



2015 Fourth Quarter Groundwater Monitoring Report October – December 2015

Claremont Polychemical Corporation Site

*505 Winding Road
Old Bethpage, Nassau County, New York 11804
Contract/WA No. D007625-19; Site No. 130015*

Prepared for:

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**Department of
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Analytical Results – 4th Quarter 2015 Groundwater Samples

1 Introduction

This quarterly groundwater monitoring report prepared by Henningson, Durham & Richardson Architecture and Engineering, P.C. (HDR) presents groundwater sampling analytical results for the fourth quarter (October through December) of 2015 and supporting information on the history, groundwater extraction and treatment (GWET) system configuration and hydrogeologic conditions at the Claremont Polychemical Corporation Site; hereinafter referred to as CPC or the “Site” (Figure 1). The groundwater monitoring event and the preparation of this deliverable are part of the routine groundwater monitoring program being conducted at the Site. This report has been prepared for submittal to the New York State Department of Environmental Conservation (NYSDEC) and includes the following:

- Brief overview of historical Site activities;
- Discussion of the on-site GWET system including discharge monitoring;
- Hydrological data;
- Brief description of the field activities;
- Analytical results of monitoring well sampling, specifically those for chlorinated volatile organic compounds (VOCs) including trends and plume evaluation; and
- Conclusions and Recommendations.

2 Site Background

2.1 Site History

Claremont Polychemical Corporation, a former manufacturer of pigments for plastics and inks, coated metal flakes, and vinyl stabilizers, operated at the Site from 1966 to 1980. According to the “Second Five-Year Review Report for Claremont Polychemical Corporation” prepared by the EPA Region 2, dated March 2014, during its operation, CPC disposed of liquid waste in three leaching basins and deposited solid wastes and treatment sludges in drums or in aboveground metal tanks. The principal wastes generated were organic solvents, resins, and wash wastes (mineral spirits). A solvent recovery system (steam distillation), two pigment dust collectors and a sump were located inside the Process Building. Five concrete treatment basins, each with a capacity of 5,000 gallons which contained sediments and water, were to the west of the building. Six aboveground tanks, three of which contained wastes, were located east of the building. Other features included an underground tank farm, construction and demolition debris, dry wells and a water supply well (EPA 2014).

In 1979, the Nassau County Department of Health (NCDH) found 2,000 to 3,000 drums of inks, resins, and organic solvents throughout the Site during a series of inspections. Inspectors' identified releases associated with damaged or mishandled drums in several

areas including one larger release located east of the Process Building (referred to as the "spill area"). CPC sorted and removed the drums in 1980 (EPA 2014). In October 1980, the NYSDEC ordered CPC to commence clean-up activities at the Site. CPC did not perform the clean-up activities required by NYSDEC and CPC ceased operations at the Site in 1980 (EPA 2014). Because of CPC's refusal to perform the clean-up, the Environmental Protection Agency (EPA) proposed the Site for listing on the National Priorities List (NPL) in October 1984 and was listed as a Superfund site in June 1986.

A Remedial Investigation Feasibility Study (RI/FS) was initiated in March 1988 under the oversight of the EPA. Surface and subsurface soil, groundwater, underground storage tanks, and the Process Building were sampled as part of the RI. The RI/FS reports were released to the public in August 1990. The RI/FS findings indicated that on-site soils contaminated with PCE, located in the former "spill area", constituted a potential threat to groundwater resources. The spill area is adjacent to and east of the former Process Building (Figure 2). Other VOCs including 2-butanone, toluene, xylene, 1,2-dichloroethene (DCE), trichloroethene (TCE), 1,1,1-trichloroethane (TCA), ethylbenzene, 1,2-dichloroethane (DCA), methylene chloride, and vinyl chloride were detected in groundwater at concentrations exceeding federal and state standards. EPA issued two Records of Decision (RODs) signed in September 1989 and September 1990 and two Explanations of Significant Differences (ESDs) signed in September 2000 and April 2003 since completion of the RI/FS. The operable units addressed by the RODs and ESDs are described in Table 1.

Table 1 - CPC Operable Units

Operable Unit	Description	Status
OU 1	Treatment and removal of wastes in 14 underground storage tanks	14 USTs and contents removed. Achieved cleanup levels allowing for unlimited use and unrestricted exposure.
OU 2	Wastes stabilized during the Sept. 1988 removal action	Testing, consolidation, treatment and disposal of wastes in containers and basins performed. Achieved unlimited use and unrestricted exposure, later changed to commercial/light industrial because of remaining contamination below the building. 2003 ESD added additional remedial actions for OU 2 under the former Process Building including an SVE system and using the building's concrete slab as a cap for cadmium contaminated soil.
OU 3	Soil contaminated with PCE at the "spill area"	Approximately 8,800 tons of PCE contaminated soils excavated, treated and backfilled on Site. Achieved cleanup levels allowing for unlimited use and unrestricted exposure.
OU 4	Contaminated groundwater on the CPC property	Extraction and treatment of groundwater via metals precipitation, air stripping and carbon adsorption. On-site reinjection. The subject of this report.

Operable Unit	Description	Status
OU 5	Contaminated groundwater off of the CPC property.	Extraction and treatment of groundwater via air stripping and off-site reinjection using the Old Bethpage Landfill treatment system extraction wells south-southeast of the CPC Site.
OU 6	Decontamination of the former Process Building	Vacuuming and dusting surfaces, asbestos abatement, pressure washing walls and interior surfaces. Achieved cleanup levels allowing for unlimited use and unrestricted exposure.

A GWET system was installed on-site by the EPA and Army Corps of Engineers (ACOE) to hydraulically contain VOCs in groundwater as the OU 4 remedy. GWET system operation began in February 2000, reportedly pumping and treating over 400 gallons per day (gpd). SAIC Inc. operated and maintained the GWET system, collected plant effluent samples and performed quarterly groundwater sampling at 41 wells from 2000 to May 2011. In May 2011, the project was transferred from the ACOE/EPA to the NYSDEC. HRP performed the same scope of work as SAIC under contract to NYSDEC from May 2011 to August 2015. HDR, also under contract to NYSDEC, took over HRP's scope of work on September 1, 2015.

2.2 Location

CPC is located on a 9.5-acre parcel in an industrial section of Old Bethpage, Nassau County, New York (Figure 1). The former 35,000 square foot Process Building, demolished in 2012, was the only building historically on the property. The concrete slab from this building remains. The 5,200 square foot GWET system building was constructed as part of the OU 4 remedy.

The Site lies approximately 800 feet west of the border between Nassau and Suffolk Counties and is accessed via Winding Road on the property's western border. Adjacent properties include (Figure 2):

- South and Southeast - Bethpage State Park and golf course;
- East – State University of New York (SUNY) - Farmingdale Campus;
- West – Town of Oyster Bay Solid Waste Disposal Complex (OBSWDC); and
- North – Commercial and Light Industrial.

The OBSWDC includes the Old Bethpage Landfill Superfund Site with the Town of Oyster Bay as the responsible party. The Nassau County Fireman's Training Center (FTC), which has also contributed to soil and groundwater contamination in the area, is located approximately 500 feet south of the OBSWDC. The OBSWDC and FTC also have GWET systems. FTC ceased operation of its GWET system in 2013 having achieved the cleanup objectives. The closest residences are approximately one-half mile from the Site, immediately west of the Old Bethpage Landfill. The nearest public supply well is located 3,500 feet northwest of the Site and nearly 47,000 people are drawing water from private-use wells located within three miles of the Site.

