



STATE OF HAWAII
DEPARTMENT OF HEALTH
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HONOLULU, HI 96801-3378

In reply, please refer to:
File:

TO: Interested Parties

THROUGH: Fenix Grange, Chief
Hazard Evaluation and Emergency Response Office (HEER)

FROM: Lene Ichinotsubo, Acting Chief
Solid and Hazardous Waste Branch (SHWB)

DATE: January 30, 2019 (DRAFT)

SUBJECT: Use of HEER Office *Environmental Action Level* guidance and HEER Office *Technical Guidance Manual* for Characterization and Remediation of Contaminated Properties Overseen by the Solid and Hazardous Waste Branch

This memorandum supersedes and takes precedence over a July 15, 2005, SHWB memorandum titled, *Use of May 2005 Environmental Action Levels ("EALs") at Leaking Underground Storage Tank sites* (Attachment 1). The 2005 memorandum recommended reference to soil and groundwater EALs published by the HEER Office earlier that year for use at underground storage tank (UST) sites overseen by the SHWB but also allowed reference to action levels published in 1995 by the SHWB. In August 2013, SHWB adopted HEER Office EALs as "alternative site-specific action levels" as referenced in state UST regulations. The HEER Office EALs and subsequent updates have since been fully adopted by the SHWB for use at contaminated properties overseen by the SHWB, including but not limited to UST sites, and use of the 1995 action levels is no longer permitted (HDOH 2017a).

Parties involved in soil and groundwater investigation projects overseen by the SHWB are furthermore advised to refer to the HEER Office *Technical Guidance Manual* (TGM) for the design and implementation of field activities (HDOH 2016). The HEER Office TGM incorporates, updates and takes precedence over information published in the UST *Technical Guidance Manual* prepared by the SHWB (HDOH 2000). In particular, guidance for testing of soil, groundwater, and soil vapor presented in the HEER Office TGM replaces guidance in Section 7 (Sampling and Analysis) of the 2000 SHWB UST TGM. Guidance specific to the installation of groundwater monitoring wells at UST sites presented in Appendix 7-E of the 2000 SHWB TGM can, however, be referred to in coordination with the overseeing project manager from the SHWB (Attachment 2). Note that the HEER Office EAL guidance adopted in August 2013 similarly supersedes and takes precedence over guidance specific to the preparation of risk assessments presented in Section 5 of the 2000 SHWB UST TGM.

Reference to the HEER Office guidance documents must take into account updates to SHWB regulations. Related technical documents published by both the SHWB and HEER Office should also be referred to as appropriate and approved by SHWB project managers. This includes the

“Clean Fill” guidance prepared jointly by the SHWB and HEER Office and used for testing of imported and exported fill material as well as soil stockpiles (HDOH 2017b, and updates).

The HEER Office TGM does not serve as a replacement for testing requirements presented in other SHWB guidance and regulations. The HEER Office TGM in particular does not discuss requirements for testing and disposal of non-soil wastes overseen by the SHWB. Explicit guidance on management of active UST facilities is also not provided in the HEER Office TGM.

The SHWB intends to prepare addendums to the HEER Office TGM that addresses these and related subjects in the future. In the interim, the SHWB has prepared the attached, Question & Answer section to discuss use of the HEER Office TGM in projects overseen by this office.

References

- HDOH, 2000, Hawaii Underground Storage Tank Technical Guidance Manual: Hawai‘i Department of Health (March 2000): Hawai‘i Department of Health, Solid and Hazardous Waste Branch. <http://health.hawaii.gov/shwb/ust-tgm/>
- HDOH, 2005, *Use of May 2005 Environmental Action Levels (“EALs”) at Leaking Underground Storage Tank sites* (July 2005): Hawai‘i Department of Health, Solid and Hazardous Waste Branch.
- HDOH, 2016, *Technical Guidance Manual* (Fall 2016, and updates): Hawai‘i Department of Health, Office of Hazard Evaluation and Emergency Response, <http://www.hawaiidoh.org/>
- HDOH, 2017a, *Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater – Hawaii Edition* (Fall 2017, and updates): Hawai‘i Department of Health, Office of Hazard Evaluation and Emergency Response. <http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/EALs>
- HDOH, 2017b, *Guidance for Soil Stockpile Characterization and Evaluation of Imported and Exported Fill Material*, (October 2017 and updates): Hawai‘i Department of Health, Office of Hazard Evaluation and Emergency Response, <http://eha-web.doh.hawaii.gov/eha-cma/Leaders/HEER/technical-guidance-and-fact-sheets>
- PVT, 2016, *Landfill Policies and Procedures for All Users*: PVT Land Company, Limited, August 2016.

SUBJECT: Use of HEER Office *Environmental Action Level* guidance and HEER Office *Technical Guidance Manual* for Characterization and Remediation of Contaminated Properties Overseen by the Solid and Hazardous Waste Branch – Common Questions and Answers

Q: How is the HEER Office TGM different from the 2000 SHWB UST TGM?

The HEER Office TGM provides an extensive update to sample collection and test methods for soil and sediment, as well as expanded guidance on the testing of indoor air and soil vapors for volatile chemicals. Updates to the guidance are coordinated with and reviewed by SHWB staff.

Guidance for testing of soil, groundwater, and soil vapor presented in the HEER TGM (HDOH 2016), in particular, updates guidance presented in Section 7 (Sampling and Analysis) of the 2000 SHWB UST TGM. Guidance presented for the installation of groundwater monitoring wells at UST sites included in Section 7 of the 2000 SHWB TGM can still be referred to, however. This information will be incorporated into future updates of the HEER TGM.

Q. Are discrete soil sampling methods described in the original SHWB TGM still acceptable for final decision making at contaminated sites overseen by the SHWB?

No. Data based on advanced and more reliable, Decision Unit-Multi Increment Sample (DU-MIS) investigation methods should be collected and used for final decision making at contaminated sites overseen by the SHWB. Existing discrete sample data can be used to design initial remediation plans, if desired. DU-MIS data collected in accordance with the HEER Office TGM should then be collected and used to confirm the adequacy of remedial actions.

Q. Do SHWB sites that were characterized and granted a No Further Action Status based on discrete sample data need to be reopened and retested?

No. Experience at sites where both discrete and Multi Increment sample data have been collected primarily highlights the inefficiency and unreliability of discrete sample data for site characterization. This led to significant, unnecessary delays and expenditures for completion of many projects. Additional confirmation testing using more reliable, DU-MIS methods could, however, be beneficial as part of property transactions or redevelopment at complex sites where localized areas of contaminated soil might have been inadvertently overlooked. This can help avoid delays in proposals for offsite reuse or disposal of soil after a project has already been initiated.

Q. The collection of Multi Increment subsurface soil samples from thirty or more borings at active gas stations and similar facilities will not be practical in some cases, due to limited access, underground tanks and utilities, and other difficulties. Can traditional, discrete soil samples be collected instead?

No. The collection of traditional discrete soil samples has been demonstrated to be unreliable for the characterization of both surface and subsurface soils. This is due to the heterogenous nature of contaminants in soil at the scale of a discrete sample and the mass tested by the laboratory. As discussed in Section 4 of the HEER TGM, data will not be reliably representative unless “Decision Unit” areas and volumes of soil are specified and a 1-2kg sample of soil is collected from at least 30 to 50 points within the targeted DU. This cannot be avoided.

Consider the use of “Single Borehole DU” investigation methods described in Sections 3.3.4 and 4.2.8.2 of the HEER Office TGM for cases where the collection of proper DU-MIS sample data from subsurface soils is not feasible. Under this method, single boreholes are used to approximate the lateral and vertical extent of subsurface contamination, in a similar manner as typically done in the past at active gas stations. A continuous core of soil is extracted from each borehole, and the core is divided into continuous depth intervals for testing. A single 1-2kg sample is then collected from multiple points within each targeted interval. In some cases, the entire targeted core interval can be collected and submitted to the laboratory for MIS processing and testing.

