GROUNDWATER AND SURFACE WATER MONITORING PLAN

Former York Naval Ordnance Plant
1425 Eden Road, Springettsbury Township
York, Pennsylvania

Prepared for:

Harley-Davidson Motor Company Operations, Inc.

1425 Eden Road

York, Pennsylvania

September 2016

Prepared by:

Groundwater Sciences Corporation

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LIST OF ACRONYMS AND ABBREVIATIONS

Bldg3	Building 3
Bldg58	Building 58
cis1,2DCE	cis-1,2-dichloroethene
COC	constituents of concern
CPA	Central Plant Area
CVOC	chlorinated volatile organic compound
FSP	field sampling plan
fYNOP	former York Naval Ordnance Plant
GSC	Groundwater Sciences Corporation
GWTS	groundwater extraction and treatment system
Harley-Davidson	Harley-Davidson Motor Company Operations, Inc.
HHRA	human health risk assessment
MSC	medium specific concentration
NPBA	Northern Property Boundary Area
O&M	operations and maintenance
PADEP	Pennsylvania Department of Environmental Protection
PCE	tetrachloroethene
QAPP	Quality Assurance Project Plan
RAA	remedial alternatives analysis
RSL	regional screening level
SPBA	Southern Property Boundary Area
SRI	Supplemental Remedial Investigation
SVOC	semivolatile organic compounds
TCE	trichloroethene
USACE	United States Army Corps of Engineers

USEPA	United States Environmental Protection Agency
VOC	volatile organic compound
WPL	West Parking Lot

1 INTRODUCTION

This plan provides a work scope for groundwater and surface water monitoring and sampling in 2016 and subsequent years in anticipation of the completion of the final remedy for the former York Naval Ordnance Plant (fYNOP) located in York, Pennsylvania (Site) (**Figure 1-1**). This document was prepared on behalf of Harley-Davidson Motor Company Operations, Inc. (Harley-Davidson) with review by fYNOP project team members from the United States Army Corps of Engineers (USACE).

The Supplemental Remedial Investigation (SRI) Groundwater Report Part 2 (GSC, 2016) (Part 2 SRI) addressed data gaps identified in the Part 1 SRI report (Groundwater Sciences Corporation [GSC], September 2011) (Part 1 SRI). A resolution of those data gaps was required to perform a human health risk assessment (HHRA) for groundwater, which was completed and submitted to regulators, along with the Part 2 SRI in September 2016.

During the implementation of the Part 2 SRI, annual comprehensive sampling was initiated and replaced the key well sampling program that was in place to monitor constituents of concern (COCs) in groundwater at selected locations across the Site during the operation of the interim groundwater extraction and treatment system (GWTS). The comprehensive sampling program combined the key well concept with other monitoring and characterization needs, such as intensive monitoring of the Northern Property Boundary Area (NPBA) groundwater extraction system shutdown, sampling of Part 2 SRI characterization wells and sampling in support of the remedial alternatives analysis (RAA), to build a robust groundwater chemistry database based on a larger set of wells from a comprehensive annual sampling event. These sampling events have generally been completed in September and early October to minimize seasonal variations and take advantage of the more stable groundwater conditions that typically exist due to the minimal groundwater recharge that occurs prior to and during that time frame.

This plan recommends a continuation of this general practice of combining monitoring at the Site into a comprehensive sampling round in the September/October time frame, and it also includes sampling that is considered necessary at other times of the year. Moreover, now that the characterization of the Site is complete, this plan represents a coordination of efforts where it is advantageous for the project to have an annual comprehensive round of synoptic water levels from all available wells and a snapshot of the groundwater chemistry from selected wells at the Site.

This plan was designed to accomplish the following objectives:

- **Plume Perimeter and Surface Water Monitoring** – This category represents sampling that was recommended in the Part 2 SRI to meet future monitoring objectives, now that characterization is complete. Wells in the Northern Property Boundary Area (NPBA), West Parking Lot (WPL), in the Levee Area, in the Southern Property Boundary Area (SPBA) and to the south-southeast of the SPBA along the perimeter of the chlorinated volatile organic compound (CVOC) plume will be sampled along with surface water in Codorus Creek.

- **Determination of Concentration and Mass Remaining in the Aquifer** – One of the conclusions in SRI Part 2 report is that cleanup of the groundwater at the fYNOP Site to meet United States Environmental Protection Agency (USEPA) regional screening levels (RSLs) or Pennsylvania Department of Environmental Protection (PADEP) medium specific concentrations (MSCs) will not be accomplished by active remediation within a reasonable time frame (30 to 60 years). However, historical chemistry results indicate that interim remedial actions and natural processes have considerably reduced the mass and concentrations over the period of record. Thus, sampling of a larger set of wells will be performed on an appropriate frequency to monitor future changes.

- **Remedial Action Performance Monitoring** – Routine sampling associated with the operation of the GWTS is included in this category along with wells to monitor potential changes in groundwater flow and chemistry associated with the modifications that were made to optimize the interim groundwater extraction system as a result of the Part 2 SRI. If additional modifications are made to the configuration of the groundwater extraction system, it is anticipated that other wells in the vicinity of the area would be added to the list of wells to be sampled and removed after the impacts are characterized.

Ongoing monitoring of results of the shutdown of the NPBA groundwater extraction system and the Bldg 3 (Softail) Lift Station are not included in this plan, but will be part of the 2016 sampling program. The five year sampling program for the NPBA will be completed after sampling in 2018, and recommendations for further monitoring of that area will be developed based on the results.

2 COMPILATION OF SAMPLING STATIONS FOR MONITORING PLAN

This section of the plan describes the rationale for the selected sampling stations based on the objectives described in Section 1 and discusses the sampling frequency. In some cases, wells are included in more than one category to meet multiple objectives. Separate figures are provided for each of the three objectives that show the sampling stations highlighted in yellow. **Table 2-1** provides a brief sampling history and information about each of the stations in the monitoring plan. Information on the wells is also included on the table for reference purposes (e.g., type, depth, construction, etc.). As this plan is modified in the future, this table can be used as a resource for the designer.

2.1 Plume Perimeter and Surface Water Monitoring

Monitoring stations in this category are illustrated on **Figure 2-1**, and will be sampled annually for volatile organic compounds (VOCs) in September/October. Wells in the WPL and in the Levee Area will be used to monitor the leading edge of CVOC toward Codorus Creek. In the SPBA and south of the Site, selected wells will monitor groundwater as it leaves the Site and the extent of the off-Site CVOC plume. Sampling of surface water will be continued to monitor concentrations at the established stations in Codorus Creek.

Table 2-2 provides a list of sampling stations included in this category, the rationale for each station, and the parameters for which the samples will be analyzed. A total of 46 samples will be collected, which consists of 36 wells, including Waterloo™ multilevel well MW-152 (2 sample ports) and 9 surface water stations. Wells located on the western edge of the WPL will be sampled for priority pollutant metals due to the soil-to-groundwater exceedances for a number of metals in the fill underlying the western half of the WPL, and the potential that buried containers may exist in the fill.

It is anticipated that this category of the plan will be appropriate for all remedial options being considered during the RAA. These sampling stations will be re-evaluated yearly, but this part of the monitoring plan is expected to remain consistent, allowing for long-term comparisons of historical results.

2.2 Determination of Concentration and Mass Remaining in the Aquifer

Figure 2-2 illustrates the 120 wells that are included in this category to monitor changes in the concentration and extent of COCs and VOC mass remaining in the aquifer that were established in the Part 2 SRI. Changes to the COC distribution and concentrations in groundwater could impact the guidance for protection of receptors working on-Site, but water quality changes will be slow. This information would be used to help develop health and safety plans for construction and utility workers in land use areas specified by the HHRA for groundwater (Newfields, 2016).

In addition, the concentrations and distribution of the following "minor" contaminant compounds will be evaluated during this extensive sampling program:

- 1,4-Dioxane – Existing wells in which 1,4-Dioxane concentrations exceeded PADEP's nonresidential MSC since 2008 have been included and will be analyzed for this parameter.

- Chromium – Total and dissolved hexavalent and total chromium will be analyzed in MW-7, MW-47, MW-51D and MW-51S.

- Semivolatile Organic Compounds (SVOCs) – No monitoring of SVOCs, excluding 1,4-Dioxane will be conducted.

- Cyanide – Monitoring well MW-2, near a known cyanide disposal area that was removed in the 1970s will be the only well sampled for cyanide.

A sampling frequency of five years is recommended as an appropriate time frame to monitor these changes. A rather extensive array of wells are required, and involve shallow and deep wells, including the multilevel wells and the wells within the footprint of the proposed buildings on the West Campus. **Table 2-3** lists the samples and the parameters for which each sample will be analyzed. This category of sampling includes 137 samples, which includes 116 wells and 4 multilevel wells (MW-136A – 5 ports, MW-137A – 6 ports, MW-139A – 6 ports and MW-140A – 4 ports).

The Part 2 SRI analysis of distribution and concentrations in the aquifer was conducted using 2014 data, thus sampling for this update is recommended for 2019. However, in the future, consideration

should be given to adjusting the sampling date to coordinate with the implementation of remedial actions or periodic (five year) reviews of the Site by the regulators.

2.3 Remedial Action Performance Monitoring

Figure 2-3 illustrates the locations of the wells in this category that will be used to monitor the operation of the interim groundwater extraction system and potential changes that occur as a result of recent modifications made to the configuration of the extraction system in the Central Plant Area (CPA). **Table 2-4** lists the stations to be sampled, and the parameters to be analyzed. Samples for VOCs will be collected from 12 wells and the GWTS (influent and effluent).

Routine sampling of the 5 active groundwater extraction wells in the WPL is included in this category to monitor CVOC concentrations (CW-9, CW-13, CW-15A, CW-17 and CW-20). Two rounds of samples will be collected from these wells, with the first round occurring in September/October, and a second round six months later, in March. In addition, quarterly sampling of GWTS influent from the combined active extraction wells is performed to estimate the mass of VOCs removed from the aquifer by pumping and quarterly sampling of the GWTS effluent is conducted for discharge monitoring purposes.

Recently abandoned extraction well CW-8 was operated near a 1,1,1-trichlorethane (TCA) spill in the CPA, which has since been cleaned up. Pumping of CW-8 also captured a trichloroethene (TCE) source area believed to be near Building 58 (Bldg58). With the shutdown of CW-8 in November 2013, the groundwater flow direction and plume migration from the Bldg58 area may shift from a westerly to a southerly direction. Thus, 5 wells in this area will be sampled annually in September/October until the trend is established.

The scope for this category of the monitoring plan will be reviewed annually and is expected to be more dynamic than other parts of the plan. If additional modifications are made to the configuration of the groundwater extraction system, it is anticipated that other wells in the vicinity of the area would be added to the list of wells to be sampled and removed after the impacts are characterized.

3 REFERENCES

GSC, 2011. *Supplemental Remedial Investigation Groundwater Report (Part 1) Former York Naval Ordnance Plant,* September.

GSC, 2012. *Field Sampling Plan (FSP) for Part 2 of the Supplemental Groundwater Remedial Investigation,* April.

GSC, 2012. *Quality Assurance Project Plan – Former York Naval Ordnance Plant,* June.

GSC, 2016. *Supplemental Remedial Investigation Groundwater Report (Part 2) Former York Naval Ordnance Plant,* August.

Newfields, 2016. *Groundwater Human Health Risk Assessment,* August.