2.3 Site Hydrogeological Setting

The CPC site is underlain primarily by sand with interbedded, discontinuous silt and lignitic clay lenses. Upper glacial aquifer deposits are mostly absent in the area, rather the Magothy formation is the uppermost geologic unit with a thickness of approximately 750 feet. The Raritan clay below acts as a barrier between the Magothy and Lloyd aquifers. Depth to the water table ranges from approximately 60 to 70 feet below ground surface (bgs) with regional groundwater flow to the south-southeast. Depths to groundwater in December 2015 ranged from 45.50 feet (well EW-14D) to 104.56 feet (well EW-11D) bgs.

The “Claremont Polychemical Superfund Site Long-Term Groundwater Monitoring Old Bethpage, New York” report dated December 2001 prepared by SAIC indicated historical gradients ranging from 0.001-0.002 feet/year and horizontal flow velocities of 0.43 feet/day or 157 feet/year (Ebasco, 1990).

Groundwater contour maps produced from the December 2015 water level measurements show groundwater flow direction in the water table wells to be due south near the treatment plant; south-southwest at the SUNY Farmingdale property to the east of the plant; and south-southeast near Winding Road to the west of the plant (Figure 3). The contour map produced from wells screened in the Magothy aquifer depicts a south-southeast flow direction (Figure 4). The recent contour maps are consistent with previous maps produced from the CPC wells and from other investigations.

3 Groundwater Extraction and Treatment System

A description of the GWET system and a review of its effectiveness of contamination recovery and hydraulic control are provided below.

3.1 Groundwater Extraction and Treatment System Description

The GWET system was originally designed to capture and treat metals, organic contaminants, and provide final pH adjustment. The system consists of an extraction system, above-ground treatment, and a reinjection system. Each of the system components are discussed below.

GWET System Extraction Wells

The groundwater collection system consists of three extraction wells - EX-1, EX-2, and EX-3 (also referred to as EXT-1, EXT-2 and EXT-3) - installed approximately 150 feet apart, south of the Site oriented in a southwest-northeast line (Figure 2). Table 2 provides extraction well screen and total depths.



Table 2 - Extraction Well Construction

Well	Total Depth	Top of 1st Screen (bgs)	Bottom of 1st Screen (bgs)	Top of 2nd Screen (bgs)	Bottom of 2nd Screen (bgs)
EX-1 (aka EXT-1)	175 ft.	75 ft.	110 ft. Packer at 115 ft. (2013)	125 ft. Not Used (2013)	175 ft.
EX-2 (aka EXT-2)	190 ft.	95 ft.	120 ft. Packer at 125 ft. (2013)	135 ft. Not used (2013)	190 ft.
EX-3 (aka EXT-3)	194 ft.	94 ft.	194 ft.	NA	NA

Clay layers located in EX-1 between 110 ft. and 125 ft. bgs, and in EX-2 between 120 ft. and 135 ft. bgs is the reason for the two screen intervals in those extraction wells. The 10 horsepower pumps in each extraction well are capable of pumping up to 200 gallons per minute (gpm). However, historically EX-1, EX-2, and EX-3 extracted 190 gpm, 188 gpm, and 175 gpm, respectively, for a total of approximately 553 gpm.¹ Based on a step-down test completed in June 2013, the pumping rates of EX-1 and EX-2 were reduced to 110 gpm and 120 gpm, respectively. The average flow rate over the course of a month after June 2013 was approximately 350 to 390 gpm. This average pumping rate equals approximately 500,000 to 560,000 gallons per day.

Packers were installed in EX-1 and EX-2 in 2013 to isolate the upper screen interval after depth discrete sampling in the wells indicated groundwater at the lower screen interval did not contain VOCs at concentrations above the criteria.

In August 2014 at the direction of NYSDEC, EX-2 was taken off line and the flow from EX-1 was decreased to approximately 60 gpm. This average pumping rate as of August 24, 2014 equaled approximately 330,000 to 360,000 gpd.

On August 27, 2015, water ponding at the surface around infiltration gallery 3 (IG-3) necessitated a further reduction in flow rate. On that date, the average flow rate for the plant was 146 gpm. The plant supervisor later determined the ponding condition resulted from leaking pipe caps, not clogged laterals as was first thought and the flow rate was gradually increased. As of December 2015, the average flow rate was 164 gpm equaling approximately 237,000 gpd.

GWET System Path of Remediation

Groundwater is pumped from the extraction wells which contain level transducers set to control the pump on time and the water level of the wells. Upon extraction, water enters a 60,000-gallon equalization tank adjacent to the GWET system building. Water from the equalization tank flows through two parallel metals-removal trains that are each rated for 250 gpm. Each train includes a reaction tank, a flocculation tank, a clarifier, and a filter

¹ The plant supervisor is not aware of rates exceeding 400 gpm.

followed by air-stripper feed tanks. In 2001, after the first nine months of operation, the addition of oxidizing chemicals (potassium permanganate) to the metals removal system was discontinued as the influent metals analytical concentrations to the plant met EPA discharge standards for metals. Water continues to flow through the metals portion of the treatment system.

The feed tanks divert the water through a single packed tower air stripper rated at an average rate of 500 gpm, where the water is collected and then pumped directly to the treated water tanks. The air emission from the air stripper is treated with vapor phase carbon and is monitored weekly by the plant operator using a photoionization detector.

The treated water is then stored in two 42,000-gallon vessels prior to reinjection to the subsurface via four injection wells and/or two infiltration galleries located on the adjacent SUNY Farmingdale campus.

The GWET system is manned by two operators working 40-hour weeks, and an autodialer (telemetry unit) is installed to contact the operators in case of plant alarms. The operators typically respond to alarms within 30 minutes. The plant operator can monitor the plant remotely from the Citect SCADA control system and make adjustments to the system operations.

GWET System Operating Permits

Water Permit

The plant was issued a water discharge permit dated January 1, 1998, which was renewed on March 4, 2015. A permit renewal application was submitted to and approved by the NYSDEC Bureau of Water Permits. The completed permit reauthorization expires on December 31, 2025.

Effluent Limitations and Monitoring Requirements outlined in the permit are enforced by the NYSDEC Division of Environmental Remediation, Remedial Bureau E.

Air Permit

An air permit is not required for the GWET system operation. In particular, NYSDEC regulation 6 NYCRR Part 375-1.7 states that “no permit is required when the substantive compliance is achieved as indicated by the NYSDEC approval of the workplan”. Based on a review of the information pertaining to the GWET system, VOCs air emissions from the GWET system historically have been negligible and are compliant with air guideline concentrations. The system remains in place and operational because it is impractical to remove it.

3.2 Groundwater Extraction and Treatment System Performance Evaluation

3.2.1 Flow Rate

Since startup, the system has treated more than 2.2 billion gallons of groundwater. During the fourth quarter of 2015 (October – December), the treatment system processed 22.4 million gallons of water. Daily flow readings are provided in the O&M

reports submitted monthly to NYSDEC (refer to December 2015 O&M report for the most recent data).

The volume of treated water discharged by the GWET system to the injection well field is determined daily from readings of the magnetic flow meter on the plant effluent line. The injection system was designed for a 500 gpm flow rate, although the maximum operating flow rate since system start-up was 400 gpm.² Currently, the injection rate is approximately 170 gpm.

The plant's effluent discharge is limited by the condition of the injection wells. Currently depth to water in the injection wells is as shallow as 2 to 3 feet bgs. Approximately 100 feet of screen at IW-1 and 140 feet of screen at IW-2 have been lost to sand accumulating in the wells. The sand appears to originate from breaks in the screens as observed on a downhole camera used to investigate the well conditions. The reduced injection rate is limiting the extraction rate and the capture zone.

3.2.2 Groundwater Extraction and Treatment System Contaminant Removal

To evaluate the treatment system's contaminant influent removal rate, HDR reviewed available GWET system influent and effluent analytical results from monthly operation and maintenance records. Approximately 939 kilograms (2,070 pounds) of VOCs have been removed to date. Mass removal peaked in 2003 at 288 kilograms and in 2015 was 16 kilograms. Cumulatively, most of the mass removed has been TCE (743 kilograms) and PCE (168 kilograms). A plot of historic mass removal rates and cumulative PCE and TCE mass removal is presented as Figure 5.