This approach works well for the general approximation of the extent and magnitude of subsurface petroleum contamination, which can be easily identified in single cores, although the representative concentration and mass of contamination present will be difficult to reliably estimate. A more detailed investigation might be required for in situ treatment of contamination once high-risk areas have been identified. For testing of volatile chemicals, small plugs of soil are collected from the entire length of the targeted core interval and either combined in methanol in the field for submittal to the laboratory or encapsulated and immediately frozen for extraction in methanol at the laboratory.

Q. Are DU-MIS data required for disposal of soil (or sediment) at municipal landfills in Hawaii or hazardous waste landfills on the mainland?

Requirements for the use of DU-MIS data for soil and similar material will be progressively incorporated into landfill disposal permits as those permits are renewed. Be aware that some municipal landfills, and the PVT Construction and Demolition Waste landfill on the island of O‘ahu, already require that the collection of soil sample data follow methods described in the HEER Office TGM (Attachment 3; PVT 2016). This is in part to ensure that landfill workers are not inadvertently exposed to high levels of contaminants in soil that is brought to the landfill for disposal or for use as cover material.

If soil is designated for disposal to a landfill or reuse at another off-site location, then the generator must make a hazardous waste determination in accordance with 40 CFR §262.11, as incorporated and amended in §11-262.1-1, Hawai‘i Administrative Rules (HAR). Refer also to Section 2 of the joint SHWB-HEER Office “Clean Fill” guidance for additional information (HDOH 2017b).

Q. Are default, Decision Unit (DU) areas and volumes presented in the HEER Office TGM and the joint, HEER-SHWB “Clean Fill Guidance” (HDOH 2017b) strict requirements or can alternative DU volumes be applied to sites overseen by the SHWB?

The default DU areas and volumes of soil presented in the HEER Office TGM and joint HEER-SHWB *Clean Fill Guidance* are intended to expedite testing and clearing of soil for unrestricted reuse in residential neighborhoods, schools, medical facilities and other sensitive locations or reuse at commercial/industrial properties. This will help to avoid potential fines for offsite transportation and placement of contaminated soil. The SHWB considers soil that exceeds the most stringent (Tier 1) Environmental Action Levels (EALs) for unrestricted use to be a “waste,” as defined in Hawaii Revised Statutes, Chapter 342H. Proposal of alternative DU volumes for testing and reuse of soil is allowed on a site-by-site basis, provided that adequate justification is presented in a workplan to the SHWB for review and approval.

Q. Are DU-MIS data required for characterization of non-soil material, including municipal or industrial waste or recyclable material not related to soil?

The collection of DU-MIS data for reuse or disposal of non-soil material is encouraged to the extent practicable. This is because data related to past, “discrete” sampling methods has been demonstrated to be unreliable and can lead to concerns regarding landfill worker exposure and offsite migration of contaminants in surface runoff or leachate.

DU-MIS data are now routinely collected for waste incinerator ash, for example. Reliable, Multi Increment samples for solids (e.g., waste sandblast grit) can often be collected from containerized waste by simply transferring the waste to another container and periodically collecting individual sample increments during this process. Sampling tubes and other tools can be used to collect representative samples of containerized, liquid waste.

Additional SHWB guidance on the use of DU-MIS methods for characterization of non-soil waste is anticipated in the future.

Attachment 1

Use of May 2005 Environmental Action Levels (“EALs”) at Leaking Underground Storage Tank sites (July 2005)

**(includes subsequent updates to EALs and use for characterization and
disposal of soil and sediment under all SHWB programs)**



STATE OF HAWAII
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In reply, please refer to:
File: EHAIHEER Office

TO: Interested Parties

FROM: Steven Chang, Chief
Solid & Hazardous Waste Branch

A handwritten signature in black ink, appearing to read "Steven Chang", written over the printed name and title.

DATE: July 15, 2005

SUBJECT: Use of May 2005 Environmental Action Levels ("EALs") at Leaking Underground Storage Tank sites

The Hazard Evaluation and Emergency Response (HEER) office has recently published a technical document entitled, *Screening For Environmental Concerns at Sites With Contaminated Soil and Groundwater (Interim Final - May 2005)*. Environmental Action Levels (EALs) presented in this document represent an update to action levels presented in the 1995 document, *Risk-Based Corrective Action and Decision Making at Sites With Contaminated Soil and Groundwater*, prepared by the Solid and Hazardous Waste Branch (December 1995, revised June 1996). Formal revision of the 1995 action levels as presented in Hawai'i Administrative Rules (HAR) Section 11-281-78 (UST Site Cleanup Requirements) is currently underway. It is anticipated that this process will be completed in early 2006.

In the interim, the Solid and Hazardous Waste Branch has prepared this Question & Answer sheet to discuss use of the May 2005 EALs at Leaking Underground Storage Tank sites.

Q: How are the May 2005 EALs different from the 1995 Action Levels?

A: The May 2005 EALs reflect more recent toxicological data and take into account additional exposure pathways and environmental concerns. Action levels for petroleum-related chemicals are not significantly different from those presented in the 1995 RBCA document with the exception of ethylbenzene and Total Petroleum Hydrocarbons (TPH). In the case of ethylbenzene, groundwater action levels were updated to reflect more recent data for the protection of aquatic habitats. For sites that do not threaten a source of drinking water, the groundwater action level for ethylbenzene increased from 140 ug/L to 290 ug/L (sites within 150m of a surface water body) and 300 ug/L (sites not within 150m of a surface water body). This change, coupled with use of an alternative model for leaching of chemicals from soil, increased soil action levels for ethylbenzene by up to one order of magnitude.

The 1995 soil action levels for Total Petroleum Hydrocarbons (TPH) were retained for use in the May 2005 EALs. Action levels for nuisance concerns (odors, staining, etc.) were also added, however. This issue was not specifically addressed in the 1995 document. The

additional action levels will be most useful at sites being redeveloped for residential purposes. For example, soil impacted with TPH-gasoline at a concentration of 2,000 mg/kg (1995 action level) could pose potential odor concerns if exposed at the ground surface or encountered during landscaping or utility work. An action level of 100 mg/kg is incorporated into the May 2005 EAL document to address this concern. An additional, nuisance-based action level of 500 mg/kg is presented for both TPH-diesel ("middle distillates") and heavier oils ("residual fuels"). Exceeding these concentrations of TPH in exposed or shallow soils indicates that nuisance concerns may exist and a more site-specific, field-based assessment of this issue should be carried out.

A third update to the 1995 RBCA document that may affect leaking underground tank sites is the inclusion of EALs for additional polynuclear aromatic hydrocarbon compounds (PAHs). A list of targeted PAHs that should be tested for at petroleum releases is provided in Chapter 2 of the May 2005 document. These compounds are often found in waste oil and to a lesser extent in diesel-range fuels. The addition of the compounds to the lookup tables reflects updates to the USEPA Preliminary Remediation Goals (PRGs) as well as other USEPA guidance.

Reference to the additional PAHs is not likely to affect the scope of cleanup required for contaminated soils. Many of the EALs for PAHs in groundwater are very low, however, and may even be below normal laboratory method reporting limits. (In cases where the EAL is below the laboratory method reporting limit, the reporting limit should be used for screening purposes.) This is primarily because these PAHs are highly toxic to aquatic organisms. At a "Tier 1" screening level, the EAL document assumes that contaminated groundwater at a site could migrate to a body of surface water and impact sensitive aquatic habitats. This is especially a concern for highly mobile chemicals (e.g., chlorinated solvents). PAHs are not significantly mobile in groundwater, however, and unlikely to migrate more than a few tens of meters from the original release area. Once it can be established that PAH-contaminated groundwater is not likely to migrate to a body of surface water, consideration of the EALs for PAHs in groundwater cleanup plans is no longer needed (e.g., based on groundwater monitoring data and length versus age and length of plume). Proper management of contaminated groundwater (and soil) during site future redevelopment activities will be required, however.

Q: Am I now required to use May 2005 EALs at Leaking Underground Storage Tank sites?

A: No. Use of the May 2005 EALs is entirely optional on the part of the party responsible for investigating, assessing and cleaning up contaminated sites.

