



Fact Sheet:

How DEQ Evaluates Sample Collection and Data Analysis for Site Assessments and Corrective Actions

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 site assessments and correction actions (remediation):

- *Waste Management and Remediation Division Statewide Generic Quality Assurance Project Plan: Third-Party Petroleum Assessment and Corrective Action, May 2017*
- *Standard Operating Procedures for Waste Management and Remediation Division: Data Review and Verification of Third-Party Petroleum Data Submittals, May 2017*
- *Standard Operating Procedures for Waste Management and Remediation Division: Data Validation of Third-Party Petroleum Data 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 site assessments and corrective actions. DEQ encourages anyone submitting data to DEQ to read all documents. They can be found at <http://www.deq.idaho.gov/waste-sample-collection>.

RELEASE REPORTING AND CONFIRMATION

Per IDAPA 58.01.02.851.01, owners or operators of a petroleum storage tank (PST) are required to notify DEQ within 24 hours if a release is suspected. Suspected releases must be investigated within 7 days. Upon confirming a release, an initial site characterization is required within 45 days.

For both non-PST system releases and PST system releases, the *Ground Water Quality Rule* (IDAPA 58.01.11.400) and *Standards and Procedures for Application of Risk Based Corrective Action at Petroleum Release Sites* (IDAPA 58.01.24) shall apply. Specifically, IDAPA 58.01.11.400.03 states the following:

The discovery of any contamination exceeding a ground water standard that poses a threat to existing or projected future beneficial uses of ground water shall require appropriate actions, as determined by the Department, to prevent further contamination.

Petroleum releases are also subject to the following documents:

- *Standard Operating Procedures for Management and Disposal of Petroleum-Contaminated Soil Following a Release from a Non-Underground Storage Tank Petroleum Storage Tanks*, February 2014
- *Petroleum Contaminated Soil Landfarm Standard Operating Procedures*, May 2017

DEQ's goal is to be on site to observe critical aspects of all site assessment and corrective action activities, including, but not limited to, soil sampling, well installation, ground water sampling, remediation system installation, and vapor sampling. To thoroughly evaluate the site assessment and corrective action activities and adhere to state rules, DEQ evaluates the following information contained in the site assessment report.

SAMPLE COLLECTION AND HANDLING

DEQ evaluates the methods used to collect the 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), 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.
- Halogenated Solvent Soil Sampling (for used oil and other applicable assessments)- The method for collection and analysis is the same as identified above for VOC soil sampling.
- Metal Soil Sampling (for used oil and other applicable assessments) — See *Used Oil UST Closure and Release Sampling Standard Operating Procedures*.
- Soil Vapor Sampling— Vapor points may be installed as subsurface or as sub-slab (below a concrete slab) points. Vapor points are installed within permeable strata deep enough to minimize potential short-circuit or withdrawal of atmospheric vapor and shallow enough to measure potential risks from soil vapor to indoor air quality. Prior to sample collection, leak detection for the vapor monitoring points is performed. The tracer gas method, with helium as the tracer gas, is generally used. Vapor point sampling occurs immediately following leak detection activities. See DEQ's *Idaho Risk Evaluation Manual for Petroleum Releases* (2018).

- Indoor/Ambient Air Sampling — Collection of indoor air data are accompanied with concurrently collected outside ambient air, an inventory of potential indoor chemical sources, and information on building construction and heating/cooling system design and operation. Indoor air/ambient air samples are collected in a method that allows for laboratory detection limits below the applicable risk screening level for the contaminants of concern. Typical collection methods are EPA Method TO-15 or EPA Method TO-17.
- Ground Water Sampling— Ground water samples are representative of ground water quality upgradient, underlying, and downgradient of the site, and are collected by appropriate methods (e.g., pumps, in-situ) and placed into appropriate containers. Samples for VOC analysis are collected directly into, or transferred using clean equipment with as little disturbance as possible, to 40 ml VOA glass vial with a Teflon coated septum-sealed screw-cap. No air space is present in the sample container. This can be checked by inverting the bottle and checking for air bubbles. The presence of air bubbles may mean the samples are not acceptable for laboratory analysis. Laboratories may analyze samples with air bubbles, if the bubbles are small, and note the presence of the bubble on the COC or data sheet. VOC samples are not collected near a source (e.g., running engine) that may bias the results.
- PAH Ground Water Sampling— The method for collection of ground water samples for PAH analysis is to place the water samples directly into laboratory provided containers (e.g., 40 ml glass VOA with Teflon lid) using clean dedicated or decontaminated water sampling equipment. The PAH ground water sample preservative is to place the samples on ice to 4°C.

SAMPLE ANALYSIS

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 sampling collection, handling, and analysis procedures were conducted in a manner that provides quality data. This includes the following:

- Identification of the petroleum release subject to the assessment or corrective action
- Identification of the release 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]).
- Sufficient type and number of samples collected from appropriate locations to determine the areal and vertical extent of soil, soil vapor, surface water, ground water, and other media contamination.
- Sufficient type and number of samples collected from appropriate locations to monitor the progress of corrective action or to confirm completion of corrective action activities, as applicable.
- Depth to ground water
- Sample collection procedures (includes information and other documentation on sample collection methods [e.g., EPA Method 5035A for VOC soil samples])
- Sample handling documentation
- Sample location map, depicting the site and locations of samples collected
- 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
 - Field duplicate samples collected of soil, soil vapor and/or surface water/ground water are within specified RPDs.
 - Rinsate blank samples collected to evaluate decontamination practices.
 - Field blank samples collected to evaluate sample collection, handling, and analysis processes.
 - 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:

- DEQ on-site during site assessment and corrective action activities. Field activities (i.e., site assessment and corrective action activities) conducted by external third parties observed and documented by DEQ staff.
- Field data summary and readings from photoionization detector (PID), water quality parameter meters, and water levels provided to DEQ, if collected, and field instrument calibration information provided to DEQ, if performed.
- 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