3.2.3 Groundwater Extraction and Treatment System Discharge Monitoring

Groundwater samples of the effluent collected monthly are analyzed for VOCs, semivolatile organic compounds (SVOCs), metals, total organic carbon (TOC), total suspended solids (TSS), total dissolved solids (TDS), total Kjeldahl nitrogen (TKN), and anions. Effluent data for select VOC compounds (PCE, TCE, and 1,1-DCE) and metals (iron and manganese) are analyzed to evaluate compliance with effluent discharge limits. Figure 6 shows that effluent concentrations for the main contaminants, PCE and TCE, have remained below permissible discharge limit levels. Figure 7 shows that the concentrations of iron and manganese were under the permissible levels for the fourth quarter 2015 sampling results. Refer to the monthly O&M and the Significant Events reports for additional information on remediation system performance and daily operations.

² According to the plant supervisor.

4 Groundwater Monitoring Program

On December 14 and 15, 2015 HDR sampled a total of 41 on-site and off-site monitoring wells. On-site monitoring wells included DW-1, DW-2, EW-5, EW-7C, EW-7D, EW-8D, EW-9D, and SW-1. Off-site wells included BP-3A, BP-3B, BP-3C, EW-1A, EW-1B, EW-1C, EW-2A, EW-2B, EW-2C, EW-2D, EW-3A, EW-3B, EW-3C, EW-4A, EW-4B, EW-4C, EW-4D, EW-6A, EW-6C, EW-10C, EW-11D, EW-12D, EW-13D, EW-14D, LF-02, MW-6D, MW-8A, MW-8B, MW-8C, MW-10B, MW-10C, MW-10D, and WT-01. In addition, the three extraction wells, EX-1, EX-2, and EX-3, were sampled. The monitoring well locations are depicted on Figure 2. A description of the groundwater sampling event is provided below.

4.1 Hydrological Data

A synoptic round of groundwater levels was measured in 39 of the 41 groundwater wells on December 11, 2015. Depth to groundwater during this event ranged from 45.50 feet (EW-14D) to 104.50 feet bgs (EW-11D). Water level elevations were calculated by subtracting the depth to water from each measurement from the top of casing elevation. HDR plotted the water levels and drew the configurations of the water table and potentiometric surface in the Magothy aquifer depicting the groundwater flow directions. These data show the groundwater flow direction is due south, south-southwest and south-southeast at the water table (Figure 3) and south-southeast in the Magothy (Figure 4). The effect on the aquifer from pumping of the CPC extraction wells is evident from bends in otherwise straight potentiometric surface contours nearest the extraction wells. Overall, groundwater elevations and inferred groundwater flow direction based on groundwater elevation contours were consistent with previous data.

4.2 Groundwater Sample Collection

The groundwater samples were collected on December 14 and 15, 2015. The groundwater samples were collected using PDBs inserted at mid-point in the screens in each monitoring well.³ Each PDB bag was retrieved, pierced with a decontaminated sharp object and the water inside was collected in VOC vials with septum caps, and preserved with hydrochloric acid (HCl). The VOC vials are labeled, recorded on a chain of custody, and placed in a cooler with ice. New PDBs were installed at the mid point of the screens of each monitoring well for the next sampling event.

The samples were submitted to Test America Laboratory, of Edison, New Jersey, an NYSDOH ELAP-approved laboratory, to be analyzed for VOCs via EPA Method 8260. A list of wells sampled and analytical results are presented in Table 5. Groundwater sampling for metals was discontinued by the NYSDEC following the July 2011 sampling event after metals concentrations met groundwater quality standards.

³ PDBs were first used for the May 2012 sampling event.



4.3 Groundwater Analytical Results

Groundwater sampling results are summarized on Table 3 and shown on the trend chart figures (Figures 8 through 25). Of note, acetone was detected in nineteen samples but did not exceed the criterion for any of the samples in which it was detected. It is likely a laboratory contaminant and not present in groundwater.

Table 3 - Monitoring and Extraction Wells with VOC Exceedances – 4th Quarter 2015

Well	TCA	1,1-DCA	1,2-DCA	DCE	PDB	Benzene	C DCE	Cumene	PCE	TCE
PCE-Dominant Wells (on-site)										
SW-1	ND	ND	ND	ND	ND	ND	<u>12</u>	ND	<u>190</u>	<u>18</u>
PCE-Dominant Wells (off-site, downgradient)										
BP-3B	0.81J	<u>11</u>	0.47J	0.52J	ND	ND	<u>78</u>	ND	<u>110</u>	<u>8.6</u>
BP-3C	0.54J	1.5	ND	ND	ND	ND	<u>74</u>	ND	<u>180</u>	<u>11</u>
TCE-Dominant Wells										
EW-4A	ND	ND	ND	ND	ND	ND	4.4	ND	<u>5.6</u>	0.73J
EW-4C	3.1	2.1	ND	2.2	ND	ND	1.0	ND	<u>5.0</u>	<u>19</u>
EW-4D	ND	ND	ND	ND	ND	ND	ND	ND	<u>12</u>	<u>12</u>
EW-7C	0.59J	0.32J	ND	0.37J	ND	ND	3.6	ND	<u>14</u>	<u>190</u>
EW-7D	ND	ND	ND	ND	ND	ND	ND	ND	3.7	<u>6.3</u>
EW-12D	0.62J	ND	ND	1.2	ND	ND	1.3	ND	1.6	<u>5.4</u>
EW-14D	<u>15</u>	0.34J	<u>2.8</u>	<u>14</u>	ND	ND	1.4	ND	2.9	<u>150</u>
LF-02	ND	ND	ND	ND	<u>3.2</u>	<u>3.4</u>	0.5J	<u>9.7</u>	ND	ND
MW-8A	ND	ND	ND	ND	ND	ND	ND	ND	<u>5.0</u>	0.28J
MW-10D	ND	ND	<u>0.78J</u>	ND	ND	ND	0.28J	ND	3.1	1.7
Extraction wells										
EX-1	ND	ND	ND	ND	ND	ND	3.3	ND	4.8	<u>6.3</u>
EX-2	ND	ND	ND	ND	ND	ND	1.0	ND	<u>5.2</u>	2.1
EX-3	0.75J	ND	ND	1.4	ND	ND	3.7	ND	<u>7.5</u>	<u>41</u>

Results units are µg/L. Bold, underlined, italicized results are exceedances of the criteria. See Table 5 for complete analytical results and comparison criteria. Cumene – Isopropylbenzene; TCE – trichloroethylene; C DCE – cis-1,2-dichloroethylene; 1,1-DCA – 1,1-dichloroethane; 1,2-DCA – 1,2-dichloroethane; DCE – 1,1-dichloroethene; PCE – tetrachloroethylene; PDB – 1,4-Dichlorobenzene; TCA – 1,1,1-trichloroethane.

4.3.1 Plume Evaluation

The groundwater contamination distribution was evaluated by creating sample location figures with iso-concentration lines for PCE and TCE in plan view and cross section (Figures 26 through 32).

On-site plume. This plume originates on-site with the highest concentrations most frequently measured at well SW-1, a water table well (Figures 26 and 27). The on-site plume is predominantly PCE, with PCE concentrations an order of magnitude greater than the TCE concentrations (Figure 10). PCE shows an overall increasing trend in well SW-1 with recent spikes this year including a concentration of 190 µg/L this quarter and over 200 µg/L in the 2nd quarter. For the remaining wells, PCE concentrations continue to decline or are stable.

