



Department of Natural Resources
and Environmental Control
Tank Management Section
391 Lukens Drive
New Castle, DE 19720
302-395-2500 (phone)
302-395-2555 (fax)
www.dnrec.delaware.gov/Tanks/

NOTIFICATION AND SOIL SAMPLING REQUIREMENTS
for
CLOSURE IN PLACE of UNDERGROUND STORAGE TANK SYSTEMS

Effective Date: October 1, 2012

The Department of Natural Resources and Environmental Control, Tank Management Section (DNREC-TMS) has developed this guidance sheet to assist tank owners, operators and contractors in complying with Delaware's *Regulations Governing Underground Storage Tank Systems* (the UST Regulations) Part A, Sections 4.1.6. and 4.8.; Parts B and C, Section 4.; and Part D, Section 3., when closing tanks in place. This is guidance only, the DNREC-TMS may impose additional requirements when deemed necessary.

NOTIFICATION

1. A completed UST Closure Notification Form must be received in the DNREC-TMS office ten (10) days prior to the closure date given on the form. The tank *may not* be closed in place unless the DNREC-TMS has received the notification form as required in the UST Regulations, Part A, Section 4.8.2. A *Confirmation of Scheduled Tank Work* form will be faxed or emailed to the contractor upon approval of the notification form.
2. UST Closure Notification forms will not be accepted if a date of work is not indicated. Include a tentative date at a minimum.
3. If the actual date of the tank closure in place changes from the date noted on the notification form, the contractor or owner or operator must give the DNREC-TMS at least give two (2) days notice prior to the new closure in place date. This notification may be done by telephone: (302) 395-2500 or fax: (302) 395-2500. The new date must be approved and confirmed by the DNREC-TMS via a faxed or emailed *Confirmation of Scheduled Tank Work* form to the contractor.
4. When prior approval is requested for a deviation from the soil sampling recommendations in this guidance a site map showing all tanks, dispensers, vents line and dimensions of the tank(s) must be submitted with the notification. The DNREC-TMS will review this information and use it to determine the number of soil samples necessary to characterize the site.
5. For notification forms received more than thirty (30) days prior to the closure in place, the DNREC-TMS must be notified again ten (10) days before the closure in place actually occurs, unless prior approval is given. This may be done by telephone: (302) 395-2500 or fax: (302) 395-2500.

SOIL SAMPLING REQUIREMENTS for UST CLOSURE IN PLACE

You must receive approval **in advance**, from the DNREC-TMS, for **any** deviation from these requirements. Requests for deviation must be written, including reason for deviation and a sketch showing proposed sampling locations.

SOIL SAMPLING PROTOCOL

Composite Soil Sampling

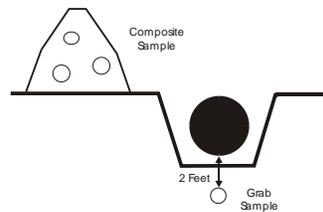
At least one composite soil sample per tank must be collected by taking several discrete samples from the soil disturbed by excavation around each individual UST being removed (*Fig. 1.*), and mixing them together. Soil samples should be field screened and samples collected from the area where the contamination appears to be the greatest. To prevent volatilization of any contamination, composite samples should be collected as soon as backfill materials surrounding the tank are excavated. The number of required composite soil samples per tank is described in *Table 1.*

Grab Soil Sampling

Grab soil samples must be collected from specific spots along the sides or bottom of the tank excavation, below the product dispensers, and occasionally within piping runs, per the diagram below (*Fig. 1.*). The location of the grab samples depends on the elevation of the water table and the presence of contamination, i.e. staining. Samples must be collected from the area where the contamination appears to be the greatest. To prevent volatilization of any contamination, grab samples should be collected as soon as the sample locations become accessible. The number of required grab soil samples per tank is described in *Table 1.*

Tanks Above the Water Table

If groundwater is not present in the tank pit, soil borings/test pits must be installed to a total depth equal in elevation to two (2) feet below the bottom of the tank undergoing a change in service.



Tanks Below the Water Table

If the tank is submerged, soil borings/test pits must be drilled to the top of the water table. Grab soil samples must be collected from the soils directly above the soil/groundwater interface.