Tables

TABLE 2-1
Well Information
Harley-Davidson Motor Company Operations, Inc.
York, PA

Well Identification	TYPE	Well Description Related to Monitoring	Well Intersects Conduit?	Depth to Top of Open Interval (ft bgs)	Depth to Base of Open Interval (ft bgs)	Open Interval Length (ft)	Screened Interval (ft bgs)	Drilled Depth (ft bgs)	Well Construction	Open to Which Unit	Rock Type	Saturated Overburden	Saturated Overburden Thickness (ft)	Voids	Void Interval (ft bgs)
CW-1	Collection Well	NPBA Collection Well subject to post-shutdown monitoring plan.	N	68.0	175.0	107.0	--	175	Open Hole	Bedrock	SS/Phyl	N	--	N	--
CW-1A	Collection Well	NPBA Collection Well subject to post-shutdown monitoring plan.	N	29.0	74.0	45.0	34-74	74	Screened	Bedrock	Phyl	N	--	N	--
CW-3	Collection Well	NPBA Collection Well subject to post-shutdown monitoring plan.	N	20.0	203.0	183.0	--	203	Open Hole	Bedrock	SS/Phyl	N	--	N	--
CW-4	Collection Well	NPBA Collection Well subject to post-shutdown monitoring plan.	N	63.0	150.0	87.0	--	150	Open Hole	Bedrock	Phyl	N	--	N	--
CW-5	Collection Well	NPBA Collection Well subject to post-shutdown monitoring plan.	N	18.5	83.0	64.5	23-83	83	Screened	Bedrock	SS/Phyl	N	--	N	--
CW-6	Collection Well	NPBA Collection Well subject to post-shutdown monitoring plan.	N	30.0	145.0	115.0	--	145	Open Hole	Bedrock	Phyl	N	--	N	--
CW-7	Collection Well	NPBA Collection Well subject to post-shutdown monitoring plan.	N	61.0	150.0	89.0	--	150	Open Hole	Bedrock	Phyl	N	--	N	--
CW-7A	Collection Well	NPBA Collection Well subject to post-shutdown monitoring plan.	N	34.0	66.0	32.0	36-66	66	Screened	Overburden and Bedrock (5')	Phyl	Y	16.17	N	--
CW-9	Collection Well	WPL Extraction Well. Well intersects solution cavities, and is efficiently connected to the SW WPL. Sample active extraction system wells twice per year.	Y	47.0	50.0	3.0	--	70	Open Hole	Bedrock	LS	N	--	Y	27-41 / 50-70
CW-13	Collection Well	WPL Extraction Well. Well has small void and intersects solution cavities. Sample active extraction system wells twice per year.	Y	59.6	70.0	10.4	--	70	Open Hole	Bedrock	LS	Y	31.22	Y	60-63
CW-14	Collection Well	Inactive Collection Well. Replaced by CW-17 due to sediment entering the well. Currently not sampled on a regular basis.	N	36.0	80.0	44.0	36-80	80	Screened	Bedrock	LS	N	--	Y	26-42, 50-51
CW-15A	Collection Well	WPL Extraction Well. Well has small void and intersects solution cavities, but yield is limited. Sample active extraction system wells twice per year.	Y	18.0	68.0	50.0	18-68	70	Screened	Overburden and Bedrock	LS	Y	13.36	Y	45-49
CW-17	Collection Well	WPL Extraction Well. Well has large void and intersects solution cavities. Sample active extraction system wells twice per year.	Y	32.0	65.0	33.0	--	65	Open Hole	Bedrock	LS	N	--	Y	32-64
CW-20	Collection Well	WPL Extraction Well. Well has large voids and intersects sediment-filled solution cavities. It is very efficiently connected to CW-9 and numerous other wells that intersect solution cavities, including springs SW-17 and SW-26. Recently added to the WPL groundwater extraction system. Sample active extraction system wells twice per year.	Y	205.0	215.0	10.0	205-215	219	Screened					Y	54-56, 116-125, 131-141, 141-146, 146-153, 153-159.5, 167-169, 169-172, 172.5-177.5, 178-182, 184-
MW-1	Monitoring Well	Bedrock monitoring well located in the southern portion of the property, north of Rt. 30. Monitors the southern leading edge of the TCE/PCE plume.	N	39.0	54.0	15.0	--	54	Open Hole	Bedrock	LS	N	--	N	--
MW-2	Monitoring Well	EPBA bedrock monitoring well near former cyanide disposal area.	N	46.0	121.0	75.0	--	121	Open Hole	Bedrock	SS	N	--	N	--
MW-3	Monitoring Well	NPBA monitoring well. Included in the NPBA Monitored Shutdown plan.	N	50.0	102.0	52.0	--	102	Open Hole	Bedrock	SS/Q	N	--	N	--
MW-5	Monitoring Well	Shallow well screening the overburden/ limestone bedrock interface north of the CPA/WPA. Establishes diminishing TCE/PCE concentrations in this area.	N	10.0	53.0	43.0	10-51	53	Screened	Overburden and Bedrock	LS	N	--	N	-24-25
MW-6	Monitoring Well	Shallow well screening the overburden/limestone bedrock interface north of the WPL. Establishes the northern extent of the TCE/PCE plume.	N	7.0	40.0	33.0	8-38	40	Screened	Overburden and Bedrock	LS	N	--	N	--
MW-7	Monitoring Well	Shallow well screening the overburden/limestone bedrock interface in the east-central portion of the WPL, downgradient of NBldg4, an area where releases from degreaser and plating operations occurred.	N	13.0	35.0	22.0	15-35	35	Screened	Overburden and Bedrock	LS & SS	N	--	N	--
MW-8	Monitoring Well	Shallow well screening the overburden/limestone bedrock interface in the southeastern portion of the WPL, downgradient of SBldg4, an area where releases from degreaser operations occurred, and upgradient of the SW-WPL.	N	10.0	36.0	26.0	12-34	36	Screened	Overburden and Bedrock	LS & SS	Y	5.03	Y	32-33
MW-9	Monitoring Well	NPBA monitoring well. Included in the NPBA Monitored Shutdown plan.	N	59.0	97.0	38.0	--	97.0	Open Hole	Bedrock	SS/Phyl	N	--	N	--
MW-10	Monitoring Well	Bedrock well in the NPBA, downgradient of the eastern end of the extraction system. Not included in the NPBA Monitored Shutdown plan.	N	78.0	120.0	42.0	--	120.0	Open Hole	Bedrock	SS/Phyl	Y	0.18	N	--

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MW-11	Monitoring Well	NPBA monitoring well in the eastern portion of the extraction system area. Included in the NPBA Monitored Shutdown plan.	N	20.0	74.0	54.0	24-74	74.0	Screened	Overburden and Bedrock	SS	N	--	N	--
MW-12	Monitoring Well	NPBA monitoring well downgradient of the central portion of the extraction system area. Included in the NPBA Monitored Shutdown plan.	N	30.0	100.0	70.0	--	100.0	Open Hole	Bedrock	SS/Q	N	--	N	--
MW-14	Monitoring Well	EPBA monitoring well upgradient of the Eastern Landfill.	N	18.0	80.0	62.0	--	80	Open Hole	Bedrock	SS/Q	N	--	N	--
MW-15	Monitoring Well	EPBA bedrock monitoring well characterizing the PCE source originating along the perimeter road in this area.	N	40.0	120.0	80.0	--	120	Open Hole	Bedrock	SS/Q	N	--	N	--
MW-16D	Monitoring Well	Multi-level monitoring well in the central portion of the NPBA extraction system area. Included in the NPBA Monitored Shutdown plan.	N	190.0	201.0	11.0	193-198	201	Screened	Bedrock	SS/Q/Phyl	N	--	N	--
MW-16S	Monitoring Well	Multi-level monitoring well in the central portion of the NPBA extraction system area. Included in the NPBA Monitored Shutdown plan.	N	98.0	110.0	12.0	103-108	201	Screened	Bedrock	SS/Q/Phyl	Y	6.49	N	--
MW-17	Monitoring Well	Eastern area monitoring well screening the overburden/sandstone interface downgradient of the Eastern Landfill. Next to MW-68, providing shallow groundwater concentrations in this area.	N	15.0	79.0	64.0	19-79	79	Screened	Overburden and Bedrock	SS	Y	26.33	N	--
MW-18D	Monitoring Well	Multi-level monitoring well in the western portion of the NPBA extraction system area. Included in the NPBA Monitored Shutdown plan.	N	130.0	140.0	10.0	133-138	161	Screened	Bedrock	SS/Q/Phyl	Y	0.41	N	--
MW-18S	Monitoring Well	Multi-level monitoring well in the western portion of the NPBA extraction system area. Included in the NPBA Monitored Shutdown plan.	N	45.0	65.0	20.0	50-60	161	Screened	Bedrock	SS/Q/Phyl	Y	0.77	N	--
MW-19	Monitoring Well	Bedrock well upgradient of the NETT, open to the sandstone/quartzite.	N	30.0	120.0	90.0	--	120	Open Hole	Bedrock	SS/Q	N	--	N	--
MW-20D	Monitoring Well	Multi-level monitoring well in the eastern portion of the NPBA extraction system area. Included in the NPBA Monitored Shutdown plan.	N	153.0	165.0	12.0	158-163	165	Screened	Bedrock	SS/Q	N	--	N	--
MW-20M	Monitoring Well	Multi-level monitoring well in the eastern portion of the NPBA extraction system area. Included in the NPBA Monitored Shutdown plan.	N	72.0	85.0	13.0	78-73	165	Screened	Bedrock	SS/Q	N	--	N	--
MW-20S	Monitoring Well	Multi-level monitoring well in the eastern portion of the NPBA extraction system area. Included in the NPBA Monitored Shutdown plan.	N	28.0	61.0	33.0	28-58	61	Screened	Bedrock	SS/Q	N	--	N	--
MW-22	Monitoring Well	EPBA well monitoring groundwater in the quartzite/sandstone upgradient of the SPBA.	N	30.0	100.0	70.0	--	100	Open Hole	Bedrock	SS/Q	N	--	N	--
MW-26	Monitoring Well	Overburden monitoring well downgradient of the NETT	N	7.0	60.0	53.0	9-59	60.0	Screened	Overburden	OB	Y	34.82	Y	45-47
MW-28	Monitoring Well	Shallow overburden and limestone bedrock well in the YCIDA building footprint downgradient of the TCA Tank area. Retained for monitoring the concentration and mass in the aquifer. 1,4-dioxane is elevated in this well.	N	8.0	55.0	47.0	10-55	55.0	Screened	Overburden and Bedrock	LS	N	--	N	--
MW-30	Monitoring Well	Shallow bedrock monitoring well west of B41. Non-detect for TCE/PCE; defines the plume extent to the north.	N	14.0	23.0	10.5	--	41	Open Hole	Overburden and Bedrock	LS	N	--	N	--
MW-31D	Monitoring Well	Multi-level monitoring well in the north plant area identifies a small release area in this vicinity.	N	66.0	81.0	15.0	70-80	85	Screened	Bedrock	LS	Y	16.66	Y	61-69
MW-31S	Monitoring Well	Multi-level monitoring well in the north plant area identifies a small release area in this vicinity.	N	12.0	36.0	24.0	14-34	85	Screened	Overburden	OB	Y	19.03	N	--
MW-32D	Monitoring Well	Multi-level well in the YCIDA building footprint downgradient of the TCA Tank area. Retained for monitoring the concentration and mass in the aquifer. 1,4-dioxane is elevated in this well.	N	196.0	220.0	24.0	210-220	220	Screened	Bedrock	LS	N	--	Y	22-45
MW-32S	Monitoring Well	Multi-level well in the YCIDA building footprint downgradient of the TCA Tank area. Retained for monitoring the concentration and mass in the aquifer.	N	133.0	148.0	15.0	138-148	220	Screened	Bedrock	LS	N	--	N	--
MW-36D	Monitoring Well	Multilevel monitoring well north of B41. Defines the edge of TCE/PCE plume in this area.	N	67.0	83.0	16.0	70-80	83	Screened	Bedrock	LS	Y	12.38	N	--
MW-36S	Monitoring Well	Multilevel monitoring well north of B41. Defines the edge of TCE/PCE plume in this area.	N	18.0	41.0	23.0	20-40	83	Screened	Overburden and Bedrock	LS	Y	12.92	Y	24-39
MW-37D	Monitoring Well	Multilevel monitoring well in the SW-WPL, screening the intermediate bedrock zone. The SW-WPL is an important source area and proximal to extraction well CW-20.	Y	125.0	141.0	16.0	131-141	141	Screened	Bedrock	LS	N	--	Y	137-138