Off-site, upgradient plume. This plume is first detected at the farthest upgradient well cluster, the EW-7 series, and flows southeast with only the western portion captured by the CPC system (Figures 26 and 27). The off-site plume is predominantly TCE, with TCE concentrations typically an order of magnitude greater than the PCE concentrations (Figure 16). TCE concentrations increased over 100 µg/L in the first two quarters of 2015 in well EW-7C. However, these concentrations have returned to the December 2014 levels as of this quarter, and the overall trend in TCE concentrations since 2011 has been decreasing. The off-site, upgradient plume extends at least as far south-southeast as the MW-10 series wells.

Well EW-14D. The groundwater contamination at EW-14D is high in TCE, similar to the off-site, upgradient plume (Figure 27). The PCE concentration, however, is below the criterion. Well EW-14D has the greatest variability in TCE concentrations of all of the wells evaluated for contaminant concentration trends (Figure 21).

Southern Area. This location is centered on the BP-3 series wells far south of the CPC site (Figures 26 and 27). The concentration of PCE is higher than the concentration of TCE by more than an order of magnitude (Table 3). The source of groundwater contamination at the BP-3 series wells has not been investigated.

PCE Cross Sections

Figures 28, 29 and 30 depict PCE concentrations in wells to the east, center, and to the west of the Site and show the vertical extent of PCE. PCE was detected at 14 µg/L at 198 feet bgs in EW-7C (Figure 28, Cross Section A – A'); 12 µg/L at 291 feet bgs at EW-4D (Figure 29, Cross Section B – B'); and 190 µg/L at 70 feet bgs at well SW-1 (Figure 30, Cross Section C – C').

TCE Cross Sections

Figures 31 and 32 depict TCE concentrations in wells to the east and west of the Site and show the vertical extent of TCE. TCE was detected at 190 µg/L at 198 feet bgs at well EW-7C and 150 µg/L at 191 feet bgs at well EW-14D. TCE was not detected at concentrations above the groundwater quality standard to the west of the Site (Figure 32, Cross Section B – B').

4.3.2 Comparison to Historical Groundwater Quality

Figures 5 through 25 illustrate the historical concentration trends for PCE and TCE in multiple wells. Table 4 summarizes the concentration trends in each of the wells.



Table 4 - PCE and TCE Concentration Trends in Select Monitoring Wells

Well	Screen Depth	Location	PCE Trend	TCE Trend	Figure
CPC Plume Wells					
DW-1	93-98	South-southwest of CPC	Flat, slightly increasing	Flat, slightly increasing	Figure 8
EW-1A	65-75	Southwest of CPC	Decreasing	Decreasing	Figure 9
SW-1	65-70	Southwest, closest to CPC	Increasing by ~100 ug/L in 2015	Slightly increasing	Figure 10
EW-5	165-175	South-southeast of CPC	Flat, slightly decreasing	Decreasing	Figure 11
Off-Site Plume(s) Wells					
EW-4A	100-115	East of CPC	Decreasing with 4th Qtr small increase	Flat	Figure 12
EW-4B	120-130	East of CPC	Decreasing	Flat, slightly decreasing	Figure 13
EW-4C	145-155	East of CPC	Flat, slightly decreasing	Decreasing	Figure 14
EW-4D	285-295	East of CPC	Flat, slightly decreasing	Decreasing	Figure 15
EW-7C	189-199	Upgradient, North of CPC	Flat	Decreasing	Figure 16
EW-7D	273-283	Upgradient, North of CPC	Decreasing	Flat	Figure 17
MW-10C	273-278	Southeast of CPC	Decreasing	Decreasing	Figure 18
MW-10D	346-351	Southeast of CPC	Flat	Increasing with fluctuations in past 1.5 years	Figure 19
EW-12D	209-219	East of CPC	Flat, 10 ug/L increase mid-2015, returned to pre-2015 levels	Increasing, spike of >50ug/L mid-2015, returned to 2014 levels	Figure 20
EW-14D	185-195	Southeast of CPC	Flat	Decreasing with very large fluctuations	Figure 21
Extraction Wells and Plant Influent					
EX-1	75-110	Extraction well south of CPC	Increasing	Increasing	Figure 22
EX-2	95-120	Extraction well south-southeast of CPC	Decreasing	Decreasing	Figure 23
EX-3	94-194	Extraction well south-southeast of CPC	Flat	Decreasing	Figure 24
PW-002	NA	Plant influent	Flat	Decreasing	Figure 25

Decreasing trends indicate mass removal from groundwater in the area around the well. Increasing and stable trends are indicative of partial capture and/or additional source(s) contributing to groundwater contamination in the area of the well.

5 Conclusions and Recommendations

5.1 Conclusions

The fourth quarter 2015 groundwater monitoring event at the CPC Site included collection of 44 groundwater samples (41 groundwater monitoring wells and 3 extraction wells). Analysis of the data has resulted in the following conclusions:

- A groundwater plume of VOCs, primarily PCE, originates proximate to the former Process Building (on-site plume). The GWET system captures most of the PCE plume reducing the concentration in groundwater;
- An off-site, upgradient plume consisting mostly of TCE originates to the north or northwest in the adjoining industrial park. The TCE contamination is only partially captured by the CPC GWET system;
- The upgradient wells and south/southeastern wells are outside the radius of influence of the CPC GWET system which was intended to treat CPC OU 4 on-site contamination only;
- 3.1 kilograms of total VOCs were removed during the reporting period;
- Concentrations of contaminants in effluent groundwater samples collected during the reporting period met discharge limits;
- The results from the fourth quarter 2015 groundwater sampling event showed compounds detected above criteria including TCE, C DCE, 1,1-DCA, 1,2-DCA, DCE, PDB, benzene, Cumene, PCE and TCA.
- **An increasing trend in PCE concentrations is observed at well SW-1 in the onsite plume nearest the former Process Building beginning mid-2015 and continuing.**

5.2 Recommendations

On January 5, 2016 HDR submitted a memo to NYSDEC recommending a reduction in the number of monitoring wells sampled from 44 to 27. A table providing the rationale for maintaining or eliminating each well was included in the memo. NYSDEC concurred with the exclusion of the recommended wells with the exception of wells BP-3A, BP-3B, BP-3C, and EW14D. Beginning the first quarter of 2016, the monitoring wells to be sampled quarterly are: DW-1, DW-2, EW-11D, EW-12D, EW-1A, EW-1B, EW-1C, EW-2A, EW-2B, EW-2C, EW-2D, EW-4A, EW-4B, EW-4C, EW-4D, EW-5, EW-7C, EW-7D, EX-1, EX-2, EX-3, MW-10D, MW-8A, MW-8B, MW-8C, SW-1, WT-01, BP-3A, BP-3B, BP-3C, and EW14D for a total of 31 wells.



In order for the CPC GWET system to continue to operate effectively, HDR recommends rehabilitation and/or replacement of the injection wells to increase the injection rate.