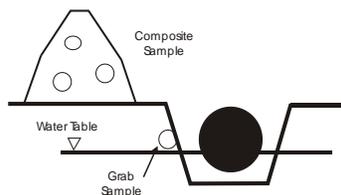


TABLE 1.
REQUIRED NUMBER OF SOIL SAMPLES BY TANK CAPACITY
for 1 TANK in a PIT*

UST Capacity (gallons)	# of Samples per Tank
0 – 1,100	2 Borings (4 samples) 1 grab & 1 composite from each boring plus Dispenser & Piping Run samples
1,101 – 15,000	4 Borings (8 samples) 1 grab & 1 composite from each boring plus Dispenser & Piping Run samples
15,001 – 30,000	6 borings (12 samples) 1 grab & 1 composite from each boring plus Dispenser & Piping Run samples
30,001 – above	Call DNREC-TMS

***For sites with more than one tank deviation from the above requirements may be requested via a written request to the DNREC-TMS. See #4 under Notification above.**

UST Systems 1,100 Gallons or Less in Capacity – 4 total samples

Unless site conditions limit access to the tank, the DNREC-TMS requires a minimum of two (2) soil boring/test pits, to be installed *along opposite corners of the tank* to be closed in place. One (1) composite and one (1) grab sample must be collected from each soil boring/test pit. (Fig. 2.)

UST Systems 1,101 Gallons -15,000 in Capacity - 8 total samples

Unless site conditions limit access to the tank, the DNREC-TMS requires a minimum of four (4) soil boring/test pits; at least one (1) soil boring/test pit is to be installed *along each side of the tank* to be closed in place. One (1) composite sample and one (1) grab sample must be collected from each soil boring/test pit. (Fig. 2.)

UST Systems 15,001 – 30,000 in Capacity - 12 total samples

Unless site conditions limit access to the tank, the DNREC-TMS requires a minimum of six (6) soil boring/test pits; at least two (2) soil borings/test pits is to be installed *along each long side of the tank* and at least one (1) soil boring/test pit to be installed *along each short side of the tank* to be closed in place. One (1) composite sample and one (1) grab sample must be collected from each soil boring/test pit. (Fig. 2.)

UST Systems Greater than 30,000 Gallons in Capacity – call DNREC-TMS

For UST Systems greater than 30,000 gallons in capacity a site map showing the area around the tank and the dimensions of the tank must be submitted with the notification. The DNREC-TMS will review this information and use it to determine the number of soil samples necessary to characterize the site, prior to commencement of closure in place activities.

Below Product Dispensers

If the product dispenser(s) are beyond the tank field area, one grab sample per dispenser must be collected from an elevation of five (5) feet below each dispenser or at the top of the water table, whichever is encountered first . If the product dispensers are within the tank field area, additional grab samples are not required. (Fig. 1.)

Piping Run Sampling- Piping includes product, vent, vapor recovery and remote fill piping.

For Piping *installed prior to January 1, 1999* where closure-in-place of a piping run is performed, sampling is required. For the purpose of this Guidance “closure-in-place of a piping run” includes any closure operations which involve pulling or lifting the piping out of an unexposed or unexcavated trench or closing in place, as they do not allow for a thorough inspection and evaluation of the soil conditions in the vicinity of the piping. **You are required to contact the TMS in advance and obtain approval for a piping sampling plan.**

For piping runs removed from the ground via trenching so that soil conditions beneath the piping can be evaluated, sampling will only be required from areas of the piping trench with observable staining or evidence of a release.

For Piping *installed after January 1, 1999* sampling is not required unless there is observable staining or evidence of a release.

QA/QC PROTOCOL

All samples must be submitted in clean sealed containers provided by the analytical laboratory and kept at $\leq 6^{\circ}\text{C}$ until delivered to the laboratory for analysis. The laboratory must receive samples within twenty-four (24) hours of collection. If sample delivery within twenty-four (24) hours is not possible (for example, samples are collected late on a Friday after the laboratory is closed) proper storage of the samples must be documented on the chain of custody form. A chain of custody form must be maintained at all times for all samples and submitted to the DNREC-TMS.

For sampling events where volatile organic compounds (BTEX, GRO, EDB, EDC, MTBE, etc.) are to be analyzed, a trip blank must accompany the cooler from pickup to delivery. The trip blank must be analyzed for the same volatile organic compounds as the collected soil samples.

For soil sampling events where volatile organic compounds are to be analyzed, methanol preservation or Encore™ sampling must be conducted. Note: Encore™ Samplers **should not** be used when sampling pea gravel. When sampling pea gravel, methanol preservation of the sample in the field is required. Coordinate with your laboratory in advance to determine best sample volume and appropriate bottleware size for representative samples and ease of sample collection.

To minimize the risk of cross-contamination the use of disposable/dedicated sampling equipment is highly recommended when collecting samples. If reusable sampling equipment is preferred, proper decontamination procedures must be employed. The collection of an equipment blank is recommended, not required, when reusable/non-dedicated sampling equipment is used.

To maintain sample integrity, a DNREC-TMS representative on-site may apply a custody seal to the sample container at the time of sample collection. If the seals are applied a separate chain-of-custody will be provided. This chain of custody must accompany the sample to the laboratory and a copy must be returned to the DNREC-TMS along with the sample results. If a sample is received by the laboratory with a damaged custody seal the DNREC-TMS may not accept the sample results and will request additional samples be collected.

