



## Fact Sheet:

# How DEQ Evaluates Sample Collection and Data Analysis for UST Closures and Release Investigations

As stated in Idaho Department of Environmental Quality (DEQ) Policy Statement PS16-01, “meeting the mission of the agency necessitates environmental decisions achieved through the use of high-quality data...” DEQ must adhere to its Quality Management Plan (QMP) to ensure quality data collection and analysis. The QMP meets federal requirements mandated by the US Environmental Protection Agency (EPA). Additionally, the QMP directs all DEQ programs involved in making decisions regarding environmental data to follow a quality assurance project plan (QAPP) and standard operating procedures. For data generated by external parties, DEQ is responsible for assessing the data and other available information received to determine if the data are of sufficient quantity, type, and quality before use in decision-making processes. DEQ uses the following documents to evaluate sample collection and data analysis for underground storage tank (UST) closures and release investigations:

- *Waste Management and Remediation Division Statewide Generic Quality Assurance Project Plan: Third-Party Petroleum Storage Tank Release Investigation and UST Closure and Change-in-Service*, May 2017
- *Standard Operating Procedures for Waste Management and Remediation Division: Data Review and Verification of Third-Party Petroleum Release Investigation and Underground Storage Tank Closure and Change-in-Service Submittals*, May 2017
- *Standard Operating Procedures for Waste Management and Remediation Division: Data Validation of Third-Party Petroleum Release Investigation and Underground Storage Tank Closure and Change-in-Service Submittals*, May 2017

This fact sheet is a condensed summary of the above documents and informs the public on how DEQ staff evaluates sample collection and data analysis in regards to UST closures and release investigations. DEQ encourages anyone submitting data to DEQ to read all documents. They can be found at <http://www.deq.idaho.gov/waste-sample-collection>.

## UST CLOSURE NOTIFICATION

Per the *Rules Regulating Underground Storage Tank Systems* (IDAPA 58.01.07), UST owners or operators are required to submit a DEQ Notification Form ([www.deq.idaho.gov/waste-mgmt-remediation/storage-tanks/underground-storage-tanks](http://www.deq.idaho.gov/waste-mgmt-remediation/storage-tanks/underground-storage-tanks)) 30 days prior to closing an UST.

DEQ’s goal is to be on-site to observe critical aspects of all regulated UST closure site assessment activities, including, but not limited to, soil sampling, tank removal, piping removal, dispenser removal, and/or closure-in-place activities. To conduct a thorough evaluation of the UST closure and adhere to state rules (*Water Quality Standards*, IDAPA 58.01.02.851–852) and adopted federal regulations (40 CFR Part 280 Subparts E & F), DEQ evaluates the following

information contained in the site assessment report. Specifically, 40 CFR Part 280.72(a) states the following:

...owners and operators must measure for the presence of a release where contamination is most likely to be present at the UST site. In selecting sample types, sample locations, and measurement methods, owners and operators must consider the method of closure, the nature of the stored substance, the type of backfill, the depth to groundwater, and other factors appropriate for identifying the presence of a release.

## SAMPLE COLLECTION AND HANDLING

DEQ will evaluate whether a sufficient number of samples were collected from appropriate locations and depths in order to identify any potential releases. While each site is different and exceptions will occur, DEQ recommends and will evaluate the number of samples collected and their locations by using the tables provided below.

### Typical Minimum Number of Samples for UST Closure When No Ground Water is Encountered in Excavation

Tank Capacity or Area	Minimum # of Soil Samples	Location of Soil Samples
Less than 1,000 gallons	One per tank	Fill port
1,000–10,000 gallons	Two per tank	One at fill port and at opposite end of tank
Greater than or equal to 10,000 gallons	Three per tank	Fill port end, middle, and submersible pump end
Piping	One	Every 20 lineal feet (at joints, if present) and obvious areas of contamination
Dispenser	One	Under each dispenser being removed/closed
Visual staining	Each	From all stained areas

### Typical Minimum Number of Soil Samples for UST Closure When Ground Water is Encountered in Excavation

Tank Capacity or Area	Minimum # of Soil Samples	Location of Soil Samples
10,000 gallons or less (single tank)	Two	From wall next to tank ends at soil/ground water interface
Greater than or equal to 10,000 gallons or tank cluster	Four	From wall next to tank ends and each side at soil/ground water interface
Dispenser	One	Side wall of dispenser being removed/closed
Visual staining	One	From all stained areas

DEQ also evaluates the methods used to collect the soil samples. DEQ's QAPPs reference the following methods:

- **Volatile Organic Compound (VOC)** (i.e., for gasoline and diesel releases) **Soil Sampling**—As specified by EPA Region 4 ([www2.epa.gov/sites/production/files/2015-06/documents/Soil-Sampling.pdf](http://www2.epa.gov/sites/production/files/2015-06/documents/Soil-Sampling.pdf)), the method for collecting soil samples for VOC analysis is EPA Method 5035A. This method significantly reduces the losses of chemical constituents by volatilization. Laboratories can supply the sampling equipment for Method 5035A, along with pre-weighed sampling containers containing the preservative. Soil moisture content is typically assessed at each sampling location by collecting a soil sample in a separate 2-ounce clear sample jar. This method allows the laboratory to calculate chemical concentrations on a dry weight basis.
- **Polycyclic Aromatic Hydrocarbon (PAH)** (i.e., for diesel releases) **Soil Sampling**—The method for collecting soil samples for PAH analysis is to place the soil samples directly into laboratory-provided containers (e.g., 4-ounce clear glass jar with Teflon lid) using clean, dedicated or decontaminated soil sampling devices (e.g., hand auger, soil corer, split spoon, direct-push probe, backhoe, or hand tool). The PAH soil sample preservation method is to place the samples on ice to 4 °C.

