Update on Emerging Contaminants of Concern

Per- and Polyfluoroalkyl Substances (PFAS) and 1,4-Dioxane

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Groundwater Characterization (2017-2019)

Phased characterization effort to determine the impacts from PFAS and 1,4-Dioxane

PFAS  (chemicals used in firefighting foam)
• Phase 1- Sample groundwater in source water contributing areas for the drinking water supply wells
• Phase 2- Characterize groundwater in the eight identified foam release areas
• Phase 3- Sample groundwater treatment wells/systems, landfill areas, Sewage Treatment Plant effluent and groundwater, select southern boundary monitoring wells. Some wells/treatment systems were also tested for 1,4-Dioxane

1,4-Dioxane  (was used as a chemical stabilizer for the solvent TCA)
• Sampled limited number of on-site and off-site monitoring wells and groundwater treatment systems that have or had detectable levels of TCA
PFAS Results Phases 1, 2 and 3
Results Compared to Proposed 10 ng/L Drinking Water Standards for PFOS and PFOA

• Focus was on-site
  • Foam release areas
  • Southern site boundary
• Highest PFOS and PFOA concentrations were detected at foam training areas
  • Current Firehouse
    • PFOS up to 12,200 ng/L
    • PFOA up to 240 ng/L
  • Former Firehouse
    • PFOS up to 5,210 ng/L
    • PFOA up to 736 ng/L
• Southern Boundary
  • PFOS up to 66 ng/L
  • PFOA up to 24 ng/L
1,4-Dioxane Results

Results Compared to Proposed 1 µg/L Drinking Water Standard

- 1,4-Dioxane was detected in on-site and off-site areas. Examples:
  - Western South Boundary area up to ~15 µg/L
  - Industrial Park Treatment System area up to ~19 µg/L
  - Airport Treatment System area up to ~2 µg/L
Continued Characterization

**Phase 4:** Extensive sampling of existing on-site and off-site monitoring wells and off-site treatment systems for PFAS and 1,4-dioxane

**Phase 5:** Detailed characterization of the two BNL firehouse PFAS plumes using temporary wells. Goal is to characterize the plume segments with the highest PFAS concentrations
Phase 4 Characterization

- Started in late January
  - Plan to complete by late July
- Collect samples for PFAS and 1,4-Dioxane at each location:
  - 350 on-site and off-site monitoring wells
    - 275 wells sampled to date
  - 27 off-site extraction/treatment wells
    - 21 extraction wells sampled to date
  - Influent and effluent from 5 off-site groundwater treatment systems
    - 3 systems sampled to date
Phase 5: Current Firehouse Area

- Expected start in early July 2020
- Install up to 42 temporary wells
  - Depths to ~150 feet
  - 10 foot sample intervals
  - Also sample for 1,4-dioxane at select locations
Phase 5: Former Firehouse Area

• Install up to 37 temporary wells
  • Depths to ~150 feet
  • 10 foot sample intervals
  • Also sample for 1,4-dioxane at select locations
Phase 5 Results Will Be Used To

• Prepare maps and cross section views of the PFAS plumes
• Hold discussions with the regulatory agencies on best approach to control/remediate the PFAS plumes
• Design groundwater treatment systems
  • Groundwater modeling and engineering
  • Number, locations, depths, and pumping rates for the groundwater extraction wells
  • Filter system design
  • Where to recharge the treated water
• Determine where permanent wells are needed for long-term surveillance of the source areas and plumes