated.

To verify the MIP data, four boreholes for sampling groundwater and soil (GS boreholes), drilled adjacent to the CPT/MIP boreholes using DPT rig, are proposed. Soil samples for chemical analysis will be collected from GS borings, at MIP-identified depths indicative of gross contamination. Boring GS-1 will be continuously logged and used to correlate CPT-obtained data with existing subsurface lithology and MIP data with existing contaminant distribution. The proposed depth of all GS boreholes will be identical to the depth of the CPT/MIP boreholes (approximately 50 feet bgs).

Soil samples will be collected at MIP-identified depths from each GS boring by advancing a 2-inch-diameter DP sampler lined with 4-foot-long clear polybutryate sleeves into the undisturbed soil profile at the base of the boring. Since CPT will be implemented prior to GS borings advancement, no continuous logging via GS borings (except for GS-1) is proposed at this time. SOMA will use a handsaw to cut the retrieved plastic liner into small sections for laboratory submittal. The collected sleeves will be covered at both ends with Teflon sheeting, sealed at both ends with polyethylene end caps, labeled, logged on a chain-of-custody form, placed in an ice-filled cooler, and kept at 4^0C for transport to a state-certified laboratory for analysis.

Depth-discrete groundwater sampling will be conducted if multiple WBZs are encountered during drilling; otherwise, grab groundwater samples will be collected. In addition, if multiple WBZs are present, SOMA will utilize a dual tube sampler to isolate the upper WBZ and prevent cross contamination samples collected at lower depths. Depth-discrete groundwater samples will be collected by driving a 4-foot-long Hydropunch tip attached to the end of the inner drive DP rod to the desired depth-discrete interval. The outer drive casing will be retracted, exposing the 4-foot-long screen interval of the Hydropunch tip. Groundwater samples will be collected with a stainless steel bailer lowered through and beneath the drive casing into the Hydropunch screen. Prior to downhole collection events and between borings, the Hydropunch and stainless steel bailer will be field decontaminated to avoid cross-contaminating groundwater samples.

If only one WBZ is encountered during drilling, SOMA will collect grab groundwater samples. Grab groundwater sampling will entail installation of a temporary 1-inch-diameter casing attached to a perforated casing screened over the desired interval. Either a disposable or a decontaminated stainless steel bailer will be used to evacuate the appropriate amount of groundwater and decant it slowly (to avoid volatilization) into appropriately preserved laboratory-supplied containers. Each retrieved groundwater sample will be labeled with a unique sample identifier and preserved on ice pending delivery to a certified analytical laboratory. All samples will be delivered to the laboratory for chemical analysis under appropriate chain-of-custody protocol. SOMA will record field observations regarding location and thickness of free product, if any.

Upon completion, all advanced boreholes will be grouted to surface grade in accordance with ACEHS requirements, with a neat cement grout mixture, tremmied into place, and completed at the surface with materials to match existing grade. A brief description of general field procedures is included in Attachment A.

Soil and groundwater samples will be submitted to a California state-certified environmental laboratory for chemical analysis of the following:

- Total petroleum hydrocarbons as gasoline and diesel (TPH-g and TPH-d)
- BTEX
- Fuel oxygenates, additives and lead scavengers including MtBE, tertiary-butyl alcohol (TBA), ethyl tertiary-butyl ether (ETBE), diisopropyl ether (DIPE), tertiary-amyl methyl ether (TAME), 1,2-dichloroethane (1,2-DCA), 1,2-dibromomethane (EDB), and ethanol.

Analyses will employ USEPA Methods 8015 and Full 8260B.

Any soil cuttings and waste water generated during soil boring advancement will be temporarily stored on-site in a secure area in DOT-rated 55-gallon steel drums pending characterization, profiling, and transport to an approved disposal-recycling facility. Each drum will be labeled with site address, contents, date of accumulation, and contact phone number.

Upon completion of this proposed investigation, SOMA will prepare a comprehensive report presenting findings and recommendations. This report will document boring advancement and all related activities, and discuss results of soil and groundwater sample analyses. The report will also include the following:

- field conditions observed during soil boring advancement activities, including boring logs describing soil types encountered, sample intervals, and PID vapor readings
- laboratory analytical results of soil and groundwater samples collected during boring advancement
- evaluation of contaminant distribution and SCM preparation
- a comprehensive SCM
- conclusions and recommendations

If you have any questions or comments concerning the above, please do not hesitate to call me at (925) 734-6400.

Sincerely,

Mansour Sepehr, PhD, PE
Principal

REGISTERED PROFESSIONAL ENGINEER
MANSOUR SEPEHR
No. C042928
Exp. 3-31-12
CIVIL
STATE OF CALIFORNIA

Attachments:
- General Field Procedures
- Figure 1: Site Map (showing features and proposed borings)

PERJURY STATEMENT

Site Location: 2844 Mountain Boulevard, Oakland, California

"I declare under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge".