Call the DNREC-TMS for more specific information about sampling methods, including proper procedures to assure QA/QC of samples and decontamination of tools.

REPORTING REQUIREMENTS

1. Site Map showing sample locations.
2. Results of the soil sample analyses with chain-of-custody.
3. Custody seal chain-of-custody, if applicable.
4. All appropriate disposal documentation. (e.g., disposal of piping, product, sludge, soil, etc.)
5. If sampling deviation is approved in the field an amended UST Closure Notification form must be submitted. The name of the DNREC-TMS project officer who approved the deviation must be clearly indicated and the sampling locations must be noted on the site map.

The UST owner, operator, or contractor must forward the required documentation to the DNREC-TMS within sixty (60) days of the tank closure in place activity. The sample results must be labeled with the full site name, address, and date of the closure in place. It is the responsibility of the UST owner and operator to ensure that all required documentation is sent to the DNREC-TMS.

ANALYTICAL PARAMETERS

All soil samples from petroleum tanks must be analyzed according to the following **DERBCAP Tier 0** table below:

Analyte	Tier 0 Action Level	Gasoline	Kerosene/ Jet Fuels	Diesel/ Heating Fuels	Used Oil ^{1,2}	Aviation Gas	New Oil	Heavy Oils	Other
BTEX ^{5,7}	Benzene 230 ppb, Total BTEX 10 ppm	X	X		X	X			
GRO ⁷	100 ppm	X	X		X	X			
DRO	1000 ppm		X	X	X		X		
HRO	Site by Site				X		X	X	
Lead, EDB ⁷ , EDC ⁷	400 ppm, 10 ppb, 400 ppb	X ⁴			X	X			
MTBE ^{3,7}	130 ppb	X	X		X	X			
Ethanol ^{7,8}	None	X							
Other ⁶	Site by Site								X ⁶

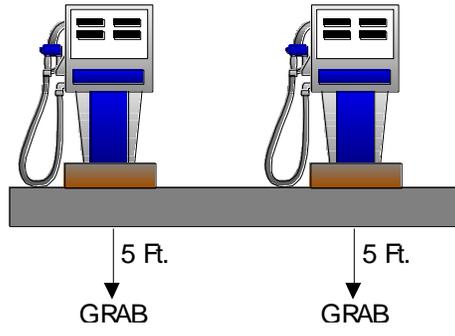
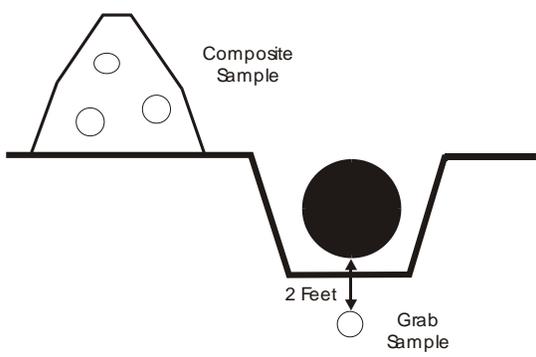
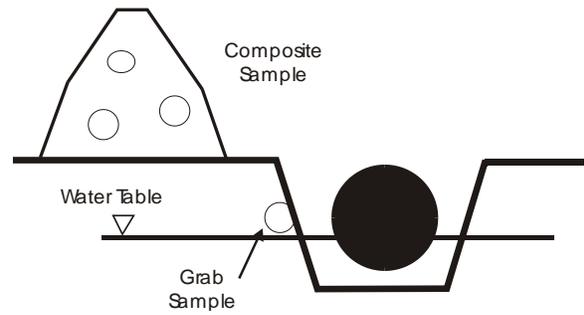
Footnotes:

1. Used oil as defined in the Delaware *Regulations Governing Underground Storage Tank Systems*, Part A, Section 2. and the Delaware *Regulations Governing Hazardous Waste*.
2. Used oil USTs may also be required to analyze for metals, volatiles, semi-volatiles or any other analyte as required on a site specific basis depending on the tank contents. Contact the DNREC-TMS for determination.
3. MTBE analysis is required, unless conclusive documentation is submitted and pre-approved by the DNREC-TMS that no portion of the tank system was in service after January 1, 1978.
4. For gasoline USTs only, Lead, EDB and EDC analysis is required, unless conclusive documentation is submitted and pre-approved by the DNREC-TMS documenting that all portions of the tank system were installed after January 1, 1996.
5. In addition to total BTEX, benzene must be reported separately.
6. If the tank system contained anything other than petroleum products or if the tank system contained Racing Fuel, contact the DNREC-TMS for information on sampling procedures and analytical requirements prior to any on site activities.
7. Samples collected for the analysis of volatile organic compounds must be preserved with methanol. Encore™® samplers are acceptable provided the preservative is methanol. Note: Encore™® Samplers should not be used when sampling pea gravel. When sampling pea gravel, methanol preservation of the sample in the field is required.
8. Ethanol analysis is required, unless conclusive documentation is submitted and pre-approved by the DNREC-TMS that no portion of the tank system was in service after April 1, 2006.

