

Sources of Uncertainty in Nutrient Levels Below Point Sources

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Goal

Estimate uncertainty associated with taking nutrient samples below a wastewater treatment plant by looking at:

- Sampling Location
- Matrix Effects
- Filtering Effects
- Dilution Error
- Sample Preservation

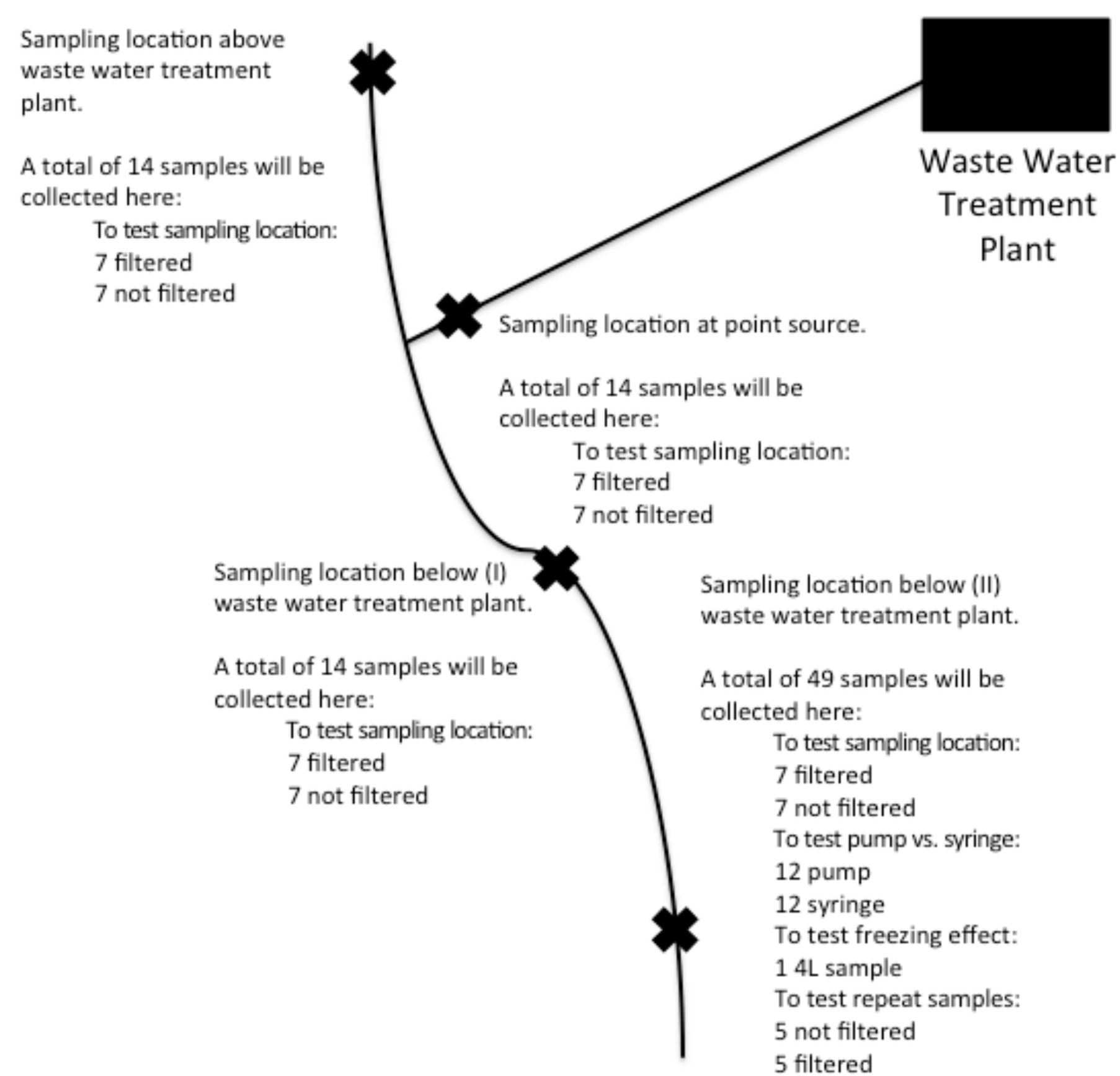


Figure 1. Number of samples collected at each location and the test for which the samples will be used

Research Methods

- Location Sampling – samples were collected in different areas of a cross section and nutrient concentrations will be compared
- Matrix Effects – this will be estimated from spiked samples as percent recovery
- Filtering Effects – samples were collected with a pump and syringe and nutrient concentrations will be compared
- Dilution Error – known dilutions were made and undiluted samples will be compared to look at variation
- Freezing Effects – Samples will be frozen for varying amounts of time and nutrient concentrations will be compared



Figure 2. Equipment used for sampling

Impact

By testing these potential sources of uncertainty, we can determine more accurate ways to take and analyze nutrient samples and have greater confidence in reporting nutrient concentrations at and around point sources. This is important, especially below wastewater treatment plants, in order to ascertain if nutrient quantities exceed water quality management standards.



Figure 3. Location of wastewater treatment plant in relation to sampling locations



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