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CS 325 - Project Scenario Selection
Last Modified: December 09, 2021

Database Prototype:
Stormwater Monitoring for the Smith Inc. North Site Remediation Project

The North Site property is owned by Smith Inc. and is currently undergoing environmental remediation in order to remove and monitor industrial contaminants from industrial operations that occurred in the 1980s. Smith Inc. has hired Forester Hydrology Consultants, Inc. to perform stormwater monitoring at the site to comply with the California State Water Board requirements during the remediation process. The 930-acre site consists of both natural areas and areas where industrial activity occurred. Three tributaries of the Seraphinite River flow through the property and collect stormwater runoff. Stormwater Best Management Practices (BMPs) have been installed throughout the property to reduce runoff contaminants before runoff enters the tributaries. The site BMPs include infiltration basins, bioretention basins, an infiltration trench, a vegetated swale, and an artificial wetland.

Stormwater runoff samples are collected during at least three storms at each monitoring location for each wet weather season. Samples are collected directly upstream and/or downstream of each BMP, at each outfall to the tributaries, and from the confluence of the three tributaries. Samples are tested for parameters of concern. During each sampled storm, one duplicate sample is collected from one of the monitoring locations to check the consistency of the sampling and testing process and one blank sample is collected using distilled water to evaluate the accuracy of the sampling process. The site soil includes Hydrologic Soil Groups A, B, C, and D. Assumed infiltration rates for these soil types and delineated drainage areas for the sampling locations may be used to estimate the volume of water and the mass of contaminants that flow to these monitoring locations.

Questions

1. What is the maximum blank concentration for dissolved Mercury?
2. For dissolved Lead, what is the mean of the difference between each pair of duplicate concentration results normalized by the pair average concentration?
3. What is the estimated total mass of dissolved Copper that enters the Seraphinite River from the site during the first storm of the 2022 wet weather season?
4. What monitoring location has the maximum concentration result for each parameter?
5. What is the difference between the upstream and downstream concentrations for dissolved Lead at the East Tributary Wetland during the first storm of the 2022 wet weather season?
6. How many days before the first storm of the 2022 wet weather season did the West Tributary Bioretention Basin undergo maintenance?