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MW-37S	Monitoring Well	Multilevel monitoring well in the SW-WPL, screening the overburden/bedrock interface. The SW-WPL is an important source area and proximal to extraction well CW-20.	Y	11.0	33.0	22.0	12-32	141	Screened	Overburden and Bedrock	LS	N	--	N	--
MW-38D	Monitoring Well	Bedrock monitoring well in the west central WPL. Not currently selected for sampling.	N	80.0	103.0	23.0	85-95	103	Screened	Bedrock	LS	N	--	N	--
MW-39D	Monitoring Well	Multilevel monitoring well in the NW-WPL, screening a large sediment-filled void in the shallow bedrock zone. This well is efficiently connected to CW-17. If CW-17 were turned off, this well would effectively monitor the impacts.	N	53.0	100.0	47.0	55-65	100	Screened	Bedrock	LS	N	--	Y	30-80 / 81-84
MW-39S	Monitoring Well	Multilevel monitoring well in the NW-WPL, screening the overburden/bedrock interface.	N	3.0	30.0	27.0	4-24	100	Screened	Overburden and Bedrock	LS	N	--	N	--
MW-40D	Monitoring Well	Multilevel well located south of the storm water management basin along Rt 30. This well monitors the southern extent of the TCE/PCE plume in this area. It is downgradient of the Bldg 58 area.	N	78.0	103.0	25.0	82-92	103	Screened	Bedrock	LS	N	--	Y	37-48 / 71-103 several voids
MW-43D	Monitoring Well	Bedrock monitoring well near the intersection of Eden Road and Rt 30. Monitors the leading edge of the southwestward migrating TCE/PCE plume.	N	79.0	92.0	13.0	82-92	92	Screened	Bedrock	LS	Y	19.36	N	--
MW-43S	Monitoring Well	Residuum monitoring well near the intersection of Eden Road and Rt 30. Monitors the leading edge of the southwestward migrating TCE/PCE plume.	N	19.0	48.0	29.0	25-45	50	Screened	Overburden and Bedrock	SS	Y	15.75	Y	38-41
MW-45	Monitoring Well	Bedrock monitoring well west of former BLDG4. Retained to continue monitoring concentration and mass in the aquifer in this area.	N	6.0	38.0	32.0	8-38	38	Screened	Overburden and Bedrock	LS	Y	7.08	N	--
MW-46	Monitoring Well	Bedrock monitoring well west of former BLDG4. Retained to continue monitoring concentration and mass in the aquifer in this area.	N	6.0	39.0	33.0	8-38	39	Screened	Overburden and Bedrock	LS	Y	6.74	N	--
MW-47	Monitoring Well	Bedrock monitoring well west of former BLDG4. Retained to continue monitoring concentration and mass in the aquifer in this area. This well is downgradient of former plating operations and will be monitored for chromium when sampled.	N	12.0	56.0	44.0	15-35	56	Screened	Overburden	OB	Y	35.79	Y	33-56
MW-49D	Monitoring Well	Multilevel well near the NBldg4, an area where releases from degreaser and plating operations occurred. 1,4-dioxane is elevated in this well.	N	201.0	220.0	19.0	202-212	220	Screened	Bedrock	LS	Y	10.09	Y	38-48
MW-49S	Monitoring Well	Multilevel well near the NBldg4, an area where releases from degreaser and plating operations occurred. 1,4-dioxane is elevated in this well.	N	134.0	158.0	24.0	135-140	220	Screened	Bedrock	LS	Y	9.61	Y	38-48
MW-50D	Monitoring Well	Multilevel well downgradient the NBldg4, an area where releases from degreaser and plating operations occurred. 1,4-dioxane is elevated in this well.	N	157.0	170.0	13.0	160-170	170	Screened	Bedrock	LS	Y	36.16	Y	27-34 / 66-67
MW-50S	Monitoring Well	Multilevel well downgradient the NBldg4, an area where releases from degreaser and plating operations occurred.	N	104.0	125.0	21.0	110-120	170	Screened	Bedrock	LS	Y	37.72	Y	27-34 / 66-67
MW-51D	Monitoring Well	Multilevel well downgradient the NBldg4, an area where releases from degreaser and plating operations occurred. 1,4-dioxane and chromium are elevated in this well.	N	88.0	120.0	32.0	110-120	120.0	Screened	Bedrock	LS	N	--	Y	37-44
MW-51S	Monitoring Well	Multilevel well downgradient the NBldg4, an area where releases from degreaser and plating operations occurred. 1,4-dioxane and chromium are elevated in this well.	N	34.0	51.0	17.0	34-44	51.0	Screened	Bedrock	LS	N	--	Y	38-51
MW-56	Monitoring Well	Overburden monitoring well on the western property line of the east campus. Relatively low concentrations of CVOCs.	N	20.0	37.0	17.0	27-37	37.0	Screened	Overburden	OB	Y	17.15	N	--
MW-57	Monitoring Well	Overburden well southwest of Building 58. This is a key location with respect to the potential for southerly migration of the Bldg 58 CVOC source after shut down of CW-8.	N	25.0	35.0	10.0	25-35	38	Screened	Overburden	OB	Y	17.25	N	--
MW-64D	Monitoring Well	SPBA Overburden Bedrock Monitoring Well. Monitors TCE and PCE concentrations in the underlying carbonate bedrock aquifer.	N	68.0	77.0	9.0	70-75	92	Screened	Bedrock	LS	N	--	Y	79-80
MW-64S	Monitoring Well	SPBA Overburden Bedrock Monitoring Well. Monitors TCE and PCE concentrations in groundwater in residuum prior to migrating vertically downward into the underlying carbonate bedrock aquifer.	N	33.0	42.0	9.0	35-40	92	Screened	Overburden	OB	Y	23.60	N	--
MW-65D	Monitoring Well	EPBA multilevel monitoring well along the perimeter road, and upgradient of the Eastern Landfill. Primarily TCE in decreasing concentrations with depth.	N	89.0	103.0	14.0	92.25-102.25	103	Screened	Bedrock	Q	N	--	Y	--
MW-65S	Monitoring Well	EPBA multilevel monitoring well along the perimeter road, and upgradient of the Eastern Landfill. Primarily TCE in decreasing concentrations with depth.	N	71.3	86.0	14.7	75-85	103	Screened	Bedrock	Q	N	--	N	--
MW-66D	Monitoring Well	Multilevel monitoring well downgradient of the Eastern Landfill.	N	81.4	100.0	18.6	84.5-99.5	100	Screened	Bedrock	Q	N	--	Y	92.5-94?
MW-66S	Monitoring Well	Multilevel monitoring well downgradient of the Eastern Landfill.	N	47.2	100.0	52.8	50-60	100	Screened	Bedrock	Q	N	--	N	--

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York, PA

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MW-67D	Monitoring Well	Multilevel monitoring well downgradient of the Eastern Landfill.	N	58.0	71.0	13.0	60-70	71	Screened	Bedrock	Q	Y	30.95	N	--
MW-67S	Monitoring Well	Multilevel monitoring well downgradient of the Eastern Landfill.	N	12.8	31.0	18.2	15-30	71	Screened	Overburden	OB	Y	20.52	N	--
MW-68	Monitoring Well	Bedrock monitoring well downgradient of the Eastern Landfill. Next to MW-17, providing deeper groundwater concentrations in this area.	N	80.0	105.0	25.0	--	105	Open Hole	Bedrock	Q	Y	30.47	Y	87.5-88
MW-69	Monitoring Well	Bedrock monitoring well in the vicinity of the former firing ranges.	N	77.0	126.0	49.0	--	126	Open Hole	Bedrock	LS	Y	61.89	N	--
MW-70D	Monitoring Well	Multilevel well in the NETT.	N	68.0	85.0	17.0	68-78	85	Screened	Bedrock	SS/Q/Phyl	Y	23.11	N	--
MW-70S	Monitoring Well	Multilevel well in the NETT.	N	15.8	35.0	19.2	18-33	85	Screened	Overburden	OB	Y	23.20	N	--
MW-74D	Monitoring Well	Multilevel well in the NW-WPL. Characterizes the vertical profile in conjunction with MW-39S&D	N	220.0	250.0	30.0	225-250	250	Screened	Bedrock	LS	Y	13.80	Y	40-45.5 / 53-56 / 61-75
MW-74S	Monitoring Well	Multilevel well in the NW-WPL. Characterizes the vertical profile in conjunction with MW-39S&D	Y	175.0	201.0	26.0	183-193	250	Screened	Bedrock	LS	Y	13.35	Y	40-45.5 / 53-56 / 61-75
MW-75D	Monitoring Well	Multilevel well in the SW-WPL. Characterizes the vertical profile in conjunction with MW-37S&D and Waterloo well MW-136A	Y	200.0	217.0	17.0	205-215	217	Screened	Bedrock	LS	N	--	Y	81-82 / 101-106 / 154-160 / 170.5-189 / 211-212
MW-75S	Monitoring Well	Multilevel well in the SW-WPL. Characterizes the vertical profile in conjunction with MW-37S&D and Waterloo well MW-136A	Y	151.0	190.0	39.0	168-173	190	Screened	Bedrock	LS	N	--	Y	83-84 / 140-146 / 154-188.5
MW-77	Monitoring Well	Monitoring well in overburden downgradient of the T-4 gasoline tank/dispenser leak and remediation.	Y	35.0	67.0	32.0	40-65	67	Screened	Overburden	OB	Y	39.40	N	--
MW-78	Monitoring Well	Residuum well in North Plant Area west of storm water pond. Defines the northern limit of CVOCs. Couplet with MW-84.	N	7.5	39.0	31.5	10-35	39	Screened	Overburden	OB	Y	21.46	N	--
MW-79	Monitoring Well	Overburden Monitoring Well. East of building 2 corridor. Historically low concentrations. Not recommended for regular sampling. Review monitoring program after remedial alternative chosen for WPL or extraction system modified or shut down.	N	17.0	42.0	25.0	20-40	42	Screened	Overburden	OB	Y	17.39	N	--
MW-80	Monitoring Well	Overburden well in Building 58 source area.	N	17.5	41.0	23.5	20.5-40.5	41	Screened	Overburden	OB	Y	15.04	N	--
MW-81S	Monitoring Well	Multilevel source area well in the BLDG 2 Eastern Corridor in the Central Plant Area. Retained well within the YCIDA building footprint.	N												
MW-81D	Monitoring Well	Multilevel source area well in the BLDG 2 Eastern Corridor in the Central Plant Area. Retained well within the YCIDA building footprint.	N	52.0	66.0	14.0	56-65	66	Screened	Bedrock	LS	Y	16.15	Y	47-48, 55-56
MW-82	Monitoring Well	Monitoring well in the carbonate north of North Plant Area. Relatively low concentrations of CVOCs.	N	53.5	76.0	22.5	--	76	Open Hole	Bedrock	LS	Y	7.70	N	--
MW-84	Monitoring Well	Bedrock well in North Plant Area west of storm water pond. Defines the northern limit of CVOCs. Couplet with MW-78.	N	67.0	98.0	31.0	75-95	98	Screened	Bedrock	LS	Y	45.40	Y	66.5-71 / 74-77
MW-85	Monitoring Well	Bedrock monitoring well near the western end of the southern storm water basin near Rt. 30. Water level influenced by storm water discharging to nearby sink hole. Not a good well for groundwater chemistry monitoring.	N	120.0	150.0	30.0	--	150	Open Hole	Bedrock	LS	N	--	N	--
MW-86D	Monitoring Well	Multilevel monitoring well screened sandstone downgradient of the former firing ranges and upgradient of the NETT.	N	67.0	98.5	31.5	70-80	98.5	Screened	Bedrock	Q	Y	47.37	N	--
MW-86S	Monitoring Well	Multilevel monitoring well screened in residuum downgradient of the former firing ranges and upgradient of the NETT.	N	10.0	32.5	22.5	12-27	98.5	Screened	Overburden	Q	Y	42.85	N	--
MW-87	Monitoring Well	Bedrock well in Building 58 source area.	N	67.0	98.0	31.0	75-95	98	Screened	Overburden and Bedrock	OB/LS	Y	16.71	Y	43-98
MW-88	Monitoring Well	Bedrock monitoring well southwest of BLDG 58 source area. Critical area with respect to monitoring groundwater flow direction after shutdown of CW-8.	N	30.0	50.0	20.0	--	50	Open Hole	Bedrock	LS	N	--	N	--
MW-91	Monitoring Well	EPBA bedrock monitoring well characterizing the PCE source originating along the perimeter road in this area, and migrating southward toward the SPBA.	N	50.0	75.0	25.0	--	75	Open Hole	Bedrock	Q	N	--	N	--

