



Surface Water Monitoring at Landfills

Technical Memorandum

September 2022

Alaska Department of Environmental Conservation
Division of Environmental Health
Solid Waste Program

Surface water monitoring is required in accordance with Title 18, Chapter 60, Section 810 of the Alaska Administrative Code (18 AAC 60.810) at solid waste facilities where the department determines that based on site-specific conditions and practices, there is the potential for constituents of concern from the solid waste stored or disposed at the facility to be present in (1) surface run-off or other liquid discharge from the facility or (2) in nearby surface water that receives surface run-off or other liquid discharge from the facility.

A surface water monitoring program must include sample collection at points of compliance approved by the Alaska Department of Environmental Conservation (ADEC) Solid Waste Program (SWP). The points of compliance must be located:

- Where representative concentrations of constituents of concern leaving the facility will most likely be detected; and
- Where impacts from sources other than the landfill will be minimized.

Sample collection must:

- Occur during high flow and low flow conditions each year unless another schedule is approved or required by ADEC.
- Include parameters from Title 40, Part 258 of the Code of Federal Regulations (40 CFR 258), Appendix I, and any other constituents the department determines are necessary based on the type of waste disposed of in the facility.

Surface Water Monitoring Plan

The owner or operator shall develop and follow a surface water monitoring plan that includes consistent sampling and analysis procedures designed to ensure that monitoring results provide an accurate representation of surface water quality at each location sampled. Sampling plans must be developed using either the Quality Assurance/Quality Control criteria in Chapter 1, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846), adopted by reference in 18 AAC 60, or another Quality Assurance Project Plan (QAPP) approved by the SWP.

The surface water monitoring plan must include the following:

- Facility information (location, local geology and hydrology, and monitoring program history)
- Surface water monitoring locations
- Monitoring schedule information
- Procedures, techniques, and standards for
 - Sample collection (refer to ADEC's Field Sampling Guidance)
 - Sample preservation and hold time
 - Analytical methods (see SW-846 or 40 CFR 136)
 - Chain of custody control
 - Quality assurance and quality control

Surface water is defined as water open to the atmosphere and subject to run-off. The ADEC Solid Waste Program also may approve addressing water from springs, wells, or other collectors directly influenced by surface water under the surface water requirements.



Total constituent concentration should be analyzed and reported to ADEC SWP. Samples should not be field filtered and dissolved concentrations are not used for comparison for solid waste facilities.

Analytical Laboratory Data Requirements

Analytical laboratory data collected for surface water monitoring must include specific analytical limits. ADEC has adopted the following definitions from the Department of Defense Quality Systems Manual (DOD QSM) for Environmental Laboratories version 5.1 (January 2017) for classification of analytical limits:

Detection Limit (DL)

The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration with 99% confidence. At the DL, the false positive rate (Type I error) is 1%. A DL may be used as the lowest concentration for reliably reporting a detection of a specific analyte in a specific matrix with a specific method with 99% confidence.

Limit of Detection (LOD)

The smallest concentration of a substance that must be present in a sample in order to be detected at the DL with 99% confidence. At the LOD, the false negative rate (Type II error) is 1%. A LOD may be used as the lowest concentration for reliably reporting a non-detect of a specific analyte in a specific matrix with a specific method at 99% confidence.

Limit of Quantitation (LOQ)

The smallest concentration that produces a quantitative result with known and recorded precision and bias.

Reporting Limit (RL)

A customer-specified lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix. This should not be used for statistical purposes.

In each laboratory or monitoring report, the **DL** must be recorded for each constituent, and the **LOD** and the **LOQ** must be recorded for each constituent in each sample.

Surface Water Quality Criteria

Surface water monitoring results should be compared to the standards listed in the ADEC *Solid Waste Program Surface Water Standards Table*. If no water quality standard exists for a given constituent, naturally-occurring background concentrations or a health-based level approved by ADEC SWP shall be used.

Corrective action may be prompted if:

- Exceeds the applicable surface water standard,
- Shows a statistically significant increasing trend over time, **OR**
- Shows a statistically significant change over its background concentration.

Any violations of water quality standards should be confirmed by resampling as soon as possible and before the next regularly scheduled monitoring event. If resampling confirms the exceedance, then corrective action in accordance with 18 AAC 60.810(j) is required.

Surface Water Monitoring Reporting

Surface water monitoring results must be submitted to the SWP within 90 days of the sampling event. All monitoring records must be maintained in the facility's operating record. The SWP must be notified in writing of any violations of the applicable surface water standards within 14 days of detecting the violation. Immediate notification is required if the violation occurs in water used as a drinking water source.

References

- ADEC. 18 AAC 60 *Solid Waste Management* (February 2022)
- ADEC. 18 AAC 70 *Water Quality Standards* (February 2017)
- ADEC. *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances* (December 2008)
- ADEC. Division of Spill Prevention and Response, Contaminated Sites Program *Field Sampling Guidance*. (August 2017)
- 40 CFR 136 *Guidelines Establishing Test Procedures for the Analysis of Pollutants*
- United States Environmental Protection Agency (USEPA). *Resource Conservation and Recovery Act (RCRA) Waste Sampling Draft Technical Guidance, Planning, Implementation, and Assessment* (EPA530-D-02-002)
- USEPA. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846)