**Leaded Gas** - For sites that are known or suspected to historically contain leaded regular gasoline (e.g., tanks in service prior to 1990) or aviation gas, DEQ will evaluate that ethylene dibromide (EDB, also known as 1,2-dibromoethane) and ethylene dichloride (EDC, also known as 1,2-dichloroethane) were included in the sampling and analysis by Method 8260B.

#### Typical Analytical Methods, Container Types, Preservation Methods, and Sample Holding Times for Soil Samples.<sup>1</sup>

Compounds	Parameter	Analytical Method	Sample Container	Temperature and Preservative	Holding Time
VOCs	BTEXN MTBE EDB EDC	EPA 5035A/8260B	3 x 5 grams soil to 40-mL amber glass VOA vial, PFTE septa cap	4 °C ± 2 °C, methanol 4 °C ± 2 °C, sodium bisulfate	14 days
PAHs	PAHs	EPA 8270C SIM	4-ounce amber glass, Teflon lid	4 °C ± 2 °C	14 days (extraction), 40 days (analysis)

Notes: mL = milliliter, PFTE = polytetrafluoroethylene, SIM = selective ion monitoring, VOA = volatile organic analysis  
The analytical method, container types, preservation method, and sampling holding time requirements provided here are typical but may vary based on the laboratory and analytical methods.

## SAMPLE ANALYSIS

In addition to using the analytical method table above, DEQ will evaluate that the laboratory used the appropriate analytical methods and quality assurance controls.

Laboratories conduct internal quality control analyses, including laboratory control sample, matrix spike sample, surrogate spike sample, duplicate/split sample, and other laboratory quality assurance/quality control (QA/QC) sample analyses. The laboratory will produce quality control data sheets that accompany the sample results. DEQ uses this information to evaluate if the data

are usable for making decisions about the property. DEQ evaluates whether the *accuracy* is within the range of acceptability for percent recovery identified by the specific laboratory conducting the analysis for each method and analyte. DEQ evaluates whether the *precision* for laboratory duplicate data (for laboratory control samples or matrix spike samples) is within the ranges of acceptability, based on relative percent difference (RPD), identified by the specific laboratory conducting the analysis for each method and analyte.

Additionally, DEQ will evaluate that the correct method detection limits (MDLs) are used. DEQ uses the residential use screening levels from the *Idaho Risk Evaluation Manual for Petroleum Releases* (2018; IDAPA 58.01.24.008.02; <http://www.deq.idaho.gov/waste-mgmt-remediation/remediation-activities/risk-evaluation-manual/>).

When making a decision, DEQ will consider other criteria such as organic vapor analysis (photoionization detector [PID]/flame ionization detector [FID]) readings and instrument calibrations, trip blanks, representativeness, field duplicates, field blanks, rinsate blank samples, and equipment blanks.

## REPORTING

When DEQ receives a site assessment report, DEQ will evaluate whether soil sampling collection, handling, and analysis procedures were conducted in a manner that provides quality data. This includes the following:

- Method of closure
- Identification of the USTs being closed as containing only certain petroleum products (e.g., leaded or unleaded gasoline, diesel, heating oil, motor oil, aviation gas, and/or jet fuels) (Table 1 of IDAPA 58.01.24.800 lists petroleum-related chemicals of interest [volatile organic compounds (VOCs) and polycyclic aromatic hydrocarbons (PAHs)].)
- Backfill type
- Depth to ground water
- Type, location, and depth of soil samples
- Sample collection procedures (includes information and other documentation on sample collection methods [e.g., EPA Method 5035A for VOCs soil samples])
- Sample handling documentation
- Sample location map, depicting the site and locations of samples collected as part of the UST closure/change-in-use activities
- Other factors appropriate for identifying a possible release
- Laboratory Analytical Quality Control / Assurance
  - Current analytical data (i.e., within the last 12 months) to be considered representative of site conditions and status
  - Appropriate analytical methods used
  - Analysis of appropriate chemicals/contaminants
  - Proper sample containers and preservatives used
  - Sample holding times met for extraction and analysis
  - Trip blank samples included for volatile organic compound (VOC) analysis
  - Laboratory reporting limits or MDLs below screening criteria (RUSLs)

- Laboratory control sample and/or duplicate analyses
- Laboratory matrix spike and/or spike duplicate analyses
- Chain of custody documentation, including sample date and time, sample numbers, sample location, sample matrix, sample container and preservation, sample analytical methods, and transfer of samples to laboratory with appropriate dates and signatures.
- Laboratory data sheets and information

Supplemental reporting considerations:

- Vertical delineation sampling during site assessment
- Stockpile and over-excavation sampling – if greater than 10 yards of petroleum contaminated soil is generated for disposal; consult the *Fact Sheet on How DEQ Evaluates Sample Collection and Data Analysis for Site Assessments and Corrective Action*
- Analytical data comparison with residential use screening levels (RUSLs) from the *Idaho Risk Evaluation Manual for Petroleum Releases* (2018; IDAPA 58.01.24.008.02; <http://www.deq.idaho.gov/waste-mgmt-remediation/remediation-activities/risk-evaluation-manual/>).
- Disposal documentation

## USED OIL AND SLUDGES

Used oil tank closure and sampling procedures are discussed in DEQ's *Used Oil UST Closure and Release Sampling Standard Operating Procedures* (May 2017). The sludge removed from a tank must have a hazardous waste determination per 40 CFR Part 262.11; consult the *Fact Sheet on How DEQ Evaluates Sample Collection and Data Analysis for Used Oil UST Closures and Releases* and contact DEQ's hazardous waste program for additional information.