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MW-92	Monitoring Well	EPBA bedrock monitoring well characterizing the PCE source originating along the perimeter road in this area, and migrating southward toward the SPBA.	N	50.0	100.5	50.5	--	100.5	Open Hole	Bedrock	Q	N	--	N	--
MW-93D	Monitoring Well	Bedrock couplet in the SW-WPL, and downgradient of the SW-WPL source area. Key well in monitoring the migration westward from the WPL, and potential changes as a result of the initiation of CW-20 pumping in the SW-WPL.	Y	134.7	160.0	25.3	134.7-144.7	160	Screened	Bedrock	LS/Dolo	Y	4.18	Y	48-54.5 / 142-160
MW-93S	Monitoring Well	Shallow residuum couplet in the SW-WPL, and downgradient of the SW-WPL source area. Key well in monitoring the migration westward from the WPL, and potential changes as a result of the initiation of CW-20 pumping in the SW-WPL.	Y	24.0	45.0	21.0	26.2-41.2	45	Screened	Bedrock	LS/Dolo	N	--	N	29-30; 39.5-40
MW-95	Monitoring Well	Monitoring well screens the top of bedrock in the extreme northern corner of the WWPL. Defines the northern edge of the CVOC plume in this area.	N	37.0	49.5	12.5	39.5-49.5	51	Screened	Bedrock	LS			N	--
MW-96D	Monitoring Well	Deeper bedrock couplet in the NW-WPL monitoring water quality below Area B (capped area).	N	75.0	87.5	12.5	77.5-87.5	90	Screened	Bedrock	LS			Y	71-72, 74-75, 78-90
MW-96S	Monitoring Well	Shallow bedrock couplet in the NW-WPL monitoring water quality below Area B (capped area).	N	27.0	39.0	12.0	29-39	70.5	Screened	Bedrock	LS			Y	33-34
MW-97	Monitoring Well	Bedrock well in the central WWPL. Intersects solution channel, would monitor exiting groundwater absent extraction system operation.	N	66.0	80.0	14.0	70-80	80	Screened	Bedrock	LS			Y	48-55, 62-80+ bottom of void unknown
MW-98D	Monitoring Well	Northern-most Levee Monitoring Well. Penetrates the phyllite below the carbonate aquifer.	Y	128.0	171.0	43.0	131-171	172	Screened	Bedrock	LS/Phyl			Y	29-31, 33-33.5, 36.5-39.5, 43.5-44.75, 46-49, 63-65, 66-70.5, 71-72.5, 77-88
MW-98I	Monitoring Well	Northern-most Levee Monitoring Well. Screens the carbonate aquifer and defines the groundwater quality discharging to the Codorus Creek.	Y	98.0	105.0	7.0	100-105	109	Screened	Bedrock	LS/Phyl			Y	36-38, 39-58, 60-64, 67-69, 76-81, 84-87, 89-90
MW-98S	Monitoring Well	Northern-most Levee Monitoring Well. Screens the carbonate aquifer and defines the groundwater quality discharging to the Codorus Creek.	Y	58.0	68.0	10.0	61-68	109	Screened	Bedrock	LS			Y	36-38, 39-58, 60-64, 67-69
MW-99D	Monitoring Well	Levee Monitoring Well. Screens the deeper carbonate aquifer and defines the groundwater quality discharging to the Codorus Creek.	Y	125.5	142.0	16.5	132-142	150	Screened	Bedrock	LS			Y	26-27, 34-35, 38.5-41, 46.5-52, 55-56, 67-86, 93-96.5, 98-100, 114-118.5,
MW-99S	Monitoring Well	Levee Monitoring Well. Screens the shallow carbonate aquifer and defines the groundwater quality discharging to the Codorus Creek.	Y	57.8	74.3	16.5	64.3-74.3	75	Screened	Bedrock	LS			Y	33-35, 41-44, 49-51, 55-56, 67-74
MW-100D	Monitoring Well	Levee Monitoring Well. Screens the deeper carbonate aquifer and defines the groundwater quality discharging to the Codorus Creek.	Y	93.0	114.0	21.0	104-114	121	Screened	Bedrock	LS			Y	74-75, 103-121
MW-100I	Monitoring Well	Levee Monitoring Well. Screens the intermediate carbonate aquifer and defines the groundwater quality discharging to the Codorus Creek.	Y	60.0	66.0	6.0	61-65	66	Screened	Bedrock	LS			Y	42-43, 44-45, 49-51
MW-100S	Monitoring Well	Levee Monitoring Well. Screens the top of bedrock and defines the groundwater quality discharging to the Codorus Creek.	Y	45.0	51.0	6.0	46-51	66	Screened	Bedrock	LS			Y	42-43, 44-45, 49-51
MW-101D	Monitoring Well	Southern-most Levee Monitoring Well. Screens the deeper carbonate aquifer and defines the groundwater quality discharging to the Codorus Creek.	N	76.0	115.0	39.0	85-115	151	Screened	Bedrock	LS			N	--
MW-101S	Monitoring Well	Southern-most Levee Monitoring Well. Screens the shallow carbonate aquifer and defines the groundwater quality discharging to the Codorus Creek.	N	18.0	40.0	22.0	20-40	51.3	Screened	Overburden and Bedrock	LS			N	--
MW-102D	Monitoring Well	Well couplet in the NETT. Included in the NPBA Monitored Shutdown plan.	N	75.0	99.0	24.0	--	99	Open Hole	Bedrock	SS			Y	82-83
MW-102S	Monitoring Well	Well couplet in the NETT. Included in the NPBA Monitored Shutdown plan.	N	41.0	65.0	24.0	45-65	65	Screened	Overburden	OB			Y	--
MW-103D	Monitoring Well	Well couplet in the NETT. Included in the NPBA Monitored Shutdown plan.	N	94.7	106.7	12.0	96.7-106.7	107	Screened	Bedrock	Phyl/Q			Y	87-88, 98-107+ bottom of void unknown
MW-103S	Monitoring Well	Well couplet in the NETT. Included in the NPBA Monitored Shutdown plan.	N	62.3	87.5	25.2	67.5-87.5	87.5	Screened	Overburden	OB			N	--
MW-104	Monitoring Well	Overburden well upgradient of the NETT and down gradient of the Bldg 14 artillery range butts.	N	15.0	28.0	13.0	18-28	29	Screened	Overburden	OB			N	--
MW-105	Monitoring Well	Overburden well upgradient of Area B (capped area).	N	10.0	22.0	12.0	12-22	22	Screened	Overburden	OB			N	--
MW-106	Monitoring Well	Overburden well in the central WWPL. Adjacent to MW-97.	N	15.0	28.0	13.0	18-28	29	Screened	Overburden	OB			N	--

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MW-107	Monitoring Well	Overburden well in the SW WPL. Defines the southern edge of source area.	Y	11.0	23.0	12.0	13-23	23	Screened	Overburden	OB			N	--
MW-108D	Monitoring Well	Bedrock monitoring well couplet east of the SPBA.	N	72.0	149.0	77.0	--	149	Open Hole	Bedrock	LS/SS/Q			Y	124-125
MW-108S	Monitoring Well	Overburden monitoring well couplet east of the SPBA.	N	22.9	55.1	32.2	25.1-55-1	68.5	Screened	Overburden	OB			N	--
MW-109D	Monitoring Well	Bedrock monitoring well couplet south of the SPBA along Old Arsenal Road. Groundwater chemistry Influenced by Rutter's gasoline spill.	N	88.0	100.0	12.0	NA	100	Screened	Bedrock	LS			Y	80-82
MW-109S	Monitoring Well	Residuum monitoring well couplet south of the SPBA along Old Arsenal Road. Groundwater chemistry Influenced by Rutter's gasoline spill.	N	42.9	65.0	22.1	45-65	65	Screened	Overburden	OB			N	--
MW-110	Monitoring Well	Bedrock monitoring well couplet south of the SPBA along Old Arsenal Road. Screens the top of bedrock.	N	31.5	44.0	12.5	34-44	55	Screened	Bedrock	LS			Y	41-55+ bottom of void unknown
MW-111	Monitoring Well	Bedrock monitoring well east of Bldg 3. Relatively low concentrations.	N	82.0	149.0	67.0	--	149	Open Hole	Bedrock	Phyl/Q			N	--
MW-112	Monitoring Well	Bedrock monitoring well near the southwest corner of Bldg 3. Relatively low concentrations.	N	97.5	120.0	22.5	100-120	120	Screened	Bedrock	LS			N	--
MW-113	Monitoring Well	Relatively deep well screened in a solution cavity in the Bldg 58 source area.	N	125.0	151.0	26.0	131-151	159	Screened	Bedrock	LS			Y	53-55, 56-57, 73-85, 87-95, 98-107, 138-152, 154-159+ bottom of void
MW-114	Monitoring Well	East Bldg 2 Corridor well in the Central Plant Area. Retained well within the YCIDA building footprint.	N	90.0	143.7	53.7	--	143.7	Open Hole	Bedrock	LS			Y	50-53, 79-80
MW-115	Monitoring Well	Bedrock monitoring well on the east side of Bldg 2. Historically low concentrations. Defines the eastern limit of the Bldg 2 source area.	N	111.5	124.5	13.0	114.5-124.5	125	Screened	Bedrock	LS			Y	117-119
MW-116	Monitoring Well	Shallow bedrock monitoring well north of Bldg 41. Characterized the contaminants from WWTP operations.	N	27.0	50.8	23.8	30.8-50.8	50.8	Screened	Overburden and Bedrock	Phyl/LS			N	--
MW-126	Monitoring Well	Shallow groundwater monitoring well north of Bldg 58 source area.	N	35.0	27.0	8.0	37-57.5	62	Screened	Bedrock	LS	Y	23-30	Y	50-61
MW-127	Monitoring Well	Shallow groundwater monitoring well south of Bldg 58 source area. Key location to monitor groundwater migration changes after cessation of CW-8 pumping.	N	57.7	24.3	33.4	61-82	82	Screened	Bedrock	LS	N	--	Y	51-75
MW-128	Monitoring Well	Shallow groundwater monitoring well northeast of Bldg 58 source area.	N	49.0	24.0	25.0	52-73	73	Screened	Bedrock	LS	N	--	Y	34-41

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MW-129	Monitoring Well	Shallow groundwater monitoring well west of Bldg 58 source area. Key location to monitor groundwater migration changes after cessation of CW-8 pumping.	N	40.0	24.0	16.0	44-64	64	Screened	Bedrock	LS	N	--	Y	48-61
MW-131	Monitoring Well	East Bldg 2 Corridor well in the Central Plant Area. Retained well within the YCIDA building footprint for determination of mass and extent in the aquifer.	N	24.0	22.0	2.0	26-46	46	Screened	Overburden and Bedrock	LS/OB	Y	25-35	N	--
MW-134	Monitoring Well	Shallow monitoring well west of the East Bldg 2 Corridor source area in the Central Plant Area. Retained well within the YCIDA building footprint for determination of mass and extent in the aquifer.	N	42.0	23.0	19.0	43.5-64.5	65	Screened	Bedrock	LS	N	--	Y	46-64
MW-136A (270-348)	Monitoring Well	Waterloo well with multiple ports located in the SW-WPL to define the vertical extent of CVOCs in this area. Key location for monitoring the influence of CW-20 on the SW-WPL source area. Also used for determination of mass and extent in the aquifer.	N	270.0	348.0	78.0	--	467	Open Hole	Bedrock	LS	N	--	N	--
MW-136A (356-356.5)	Monitoring Well	Waterloo well with multiple ports located in the SW-WPL to define the vertical extent of CVOCs in this area. Key location for monitoring the influence of CW-20 on the SW-WPL source area. Also used for determination of mass and extent in the aquifer.	N	351.0	365.5	14.5	356-356.5	467	Screened	Bedrock	LS	N	--	Y	355-357.5
MW-136A (372.5-373)	Monitoring Well	Waterloo well with multiple ports located in the SW-WPL to define the vertical extent of CVOCs in this area. Key location for monitoring the influence of CW-20 on the SW-WPL source area. Also used for determination of mass and extent in the aquifer.	N	368.5	378.0	9.5	372.5-373	467	Screened	Bedrock	LS	N	--	Y	373.75-374
MW-136A (434-434.5)	Monitoring Well	Waterloo well with multiple ports located in the SW-WPL to define the vertical extent of CVOCs in this area. Key location for monitoring the influence of CW-20 on the SW-WPL source area. Also used for determination of mass and extent in the aquifer.	N	429.0	438.5	9.5	434-434.5	467	Screened	Bedrock	LS	N	--	N	--
MW-136A (459.5-460)	Monitoring Well	Waterloo well with multiple ports located in the SW-WPL to define the vertical extent of CVOCs in this area. Key location for monitoring the influence of CW-20 on the SW-WPL source area. Also used for determination of mass and extent in the aquifer.	N	441.5	467.0	25.5	459.5-460	467	Screened	Bedrock	Dolo	N	--	N	--
MW-137A (295.5-296)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the TCA Tank area. Retained to determine mass and extent in the aquifer.	N	270.0	306.0	36.0	295.5-296	452	Screened	Bedrock	LS	N	--	Y	285-296
MW-137A (343-343.5)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the TCA Tank area. Retained to determine mass and extent in the aquifer.	N	340.0	350.5	10.5	343-343.5	452	Screened	Bedrock	LS	N	--	N	--
MW-137A (343-343.5)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the TCA Tank area. Retained to determine mass and extent in the aquifer.	N	340.0	350.5	10.5	343-343.5	452	Screened	Bedrock	LS	N	--	N	--
MW-137A (343-343.5)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the TCA Tank area. Retained to determine mass and extent in the aquifer.	N	340.0	350.5	10.5	343-343.5	452	Screened	Bedrock	LS	N	--	N	--
MW-137A (343-343.5)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the TCA Tank area. Retained to determine mass and extent in the aquifer.	N	340.0	350.5	10.5	343-343.5	452	Screened	Bedrock	LS	N	--	N	--
MW-138A	Monitoring Well	Deep well defining the vertical extent of the Bldg 58 source area.	N	260.0	320.0	60.0	260-320	320	Screened	Bedrock	LS/Dolo	N	--	Y	145-174
MW-139A (305-305.5)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the NBldg4 area. Retained to determine mass and extent in the aquifer.	N	295.0	325.5	30.5	305-305.5	470	Screened	Bedrock	Dolo	N	--	N	--
MW-139A (333.5-334)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the NBldg4 area. Retained to determine mass and extent in the aquifer.	N	328.5	357.0	28.5	333.5-334	470	Screened	Bedrock	Dolo	N	--	N	--
MW-139A (365-365.5)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the NBldg4 area. Retained to determine mass and extent in the aquifer.	N	360.0	370.5	10.5	365-365.5	470	Screened	Bedrock	Dolo	N	--	N	--