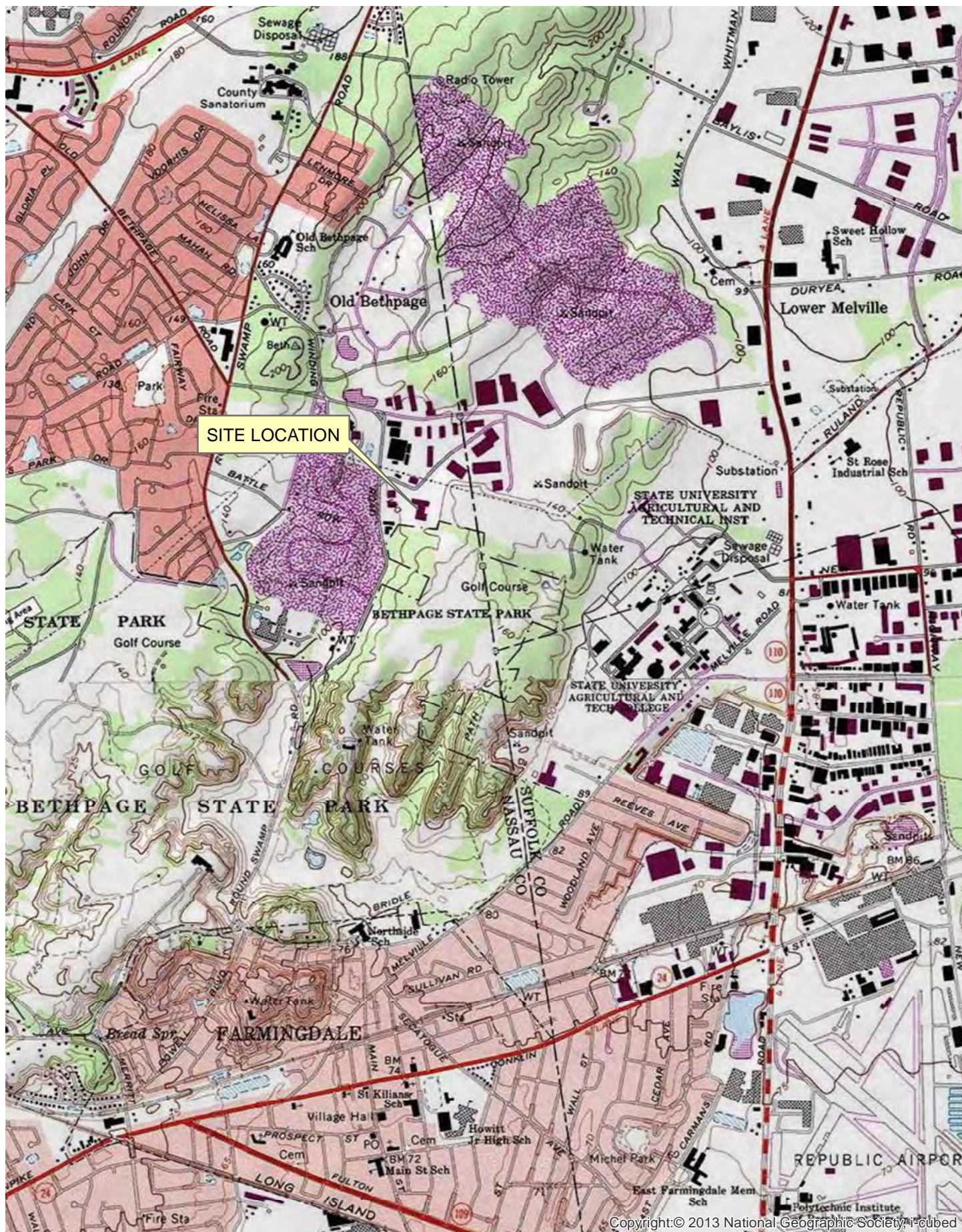
HDR was informed by NYSDEC that additional investigation to identify the source(s) of PCE and TCE detected in groundwater samples from the BP-3 series well cluster and at EW-14D is in the planning stages. This was a recommendation from last quarter.

6 References

- Ebasco Services Inc. "Draft final remedial investigation report, Claremont Polychemical Superfund Site, Old Bethpage, New York." Lyndhurst, NJ, 1990.
- Ebasco Services Inc. "Draft final feasibility study, Claremont Polychemical Superfund Site, Old Bethpage, New York." Lyndhurst, NJ, 1990.
- US Army Corps of Engineers. "Claremont Polychemical Superfund Site Long-term Groundwater Monitoring Old Bethpage, New York." 2001.
- US Environmental Protection Agency. "Second Five-Year Review Report for the Claremont Polychemical Corporation Superfund Site." New York, NY, 2014.

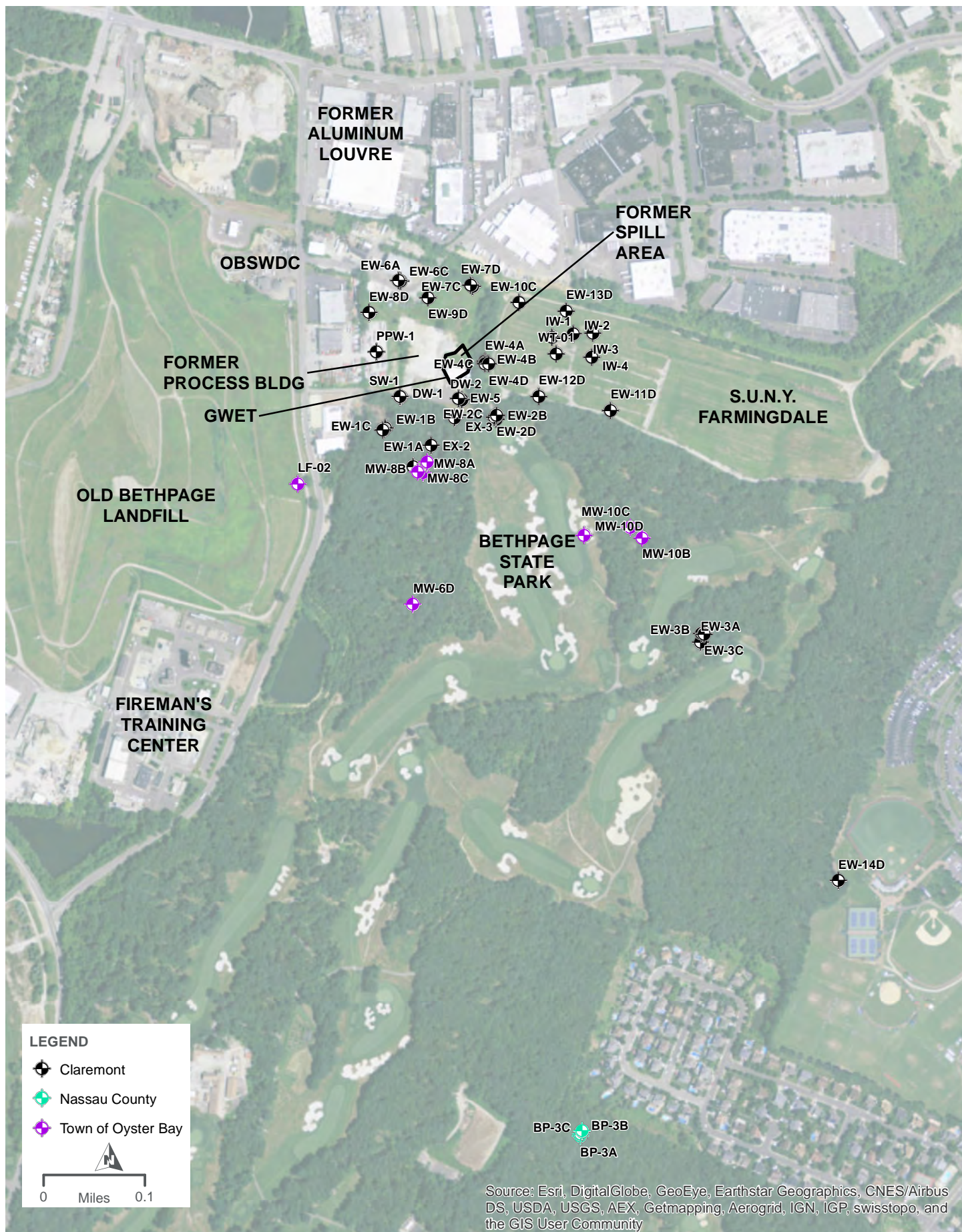
Table 5
Summary of Analytical Results
December 2015 (4Q15) Sampling Event
Claremont Polychemical Superfund Site
Old Bethpage, NY