Tejindar Singh
6400 Dublin Boulevard
Dublin, California 94568
Responsible Party

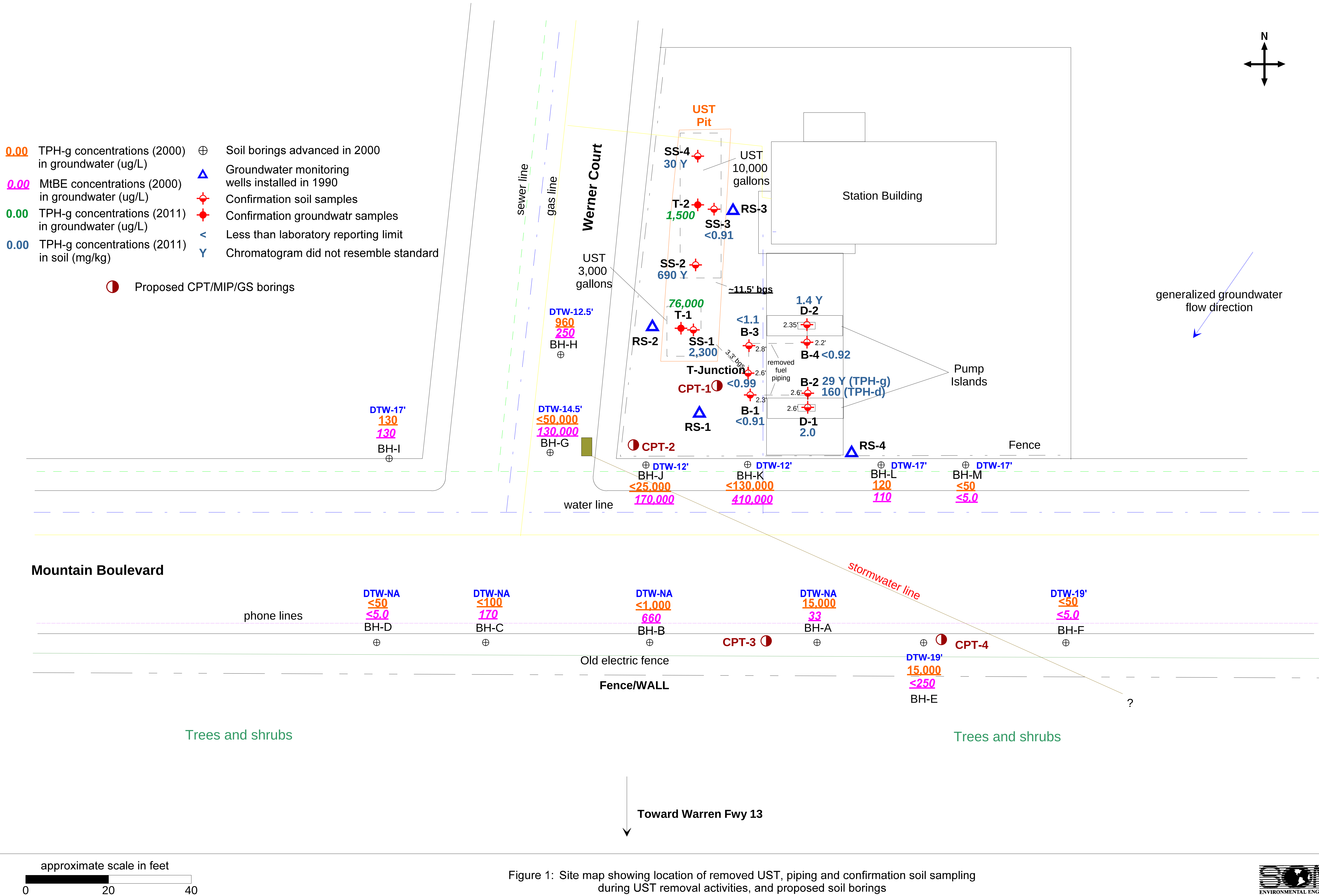

Figure 1: Site map showing location of removed UST, piping and confirmation soil sampling during UST removal activities, and proposed soil borings

GENERAL FIELD PROCEDURES

Utility Locating

Prior to drilling, boring locations are marked with white paint or other discernible marking and cleared for underground utilities through Underground Service Alert (USA). In addition, the first five feet of each borehole are air-knifed, or carefully advanced with a hand auger if shallow soil samples are necessary, to help evaluate the borehole location for underground structures or utilities.

DPT Borehole Advancement

Pre-cleaned push rods (typically one to two inches in diameter) are advanced using a hydraulic push type rig for the purpose of collecting samples and evaluating subsurface conditions. The drill rod serves as a soil sampler, and an acetate liner is inserted into the annulus of the drill rod prior to advancement. Once the sample is collected, the rods and sampler are retracted and the sample tubes are removed from the sampler head. The sampler head is then cleaned, filled with clean sample tubes, inserted into the borehole and advanced to the next sampling point where the sample collection process is repeated.

Borehole Completion

Upon completion of drilling and sampling, the rods are retracted. Neat cement grout, mixed at a ratio of 6 gallons of water per 94 pounds of Portland cement, is introduced, *via* a tremmie pipe, and pumped to displace standing water in the borehole. Displaced groundwater is collected at the surface into DOT approved 55-gallon steel drums, or an equivalent storage container. In areas where the borehole penetrates asphalt or concrete, the borehole is capped with an equivalent thickness of asphalt or concrete patch to match finished grade.

Equipment Decontamination

Equipment that could potentially contact subsurface media and compromise the integrity of the samples is carefully decontaminated prior to drilling and sampling. Drill augers and other large pieces of equipment are decontaminated using high pressure hot water spray. Samplers, groundwater pumps, liners and other equipment are decontaminated in an Alconox scrub solution and double rinsed in clean tap water rinse followed by a final distilled water rinse.

The rinsate and other wastewater are contained in 55-gallon DOT-approved drums, labeled (to identify the contents, generation date and project) and stored on-site pending waste profiling and disposal.