Q: Can I use the May 2005 EALs at Leaking Underground Storage Tank sites if I so desire?

A: Yes. The May 2005 EALs are primarily a compilation of published information that would be normally accessible for use in a "site-specific" environmental risk assessment. HAR Section 11-281-78 (UST Site Cleanup Requirements) allows for the use of approved, "site-specific" action levels at leaking underground storage tank sites provided that all potential environmental concerns are addressed. The updated EALs meet this requirement. Action levels from the 1995 document and the 2005 document should not be mixed, however.

Either one document or the other should be referred to unless otherwise approved by the Solid and Hazardous Waste Branch.

Q: Should I use the May 2005 EALs at Leaking Underground Storage Tank sites, even if this is not required?

A: This depends on the nature and status of the site. A review of cleanup levels at sites that have already been closed or at sites where cleanup levels have already been approved is not necessary.

As indicated above, the May 2005 EALs may be used at sites where investigation and cleanup actions are still underway via a "site-specific" environmental risk assessment. Updated EALs for ethylbenzene may reduce the scope of cleanup needed at many sites, especially where cleanup is being driven by groundwater protection concerns. At sites being redeveloped for residential purposes, additional screening of TPH levels in shallow soils for potential nuisance concerns (odors, staining, etc.) is prudent. This allows the property owner and developer to identify areas where potential cleanup of contaminated soils beyond typical toxicity and leaching concerns may be needed and helps avoid unexpected delays and disposal costs during redevelopment. Although final action levels for petroleum-related releases are not significantly affected, the updated EALs also take into account potential vapor intrusion concerns and subsequent impacts to indoor air.

Q: Can I still use the 1995 Action Levels?

A: Yes. The 1995 action levels (and 1996 updates) can be used until such time that HAR Chapter 11-281 ("Underground Storage Tanks"), including HAR Section 11-281-78 (UST Site Cleanup Requirements), is formally revised (anticipated early 2006). As discussed above, action levels from the two documents should not be mixed except as discussed in the May 2005 document (e.g., soil action levels for high rainfall areas).

The May 2005 EAL document will be revised and updated on a regular basis. Comments and suggestions from the general public are welcome at any time. Updates will be posted to this website and notification sent to persons on the EAL mailing list. Workshops to present and discuss the EALs will also be held periodically. To provide comments or be included on the mailing list for updates and workshop announcements, please contact:

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Attachment 2

Hawaii Underground Storage Tank Technical Guidance Manual (March 2000), Appendix 7-e: Recommended Sampling and Analysis Procedures (water)



WATER SAMPLING

Surface Water Sampling

Representative concentrations of the contaminants of interest in water samples should be assured by taking the following precautions in obtaining field samples.

1. Prior to the initial sampling, decontamination procedures should be followed on all equipment   to prevent the introduction of contaminants by outside sources.
2. Samples from shallow depths can be readily collected by merely submerging the sample container. The container's mouth should be positioned so that it faces upstream, while the sampling personnel are standing downstream so as not to stir up any sediment that may contaminate the sample.
3. To avoid aeration of the sample, the sample container should be held at an angle so that the stream of water flows down the side. The sample container should be filled until it overflows and the lid carefully screwed on. Zero headspace in the sample container should be ensured by inverting the vial and carefully tapping on the cap. If air bubbles appear, remove the cap and add enough sample water to produce an inverted meniscus. Cap and repeat the check for air bubbles.
4. Collecting a representative sample at depth or from a larger body of surface water is difficult but not impossible. Samples should be collected near the shore if possible. If boats are used, the body of water should be cross-sectioned, and samples should be collected at various depths across the water in accordance with the specified sample location plan. For this type of sampling, a weighted-bottle sampler is used to collect samples at any predetermined depth. The sampler consists of a glass bottle, a weighted sinker, a bottle stopper,

and a line that is used to open the bottle and to lower and raise the bottle during sampling. The procedure for use is as follows:

- a. Gently lower the sampler to the desired depth so as not to remove the stopper prematurely.
 - b. Pull out the stopper with a sharp jerk of the sampler line.
 - c. Allow the bottle to fill completely, as evidenced by the cessation of air bubbles.
 - d. Raise the sampler and cap the bottle.
 - e. Wipe the bottle clean. The bottle can also be used as the sample container.
5. Samples for volatiles should be placed in three 40 mL volatile organic analysis (VOA) bottles provided by the analytical laboratory. These sample bottles are screw-top vials with Teflon-lined silicone septa. Sample bottles should not be rinsed prior to sampling, and should be placed in the ice chest immediately after labeling.
 6. Duplicate samples, when collected, should be taken immediately after the field sample. Decontamination procedures are not necessary between sampling for the field sample and the duplicate.
 7. Field samples, field duplicates, and trip blanks should be labeled in sequence and individually placed in plastic bags to prevent cross-contamination. Chain of custody and sample analysis request forms should accompany each shipment of samples to the laboratory, listing the analyses to be performed and the QA/QC criteria for laboratory duplicates and matrix spikes. All samples should be packed in a cooler on blue ice (at 4° C) in such a way as to prevent breakage. A thermometer should be placed in the cooler during transport.

Groundwater Sampling. Groundwater samples should be obtained from monitoring wells in accordance with the procedures set forth in this section. All monitoring wells intended for use in groundwater sampling programs are required to be designed and constructed in accordance with Department of Health (DOH) guidelines set forth in this section and the HDOH document titled draft *Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan* dated December 1996. An example groundwater monitoring well construction design is provided in Figure 7E.2. DOH does not set restrictions on the minimum