Note: values in blue <i>italics</i> are "J" flagged. Values in shaded cells exceed criteria.		75-65-0	1634-04-4	127-18-4	108-88-3	156-60-5	0061-02-	79-01-6	75-69-4	75-01-4
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Sample Description	Date Collected	Tert-Butyl Alcohol	Tert-Butyl Methyl Ether	Tetrachloroethylene (PCE)	Toluene	Trans-1,2-Dichloroethene	Trans-1,3-Dichloropropene	Trichloroethylene (TCE)	Trichlorofluoromethane	Vinyl Chloride
BP-3A	12/14/2015	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
BP-3B	12/14/2015	< 1.0 U	< 1.0 U	110	< 1.0 U	0.48	< 1.0 U	8.6	0.29	0.43
BP-3C	12/14/2015	< 1.0 U	< 1.0 U	180	< 1.0 U	0.54	< 1.0 U	11	< 1.0 U	< 1.0 U
DW-1	12/15/2015	< 1.0 U	< 1.0 U	0.38	0.36	< 1.0 U	< 1.0 U	1.3	< 1.0 U	< 1.0 U
DW-2	12/15/2015	< 1.0 U	< 1.0 U	0.5	< 1.0 U	< 1.0 U	< 1.0 U	0.88	< 1.0 U	< 1.0 U
EW-10C	12/15/2015	< 1.0 U	< 1.0 U	0.18	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
EW-11D	12/15/2015	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
EW-12D	12/15/2015	< 1.0 U	< 1.0 U	1.6	< 1.0 U	< 1.0 U	< 1.0 U	5.4	< 1.0 U	< 1.0 U
EW-13D	12/15/2015	< 1.0 U	< 1.0 U	1.2	< 1.0 U	< 1.0 U	< 1.0 U	2.1	< 1.0 U	< 1.0 U
EW-14D	12/14/2015	< 1.0 U	< 1.0 U	2.9	< 1.0 U	< 1.0 U	< 1.0 U	150	< 1.0 U	< 1.0 U
EW-1A	12/15/2015	< 1.0 U	< 1.0 U	4.6	< 1.0 U	< 1.0 U	< 1.0 U	1.3	< 1.0 U	< 1.0 U
EW-1A DUP	12/15/2015	< 1.0 U	< 1.0 U	4.2	< 1.0 U	< 1.0 U	< 1.0 U	1.2	< 1.0 U	< 1.0 U
EW-1B	12/15/2015	< 1.0 U	< 1.0 U	0.44	< 1.0 U	< 1.0 U	< 1.0 U	0.85	< 1.0 U	< 1.0 U
EW-1C	12/15/2015	< 1.0 U	< 1.0 U	0.15	< 1.0 U	< 1.0 U	< 1.0 U	0.92	< 1.0 U	< 1.0 U
EW-2A	12/14/2015	< 1.0 U	< 1.0 U	< 1.0 U	0.26	< 1.0 U	< 1.0 U	0.23	< 1.0 U	< 1.0 U
EW-2B	12/14/2015	< 1.0 U	< 1.0 U	0.19	< 1.0 U	< 1.0 U	< 1.0 U	0.34	< 1.0 U	< 1.0 U
EW-2C	12/14/2015	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	0.52	< 1.0 U	< 1.0 U
EW-2D	12/14/2015	< 1.0 U	< 1.0 U	0.56	< 1.0 U	< 1.0 U	< 1.0 U	0.22	< 1.0 U	< 1.0 U
EW-3A	12/14/2015	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
EW-3B	12/14/2015	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
EW-3C	12/14/2015	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	0.33	< 1.0 U	< 1.0 U
EW-4A	12/15/2015	< 1.0 U	< 1.0 U	5.6	< 1.0 U	< 1.0 U	< 1.0 U	0.73	< 1.0 U	< 1.0 U
EW-4B	12/15/2015	< 1.0 U	< 1.0 U	0.97	< 1.0 U	< 1.0 U	< 1.0 U	2.4	0.17	< 1.0 U
EW-4C	12/15/2015	< 1.0 U	< 1.0 U	5.0	< 1.0 U	2.2	< 1.0 U	19	< 1.0 U	< 1.0 U
EW-4D	12/15/2015	< 1.0 U	< 1.0 U	12	< 1.0 U	< 1.0 U	< 1.0 U	12	< 1.0 U	< 1.0 U
EW-5	12/15/2015	< 1.0 U	< 1.0 U	0.76	< 1.0 U	< 1.0 U	< 1.0 U	2.0	< 1.0 U	< 1.0 U
EW-6A	12/14/2015	< 1.0 U	< 1.0 U	0.14	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
EW-6C	12/14/2015	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	0.43	< 1.0 U	< 1.0 U
EW-7C	12/14/2015	< 1.0 U	1.4	14	< 1.0 U	< 1.0 U	< 1.0 U	190	< 1.0 U	< 1.0 U
EW-7D	12/14/2015	< 1.0 U	< 1.0 U	3.7	< 1.0 U	< 1.0 U	< 1.0 U	6.3	< 1.0 U	< 1.0 U
EW-8D	12/15/2015	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
EW-9D	12/14/2015	< 1.0 U	< 1.0 U	1.1	< 1.0 U	< 1.0 U	< 1.0 U	0.41	< 1.0 U	< 1.0 U
EX-1	11/17/2015	< 1.0 U	0.34	4.8	< 1.0 U	< 1.0 U	< 1.0 U	6.3	< 1.0 U	< 1.0 U
EX-1 DUP	11/17/2015	< 1.0 U	0.27	4.7	< 1.0 U	< 1.0 U	< 1.0 U	6.0	< 1.0 U	< 1.0 U
EX-2	11/17/2015	< 1.0 U	0.21	5.2	< 1.0 U	< 1.0 U	< 1.0 U	2.1	< 1.0 U	< 1.0 U
EX-3	11/17/2015	< 1.0 U	0.43	7.5	< 1.0 U	< 1.0 U	< 1.0 U	41	< 1.0 U	< 1.0 U
LF-02	12/14/2015	< 1.0 U	0.23	< 1.0 U	0.35	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	0.24
MW-10B	12/14/2015	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
MW-10C	12/14/2015	< 1.0 U	< 1.0 U	0.74	< 1.0 U	< 1.0 U	< 1.0 U	1.2	< 1.0 U	< 1.0 U
MW-10D	12/14/2015	< 1.0 U	< 1.0 U	3.1	< 1.0 U	< 1.0 U	< 1.0 U	1.7	< 1.0 U	< 1.0 U
MW-6D	12/14/2015	< 1.0 U	0.74	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
MW-8A	12/14/2015	< 1.0 U	< 1.0 U	5.0	< 1.0 U	< 1.0 U	< 1.0 U	0.28	< 1.0 U	< 1.0 U
MW-8B	12/14/2015	< 1.0 U	< 1.0 U	0.24	< 1.0 U	< 1.0 U	< 1.0 U	0.4	< 1.0 U	< 1.0 U
MW-8C	12/14/2015	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	0.23	< 1.0 U	< 1.0 U
SW-1	12/15/2015	< 1.0 U	< 1.0 U	190	< 1.0 U	< 1.0 U	< 1.0 U	18	< 1.0 U	< 1.0 U
WT-01	12/15/2015	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
WT-01 DUP	12/15/2015	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U



