6.1.4 Monitoring and Reporting Requirements/Monitoring Conditions/ Analytical Methods

Applicability:

This section is to make the permit writer aware of the appropriate information sources that describe sample analysis reference methods that are acceptable for use by the permittee to assure compliance with regulatory requirements related to sampling and analytical methods.

Content:

Laboratory and field analyses of effluent and instream samples are the responsibility of the permittee. Smaller wastewater facilities generally will not have their own laboratories, and they must contract with private laboratories for sample analysis and sometimes for sample collection and analysis.

Data from facilities and contract labs must meet the requirements of an approved quality assurance/quality control plan. Analytical and sampling methods must be in accordance with one of the following sources unless the department approves alternative methods.

- Water Environment Federation, American Public Health Association, and American Water Works Association. Standard Methods for the Examination of Water and Wastewater, 20th Edition. L.S. Clesceri, A.E. Greenberg, and A.D. Eaton, eds. American Public Health Assoc., Washington, D.C. [14th through 19th editions are also acceptable].

- American Society for Testing and Materials. Water Testing Standards, Vol. 11.01 and 11.02. West Conshohocken, PA.

- US EPA, 1983. Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020)

- US EPA, 2004. NPDES Compliance Sampling Inspection Manual. (EPA-305/X-03-004) Enforcement Division, Office of Water Enforcement, Washington DC.

For some toxins, the water quality standard for protection of beneficial uses is a concentration that is low enough that it cannot be detected through approved analytical methods. The lowest concentration of a substance that can be measured by analytical methods is termed the detection level. Detection levels can be controversial because definitions may be unclear.

Detection levels for a constituent can be determined as part of the quality control process using blank samples and comparing them with standard benchmark solutions that have been diluted to low concentrations. Sufficient analyses of concentration in the blank samples will yield a normal distribution of readings for the constituent in question. This is referred to as noise. Repeated analyses of the low concentration standards will also yield a range of results. If both distributions are normal, the detection level is determined by calculating the standard deviations of both distributions and then deriving the minimum concentration that indicates a statistically significant difference from the blank sample results.

The Environmental Services Program (ESP) has established detection levels for most water contaminants that are included in permits. These are subject to change as analysis methods improve over time. ESP staff should be consulted if the permit writer suspects that the appropriate limit for an analyte is near or below the detection level. If it turns out to be below the

detection level, then the limit in the permit should be written as “non-detect”, and the detection level should be footnoted.

Legal References:

Code of State Regulations:

10 CSR 20-7.015(9)	Effluent Regulations - General Conditions

Other Links:

MDNR, Environmental Services Program, Water Quality Monitoring Section, Most Commonly Used Standard Operating Procedures

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6.1.5.1 Analytical Detection Levels – Definitions

6.1.5.2 Analytical Detection Levels – Compliance

Key Words:

Laboratory, field analysis, quality assurance, quality control, standard methods

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