

## Appendix E

### Groundwater Attainment Sampling Results by Area at fYNOP

Analytical results for 346 groundwater attainment samples collected from the Northern Property Boundary (NPBA), Eastern Site Perimeter (ESP), South-Central Site Area (SCSA), Southern Property Boundary Area (SPBA), South Plume Area (SPA), Codorus Creek Levee Area, West Side of Codorus Creek, and Northern Site Perimeter (NSP) since the human health risk assessment for groundwater (Groundwater RA) completion are provided on **Table 4.2-3** (volatile organic compounds (VOCs)) and **Table 4.2-4** (total and available cyanide). The tables include United States Environmental Protection Agency (USEPA) maximum contaminant levels (MCLs), USEPA tap water regional screening level (RSLs) that correspond to a cancer risk level of  $1 \times 10^{-6}$  and a hazard quotient (HQ) of 1.0, and Pennsylvania Department of Environmental Protection (PADEP) Statewide health standards (SHS) residential and non-residential medium-specific concentrations (MSCs) for comparison. A summary of the analytical results for the groundwater attainment demonstration is provided on **Tables 4.2-5** and **4.2-6**. The tables identify the number of samples collected, number of detections, maximum concentrations, and regulatory standards for COCs on a per well basis.

A detailed discussion of groundwater analytical results from samples collected after publication of the Groundwater RA are provided, below.

#### NPBA Groundwater Results

Constituents of concern (COCs) in NPBA groundwater are trichloroethene (TCE), tetrachloroethene (PCE), cis-1,2-dichloroethene (cis12DCE), and vinyl chloride (VC). Analytical results for COCs in 157 NPBA groundwater attainment samples since 2013, following shutdown of the NPBA groundwater extraction system, are as follows:

- Maximum TCE sample concentrations per well range from 0.15 micrograms per liter ( $\mu\text{g/L}$ ) in MW-142S to 130  $\mu\text{g/L}$  in MW-12; TCE was detected in 118 samples; and of the 16 NPBA wells, six wells contain groundwater with TCE below the MSC of 5  $\mu\text{g/L}$ .
- Maximum PCE sample concentrations per well range from 0.22  $\mu\text{g/L}$  in MW-9 to 450  $\mu\text{g/L}$  in MW-16S; PCE was detected in 71 samples; and of the 16 NPBA wells, 13 wells contain groundwater with PCE below the MSC of 5  $\mu\text{g/L}$ .

- Maximum cis12DCE sample concentrations per well range from less than 0.71 µg/L in MW-143S to 71 µg/L in MW-18S; concentrations of cis12DCE were detected in 111 samples; and of the 16 NPBA wells, 15 wells contain groundwater with cis12DCE below the MSC of 70 µg/L.
- Maximum VC sample concentrations per well range from less than 0.88 µg/L in several wells to 5.6 µg/L in MW-9; VC was detected in 19 samples; and of the 16 NPBA wells, 15 wells contain groundwater with VC below the MSC of 2 µg/L.

### ESP Groundwater Results

COCs in ESP groundwater are TCE, PCE, cis12DCE, and cyanide. Analytical results for COCs in 12 ESP groundwater attainment samples since 2019 are as follows:

- Maximum TCE sample concentrations per well range from 0.47 µg/L in MW-14 to 17 µg/L in MW-65S; TCE was detected in nine samples, and of the three ESP wells, two wells contain groundwater with TCE below the MSC of 5 µg/L.
- Maximum PCE sample concentrations per well range from 2.4 µg/L in MW-65S to 110 µg/L in MW-65S; PCE was detected in 12 samples; and of the three ESP wells, one well contains groundwater with PCE below the MSC of 5 µg/L.
- Maximum cis12DCE sample concentrations per well range from 0.24 µg/L in MW-65S to 3.5 µg/L in MW-2; concentrations of cis12DCE were detected in five samples; and three ESP wells contain groundwater with cis12DCE below the MSC of 70 µg/L.