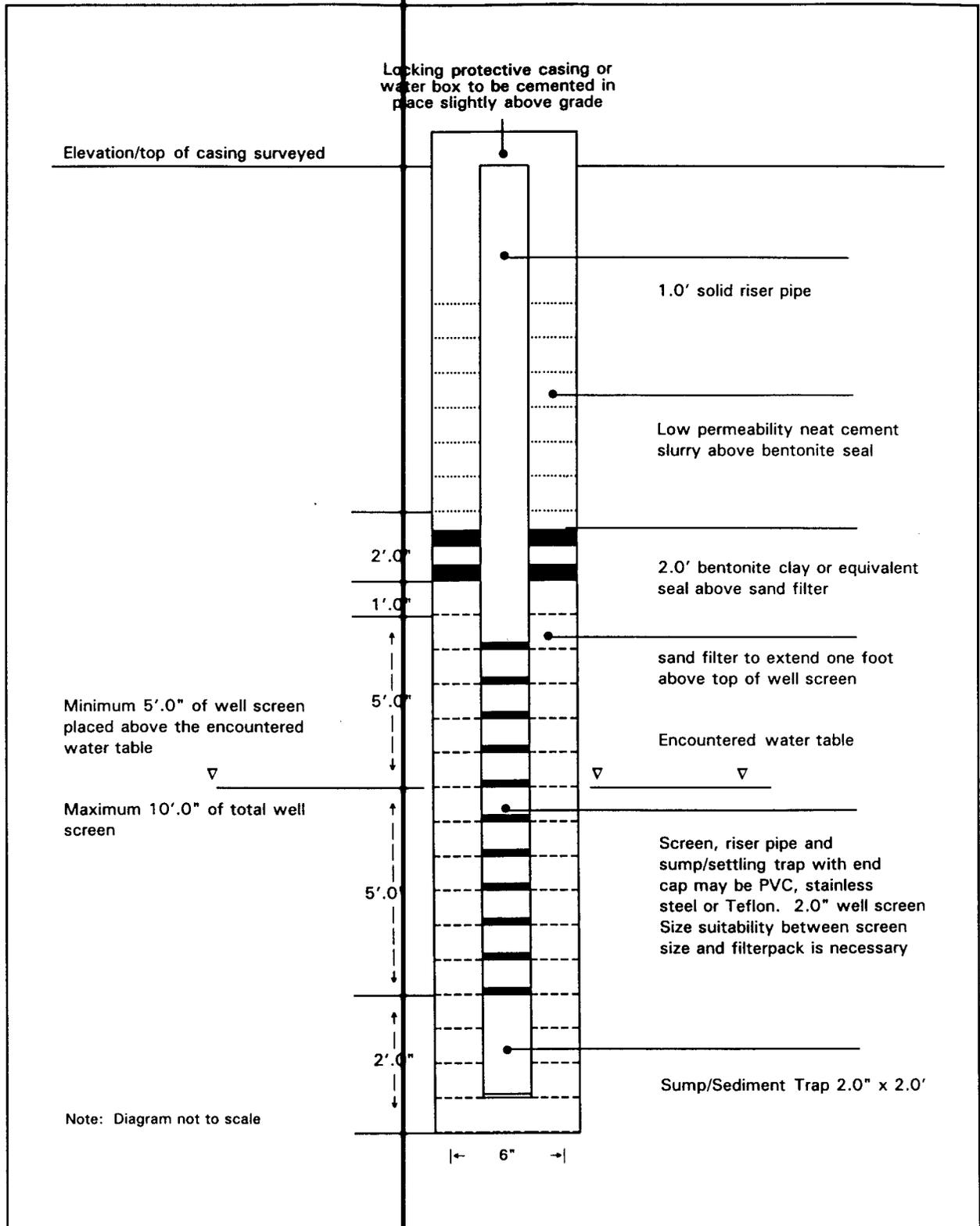


Figure 7E.2 Example Ground-water Monitoring Well Construction Detail

allowable diameter of a monitoring well provided that the well is constructed in accordance with the above-stated guidelines. While the diameter of a monitoring well strongly effects the present and future **utility** and **efficiency** of the well, DOH does not consider well diameter to cause a significant negative bias on the **quality** of groundwater samples extracted from the well, provided that standard sampling procedures are adhered to. DOH also does not place restrictions on the use of push-type devices (e.g., Geoprobe, Stratoprobe, etc.) to install small-diameter monitoring wells, again provided that the wells are designed and constructed in accordance with DOH-recommended guidelines.

As noted, small-diameter wells have distinct advantages but site-specific considerations must be taken into account before deciding on the well diameter most appropriate for a given site. Problems reported to DOH regarding the use of small-diameter wells include difficulties in installing wells in soils or sediments with intermixed, consolidated rock; difficulties in obtaining adequate sample volumes in low permeability soils or sediments; clogging of wells over time; and difficulties in locating the vadose-zone/groundwater interface so that well screens can be properly positioned.

Monitoring wells should be constructed in accordance with the specifications provided in Figure 7E.2. Wells should be developed (bailed, pumped, surged) until a constant minimum turbidity is achieved. Excessive turbidity of water removed from a well may affect sample integrity and may indicate improper well installation. Monitoring well placement should be specified in the sample location plan.

Filtering of Groundwater Samples

Unless otherwise directed by DOH, groundwater samples that are to be tested for non-volatile constituents (Henry's Law Constant $\leq 10^{-5}$ atm-m³/mol and a molecular weight ≥ 200 grams/mol) should be filtered if there is any evidence of turbidity in the samples (e.g., turbidity > 5 NTU), refer to Table 7E.1. Turbidity should be measured in the field during sampling as needed. Filtering of the samples should take place prior to the addition of a preservative in order to prevent leaching of otherwise sorbed-phase contaminants from suspended sediment. Filter pore sizes should be no smaller than 0.45 microns. The methods and equipment used to filter groundwater samples should be clearly described in the text of the groundwater sampling report presented to DOH for review and incorporation into the public file for the facility.

Filtering of samples that are to be tested for volatile contaminants (Henry's Law Constant $> 10^{-5}$ atm-m³/mol and a molecular weight < 200 gm/mol) should be avoided in order to minimize the loss of contaminants due to volatilization during sampling. Based on published partitioning data for low molecular weight, non-surface reactive contaminants (e.g., volatile compounds), the contribution of

Contaminant	² Volatile?	³ OK to Composite Soil Samples?	⁴ OK to Filter Groundwater Samples?	OK to Collect Sample With Vacuum-Type Pump?
¹COMMON USE-RELATED CONTAMINANTS				
Benzene	yes	NO	NO	⁵ YES(see note)
Toluene	yes	NO	NO	⁵ YES(see note)
Ethylbenzene	yes	NO	NO	⁵ YES(see note)
Xylene (mixed)	yes	NO	NO	⁵ YES(see note)
Benzo(a)pyrene	no	YES	YES	YES
Acenaphthene	yes	NO	NO	⁵ YES(see note)
Fluoranthene	no	YES	YES	YES
Naphthalene	yes	NO	NO	⁵ YES(see note)
PCE	yes	NO	NO	⁵ YES(see note)
1,1 DCE	yes	NO	NO	NO
Vinyl Chloride	yes	NO	NO	NO
TCE	yes	NO	NO	⁵ YES(see note)
1,1,1 TCA	yes	NO	NO	⁵ YES(see note)
PCBs (1260 Arochlor)	no	YES	YES	YES
TPH-residual fuels	no	YES	YES	YES
TPH-middle distillates	yes	⁶ NO (see note)	⁶ NO (see note)	YES
TPH-gasolines	yes	⁶ NO (see note)	⁶ NO (see note)	YES
⁷OTHER CONTAMINANTS				
Acetone	yes	NO	NO	⁵ YES(see note)
Chlorobenzene	yes	NO	NO	⁵ YES(see note)
Chloroform	yes	NO	NO	⁵ YES(see note)
4,4 DDD	no	YES	YES	YES
4,4 DDE	no	YES	YES	YES
4,4 DDT	no	YES	YES	YES
Di-n-octyl phthalate	no	YES	YES	YES
Ethylene glycol	no	YES	YES	YES
Methylene chloride	yes	NO	NO	⁵ YES(see note)
2,3,7,8 TCDD (Dioxin)	no	YES	YES	YES
Chlordane	no	YES	YES	YES
Carbon tetrachloride	yes	NO	NO	⁵ YES(see note)

1. Refer to recommended chemical analysis for UST closure and release response (Table 7.2, DOH Technical Guidance Manual - August 1992).
2. Defined as Henry's Law Constant > 0.0001 m³-atm/mole and molecular weight < 200 gm/mol.
3. For biased-sampling actions, analytical results from composited samples should be multiplied by the number of samples composited to determine the maximum possible contaminant concentration in any one sample. This adjusted value should be used for comparison to applicable DOH action levels.
4. Minimum filter size 0.45μ.
5. Multiply laboratory analytical results by a factor of two for volatile contaminants.
6. Soil and groundwater samples to be tested for TPH may be composited or filtered for release verification purposes only. Any detection of TPH in the samples constitutes a release and requires followup action.
7. Contact DOH for information on contaminants not listed.

Table 7E.1 Allowance for Compositing Soil Samples

sorbed or colloidal phases of these contaminants to total contaminant concentration can be expected to be insignificant. If the collection of highly turbid groundwater samples cannot be avoided at a site (e.g., due to the placement of the monitoring well in clayey, oversaturated lagoonal sediments), then an in-line filter should be used to minimize sample disturbance. Again, this should be clearly described and justified in the text of the report.

Water Level Measurements. Water level measurements are routinely required as part of the sampling program. Collection of water elevations on a continuing basis is important for determining if horizontal and vertical flow gradients have changed since the initial site characterization. A change in hydrologic conditions may necessitate modifications in the design of the ground-water monitoring system or of the corrective action technology being implemented.

The field measurements should include depth to standing water and total depth of the well. This information is required to calculate the volume of stagnant water in the well and to provide a check on the integrity of the well (e.g., identify siltation problems). Each well should have a permanent, easily identified reference point from which its water level measurement is taken. The reference points should be established by an accurate survey and typically located and marked at the north side and top of the well casing with the locking cap removed or on the apron, and, where applicable, the protective casing.

Measure the static water level before removing water from the well for purging or sampling. The well should be allowed to stabilize for a minimum of 24 hours after development of the well or any other withdrawal procedures before a water level measurement is taken. The device used to detect the water level surface must be sufficiently sensitive so that a measurement to ± 0.01 foot can be reliably obtained. The water level reading should be recorded on the ground-water sampling data sheet in Figure 7E.3. Three methods of measuring the water level in a well are described below:

1. Electric tape

Note: The electric tape method should not be used in wells containing free product unless electrical connections are intrinsically safe (explosion proof).