TABLE 2-1
Well Information
Harley-Davidson Motor Company Operations, Inc.
York, PA

Well Identification	TYPE	Well Description Related to Monitoring	Well Intersects Conduit?	Depth to Top of Open Interval (ft bgs)	Depth to Base of Open Interval (ft bgs)	Open Interval Length (ft)	Screened Interval (ft bgs)	Drilled Depth (ft bgs)	Well Construction	Open to Which Unit	Rock Type	Saturated Overburden	Saturated Overburden Thickness (ft)	Voids	Void Interval (ft bgs)
MW-139A (421.5-422)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the NBldg4 area. Retained to determine mass and extent in the aquifer.	N	416.5	426.0	9.5	421.5-422	470	Screened	Bedrock	Dolo	N	--	N	--
MW-139A (454-454.5)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the NBldg4 area. Retained to determine mass and extent in the aquifer.	N	452.0	470.0	18.0	454-454.5	470	Screened	Bedrock	Dolo	N	--	N	--
MW-140A (209.5-210)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the EBldg2 Corridor area. Retained to determine mass and extent in the aquifer.	N	205.0	215.0	10.0	209.5-210	417	Screened	Bedrock	Marble	N	--	Y	--
MW-140A (285-285.5)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the EBldg2 Corridor area. Retained to determine mass and extent in the aquifer.	N	278.5	289.3	10.8	285-285.5	417	Screened	Bedrock	Dolo/quartzite	N	--	Y	--
MW-140A (323.5-324)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the EBldg2 Corridor area. Retained to determine mass and extent in the aquifer.	N	318.5	326.0	7.5	323.5-324	417	Screened	Bedrock	Quartzite	N	--	Y	--
MW-140A (372-372.5)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the EBldg2 Corridor area. Retained to determine mass and extent in the aquifer.	N	367.0	378.5	11.5	372-372.5	417	Screened	Bedrock	Phyllite	N	--	Y	--
MW-140A (407.5-408)	Monitoring Well	Waterloo well with multiple ports located in the YCIDA Bldg footprint to determine the vertical extent of CVOCs in the EBldg2 Corridor area. Retained to determine mass and extent in the aquifer.	N	402.5	416.0	13.5	407.5-408	417	Screened	Bedrock	Phyllite	N	--	Y	--

TABLE 2-1
Well Information
Harley-Davidson Motor Company Operations, Inc.
York, PA

Well Identification	TYPE	Well Description Related to Monitoring	Well Intersects Conduit?	Depth to Top of Open Interval (ft bgs)	Depth to Base of Open Interval (ft bgs)	Open Interval Length (ft)	Screened Interval (ft bgs)	Drilled Depth (ft bgs)	Well Construction	Open to Which Unit	Rock Type	Saturated Overburden	Saturated Overburden Thickness (ft)	Voids	Void Interval (ft bgs)
MW-141A	Monitoring Well	Deep well defining the vertical extent of CVOCs in the SPBA area.	N	200.0	100.0	100.0	NA	300	Open Hole	Bedrock	LS/Dolo	Y	42.00	Y	101-103
MW-142D	Monitoring Well	NPBA multilevel monitoring well downgradient of the of the extraction system. Included in the NPBA Monitored Shutdown plan.	N	122.0	23.4	23.4	125-140	151	Screened	Bedrock	SS/Phyl	N	--	N	--
MW-142S	Monitoring Well	NPBA multilevel monitoring well downgradient of the of the extraction system. Included in the NPBA Monitored Shutdown plan.	N	56.0	14.0	14.0	58.5-68.5	70	Screened	Bedrock	SS/Phyl	N	--	N	--
MW-143D	Monitoring Well	NPBA multilevel monitoring well downgradient of the of the extraction system. Included in the NPBA Monitored Shutdown plan.	N	117.4	16.6	16.6	120.5-130.5	150	Screened	Bedrock	Dolo	Y	33.00	N	--
MW-143S	Monitoring Well	NPBA multilevel monitoring well downgradient of the of the extraction system. Included in the NPBA Monitored Shutdown plan.	N	24.0	30.5	30.5	29.8-49.8	54.5	Screened	Overburden	OB	Y	33.00	N	--
MW-144	Monitoring Well	Shallow levee monitoring well near MW-98, the northern-most levee well.	N	12.0	12.0	12.0	14.1-24.1	24.1	Screened	Overburden	OB	Y	5.10	N	--
MW-145A	Monitoring Well	Deep bedrock monitoring well on the levee used to define the vertical extent of the CVOC plume and upward vertical head in this area. Characterizes the groundwater quality discharging to Codorus Creek in this area.	Y	200.0	50.0	50.0	NA	250	Open Hole	Bedrock	LS/Dolo	Y	5.50	Y	36-43, 51-54.5, 91.2-92.7, 100.5-101.5, 102-102.4, 105.3-109.6, 110-110.5,
MW-146	Monitoring Well	Shallow levee monitoring well near MW-100. Defines the shallowest portion of the aquifer discharging to the creek.	Y	13.0	12.0	12.0	15-25	25	Screened	Overburden	OB	Y	5.00	N	--
MW-147A	Monitoring Well	Deep bedrock monitoring well on the levee used to define the vertical extent of the CVOC plume and upward vertical head in this area. Characterizes the groundwater quality discharging to Codorus Creek in this area.	Y	200.0	50.0	50.0	NA	250	Open Hole	Bedrock	LS/Dolo	Y	2.00	Y	33.5-42.3, 207-215
MW-148A (72.5-73)	Monitoring Well	Waterloo multilevel monitoring well on the west side of the levee used to determine no migration beyond the Creek, and limited carbonate aquifer in the "Northwest Passage" area.	N	67.0	78.0	11.0	72.5-73	221	Screened	Bedrock	Phyl/Ls/Dolo	N	--	N	
MW-148A (136-136.5)	Monitoring Well	Waterloo multilevel monitoring well on the west side of the levee used to determine no migration beyond the Creek, and limited carbonate aquifer in the "Northwest Passage" area.	N	130.0	140.5	10.5	136-136.5	221	Screened	Bedrock	Phyl/Ls/Dolo	N	--	N	
MW-148A (218-218.5)	Monitoring Well	Waterloo multilevel monitoring well on the west side of the levee used to determine no migration beyond the Creek, and limited carbonate aquifer in the "Northwest Passage" area.	N	210.7	221.0	10.3	2180-218.5	221	Screened	Bedrock	Phyl/Ls/Dolo	N	--	N	
MW-150	Monitoring Well	Bedrock well south of Rt 30 characterizes the off-Site extent of the CVOC plume. Monitors the leading edge of the plume.	N	147.5	200.0	52.5	150-200	200	Screened	Bedrock	Marble	Y	?	N	--
MW-151	Monitoring Well	Bedrock well south of Rt 30 characterizes the off-Site extent of the CVOC plume. Monitors the leading edge of the plume.	N	20.2	72.0	51.8	22-72	72	Screened	Bedrock	Ls/Dolo/Q	N	--	N	--
MW-152 (23-23.5)	Monitoring Well	Waterloo multilevel monitoring well south of Rt. 30. Used to determine extent of CVOC plume migration did not reach this far.	N	10.0	30.0	20.0	23-23.5	200	Screened	Bedrock	Ls/Dolo	N	--	Y	24-26, 28-29
MW-152 (137.5-138)	Monitoring Well	Waterloo multilevel monitoring well south of Rt. 30. Used to determine extent of CVOC plume migration did not reach this far.	N	122.5	200.0	77.5	137.5-138	200	Screened	Bedrock	Ls	N	--	Y	24-26, 28-29
MW-155	Monitoring Well	Overburden monitoring well near the wetlands between the WPL and Codorus Creek.	N	10.5	24.0	13.5	14-24	24	Screened	Bedrock	Ls	Y	19-20	N	--
MW-156	Monitoring Well	Overburden monitoring well near the wetlands between the WPL and Codorus Creek.	N	4.0	22.0	18.0	7-22	24	Screened	Overburden	OB	Y	18.00	N	--
MW-161	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	53.0	65.7	12.7	55.7-65.7	66	Screened	Overburden	OB	Y	43.3-66	N	--
MW-162	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	41.0	53.0	12.0	43-53	57	Screened	Overburden	OB	Y	?	N	--
MW-163	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	32.8	55.0	22.2	35-55	57	Screened	Bedrock	Ls	Y	28-57	N	--
MW-164	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	40.0	53.0	13.0	43-53	53	Screened	Bedrock	SS/Q	N	--	N	--

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Well Information
Harley-Davidson Motor Company Operations, Inc.
York, PA

Well Identification	TYPE	Well Description Related to Monitoring	Well Intersects Conduit?	Depth to Top of Open Interval (ft bgs)	Depth to Base of Open Interval (ft bgs)	Open Interval Length (ft)	Screened Interval (ft bgs)	Drilled Depth (ft bgs)	Well Construction	Open to Which Unit	Rock Type	Saturated Overburden	Saturated Overburden Thickness (ft)	Voids	Void Interval (ft bgs)
MW-165	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	47.5	70.5	23.0	50.5-70.5	72.5	Screened	Bedrock	SS/Dolo	N	--	N	--
MW-166	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	39.0	52.0	13.0	41-51	60	Screened	Overburden	OB	Y	53-60	N	--

TABLE 2-1
Well Information
Harley-Davidson Motor Company Operations, Inc.
York, PA

Well Identification	TYPE	Well Description Related to Monitoring	Well Intersects Conduit?	Depth to Top of Open Interval (ft bgs)	Depth to Base of Open Interval (ft bgs)	Open Interval Length (ft)	Screened Interval (ft bgs)	Drilled Depth (ft bgs)	Well Construction	Open to Which Unit	Rock Type	Saturated Overburden	Saturated Overburden Thickness (ft)	Voids	Void Interval (ft bgs)
MW-167	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	39.0	52.0	13.0	41-51	60	Screened	Overburden	OB	Y	58-60	N	--
MW-168	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	28.5	42.0	13.5	31-41	57	Screened	Overburden	OB	Y	40-57	N	--
MW-169	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	32.5	47.0	14.5	37-47	47	Screened	Overburden	OB	Y	35-47	N	
MW-170	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	19.2	32.3	13.1	21.3-31.3	40	Screened	Overburden	OB	Y	30.2-40	N	--
MW-171	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	30.8	43.5	12.7	32.8-42.8	45.5	Screened	Overburden and Bedrock	OB/Ls	Y	26.5-35	N	--
MW-172	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	23.9	38.5	14.6	27.5-37.5	40	Screened	Overburden	OB	Y	34.5-40	N	--
MW-173	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	18.7	32.8	14.1	21.6-31.6	40	Screened	Overburden	OB	Y	35.5-40	N	--
MW-174	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	18.9	31.8	12.9	21-31	35	Screened	Overburden	OB	Y	30-35	N	--
MW-175	Monitoring Well	SPBA Shallow Monitoring Well. No further sampling of shallow groundwater investigation wells on Canterbury Lane and Old Arsenal Road.	N	16.6	28.9	12.3	18.8-28.8	37	Screened	Overburden	OB	Y	32.2-37	N	--
Folk	Monitoring Well	Residential supply well north of the NPBA, included in the NPBA Monitored Shutdown plan.	N												
RW-5	Monitoring Well	Former commercial supply well south of Rt. 30. Area is beyond the CVOC plume.	N												
RW-2	Monitoring Well	Residential supply well north of the NPBA, included in the NPBA Monitored Shutdown plan.	N												
COD-SW-6	Surface Water	Codorus Creek sample upgradient of the Site and adjacent to COD-SW-7 used to characterize the upgradient water quality prior to the majority of Site-impacted groundwater discharges to the creek. Proposed to be used as a surface water monitoring point.	NA												
COD-SW-7	Surface Water	Codorus Creek sample upgradient of the Site and adjacent to COD-SW-6 used to characterize the upgradient water quality prior to the majority of Site-impacted groundwater discharges to the creek. Proposed to be used as a surface water monitoring point.	NA												
COD-SW-8	Surface Water	Codorus Creek sample downgradient of the Site and adjacent to COD-SW-9 used to characterize the potentially impacted portion of the creek from Site-impacted groundwater discharges to the creek. Proposed to be used as a surface water monitoring point.	NA												
COD-SW-9	Surface Water	Codorus Creek sample downgradient of the Site and adjacent to COD-SW-8 used to characterize the potentially impacted portion of the creek from Site-impacted groundwater discharges to the creek. Proposed to be used as a surface water monitoring point.	NA												
COD-SW-12	Surface Water	York City wastewater treatment plant effluent.	NA												
COD-SW-13	Surface Water	Codorus Creek sample downgradient of the Site and adjacent to COD-SW-28 used to characterize the potentially impacted portion of the creek from Site-impacted groundwater discharges to the creek. Proposed to be used as a surface water monitoring point.	NA												
COD-SW-15	Spring	Spring discharging to Codorus Creek on the west side of the creek.	NA												
COD-SW-16	Surface Water	Codorus Creek sample downgradient of the Site and adjacent to COD-SW-27 used to characterize the potentially impacted portion of the creek from Site-impacted groundwater discharges to the creek. Proposed to be used as a surface water monitoring point.	NA												
COD-SW-17	Spring	Stream Spring Water Location. Sample Spring and Fall with groundwater extraction system operating, quarterly if extraction system modified or shut down. Monitor for westward or off-site migration of plumes.	NA												
COD-SW-26	Spring	Submerged spring in the Codorus Creek channel upgradient of the Site upstream (south) of the I-83 bridge. Impacted by Site-related groundwater when groundwater extraction system is off.	NA												
COD-SW-27	Surface Water	Codorus Creek sample downgradient of the Site and adjacent to COD-SW-16 used to characterize the potentially impacted portion of the creek from Site-impacted groundwater discharges to the creek. Proposed to be used as a surface water monitoring point.	NA												
COD-SW-28	Surface Water	Codorus Creek sample downgradient of the Site and adjacent to COD-SW-16 used to characterize the potentially impacted portion of the creek from Site-impacted groundwater discharges to the creek. Proposed to be used as a surface water monitoring point.	NA												