During the most recent four-year period of annual sampling, both total cyanide and available cyanide (i.e., free cyanide and complexes that easily dissociate) were detected in samples from MW-2 located in the south-central portion of the ESP. Concentrations of available cyanide in these samples were less than the MCL of 200 µg/L (9.7 to 80 µg/L); no MCL/RSL is published for total cyanide.

### SCSA Groundwater Results

COCs in SCSA groundwater are TCE, PCE, cis12DCE, VC, 1,1-dichloroethane (11DCA), 1,1-dichloroethene (11DCE), 1,2-dichloroethane (12DCA), 1,1,1-trichloroethane (TCA), benzene, and methyl tertiary-butyl ether (MTBE). Analytical results for COCs in 34 SCSA groundwater attainment samples since 2019 are as follows:

- Maximum TCE sample concentrations per well range from 0.42 µg/L in MW-79 to 9.4 µg/L in MW-69; TCE was detected in 28 samples; and of the eight SCSA wells, seven wells contain groundwater with TCE below the MSC of 5 µg/L.
- Maximum PCE sample concentrations per well range from 0.30 µg/L in MW-67D to 11 µg/L in MW-88; PCE was detected in 16 samples; and of the eight SCSA wells, seven wells contain groundwater with PCE below the MSC of 5 µg/L.
- Maximum cis12DCE sample concentrations per well range from 0.34 µg/L in MW-67D to 150 µg/L in MW-115; concentrations of cis12DCE were detected in 26 samples; and of the eight SCSA wells, seven wells contain groundwater with cis12DCE below the MSC of 70 µg/L.
- Maximum VC sample concentrations per well range from less than 0.20 µg/L in MW-88 to 95 µg/L in MW-115; VC was detected in four samples; and of the eight SCSA wells, seven wells contain groundwater with VC below the MSC value of 2 µg/L.
- Maximum 11DCA sample concentrations per well range from less than 0.63 µg/L in several wells to 20 µg/L in MW-115; 11DCA was detected in four samples, and eight SCSA wells contain groundwater with 11DCA below the MSC of 160 µg/L.
- Maximum 11DCE sample concentrations per well range from less than 0.55 µg/L in several wells to 3.1 µg/L in MW-115; 11DCE was detected in 11 samples, and eight SCSA wells contain groundwater with 11DCE below the MSC of 7 µg/L.
- Maximum 12DCA sample concentrations per well range from less than 0.57 µg/L in several wells to 1.5 µg/L in MW-115, 12DCA was detected in four samples, and eight SCSA wells contain groundwater with 12DCA below the MSC value of 5 µg/L.
- Maximum TCA sample concentrations per well range from less than 0.60 µg/L in several wells to 4.9 µg/L in MW-67S; TCA was detected in four samples, eight SCSA wells contain groundwater with TCA below the MSC of 200 µg/L.
- Maximum benzene sample concentrations per well range from less than 0.60 µg/L in several wells to 9.3 µg/L in MW-115; benzene was detected in four samples; and of the eight SCSA wells, seven wells contain groundwater with benzene below the MSC of 5 µg/L.
- Maximum MTBE sample concentrations per well range from less than 0.59 µg/L in several wells to 28 µg/L in MW-115; MTBE was detected in four samples; and of the eight SCSA wells, seven wells contain groundwater with MTBE below the MSC of 20 µg/L.