- a. Turn on the switch. Check the batteries by inserting the probe (the tip) into water and noting if the contact between the probe and the water surface is registering clearly.
- b. Rinse the probe with distilled water.

SITE INFORMATION: Site Name, Date: _____ Location: _____ UST Facility ID Number: ____ -- ____ _ _ _ _ _ _ _ _ Owner/Operator: _____				
SAMPLER INFORMATION: Name: _____ Phone Number: _____ Organization: _____				
WELL INFORMATION: Well Number: _____ Well Location: _____ Depth to Water: ____ ft. Depth of Well: ____ ft. Water Column Height: _____ ft. Well Diameter: _____ in.				
VOLUME OF WATER TO BE REMOVED DURING PURGING: $V = \frac{\pi}{4} (D)^2 \times H \times 0.041$ V = one well volume (gal) H = height of water column (ft) D = inside diameter of well (in.) Well volume, V = _____ gal V * 3 well volumes = _____ gal V * 5 well volumes = _____ gal				
COLLECT SPECIFIC CONDUCTIVITY, TEMPERATURE AND pH MEASUREMENTS INITIALLY AND AFTER EVERY WELL VOLUME IS PURGED				
<u>TIME</u>	<u>SPEC. COND.</u>	<u>TEMP</u>	<u>pH</u>	<u>COMMENTS</u>
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
SAMPLE INFORMATION: Sample numbers: _____ Time of Collection: _____ Total Pre-Sampling Time: _____ _____ _____ _____				

Figure 7E.3 Ground-water Sampling Data Sheet

- c. Slowly lower the probe into the well by pulling cable from the hand-held reel.
- d. Continue lowering until the bulb lights up, the beeper beeps, or the ammeter needle deflects, indicating that the water table has been reached.
- e. Measure the length of cable in the well from a datum point (the top of the casing) or other reference point (look for a mark on or in the casing or some type of "v" etched into the casing) to the nearest 0.01 foot. Subtract this length (depth to the water table) from the reference elevation to determine the water level elevation.
- f. Raise the probe until contact with the water has been broken. Lower the probe once again in order to check the measurement reading.
- g. Rinse the cable and probe with distilled water.

Note: Multiphase probes are available which audibly indicate the relative position of both nonaqueous phase liquids and aqueous phase liquids. Operation is similar to that of the single phase electric tape probe discussed above.

2. Popper

- a. Measure the length of the popper.
- b. Rinse the line and popper with distilled water.
- c. Lower the popper into the well.
- d. Listen for the "pop." You may have to raise and lower the popper several times to make sure you have found the water level.
- e. Read the tape measurement from a datum point (the top of the casing) or other prescribed point (look for a mark on or in the casing or some type of "v" etched into the casing) to the nearest 0.01 foot. Add the length of the popper to arrive at the depth to water.
- f. Raise the tape approximately 1 foot. Lower the tape once again and repeat steps "d" and "e" in order to check the reading.

- g. Subtract the depth to water from the reference point elevation to obtain the water level elevation.
- h. Rinse the line and popper with distilled water.

3. Coated tape

Note: The coated tape usually has a weight attached to the end, and it may be necessary to add or subtract the length of the weight from the total water level elevation. Know which type of tape measuring device you intend to use before going into the field.

- a. Rinse the lower few feet of the tape with distilled water and dry.
- b. Chalk the lower few feet of the tape by drawing the tape across a piece of colored carpenter's chalk.
- c. Lower the tape into the well until you hear or feel the tape reach the water surface. Lower the tape a few inches into the water.
- d. Read the tape measurement from a datum point (the top of the casing) or other prescribed reference point (look for a mark on or in the casing or some type of "v" etched into the casing) to the nearest 0.01 foot. Record the reading.
- e. Withdraw the tape from the well and observe the lower end of the tape. The demarcation between the wetted and unwetted portions of the chalked tape should be apparent.
- f. Subtract this value (item d) from the elevation of the top of the casing (from reading item c). This difference is the depth to the water surface.
- g. Subtract the depth to water from the elevation at the top of the casing to obtain the water level elevation.
- h. Record the well location and number, depth to groundwater, depth to bottom of the monitoring well, reference point used, and other pertinent data on the groundwater sampling data sheet.
- i. Rinse the tape with distilled water.

If the presence of free product is indicated, the thickness of the free product layer can be determined using a tape coated with water and hydrocarbon indicator pastes or an intrinsically safe electronic interface probe. In the case of the former,

a steel tape coated with water indicator paste on one side and hydrocarbon indicator paste on the other is lowered into the monitoring well. This should be done so there is as little disturbance of the water surface as possible. The hydrocarbon indicator paste should coat a length of the steel tape that is 2 to 4 inches greater than the estimated thickness of the product. The thickness of the product is measured to the nearest 0.01 foot. As for the interface probe, this instrument is operated similarly to the electric tape device explained above except a different signal should result when product is encountered.

All equipment should be constructed of inert materials and should be decontaminated prior to use at another well to avoid cross- contamination.

Well Purging. The goal in sampling ground-water monitoring wells is to obtain samples that are representative of the aquifer or ground water in question. A representative sample is a volume of water taken from a well whose physical and chemical properties are accurately interpreted to be indicative of conditions in the ground water. Water that stands within a monitoring well for a long period of time may become unrepresentative of the ground water because chemical change may cause water quality alterations. Even if the stored water in the monitoring well may be unchanged from the time it entered the well, the stored water may not be representative of ground water at the time of sampling. In order to obtain a representative sample, the stored water must be removed, or purged, from the monitoring well before samples are collected. The following procedures should be followed for purging monitoring wells.

1. Wells screened in low permeability formations (wells that can be purged dry):
 - a. Pump or bail the well dry.
 - b. Allow the well to recover after purging.
 - c. Purge the well a second time, if time permits.
 - d. Collect the sample as soon as there is a sufficient volume of water for the intended analyses; the well does not need to fully recover.
2. Wells screened in high permeability formations:
 - a. Pump or bail three to five well volumes.
 - b. Do not pump a well dry if the recharge rate causes the formation water to vigorously cascade down the sides of the screen and

causes an accelerated loss of volatiles. Purge the well volumes at a rate that does not cause recharge water to be excessively agitated.

- c. Test the ground water for pH, temperature, and specific conductance (see the Field Measurements section below for sampling procedures) after every well volume, or after every 10 minutes, whichever comes first. The pH, temperature, and specific conductance should stabilize with time. This stabilization indicates that water is now being drawn from the aquifer and not from the vicinity of the casing. If stabilization occurs before pumping or bailing three to five well volumes, continue to pump or bail until three to five complete well volumes have been purged.
- d. Introduce as little air and turbulence into the formation as possible in order to prevent alteration of the samples.

Calculation of the well volume is accomplished by using the following formula:

$$V = (H)(D^2)(C)$$

where:

- V = one well volume, gallons
- H = height of water column, feet
- D = inside diameter of well, inches
- C = 0.041 gallons/(inches)² (feet)

The volume in gallons calculated by the above equation must be multiplied by the number of well volumes necessary to adequately purge the well.

Purging of monitoring wells can be accomplished with Teflon or stainless steel PVC bailers or with bladder, peristaltic, gas-lift, centrifugal, or venturi pumps. All pump components that may be exposed to the water, including the discharge tubing, should be constructed of Teflon, stainless steel, or PVC. Some of these pumps cause volatilization and produce high pressure differentials, which result in variability in the analysis of pH, specific conductance, metals, and volatile organic samples. They are, however, acceptable for purging the wells if sufficient time is allowed to let the water stabilize prior to sampling. Do not use purged water for samples since the water is aerated in the purging process.

When purging equipment must be reused, it should be decontaminated, following the same procedures as those required for the sampling equipment. Steps should be taken to prevent surface soils from coming into contact with the purging equipment and lines, which could introduce contaminants into the well. The purged ground water must be stored in a specified waste drum until the water

samples are analyzed and appropriate disposal procedures are determined. The purged water may NOT be dumped on the ground.

