



# Wastewater Analysis Services

The MSE Laboratory is a full service, certified laboratory offering a variety of services and testing. MSE has an experienced staff working to ensure that your sample is analyzed in a timely and professional manner. Our knowledge, high-tech instrumentation, a rigorous quality assurance program, and a willingness to provide tailored services have made us one of the leading laboratories in Montana.

Our experience includes analyses related to the evaluation and remediation of Superfund sites and encompasses water, biological, solid, and hazardous waste analyses. We offer a large variety of scientific sampling and testing services and perform comprehensive testing for all customer types including individuals, private/commercial groups, mines, and government organizations. Our lab services include

- Inorganic metals analyses, using both standard and Contract Laboratory Program (CLP) EPA methodologies
- Inorganic non-metallic analyses
- Biological drinking water analysis
- Analyses for physical properties
- Organic analyses
- Safe Drinking Water Act (SDWA) compliance parameters
- DMR Assistance
- CCR Reporting

The MSE Lab places customer service as our top priority. Our employees welcome the opportunity to serve your analytical needs and will provide professional, precise service in a cost effective solution.

## The MSE Lab Services

Knowledge - Experience - Comprehensive Service

## Analytical Tests

- **Total Kjeldahl Nitrogen (TKN)  
EPA Method 351.2**  
TKN is the total of the organic nitrogen plus any ammonia-nitrogen in a sample. The difference between the TKN value and the ammonia value will be the organic nitrogen. Samples for TKN analysis can be collected in either glass or plastic bottles with a sulfuric acid preservative to a pH less than 2. Samples that are preserved and cooled to 4°C have a holding time of 28 days before analysis.
- **Ammonia - EPA Method 350.2**  
To keep samples from biologically or chemically degrading, ammonia samples must be preserved with sulfuric acid to a pH less than 2 and cooled to 4°C. Since residual chlorine reacts with ammonia, any sample containing residual chlorine must be dechlorinated with sodium thiosulfate. The holding time for ammonia analysis is 28 days from the time of sample collection.
- **Total Residual Chlorine  
Standard Methods 4500 CL-G**  
Treatment plants that disinfect the effluent by chlorination use either chlorine gas or sodium hypochlorite. Chlorine is added and a percentage of the chlorine is deactivated by sunlight, reduced, converted to less active forms of chlorine by substances in the water, or is taken up in the disinfection mechanisms. Whatever uses up the chlorine to make it ineffective is called the chlorine demand and the remaining chlorine that has retained its disinfection properties is measured as the total residual chlorine (TRC). Samples to be analyzed for TRC are not chemically preserved and should be analyzed immediately after collection.
- **Total Suspended Solids (TSS) -  
EPA Method 160.2**  
The holding time for TSS analysis is 7 days from the time of sample collection. 1-liter of sample should be collected in a glass or plastic container – no preservative is required.

More tests on back>

**MSE**  
**LABORATORY SERVICES**  
Knowledge - Experience - Comprehensive Service

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- **Alkalinity - Standard Method 2320**

- **Acidity - EPA Method 305.1**

Acidity and alkalinity levels in wastewater play a part in regulating biological process as well as in chemical reactions such as coagulation and flocculation. Alkalinity is a measurement of a solution's capacity to react with a strong acid (usually sulfuric acid) to a predetermined pH. The alkalinity of a solution is usually made up of carbonate, bicarbonate, and hydroxides. The higher the alkalinity measurement, the more neutralizing agent is needed to counteract it. Acidity is a measure of a solution's capacity to react with a strong base (usually NaOH) to a predetermined pH value. Acidity measurements are based on the total acidic constituent of a solution (strong and weak acids, hydrolyzing salts, etc). It is possible to have highly acidic water by have moderate pH values or have a low pH and a relatively low acidity. In general, wastewater treatment plants operate better with wastewater lower in acidity and higher in alkalinity. Samples for both acidity and alkalinity should be collected in glass or plastic bottles (with zero headspace) and stored at 4°C for up to 14 days prior to analysis.

- **Biochemical Oxygen Demand (BOD<sub>5</sub>/CBOD<sub>5</sub>) Standard Method 5210B**

The BOD test measures the relative oxygen requirements of wastewaters, effluents, and polluted waters. The test has its widest application in measuring waste loadings to treatment plants and in evaluating the BOD-removal efficiency of such treatment systems. The test measures the molecular oxygen utilized during a specified incubation period for the biochemical degradation of organic material and the oxygen used to oxidize inorganic material such as sulfides and ferrous iron. Samples to be analyzed for BOD are not chemically preserved and should be cooled to 4°C and analyzed immediately.

- **Chemical Oxygen Demand (COD) EPA 410.1**

- **Chlorophyll MTDEQ/WQPBWQM-011**

- **Cyanide Standard Method 4500 CN-E**

- **DMR Assistance**  
The MSE Lab assists clients with DMR reports. Whether you need help setting up a spreadsheet to perform the

The MSE Lab is certified by the State of Montana's Environmental Laboratory to analyze samples from public drinking water systems in Montana as well as EPA Region VIII for the analysis of drinking water in Wyoming. The certification applies to the analysis of a variety of metal contaminants and other parameters. The lab also has a Soil Import Permit (from the U.S. Department of Agriculture (USDA) that allows soil samples to be imported to our lab through any U.S. port of entry.

complex calculations required for your DMR or have questions about requirements or completing your report, we are here to help.

- **E. Coli Standard Methods 9223B**

The fecal coliform and E. Coli (one species of bacteria within the fecal coliform group) are used as indicator organisms to test the effectiveness of effluent disinfection in a wastewater treatment plant. Use sterilized plastic containers for sample collection, leaving approximately 1 inch of headspace in the container to aid in mixing. If there is any residual chlorine, the sample must be dechlorinated with sodium thiosulfate and kept on ice prior to analysis (hold time = 6 hours).

- **Fecal Coliform**

- **Standard Method 9222D**

Untreated organic matter that contains fecal coliform can be harmful to the environment. Aerobic decomposition of this material can reduce dissolved oxygen levels if discharged into rivers or waterways. This may reduce the oxygen level enough to kill fish and other aquatic life. Reduction of fecal coliform in wastewater may require using chlorine and other disinfectant chemicals.

- **Metals by ICP/ICPMS**

- **EPA 200.7/200.8/6010/6020**

- **Total Phosphorus EPA Method 365.3**

Much of the available phosphorus in our waterways can be traced directly to its use in detergents, boiler treatments, and fertilizers. When this phosphorus reaches the environment through runoff or wastewater discharge, accelerated eutrophication\* can occur. Samples for phosphorus analysis can be collected in either glass or plastic bottles with a sulfuric acid preservative to a pH less than 2. Samples that are preserved and cooled to 4°C have a holding time of 28 days before analysis.

\* Eutrophication is when a body of water becomes rich in dissolved nutrients, leading to one of two conditions. The nutrient rich water continually contributes to the production of plant biomass, eventually turning water bodies into marshes or the production of massive algal blooms. The limiting factor that usually keeps eutrophication from happening is the lack of readily available phosphorus.



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MSE Technology Applications Inc., is a certified small business with offices across the United States. We have performed projects or sold products across 45 states and several foreign countries.