

Water Quality Monitoring – Wastewater Treatment Plant Monitoring – Effluent Suspended Sediment Monitoring

Monitoring Purpose

Monitoring for potentially toxic substances associated with the suspended sediment in the Metropolitan Wastewater Treatment Plant effluent has been conducted since 1990, as required by the National Pollutant Discharge Elimination System (NPDES) Permit.



Suspended sediments are solids that are held in suspension by the force of flowing water. A variety of potentially toxic materials have a tendency to adsorb to the surface of these very small particles. This type of long-term monitoring can track changes in pollutant levels associated with suspended sediments over time, reflecting improvements in treatment plant processes, and implementation of pretreatment programs.

Monitoring Sites

- Metropolitan Wastewater Treatment Plant effluent discharge channel, located in St. Paul, MN
- Mississippi River (UM 836.8) located approximately 1.5 miles upstream from the Metropolitan Wastewater Treatment Plant outfall.

Monitoring at the Mississippi River site (UM 836.8) is not required by permit; however results are used for comparative purposes.

Suspended Sediment Variables Analyzed

- Trace Metals:
 - Cadmium
 - Chromium
 - Copper
 - Lead
 - Mercury
 - Nickel
 - Zinc
- Pesticides:
 - Aldrin
 - a-BHC
 - b-BHC
 - d-BHC
 - g-BHC
 - Chlordane
 - 4,4'-DDD
 - 4,4'-DDE
 - 4,4'-DDT
 - Dieldrin
 - Endosulfan I
 - Endosulfan II
 - Endosulfan Sulfate
 - Endrin
 - Endrin Aldehyde
 - Heptachlor
 - Heptachlor Epoxide
 - Toxaphene
 - PCB (Aroclor 1016)
 - PCB (Aroclor 1221)
 - PCB (Aroclor 1232)
 - PCB (Aroclor 1242)
 - PCB (Aroclor 1248)
 - PCB (Aroclor 1254)
 - PCB (Aroclor 1260)
- Total Organic Carbon
- Total Phosphorus
- Total Solid

Monitoring Protocols

Suspended sediment samples are collected by deploying samplers for a 90 day collection period. Each sampler consists of a 10 ft stainless steel pole with three sets of four glass bottles

attached at top, mid, and bottom locations in the water column (12 bottles per sampler). In order to collect a representative sample, up to three samplers are evenly spaced across the effluent channel. Each of the effluent channel samplers is attached to the downstream side of a floating dock located in the effluent channel. A single suspended sediment sampler is used at the Mississippi River site (UM 836.8). The suspended sediment sampler located in the Mississippi River site is attached to a wooden pier approximately 50 ft from shore.

After the 90 day collection period has passed the samplers are retrieved, and returned to the lab. Upon removal of the full samplers, the samplers are redeployed with clean bottles for another 90 day sample collection period. The sediment which has settled into the bottles during the collection period is composited and homogenized in a solvent rinsed stainless steel mixing bowl, prior to being submitted for laboratory analyses. Triplicate laboratory analysis is performed for each variable (listed above).

Monitoring Equipment

- 350 ml glass bottles, 10" tall, 1.75" in diameter
- Suspended sediment sampler (10ft stainless steel pole with bottle holders)
- Stainless steel mixing bowl
- Stainless steel spoons and spatulas

For further information on suspended sediment monitoring, please contact Tim Pattock via [email](#) or at 651.602.8084.