SITE LOCATION
CLAREMONT POLYCHEMICAL CORPORATION

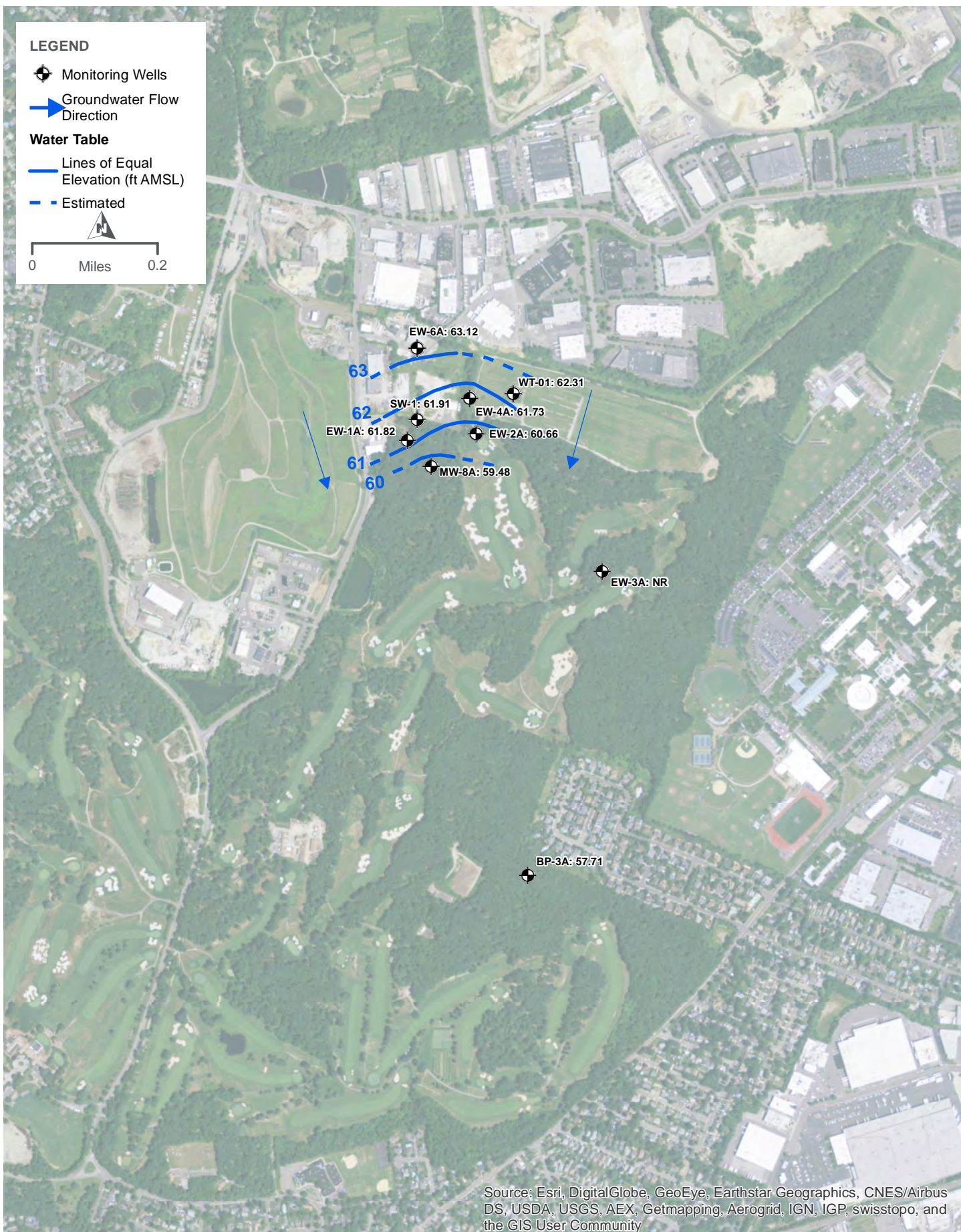
FIGURE 1



WELL LOCATIONS CLAREMONT POLYCHEMICAL CORPORATION

FIGURE 2





WATER TABLE CONTOURS CLAREMONT POLYCHEMICAL CORPORATION

FIGURE 3

LEGEND



Monitoring Wells



GW Flow Direction

Water Table



Lines of Equal
Elevation (ft AMSL)



Estimated



0 Miles 0.2

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



POTENTIOMETRIC SURFACE - MAGOTHY AQUIFER (-91 TO -142 FT AMSL) CLAREMONT POLYCHEMICAL CORPORATION

FIGURE 4

VOC Removal vs Time (PCE, TCE)