TABLE 2-1
Well Information
Harley-Davidson Motor Company Operations, Inc.
York, PA

Well Identification	TYPE	Well Description Related to Monitoring	Well Intersects Conduit?	Depth to Top of Open Interval (ft bgs)	Depth to Base of Open Interval (ft bgs)	Open Interval Length (ft)	Screened Interval (ft bgs)	Drilled Depth (ft bgs)	Well Construction	Open to Which Unit	Rock Type	Saturated Overburden	Saturated Overburden Thickness (ft)	Voids	Void Interval (ft bgs)
COD-SW-29	Surface Water	Codorus Creek sample approximately 2300 feet downgradient of the Site at a point where the creek has been thoroughly mixed by the sharp bend in the creek immediately upgradient. Proposed to be used as a surface water monitoring point.	NA												

Q - Quartzite
Phyl - Phyllite
SltStn - Siltstone
OB - Over Burden

Table 2-2
List of Stations for Plume Perimeter and Surface Water Monitoring
Harley-Davidson Motor Company Operations, Inc.
York, Pa

Location	Location Type	Rationale	Laboratory Analyses				
			VOCs	Chromium	1,4-Dioxane	Cyanide	Metals
Plume Perimeter and Surface Water Monitoring							
Cole D	Monitoring Well	**Monitor Plume Edge South of Site**	X				
GM-1D	Monitoring Well	**Monitor Plume Edge South of Site**	X				
MW-4 (Cole)	Monitoring Well	**Monitor Plume Edge South of Site**	X				
Cole Steel MW-12	Monitoring Well	**Monitor Plume Edge South of Site**	X				
MW-1	Monitoring Well	**Monitor Plume Edge in SPBA**	X				
MW-18D	Monitoring Well	**Monitor Plume Edge in NPBA**	X				
MW-18S	Monitoring Well	**Monitor Plume Edge in NPBA**	X				
MW-43D	Monitoring Well	**Monitor Plume Edge in SPBA**	X				
MW-43S	Monitoring Well	**Monitor Plume Edge in SPBA**	X				
MW-64D	Monitoring Well	**Monitor Plume Edge in SPBA**	X				
MW-64S	Monitoring Well	**Monitor Plume Edge in SPBA**	X				
MW-74S	Monitoring Well	**Monitor NWPL Property Line**	X				X
MW-75D	Monitoring Well	**Monitor SWPL Property Line**	X				X
MW-75S	Monitoring Well	**Monitor SWPL Property Line**	X				X
MW-82	Monitoring Well	**Monitor Plume Edge in NPBA**	X				
MW-93D	Monitoring Well	**Monitor SW-WPL Property Line**	X				X
MW-93S	Monitoring Well	**Monitor SW-WPL Property Line**	X				X
MW-96D	Monitoring Well	**Monitor NW-WPL Property Line**	X				X
MW-96S	Monitoring Well	**Monitor NW-WPL Property Line**	X				X
MW-98I	Monitoring Well	**Monitor Levee Area Concentrations**	X				
MW-98S	Monitoring Well	**Monitor Levee Area Concentrations**	X				
MW-99D	Monitoring Well	**Monitor Levee Area Concentrations**	X				
MW-99S	Monitoring Well	**Monitor Levee Area Concentrations**	X				
MW-100I	Monitoring Well	**Monitor Levee Area Concentrations**	X				
MW-101D	Monitoring Well	**Monitor Levee Area Concentrations**	X				
MW-101S	Monitoring Well	**Monitor Levee Area Concentrations**	X				
MW-110	Monitoring Well	**Monitor Plume Edge South of Site**	X				
MW-142D	Monitoring Well	**Monitor Plume Edge in NPBA**	X				
MW-142S	Monitoring Well	**Monitor Plume Edge in NPBA**	X				
MW-143D	Monitoring Well	**Monitor Plume Edge in NPBA**	X				
MW-143S	Monitoring Well	**Monitor Plume Edge in NPBA**	X				
MW-150	Monitoring Well	**Monitor Plume Edge South of Site**	X				
MW-151	Monitoring Well	**Monitor Plume Edge South of Site**	X				
MW-152 (23-23.5)	Waterloo Monitoring Well	**Monitor Plume Edge South of Site**	X				
MW-152 (137.5-138)	Waterloo Monitoring Well	**Monitor Plume Edge South of Site**	X				

Table 2-2
List of Stations for Plume Perimeter and Surface Water Monitoring
Harley-Davidson Motor Company Operations, Inc.
York, Pa

Location	Location Type	Rationale	Laboratory Analyses				
			VOCs	Chromium	1,4-Dioxane	Cyanide	Metals
RW-4 (Folk)	Residential Well	**Operating Residential Well near NPBA**	X				
RW-5	Residential Well	**Monitor Plume Edge South of Site**	X				
COD-SW-6	Surface Water	**Up-gradient Codorus Creek**	X				
COD-SW-7	Surface Water	**Up-gradient Codorus Creek**	X				
COD-SW-8	Surface Water	**Down-gradient Codorus Creek**	X				
COD-SW-9	Surface Water	**Down-gradient Codorus Creek**	X				
COD-SW-13	Surface Water	**Codorus Creek west of Site**	X				
COD-SW-16	Surface Water	**Codorus Creek west of Site**	X				
COD-SW-27	Surface Water	**Codorus Creek west of Site**	X				
COD-SW-28	Surface Water	**Codorus Creek west of Site**	X				
COD-SW-29	Surface Water	**Down-gradient Codorus Creek**	X				
		Total	46	0	0	0	7

Table 2-3
List of Stations for Determination of Concentrations and Mass in the Aquifer
Harley-Davidson Motor Company Operations, Inc.
York, Pa

Location	Location Type	Rationale	Laboratory Analyses				
			VOCs	Chromium	1,4-Dioxane	Cyanide	Metals
Determination of Concentrations and Mass Remaining in the Aquifer							
CW-9	Collection Well	**Extraction Well**	X				
CW-13	Collection Well	**Extraction Well**	X				
CW-15A	Collection Well	**Extraction Well**	X		X		
CW-17	Collection Well	**Extraction Well**	X				
CW-20	Collection Well	**Extraction Well**	X				
MW-1	Monitoring Well	**SPBA Area**	X				
MW-2	Monitoring Well	**EPBA Area**	X			X	
MW-3	Monitoring Well	**NPBA Area**	X				
MW-5	Monitoring Well	**NPBA Area**	X				
MW-7	Monitoring Well	**WPL Area**	X	X	X		
MW-8	Monitoring Well	**WPL Area**	X				
MW-9	Monitoring Well	**NPBA Area**	X				
MW-10	Monitoring Well	**NPBA Area**	X				
MW-11	Monitoring Well	**NPBA Area**	X				
MW-12	Monitoring Well	**NPBA Area**	X				
MW-14	Monitoring Well	**EPBA Area**	X				X
MW-15	Monitoring Well	**EPBA Area**	X				
MW-16D	Monitoring Well	**NPBA Area**	X				
MW-16S	Monitoring Well	**NPBA Area**	X				
MW-17	Monitoring Well	**Eastern Landfill Area**	X				X
MW-18D	Monitoring Well	**NPBA Area**	X				
MW-18S	Monitoring Well	**NPBA Area**	X				
MW-19	Monitoring Well	**NETT Area**	X				
MW-22	Monitoring Well	**SPBA Area**	X				
MW-26	Monitoring Well	**NETT Area**	X				
MW-28	Monitoring Well	**TCA Tank Area**	X		X		
MW-31D	Monitoring Well	**North Plant Area**	X				
MW-32D	Monitoring Well	**TCA Tank Area**	X		X		
MW-32S	Monitoring Well	**TCA Tank Area**	X				
MW-36D	Monitoring Well	**TCA Tank Area**	X				

Table 2-3
List of Stations for Determination of Concentrations and Mass in the Aquifer
Harley-Davidson Motor Company Operations, Inc.
York, Pa

Location	Location Type	Rationale	Laboratory Analyses				
			VOCs	Chromium	1,4-Dioxane	Cyanide	Metals
MW-36S	Monitoring Well	**IWTP Area**	X				
MW-37D	Monitoring Well	**SW-WPL Area**	X				
MW-37S	Monitoring Well	**SW-WPL Area**	X				
MW-39D	Monitoring Well	**NW-WPL Area**	X				
MW-39S	Monitoring Well	**NW-WPL Area**	X				
MW-42M	Monitoring Well	**SPBA Area**	X				
MW-43D	Monitoring Well	**SPBA Area**	X				
MW-43S	Monitoring Well	**SPBA Area**	X				
MW-45	Monitoring Well	**Between CPA and WPL**	X				
MW-46	Monitoring Well	**Between CPA and WPL**	X				
MW-47	Monitoring Well	**Between CPA and WPL**	X	X			
MW-49D	Monitoring Well	**NBldg 4 Area**	X				
MW-49S	Monitoring Well	**NBldg 4 Area**	X		X		
MW-50D	Monitoring Well	**NBldg 4 Area**	X		X		
MW-50S	Monitoring Well	**NBldg 4 Area**	X				
MW-51D	Monitoring Well	**NBldg 4 Area**	X	X			
MW-51S	Monitoring Well	**NBldg 4 Area**	X	X	X		
MW-64D	Monitoring Well	**SPBA Area**	X				
MW-64S	Monitoring Well	**SPBA Area**	X				
MW-65D	Monitoring Well	**EPBA Area**	X				X
MW-65S	Monitoring Well	**EPBA Area**	X				X
MW-66D	Monitoring Well	**Eastern Landfill Area**	X				X
MW-66S	Monitoring Well	**Eastern Landfill Area**	X				X
MW-67D	Monitoring Well	**Eastern Landfill Area**	X				
MW-67S	Monitoring Well	**Eastern Landfill Area**	X				
MW-68	Monitoring Well	**Eastern Landfill Area**	X				X
MW-69	Monitoring Well	**Firing Ranges Area**	X				
MW-70D	Monitoring Well	**NETT Area**	X				
MW-70S	Monitoring Well	**NETT Area**	X				
MW-74D	Monitoring Well	**NW-WPL Area**	X				
MW-74S	Monitoring Well	**NW-WPL Area**	X				X
MW-75D	Monitoring Well	**SW-WPL Area**	X				X
MW-75S	Monitoring Well	**SW-WPL Area**	X				X

Table 2-3
List of Stations for Determination of Concentrations and Mass in the Aquifer
Harley-Davidson Motor Company Operations, Inc.
York, Pa