SOIL SAMPLING FOR TANK CLOSURES IN PLACE

Any deviation from the following **must** be approved in advance by the DNREC-TMS:

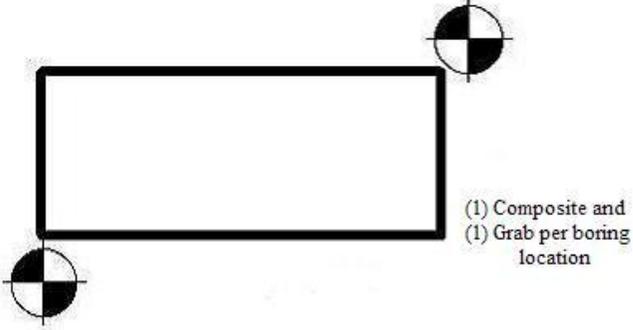
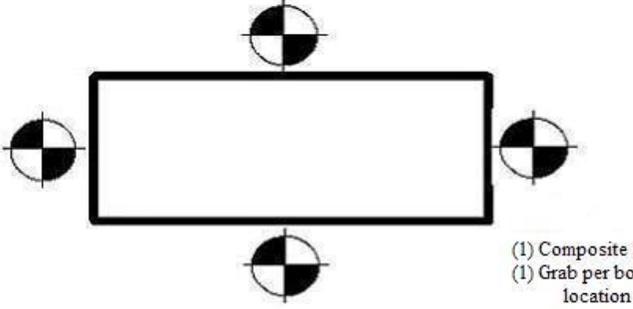
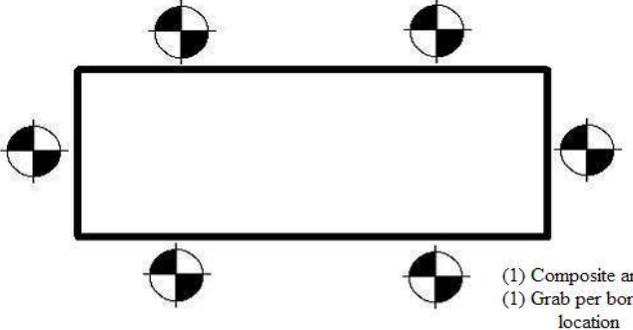
Figure 1

<p style="text-align: center;">DISPENSERS</p> <p>All dispensers associated with the removed tank(s) must be sampled.</p> <p>One grab sample taken 5' below each dispenser is required unless the dispenser is located in the tank field.</p>	
<p style="text-align: center;">TANKS ABOVE THE WATER TABLE</p> <p>Collect grab samples at a depth equal in elevation to two (2) feet below the bottom of the tank.</p> <p>Composite soil samples must be collected by taking several discrete samples from the soil in each boring/test pit and mixing them together.</p>	
<p style="text-align: center;">TANKS BELOW THE WATER TABLE</p> <p>Collect grab samples from the sidewall of the excavation immediately above the water table level in the pit.</p> <p>Composite soil samples must be collected by taking several discrete samples from the soil in each boring/test pit and mixing them together.</p>	

SOIL SAMPLING FOR TANK CLOSURES IN PLACE

Any deviation from the following **must** be approved in advance by the DNREC-TMS:

Figure 2

UST Capacity (gallons)	# of Samples per Tank	Illustration
0 – 1,100	Install soil borings at opposite corners of the tank to a depth equal in elevation to two (2) feet below the bottom of the tank. Collect a grab sample from soils at the bottom of each boring or just above the soil/groundwater interface. Collect a composite sample by taking several discrete samples from the backfill materials generated during installation of the boring. (Total: 4 soil samples)	
1,101 – 15,000	Install one soil boring along each side to a depth equal in elevation to two (2) feet below the bottom of the tank to be closed in place. Collect a grab sample from soils at the bottom of each boring or just above the soil/groundwater interface. Collect a composite sample by taking several discrete samples from the backfill materials generated during installation of the boring. (Total: 8 soil samples)	
15,001-30,000	Install two soil borings along each long side and one soil boring along each short side to a depth equal in elevation to two (2) feet below the bottom of the tank to be closed in place. Collect a grab sample from soils at the bottom of each boring or just above the soil/groundwater interface. Collect a composite sample by taking several discrete samples from the backfill materials generated during installation of the boring. (Total: 12 soil samples)	
Greater than 30,000	Call DNREC-TMS	For tanks greater than 30,000 gallons, the DNREC-TMS will determine the number of soil samples necessary to characterize the site prior to commencement of closure in place activities. Soil borings and sample collection should follow the protocol described above.