Field Measurement Procedures

Several water quality parameters are subject to rapid change when the groundwater is removed from its natural environment and exposed to the atmosphere. Therefore, temperature, specific conductance, and pH must be measured on an unfiltered sample at the time of sample collection.

Field personnel should familiarize themselves with the manufacturer's instructions for use of the pH, temperature, and/or specific conductance meter(s) before going to the field and collecting samples. Calibration of any field-test probes or kits should be done at the beginning of each use according to the manufacturer's specifications.

Temperature.

1. Rinse the thermometer or temperature meter probe with distilled water.
2. Immerse the thermometer or probe into the sample. The thermometer or probe must not be placed in sample containers containing groundwater samples for laboratory analysis.
3. Wait for the temperature reading to stabilize (this may take about a minute).
4. Read and record the temperature to the nearest 0.5° C (or °F). Read the thermometer while it is immersed in the sample.
5. Rinse the thermometer or probe with distilled water.

Specific Conductance.

1. Set up and calibrate the conductivity meter according to the manufacturer's instructions.
2. The specific conductance cell can become coated with oil and other materials. It is essential that the cell be thoroughly rinsed and, if necessary, cleaned between samples.
3. Set the range selector to the desired range for measurement.

4. Measure the temperature of the sample with a thermometer (as above) and set the temperature selector on the conductivity meter to the measured temperature (if required). Whenever possible, samples should be analyzed at 25° C. If samples are analyzed at different temperatures, temperature corrections must be made and resulting specific conductance reading reported at 25° C.
5. Rinse the probe with distilled water.
6. Place the probe into the sample and move it up and down several times to remove the air bubbles inside the cell casing. Rotate the cell slowly in the sample until the reading stabilizes (some meters may require different procedures).
7. Read and record the conductivity measurement. Remember to multiply the reading by the range the dial is set to (see No. 2).
8. Rinse the probe with distilled water.
9. If necessary, correct the measurement to the standardized 25° C.

pH.

1. Set up and calibrate the pH meter with the proper buffer solution according to the manufacturer's instructions.
2. Rinse the electrode thoroughly with distilled water. Coatings of oily material or particulate matter can impair electrode response. These coatings can usually be removed by gentle wiping or detergent washing, followed by rinsing with distilled water. An additional treatment with hydrochloric acid (1:9) may be necessary to remove any remaining film.
3. Immerse the electrode into the sample and if possible gently swirl.
4. Wait for the reading to stabilize.
5. Read and record the pH to the nearest 0.1 unit.
6. Remove the electrode from the sample and rinse the electrode with distilled water.
7. Store the electrode in the buffer solution (following the manufacturer's recommended storage procedure). The electrode should never be allowed to dry out, since it could damage the electrode.

Sampling Procedures. Special care must be taken in order to prevent cross-contamination when carrying sampling equipment from one well to another. The sampling equipment must be cleaned thoroughly prior to sampling each monitoring well. The effects of cross contamination can be minimized by sampling the least contaminated wells first and progressing to the more contaminated ones. Dedicated sampling devices for each well may be desirable in certain cases where the potential for cross-contamination is extremely high.

The decontamination procedure is as follows:

1. Steam clean or scrub equipment with a nonphosphate detergent.
2. Rinse twice with distilled water.

Equipment and procedures that minimize sample agitation and reduce or eliminate contact with the atmosphere during sample transfer must be used in order to eliminate the loss of volatile constituents from the sample. For collecting samples, a Teflon or stainless steel bailer is acceptable as is a gas-actuated positive displacement pump or a submersible pump. Airlift pumps should not be used. Sampling equipment should be constructed of inert materials. Equipment with neoprene fittings, PVC bailers, tygon tubing, silicon rubber bladders, neoprene impellers, polyethylene, and viton are not acceptable. If bailers are used, an inert line, cable, or chain should be used to raise and lower the bailer.

Vacuum-type (e.g., peristaltic) pumps may be used to collect groundwater samples with the following constraints: 1) the pump is operated at a low flow rate (generally < 200ml/minute); 2) contaminants of concern must have a Henry's Law Constant of less than or equal to 0.03 atm-m³/mol (refer to Table 7E.2); and 3) a 50% sampling loss is assumed for volatile contaminants. Unless otherwise directed or approved by DOH, concentrations of volatile contaminants should be reported as the laboratory analytical results for the contaminant multiplied by two (i.e., following the assumption that 50% of the contaminant was lost during the sample collection).

When sampling for volatile organics, evaluate the area around the sampling point prior to sample collection for possible contamination from air routes. Products that may contaminate the ground-water samples include perfumes, cosmetics, suntan lotions, and automotive products such as gasoline, starting fluids, and carburetor cleaners. Avoid contact of sampling equipment with surface soils surrounding the monitoring wells. Sampling equipment may be laid on polyethylene sheeting.

Before collecting the water sample, mark the sample bottles to be used for the ground-water sample with a waterproof pen. Label the bottle with the name, or identification, of the monitoring well, the date, time the sample was collected, and the sampler's name.

Samples for volatiles should be placed in three 40 mL VOA bottles provided by the analytical laboratory. These sample bottles are screw-top vials with Teflon-lined silicone septa. Sample bottles should not be rinsed prior to sampling.

Procedures for sampling using bailers:

1. Put on latex or surgical gloves.
2. Rinse the bailer and line with distilled water. Use of a disposable bailer and new line at each sampling interval is preferred.
3. Lower the bailer slowly into the monitoring well. Once the bailer has contacted and entered the ground water, allow the bailer to fill with the ground-water sample.
4. Gently raise the bailer out of the monitoring well (do not allow the bailer rope to touch the ground--use plastic sheeting).
5. Empty the bailer into the sample bottles, using a slow, steady stream. Open, or uncap, one volatile organics analyses vial at a time. Fill the VOA vial so that it is slightly overflowing and a positive, or convex, meniscus is formed. Cap immediately. Turn the VOA vial upside down and tap the vial gently. Check for air bubbles. If air bubbles are found, uncap bottle and allow gas to escape, then create a positive meniscus. The bottle should be emptied and refilled as the preservative would be lost. Keep trying until no air bubbles are found in the VOA vial. Any air bubbles in the VOA vial could aerate the sample and void the analysis.
6. Duplicate samples, when collected, should be taken immediately after the field sample.
7. Record all pertinent sampling data on the ground-water sampling data sheet (Figure 7E.3).
8. Decontaminate the bailer. Cut off and discard any of the line that came in contact with the ground water. Decontaminate the remaining line.
9. Place the sample bottles in baggies to prevent cross contamination. If the sample is highly contaminated, wrap the sample bottle in aluminum foil before placing in a baggie.
10. Place the samples in a 4° C cooler with ice. VOA vials may get too cold when they are placed against the ice, and may freeze and crack. Therefore, care should be taken when placing the VOA vials inside the cooler. A thermometer should be placed in the cooler during transport.

11. Carefully remove gloves. Do not touch the outside of the gloves where they may have been contaminated by the ground water. Place the gloves in a designated garbage bag, or a baggie, for proper disposal. Gloves should be changed for each sampling site.

The procedure for sampling using bladder pumps is the same as the procedure for bailers with the exception of the following steps:

1. Positive gas displacement bladder pumps should be operated in a continuous manner so that they do not produce pulsating samples that are aerated in the return tube or upon discharge.
2. When collecting samples where volatile constituents or gases are of interest using a positive gas displacement bladder pump (or a submersible pump), pumping rates should not exceed 100 mL/minute. Higher rates can increase the loss of volatile constituents and can cause fluctuation in pH and pH-sensitive analytes. Samples should be placed in an ice chest maintained at 4° C with blue ice. A thermometer with a protected bulb should be carried in each ice chest.

Attachment 3

**Landfill Policies and Procedures for All Users: PVT Land
Company, Limited, August 2016**



LANDFILL POLICIES AND PROCEDURES FOR ALL USERS

Enforcement of Policies. Compliance with PVT's policies and procedures is mandatory. PVT reserves the right to deny access to the landfill to any customer, user, transporter or driver who is not in good standing.