Location	Location Type	Rationale	Laboratory Analyses				
			VOCs	Chromium	1,4-Dioxane	Cyanide	Metals
MW-77	Monitoring Well	**UST Area**	X				
MW-80	Monitoring Well	**Bldg 58 Area**	X				
MW-81D	Monitoring Well	**EBldg2 Corridor Area**	X				
MW-81S	Monitoring Well	**EBldg2 Corridor Area**	X				
MW-84	Monitoring Well	**North Plant Area**	X				
MW-86D	Monitoring Well	**Firing Ranges Area**	X				
MW-86S	Monitoring Well	**Firing Ranges Area**	X				
MW-87	Monitoring Well	**Bldg 58 Area**	X		X		
MW-88	Monitoring Well	**South of Bldg 58 Area**	X				
MW-91	Monitoring Well	**EPBA Area**	X				
MW-92	Monitoring Well	**EPBA Area**	X				
MW-93D	Monitoring Well	**SW-WPL Area**	X				X
MW-93S	Monitoring Well	**SW-WPL Area**	X				X
MW-96D	Monitoring Well	**NW-WPL Area**	X				X
MW-96S	Monitoring Well	**NW-WPL Area**	X				X
MW-98D	Monitoring Well	**Levee Area**	X				
MW-98I	Monitoring Well	**Levee Area**	X				
MW-98S	Monitoring Well	**Levee Area**	X				
MW-99D	Monitoring Well	**Levee Area**	X				
MW-99S	Monitoring Well	**Levee Area**	X				
MW-100D	Monitoring Well	**Levee Area**	X				
MW-100I	Monitoring Well	**Levee Area**	X				
MW-100S	Monitoring Well	**Levee Area**	X				
MW-101D	Monitoring Well	**Levee Area**	X				
MW-101S	Monitoring Well	**Levee Area**	X				
MW-102D	Monitoring Well	**NETT Area**	X				
MW-102S	Monitoring Well	**NETT Area**	X				
MW-103D	Monitoring Well	**NETT Area**	X				
MW-103S	Monitoring Well	**NETT Area**	X				
MW-104	Monitoring Well	**NETT Area**	X				
MW-107	Monitoring Well	**SW-WPL Area**	X				
MW-110	Monitoring Well	**South of Site**	X				
MW-111	Monitoring Well	**East of Bldg 3**	X				

Table 2-3
List of Stations for Determination of Concentrations and Mass in the Aquifer
Harley-Davidson Motor Company Operations, Inc.
York, Pa

Location	Location Type	Rationale	Laboratory Analyses				
			VOCs	Chromium	1,4-Dioxane	Cyanide	Metals
MW-112	Monitoring Well	**Up-gradient of Bldg 58 Area**	X				
MW-113	Monitoring Well	**Bldg 58 Area**	X		X		
MW-114	Monitoring Well	**EBldg2 Corridor Area**	X				
MW-116	Monitoring Well	**North Plant Area**	X		X		
MW-128	Monitoring Well	**Bldg 58 Area**	X		X		
MW-129	Monitoring Well	**Bldg 58 Area**	X				
MW-131	Monitoring Well	**EBldg2 Corridor Area**	X		X		
MW-134	Monitoring Well	**EBldg2 Corridor Area**	X		X		
MW-138A	Monitoring Well	**Bldg 58 Area**	X				
MW-141A	Monitoring Well	**SPBA Area**	X				
MW-142D	Monitoring Well	**NPBA Area**	X				
MW-142S	Monitoring Well	**NPBA Area**	X				
MW-143D	Monitoring Well	**NPBA Area**	X				
MW-143S	Monitoring Well	**NPBA Area**	X				
MW-144	Monitoring Well	**Levee Area**	X				
MW-145A	Monitoring Well	**Levee Area**	X				
MW-146	Monitoring Well	**Levee Area**	X				
MW-147A	Monitoring Well	**Levee Area**	X				
MW-155	Monitoring Well	**West of WLP**	X				
MW-156	Monitoring Well	**West of WLP**	X				
MW-136A (270-348)	Waterloo Monitoring Well	**SW-WPL Area**	X				
MW-136A (356-356.5)	Waterloo Monitoring Well	**SW-WPL Area**	X		X		
MW-136A (372.5-373)	Waterloo Monitoring Well	**SW-WPL Area**	X		X		
MW-136A (434-434.5)	Waterloo Monitoring Well	**SW-WPL Area**	X				
MW-136A (459.5-460)	Waterloo Monitoring Well	**SW-WPL Area**	X				
MW-137A (270-306)	Waterloo Monitoring Well	**CPA Area**	X				
MW-137A (295.5-296)	Waterloo Monitoring Well	**CPA Area**	X		X		
MW-137A (343-343.5)	Waterloo Monitoring Well	**CPA Area**	X		X		
MW-137A (374.5-375)	Waterloo Monitoring Well	**CPA Area**	X		X		
MW-137A (420-420.5)	Waterloo Monitoring Well	**CPA Area**	X		X		
MW-137A (434.5-435)	Waterloo Monitoring Well	**CPA Area**	X		X		
MW-139A (270-285)	Waterloo Monitoring Well	**CPA Area**	X				
MW-139A (305-305.5)	Waterloo Monitoring Well	**CPA Area**	X				

Table 2-3
List of Stations for Determination of Concentrations and Mass in the Aquifer
Harley-Davidson Motor Company Operations, Inc.
York, Pa

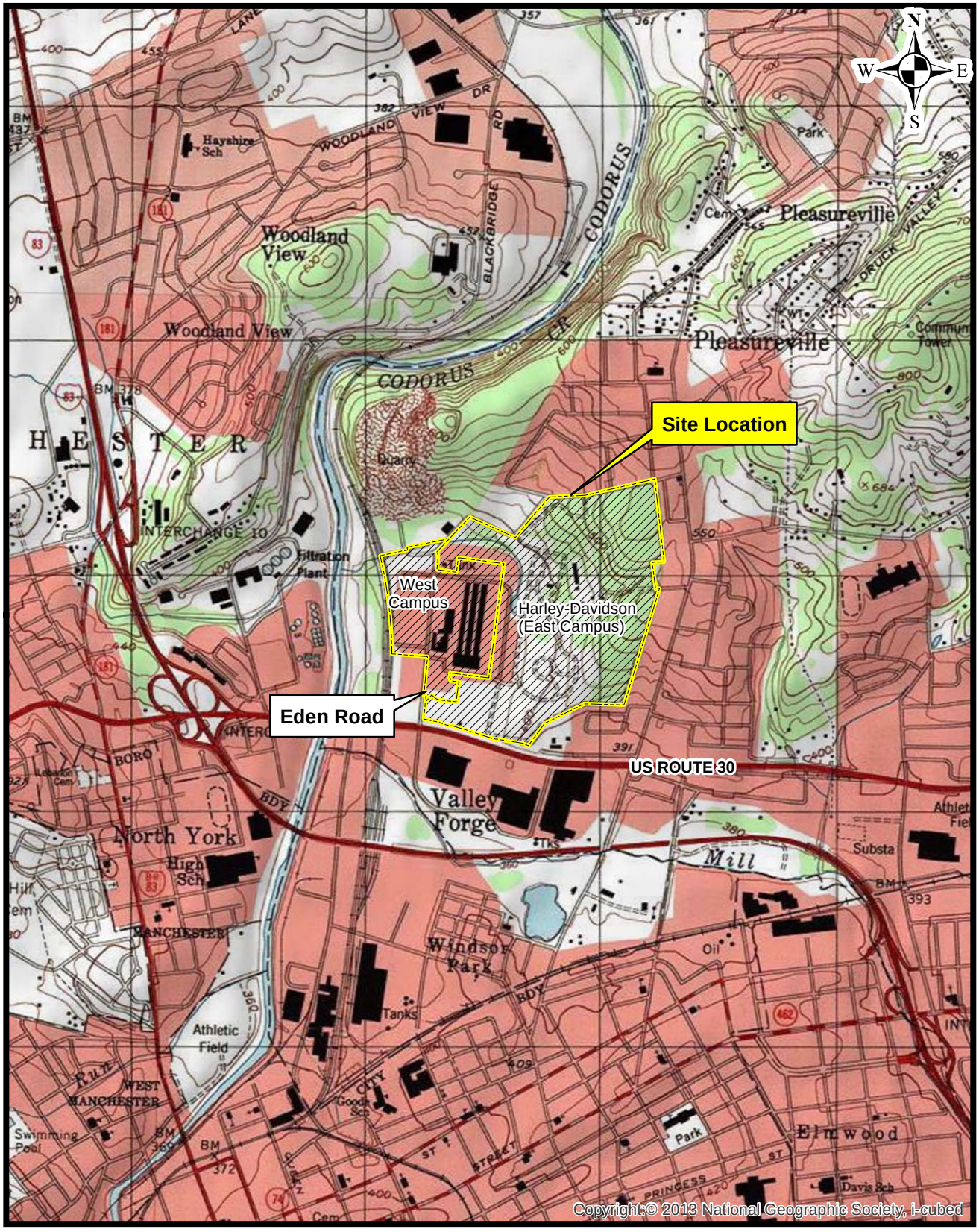
Location	Location Type	Rationale	Laboratory Analyses				
			VOCs	Chromium	1,4-Dioxane	Cyanide	Metals
MW-139A (333.5-334)	Waterloo Monitoring Well	**CPA Area**	X				
MW-139A (365-365.5)	Waterloo Monitoring Well	**CPA Area**	X				
MW-139A (421.5-422)	Waterloo Monitoring Well	**CPA Area**	X				
MW-139A (454-454.5)	Waterloo Monitoring Well	**CPA Area**	X				
MW-140A (209.5-210)	Waterloo Monitoring Well	**CPA Area**	X				
MW-140A (285-285.5)	Waterloo Monitoring Well	**CPA Area**	X				
MW-140A (323.5-324)	Waterloo Monitoring Well	**CPA Area**	X		X		
MW-140A (372-372.5)	Waterloo Monitoring Well	**CPA Area**	X				
	Total	**137**	**137**	**4**	**21**	**1**	**14**

Table 2-4
List of Stations for Remedial Action Performance Sampling
Harley-Davidson Motor Company Operations, Inc.
York, Pa

Location	Location Type		Laboratory Analyses				
			VOCs	Chromium	1,4-Dioxane	Cyanide	Metals
Remedial Action Performance Monitoring							
CW-9	Collection Well	**Active Extraction Well**	X				
CW-13	Collection Well	**Active Extraction Well**	X				
CW-15A	Collection Well	**Active Extraction Well**	X		X		
CW-17	Collection Well	**Active Extraction Well**	X				
CW-20	Collection Well	**Active Extraction Well**	X				
MW-57	Monitoring Well	**Bldg 58 Area**	X				
MW-87	Monitoring Well	**Bldg 58 Area**	X		X		
MW-88	Monitoring Well	**Bldg 58 Area**	X				
MW-127	Monitoring Well	**Bldg 58 Area**	X		X		
MW-129	Monitoring Well	**Bldg 58 Area**	X				
GWTS Influent	Treatment System	**1**	X				
GWTS Effluent	Treatment System	**1**	X				
	Total	**12**	**12**	**0**	**3**	**0**	**0**

Notes
GWTS-Groundwater extraction and treatment system.
1- The active groundwater extraction wells are sampled twice per year.
2- The GWTS influent and effluent samples are collected quarterly.

Figures

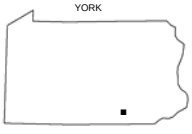


Portion of the York and York Haven PA
7.5-minute USGS Quadrangles
(2001)

Figure 1-1

Former York Naval Ordnance Plant
1425 Eden Road, York, PA 17402

Site Location Map



Scale (feet)
0 495 990 1,980

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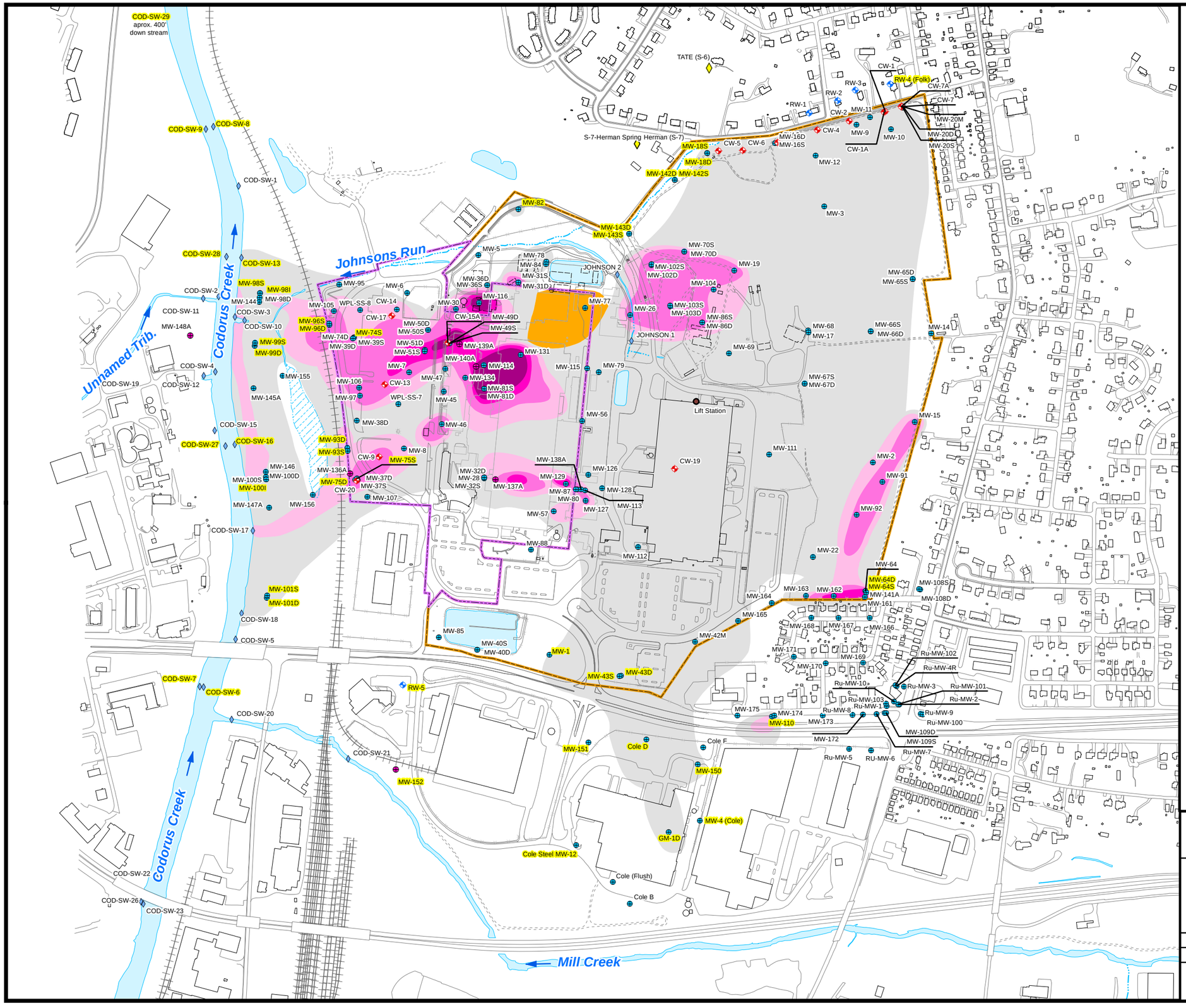