## SPBA Groundwater Results

COCs in SPBA groundwater are TCE, PCE and cis12DCE. Analytical results for COCs in 80 SPBA groundwater attainment samples since 2018 are as follows:

- Maximum TCE sample concentrations per well range from 0.29 µg/L in MW-108D to 6.9 µg/L in MW-167; TCE was detected in 46 samples; and of the seven SPBA wells, six wells contain groundwater with TCE below the MSC of 5 µg/L.
- Maximum PCE sample concentrations per well range from less than 0.47 µg/L in MW-108S to 70 µg/L in MW-166; PCE was detected in 61 samples; and of the seven SPBA wells, four wells contain groundwater with PCE below the MSC of 5 µg/L.
- Maximum cis12DCE sample concentrations per well range from 0.20 µg/L in MW-22 to 0.8 µg/L in MW-166; concentrations of cis12DCE were detected in two samples, and seven SPBA wells contain groundwater with cis12DCE below the MSC of 70 µg/L.

### SPA Groundwater Results

COCs in SPA groundwater are TCE, PCE, cis12DCE, and 11DCE. Analytical results for COCs in 24 SPA groundwater attainment samples since 2019 are as follows:

- Maximum TCE sample concentrations per well range from 0.39 µg/L in GM-1D to 46 µg/L in MW-150; TCE was detected in 20 samples; and of the six SPA wells, three wells contain groundwater with TCE below the MSC of 5 µg/L.
- Maximum PCE sample concentrations per well range from less than 0.47 µg/L in MW-150 to 26 µg/L in Cole D; PCE was detected in 19 samples; and of the six SPA wells, two wells contain groundwater with PCE below the MSC of 5 µg/L.
- Maximum cis12DCE sample concentrations per well range from 0.20 µg/L in MW-22 to 0.8 µg/L in MW-166; concentrations of cis12DCE were detected in 12 samples, and six SPA wells contain groundwater with cis12DCE below the MSC of 70 µg/L.
- Maximum 11DCE sample concentrations in MW-150 range from 0.38 µg/L to 0.9 µg/L; 11DCE was detected in four samples, and six SPA wells contain groundwater with 11DCE below the MSC of 7 µg/L.

### Codorus Creek Levee Area Groundwater Results

COCs in Levee Area groundwater are TCE, PCE, and cis12DCE. Analytical results for COCs in 12 Levee Area groundwater attainment samples since 2021, following shutdown of the WPL groundwater extraction system, are as follows:

- Maximum TCE sample concentrations per well range from 0.76 µg/L in MW-101S to 6.5 µg/L in MW-101D; TCE was detected in 11 samples; and one of the two Levee Area wells contain groundwater with TCE below the MSC of 5 µg/L.

- Maximum PCE sample concentrations per well range from 4.2 µg/L in MW-101S to 5.6 µg/L in MW-101D; PCE was detected in 12 samples; and one of the two Levee Area wells contain groundwater with PCE below the MSC of 5 µg/L.
- Maximum cis12DCE sample concentrations per well range from 0.70 µg/L in MW-101S to 13 µg/L in MW-101D; concentrations of cis12DCE were detected in 11 samples; and one of the two Levee Area wells contain groundwater with cis12DCE below the MSC of 70 µg/L.

### **West Side of Codorus Creek Groundwater Results**

No COCs are detected in West Side of Codorus Creek groundwater at multilevel well MW-148A.

### **NSP Groundwater Results**

COCs in NSP groundwater are TCE, PCE, and cis12DCE. Analytical results for COCs in 19 NSP groundwater attainment samples collected since 2019 are as follows:

- Maximum TCE sample concentrations per well range from less than 0.30 µg/L in two wells to 1.9 µg/L in MW-5; TCE was detected in eight samples; and four NSP wells contain groundwater with TCE below the MSC of 5 µg/L.
- Maximum PCE sample concentrations per well range from less than 0.30 µg/L in three wells to 1.8 µg/L in MW-82; PCE was detected in four samples; and four NSP wells contain groundwater with PCE below the MSC of 5 µg/L.
- Maximum cis12DCE sample concentrations per well range from less than 0.30 µg/L in two wells to 6 µg/L in MW-5; concentrations of cis12DCE were detected in ten samples; and four NSP wells contain groundwater with cis12DCE below the MSC of 70 µg/L.