Landfill Hours. Landfill hours of operation on Monday through Friday are from 7:00 am to 4:00 pm. The last load of the day must be on the scale by 3:00 pm and scaled out no later than 3:30 pm; no exceptions. Landfill hours of operation on Saturday are 7:00 am to 1:30 pm. The last load of the day must be on the scale by 1:00 pm. and scaled out no later than 1:30 pm; no exceptions. Unless otherwise notified, landfill hours shall not include Sundays and holidays (see PVT website (www.pvtland.com) for Holiday Schedule). Landfill hours of operation are subject to change without notice; PVT reserves the right to close the landfill at any time for any purpose, including but not limited to rain, high winds, and repair and maintenance.

Permitted Materials. User may only dispose at the landfill: (1) materials which originate from construction or demolition sites, including concrete, hollow tile, bituminous concrete, asphaltic pavement, wood, glass, masonry, roofing, siding, plaster, dirt, rock, stumps, boulders and brush, as defined in Chapter 342H, Hawaii Revised Statutes, and Title 11, Administrative Rules Chapter 58.1, Solid Waste Management Control, as may be amended, (2) petroleum-contaminated soil with required Agreement and pre-approval, (3) contaminated soil from construction and demolition operations with required Agreement and pre-approval, (4) petroleum-based liquids for solidification and (5) asbestos waste. Permitted materials will only be accepted with the required Agreements and pre-approvals

Prohibited Materials. User shall not dispose at the landfill: (1) household waste, garbage, commercial solid waste or industrial solid waste as defined in HAR 11-58.1-03, (2) regulated hazardous wastes and TSCA-regulated PCB contaminated materials, (3) pesticide containers, (4) bulk green waste (grass, leaves, tree trimmings, etc.), loads of land clearing debris or C&D waste containing more than 10 percent green waste, (5) whole tires or car parts, (6) free liquids and liquids products, including paints, solvents, sealers or adhesives (except liquids accepted for solidification), (7) white goods, (8) contaminated C&D loads, and (9) lead-acid batteries.

As stated, household wastes, including household hazard wastes are prohibited. For information on the proper disposal of household wastes, please call the City and County of Honolulu Refuse Division at 808-523-4774. THESE WASTES WILL NOT BE ACCEPTED AT PVT:

Living Room

glass cleaner rug
shampoo
insecticides flea
collar flea bomb
furniture polish
rubber cement
mothballs

Kitchen

oven cleaner
ammonia drain
cleaner floor
stripper metal
polish insect spray
rodent killer roach
poison

Bathroom

toilet bowl cleaner
disinfectant
mildew remover
home perm.
medicine
nail polish remover
lice/flea shampoo
bleach

Storage Shed

oil based paint
paint thinners
lacquer, varnish
adhesives
epoxies
paint stripper
photographic chemicals
herbicides
pesticides
insect repellent

Garage:

Motor oil, antifreeze, car batteries, brake/transmission fluid, engine degreasers, carburetor cleaners, gasoline, gunk remover, cleaning solvents of any type are all deemed unacceptable.

User Responsibilities. User is responsible for screening, examining and inspecting all of User's loads to verify that no load contains any prohibited materials. PVT assumes no responsibility for screening, examining or inspecting any loads delivered by User, except that PVT reserves the right to examine, screen and/or inspect any load at any time. If any load contains any prohibited materials, User is responsible for the removal of such loads or prohibited materials, and any additional fees for the processing and removal of such loads and prohibited materials, as determined by PVT.

Pre-approval of all Permitted Materials. All materials to be landfilled must be approved by PVT prior to acceptance. User shall submit to PVT the completed and executed Request for Clearance form (available on PVT's website (www.pvtland.com) or at PVT's office) no less than seven (7) business days prior to commencement of the demolition or scheduled hauling of Permitted Materials to the landfill. Failure to comply with this paragraph may result in the denial of acceptance for disposal at the landfill. PVT reserves the right to inspect all demolition sites and contaminated soil sites prior to the acceptance of Permitted Materials.

PVT's Right of Rejection. PVT reserves the right to reject any load where PVT believes, for any reason, said load may contain Prohibited Materials. PVT reserves the right to reject any load which may be a violation of its solid waste permit or any laws, rules or regulations (federal, state or local) now or hereafter in effect, or any load which would adversely impact the landfill.

POLICIES AND PROCEDURES FOR DRIVERS WHILE AT THE LANDFILL

Speed Limits. The speed limit at the landfill is 15 miles per hour. This speed limit will be strictly enforced.

PVT Instructions. Drivers of all vehicles must follow the instructions of PVT spotters and other PVT employees.

Vehicle noise. All customer-owned vehicles must be operating with fully functional mufflers and be in a good state of repair while on the landfill. Quiet operating techniques and practices must be followed. There shall be no engine braking. Vehicle horns may not be used except in the event of an emergency. Drivers must turn-off their engines while queuing for the scale house or while parked at the landfill.

Cover Loads. Drivers of non-household vehicles must cover their loads.

Lualualei Naval Road. Lualualei Naval Road is owned by the United States Navy. The Navy has posted no parking signs along the road. Drivers and operators of all vehicles should obey the posted signs and should refrain from stopping and/or parking along the shoulders of Lualualei Naval Road.

Landfill parking. Drivers are not permitted to park at the landfill except in the area designated for drivers to make phone calls to dispatchers, finish paperwork or wait for the next job. All vehicles must leave the landfill at the close of operating hours; there is no overnight parking. In the event that a customer's vehicle breaks down and cannot be driven from the landfill, PVT may in its discretion allow the vehicle to remain at the landfill for up to 24 hours subject to the terms and conditions of an executed Temporary Parking Agreement. Under no circumstances shall a vehicle remain for more than 24 hours; if the vehicle is not removed, PVT will have the vehicle removed from the landfill at the owner's expense.

Unloading at the landfill. Drivers are required to unload their loads at the landfill as directed by spotters or other PVT employees. If a driver is unable to unload debris from the truck, trailer or bin, PVT may in its discretion assist with the removal of debris from the truck, trailer or bin subject to the terms and conditions of an executed Additional Services Agreement.

POLICIES AND PROCEDURES FOR ASBESTOS DISPOSAL

Landfill hours. The landfill will only accept asbestos on Tuesdays and Thursdays from 7:00 am to 1:30 pm. All asbestos loads must be scheduled twenty-four (24) hours before delivery. Last asbestos loads must be on the scale by 1:30 pm. Last hand unloads for asbestos loads must be on the scale by 1:30 pm. Scheduled loads that are not received by the required time will require re-scheduling for future delivery and acceptance. Landfill hours of operation are subject to change without notice; PVT reserves the right to close the landfill at any time for any purpose, including but not limited to rain, high winds, and repair and maintenance.

Permitted Asbestos Materials. User may dispose non-friable and friable asbestos, such as roofing, ceiling and insulating materials, and fixed asbestos, with required Agreements and pre-approvals.

Asbestos Containment and Labelling. All asbestos containing material ("ACM") that is brought into landfill is required to be prepared for disposal as though the ACM were friable, even if it has been determined to be non-friable. All ACM must be thoroughly wet down or encapsulated prior to containment by the operator preparing the debris for disposal. All ACM must be double bagged or double wrapped in plastic with a minimum thickness of six (6) millimeters, or contained in sealed drums or barrels. All bagged, wrapped, or contained ACM must display asbestos hazard warning labels, as well as labels that have the owner's name, address and telephone number. Any chemical (e.g., solvent used to remove VAT mastic) added to the ACM waste must be pre-approved by the landfill's Operation Manager prior to acceptance for disposal.

Asbestos Pre-approval. PVT will accept ACM on a prearranged basis only. A Request for Clearance Number form and an Asbestos Notification of Demolition and Renovation form must be completed and submitted to the PVT Office in advance of any ACM being accepted for disposal. All asbestos loads must be scheduled twenty-four (24) hours before delivery and accompanied by a properly executed Asbestos Waste Shipment Record. Each Asbestos Waste Shipment Record must be signed by both the operator and transporter hauling the ACM to the landfill. No disposal will be allowed without a complete Asbestos Waste Shipment Record. All other applicable State and Federal Regulations concerning this waste stream must be met prior to acceptance of this waste stream for disposal. It is the responsibility of the User to know and comply with these regulations.