Legend

- Collection Well
- Lift Station
- Monitoring Well
- Residential Well
- Spring
- Surface Water
- Waterloo Monitoring Well
- Existing Building
- Demolished/Slab Remains
- Demolished/Slab Removed
- West Campus Property Boundary
- Harley-Davidson Property Boundary (East Campus)
- Railroad
- Road (Paved)
- Road Curb
- Road (Unpaved)
- Walkway
- Fenceline
- Existing Stream
- Existing Water Feature
- Wetland Boundary (2006)
- TCE/PCE Concentration 5 ug/L
- TCE/PCE Concentration 50 ug/L
- TCE/PCE Concentration 100 ug/L
- TCE/PCE Concentration 500 ug/L
- TCE/PCE Concentration 1,000 ug/L
- TCE/PCE Concentration 10,000 ug/L
- Petroleum Plume

Note:
TCE/PCE concentration contours are for the shallow portion of the aquifer (defined as any well monitoring groundwater within approximately 75 feet of the ground surface).

N
W E
S

Scale (feet)
0 300 600

Figure 2-1

Former York Naval Ordnance Plant
1425 Eden Road, York, PA 17402

Plume Perimeter and Surface Water Monitoring

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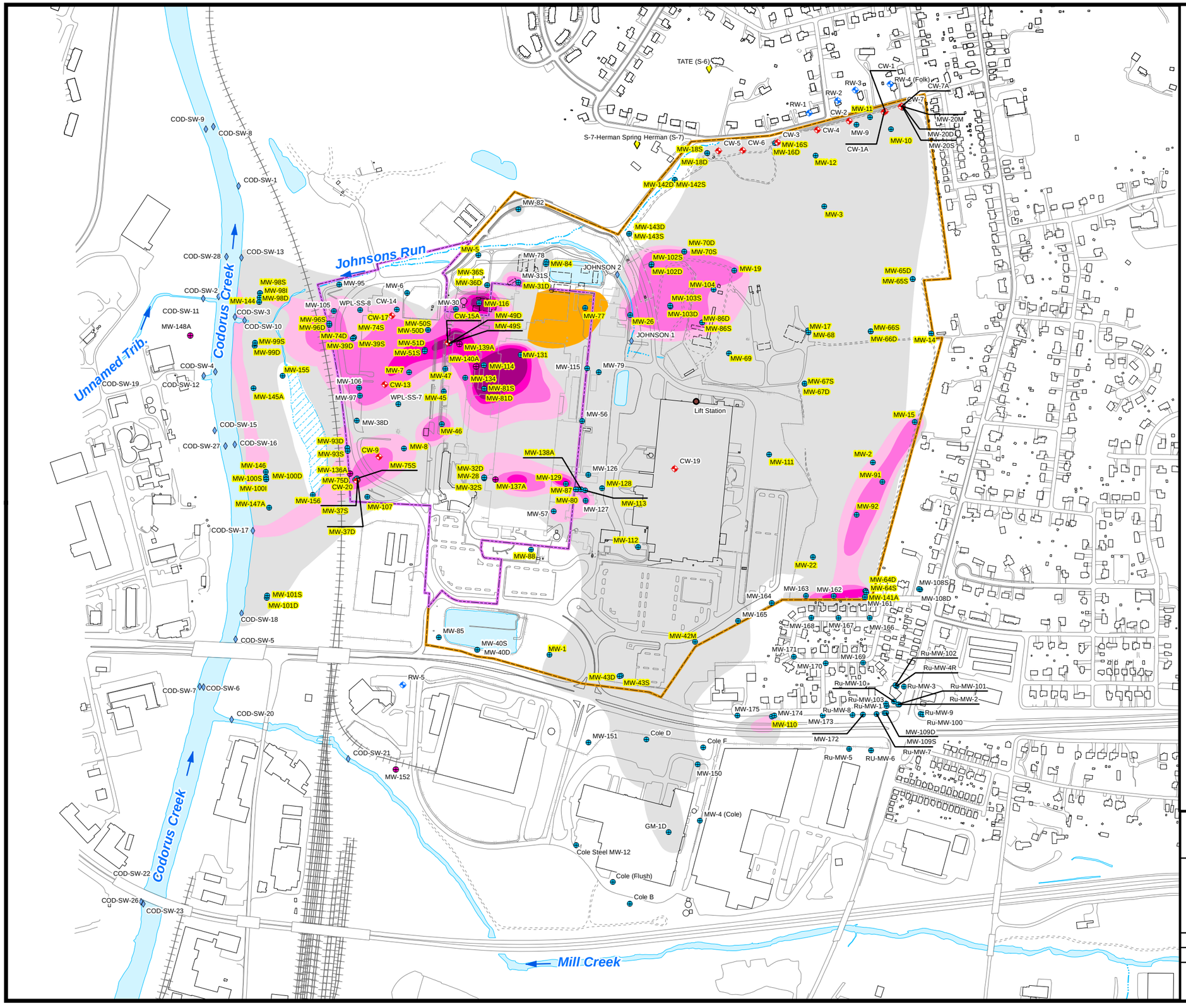

Legend

- Collection Well
- Lift Station
- Monitoring Well
- Residential Well
- Spring
- Surface Water
- Waterloo Monitoring Well
- Existing Building
- Demolished/Slab Remains
- Demolished/Slab Removed
- West Campus Property Boundary
- Harley-Davidson Property Boundary (East Campus)
- Railroad
- Road (Paved)
- Road Curb
- Road (Unpaved)
- Walkway
- Fenceline
- Existing Stream
- Existing Water Feature
- Wetland Boundary (2006)
- TCE/PCE Concentration 5 ug/L
- TCE/PCE Concentration 50 ug/L
- TCE/PCE Concentration 100 ug/L
- TCE/PCE Concentration 500 ug/L
- TCE/PCE Concentration 1,000 ug/L
- TCE/PCE Concentration 10,000 ug/L
- Petroleum Plume

Note:
Yellow highlighted location is to be sampled.
TCE/PCE concentration contours are for the shallow portion of the aquifer (defined as any well monitoring groundwater within approximately 75 feet of the ground surface).

N
W E
S

Scale (feet)
0 300 600

Figure 2-2

Former York Naval Ordnance Plant
1425 Eden Road, York, PA 17402

Determination of Concentrations and Mass Remaining in the Aquifer

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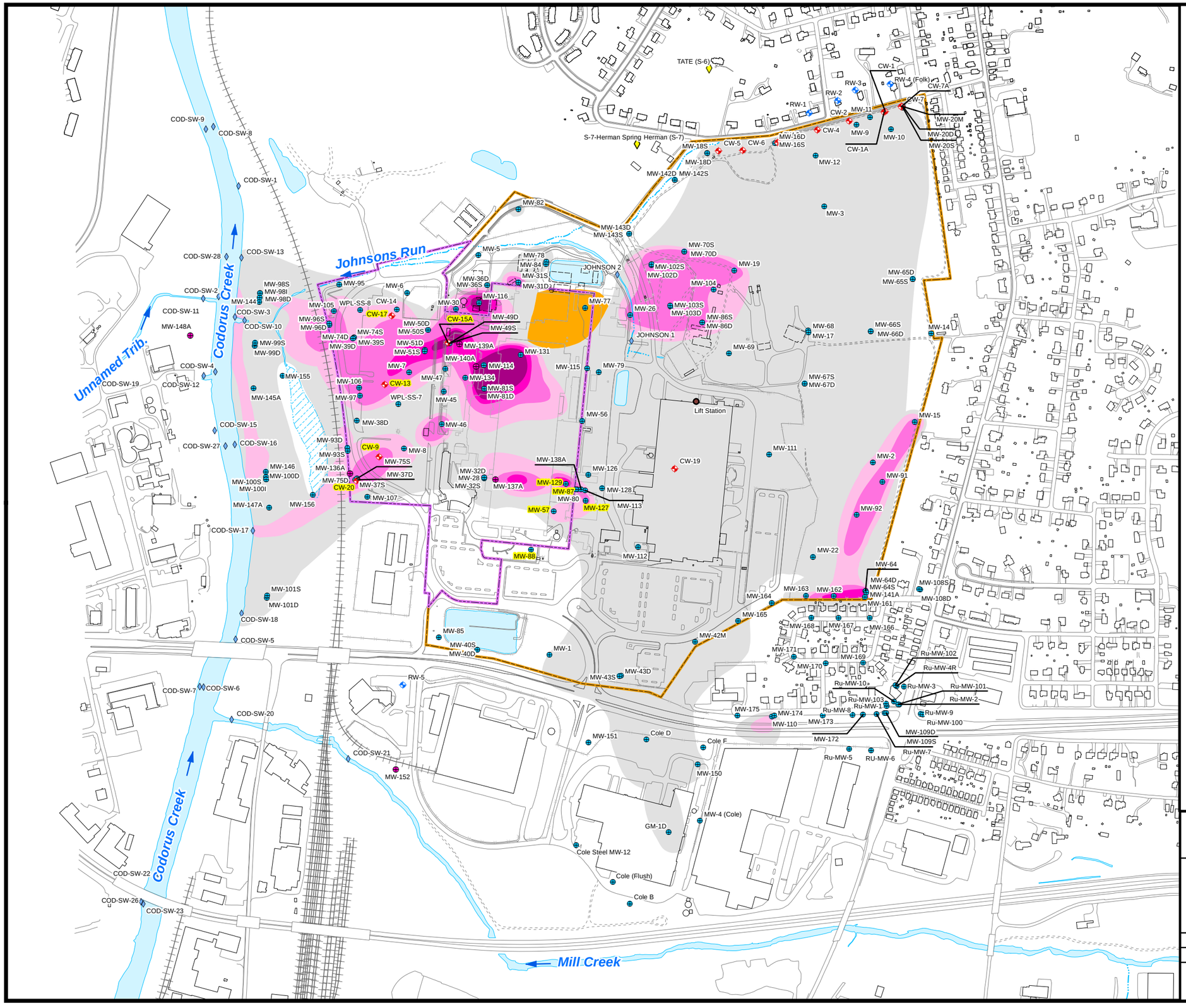

Legend

- Collection Well
- Lift Station
- Monitoring Well
- Residential Well
- Spring
- Surface Water
- Waterloo Monitoring Well
- Existing Building
- Demolished/Slab Remains
- Demolished/Slab Removed
- West Campus Property Boundary
- Harley-Davidson Property Boundary (East Campus)
- Railroad
- Road (Paved)
- Road Curb
- Road (Unpaved)
- Walkway
- Fenceline
- Existing Stream
- Existing Water Feature
- Wetland Boundary (2006)
- TCE/PCE Concentration 5 ug/L
- TCE/PCE Concentration 50 ug/L
- TCE/PCE Concentration 100 ug/L
- TCE/PCE Concentration 500 ug/L
- TCE/PCE Concentration 1,000 ug/L
- TCE/PCE Concentration 10,000 ug/L
- Petroleum Plume

Note:
Yellow highlighted location is to be sampled.
TCE/PCE concentration contours are for the shallow portion of the aquifer (defined as any well monitoring groundwater within approximately 75 feet of the ground surface).

N
W E
S

Scale (feet)
0 300 600

Figure 2-3

Former York Naval Ordnance Plant
1425 Eden Road, York, PA 17402

Remedial Action Performance Monitoring

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