

Fate and Transport Assessment

Plain Language Overview

Key Points & Takeaways

- This report presents an assessment of the fate and transport of groundwater contaminants from Sunoco operation of the former Philadelphia Refinery.
- Act 2 requires a fate and transport assessment to evaluate future conditions so that potential negative impacts to human health and the environment can be assessed via risk assessment, if needed, that could be caused by migration of the contaminated groundwater.
- This assessment was performed with a series of computer models simulating future conditions in groundwater and the Schuylkill River and supplements the qualitative fate and transport assessments that were included in each of the Area of Interest Remedial Investigation Reports.
- The models predict that Sunoco contamination present in groundwater at the former Philadelphia Refinery continues to break down and the impacted areas generally shrink in size over time. Groundwater pumping at the former refinery is not expected to be needed to get these results.
- The Schuylkill River model predicts that the river can adequately mix and dilute contaminated groundwater that seeps into the river and Mingo basin, a stormwater pumping basin adjacent to the facility.

Summary

The fate and transport assessment includes a groundwater flow model, a transport model, and a river flow model. The report also updates understanding of the conditions in and adjacent to the facility resulting from recent field investigations.

Field Investigations

- Additional wells were installed in the ball field of AOI 8, along the river in AOI 2, in adjoining Belmont Terminal, and south of Penrose Avenue on Conrail Property.
- High resolution technologies were used including underground scans and imaging to help decide where to drill so wells and samples were placed/collected in the right spots to make the fate and transport assessment better.
- Some additional groundwater samples were collected along 26th Street to help understand the sources of the contaminants. These helped fine-tune the groundwater models.

Groundwater Models

- A 3-dimensional model was used to simulate groundwater flow in and around the facility. The model was designed with as much site-specific information as was available to Evergreen.
- The groundwater model was able to simulate flows of groundwater sufficiently well based on recent conditions from the gauging of hundreds of wells.
- Evergreen's characterized contamination sources were loaded into the transport model for five indicator compounds, and conservative settings were used with the highest groundwater

concentrations since 2014. The impacted groundwater areas generally shrink in size over time as the contaminants continue to break down.

Schuylkill River Model

- A 3-dimensional model was used to simulate surface water flow in the Schuylkill and Delaware Rivers near the facility. The model was designed with as much site-specific information as was available to Evergreen.
- The river model was able to simulate flows and water levels of surface water sufficiently based on measurement of flow and tide in the rivers from recent studies and available data.
- Groundwater flows and contaminants were seeped into the Schuylkill River and scenarios of mixing and dilution were performed.
- The levels of contaminants in the Schuylkill River from the facility groundwater seeps were predicted to be far below any of the protective standards as a result of the large dilution capacity of the river.

For more information

- View the detailed report that was submitted to PADEP (report is attached and can also be downloaded from: www.phillyrefinerycleanup.info/act-2-documents)
- During the public comment period of June 30, 2022 through July 30, 2022, comments and questions regarding the report may be submitted to Evergreen which will be addressed and submitted to PADEP and EPA as part of their review of this report.
- Comments/questions can be submitted via the following methods:
 - Website comment page: www.phillyrefinerycleanup.info/comment-submission-form
 - Via email to: phillyrefinerycleanup@ghd.com
 - Via USPS to: PO Box 7275, Wilmington, DE 19803