Asbestos Contractors and Transporters. All asbestos contractors and transporters must have an active account with PVT. All contractors and transporters must provide a local telephone number for emergency purposes.

Asbestos Disposal. Each asbestos load accepted for disposal will be escorted and directed where to unload. The PVT escort will stand a safe distance away from the unloading area and truck, while viewing the load disposal. The transporter must make every reasonable effort to avoid the release of any ACM at the landfill. A qualified individual must accompany the load and observe disposal. If the asbestos load breaks open upon disposal and ACM is exposed, the qualified individual must cover the exposed area promptly. All asbestos will be covered at the end of the day. No bags will be left exposed.

Asbestos Records. The Weigh Master for PVT will be responsible for signing the Asbestos Waste Shipment Record, printing a tag and returning copies to the driver.

PVT's Right of Rejection. PVT reserves the right to reject any load where PVT believes, for any reason, said load may contain Prohibited Materials. PVT reserves the right to reject any load which may be a violation of its solid waste permit or any laws, rules or regulations (federal, state or local) now or hereafter in effect, or any load which would adversely impact the landfill.

POLICIES AND PROCEDURES FOR CONTAMINATED SOIL

Landfill hours. The landfill will only accept contaminated soil from 7:00 am to 3:00 pm, Monday through Saturday. All contaminated soil loads must be scheduled twenty-four (24) hours before delivery. The last contaminated soil load must be on the scale by 3:00 pm. Monday through Friday, and by 1:00 pm Saturday. Scheduled loads that are not received by the required time will require re-scheduling for future delivery and acceptance. Landfill hours of operation are subject to change without notice; PVT reserves the right to close the landfill at any time for any purpose, including but not limited to rain, high winds, and repair and maintenance.

Permitted Contaminated Soil. User may dispose petroleum-contaminated soil and contaminated soil from construction and demolition operations with required Agreements and pre-approvals.

Contaminated Soil Pre-approval. PVT will accept contaminated soil on a prearranged basis only. Only contaminated soil from known sources will be accepted for disposal. Generators must provide reliable documentation describing the nature and source of the contamination. The following forms must be completed and submitted to the PVT Office in advance of any contaminated soil being accepted for disposal: Request for Clearance Number and Soil Profile Sheet. The Soil Profile Sheet must be signed by both the generator and the transporter hauling the contaminated soil to the landfill. All contaminated soil loads must be scheduled twenty-four (24) hours before delivery. All other applicable State and Federal Regulations concerning this waste stream must be met prior to acceptance of this waste stream for disposal. It is the responsibility of the generator to know and comply with these regulations.

Contaminated Soil Testing Requirements. All potentially contaminated soil must be tested prior to acceptance for disposal. All soil that may have been impacted by contamination or that was generated as a result of a remedial activity for contamination must be tested. Testing must be designed to screen for potential constituents and their concentrations in the soil. **Sampling and analysis of contaminated soil shall be performed in accordance with the Department of Health, Office of Hazard Evaluation and Emergency Response ("HEER") Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan, as updated ("TGM").** Persons conducting the sampling must be qualified and experienced environmental professionals. Soil samples must be collected so as to be representative of the soil to be disposed. *See, e.g.,* TGM Section 4, Soil Sample Collection Approaches; *see also* "Guidance for the Evaluation of Imported and Exported Fill Material, Including Contaminant Characterization of Stockpiles," HEER, October 2011. Soil samples must be collected and analyzed so as to provide accurate information on the soil to be disposed. *See, e.g.,* TGM Section 11, Handling and Analysis of Samples. The following chemical testing is required where appropriate to the potential source of contamination:

- Toxicity Characteristic Leaching Procedure (TCLP) for Resource Conservation and Recovery Act (RCRA) metals, including arsenic, cadmium, chromium and lead
- Ignitability
- Total metals for RCRA metals, including arsenic, cadmium, chromium and lead.
- Total petroleum hydrocarbons (TPH), including TPH as gasoline, TPH as diesel, and/or -TPH as oil as appropriate
- Benzene, toluene, ethylbenzene, xylenes (BTEX)
- Polynuclear aromatic hydrocarbons (PAHs)
- Polychlorinated biphenyl's (PCBs)
- Halogenated volatile organic compounds (HVOCs)
- Toxic Equivalent (TEQ) dioxins
- Technical chlordane and other organochlorine pesticides
- Other contaminants for which HEER has set Environmental Action Levels (EALs)

Additional testing and/or supplemental information on the soil may be requested on a case-by case basis.

Contaminated Soil Documentation Requirements. Documentation of the sampling methods and analytical results must be submitted with the Request for Clearance Number and the Soil Profile Sheet.

PVT's Right of Rejection. PVT reserves the right to reject any load where PVT believes, for any reason, said load may contain Prohibited Materials. PVT reserves the right to reject any load which may be a violation of its solid waste permit or any laws, rules or regulations (federal, state or local) now or hereafter in effect, or any load which would adversely impact the landfill.

POLICIES AND PROCEDURES FOR PETROLEUM-BASED LIQUIDS FOR SOLIDIFICATION

Landfill hours. The landfill will only accept petroleum-based liquids from 7:00 am to 2:00 pm, Monday through Friday. All petroleum-based liquid loads must be scheduled twenty-four (24) hours before delivery. The last petroleum-based liquid load must be on the scale by 2:00 pm. Scheduled loads that are not received by the required time will require re-scheduling for future delivery and acceptance. Landfill hours of operation are subject to change without notice; PVT reserves the right to close the landfill at any time for any purpose, including but not limited to rain, high winds, and repair and maintenance.

Permitted Petroleum-Based Liquids. User may dispose liquid wastes containing only known sources of petroleum products for solidification ("petroleum-based liquids") with required Agreements and pre-approvals.

Petroleum-Based Liquids Pre-approval. PVT will accept petroleum-based liquids on a prearranged basis only. Only petroleum-based liquids from known sources will be accepted for solidification. Generators must provide reliable documentation describing the origin and contaminant anticipated in the petroleum-based liquids. The following forms must be completed and submitted to the PVT Office in advance of any petroleum-based liquids being accepted for solidification: Request for Clearance Number and Solidification Profile Sheet. All petroleum-based liquids must be scheduled twenty-four (24) hours before delivery. All other applicable State and Federal Regulations concerning this waste stream must be met prior to acceptance of this waste stream for solidification and disposal. It is the responsibility of the generator to know and comply with these regulations.

Petroleum-Based Liquids Testing Requirements. All petroleum-based liquids must be tested prior to acceptance for solidification. Sampling and analysis of petroleum-based liquids shall be performed in accordance with the Department of Health, Office of Hazard Evaluation and Emergency Response ("HEER") Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan, as updated ("TGM"). Persons conducting the sampling must be qualified and experienced environmental professionals. Samples must be collected and analyzed so as to provide accurate information on the petroleum-based liquids for solidification. *See, e.g.,* TGM Section 11, Handling and Analysis of Samples. The following chemical testing is required where appropriate to the potential source of contamination:

- TCLP for RCRA 8 metals
- Volatile organic compounds
- Semivolatile organic compounds
- PCBs
- Pesticides
- Herbicides
- TPH

Additional testing and/or supplemental information on the petroleum-based liquids may be requested on a case-by case basis.

Petroleum-Based Liquids Documentation Requirements. Documentation of the sampling methods and analytical results must be submitted with the Request for Clearance Number and the PVT Solidification Profile Sheet.

PVT's Right of Rejection. PVT reserves the right to reject any load where PVT believes, for any reason, said load may contain Prohibited Materials. PVT reserves the right to reject any load which may be a violation of its solid waste permit or any laws, rules or regulations (federal, state or local) now or hereafter in effect, or any load which would adversely impact the landfill.