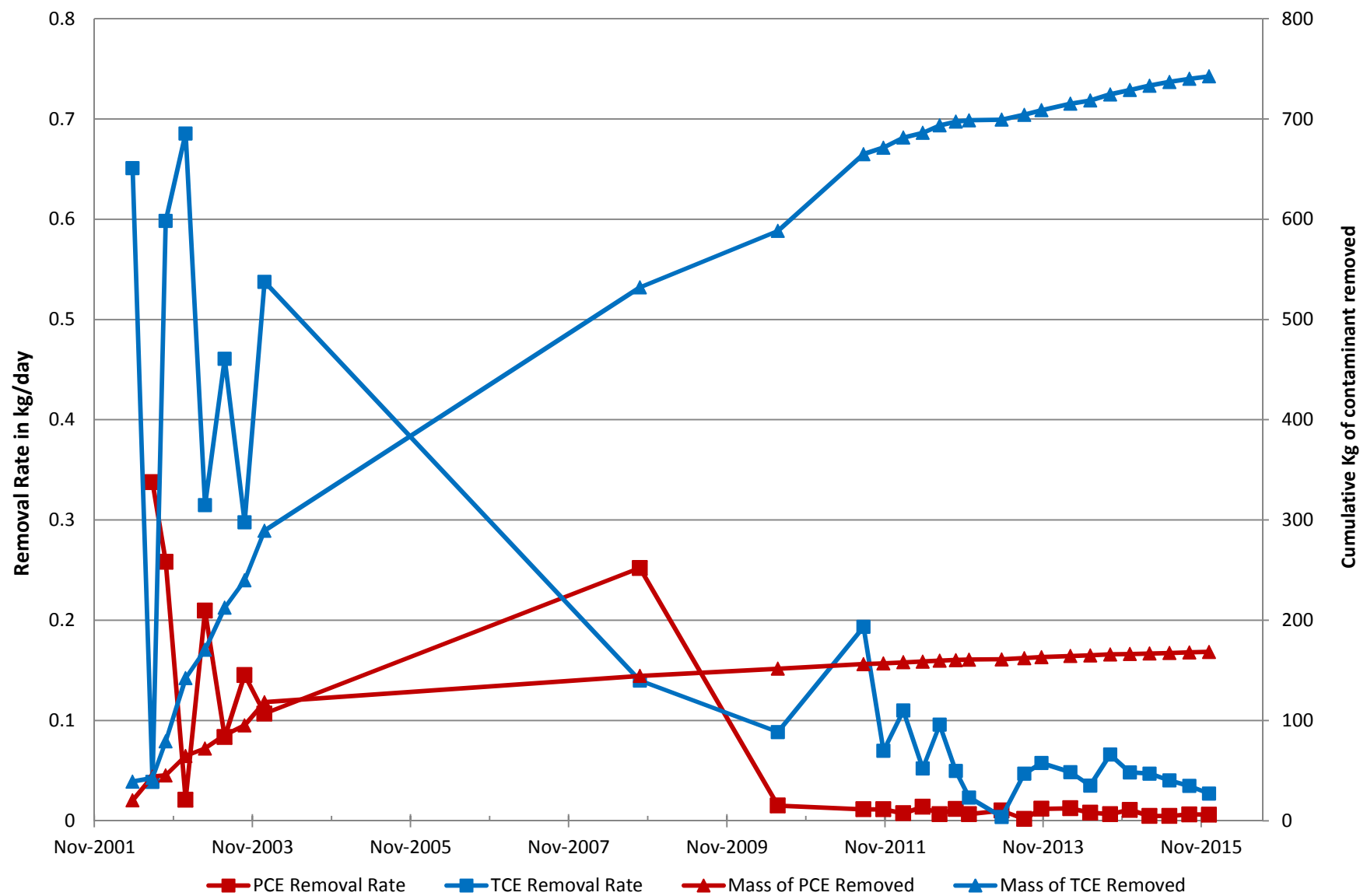


Figure 5

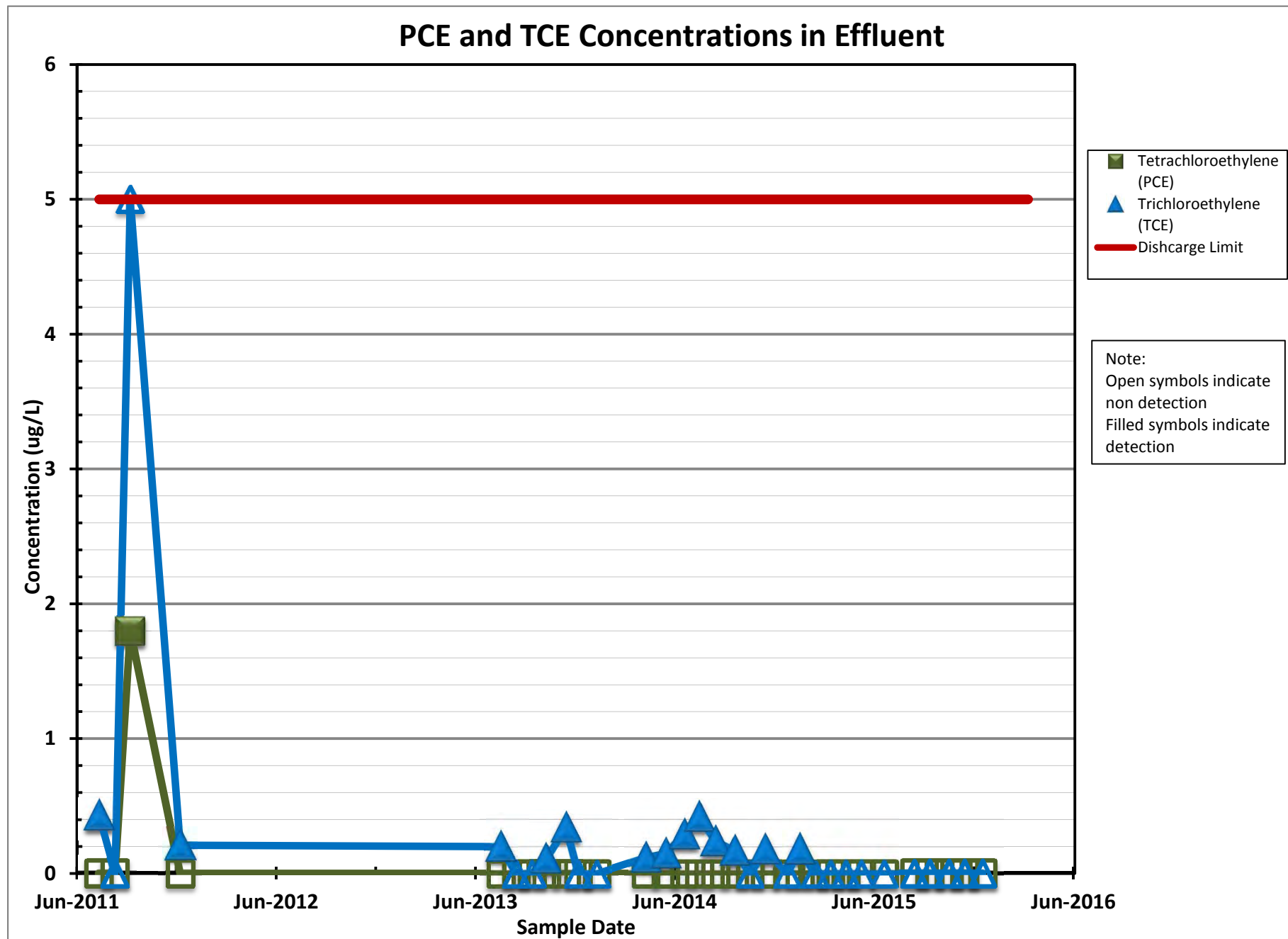


Figure 6

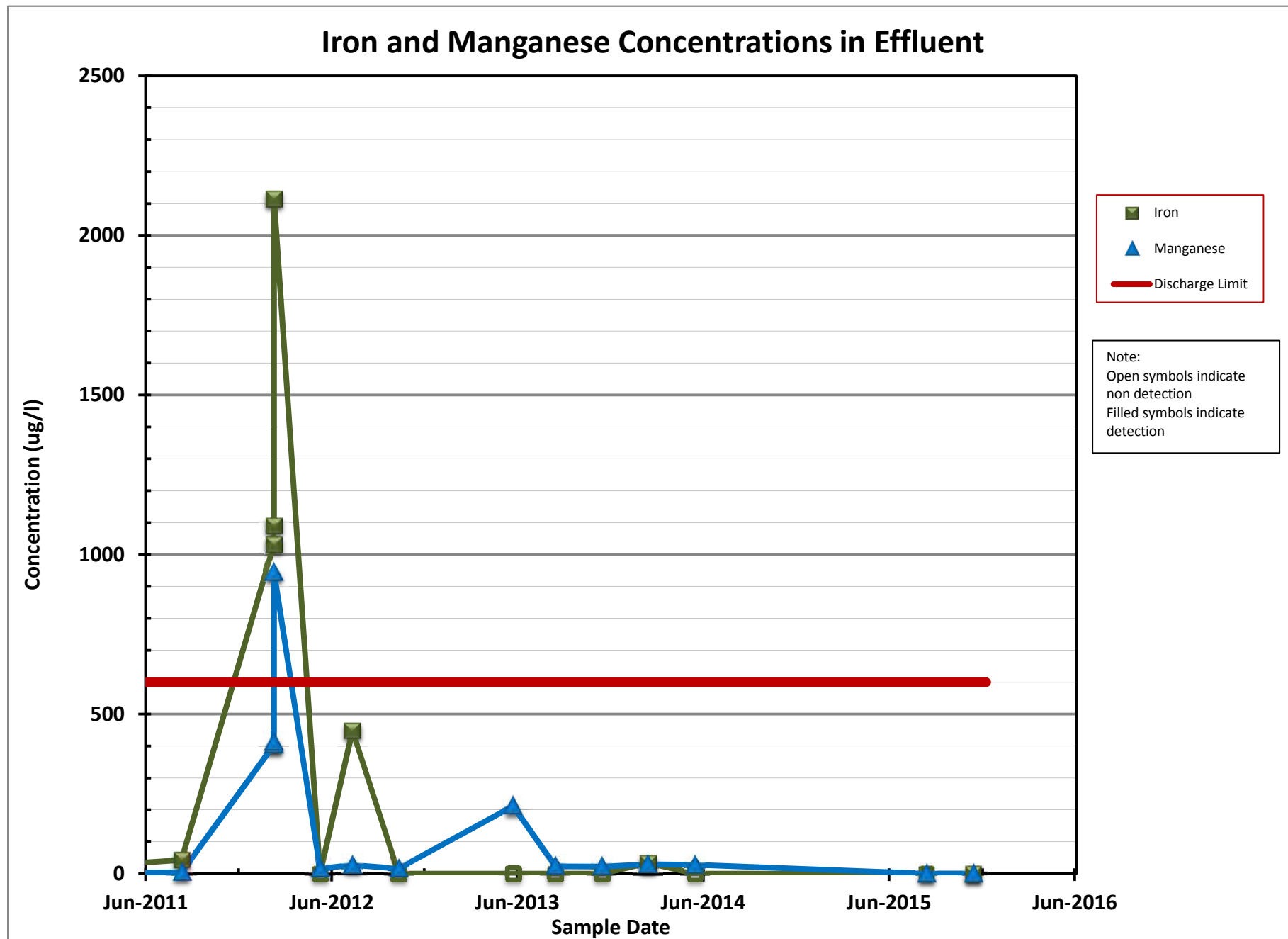


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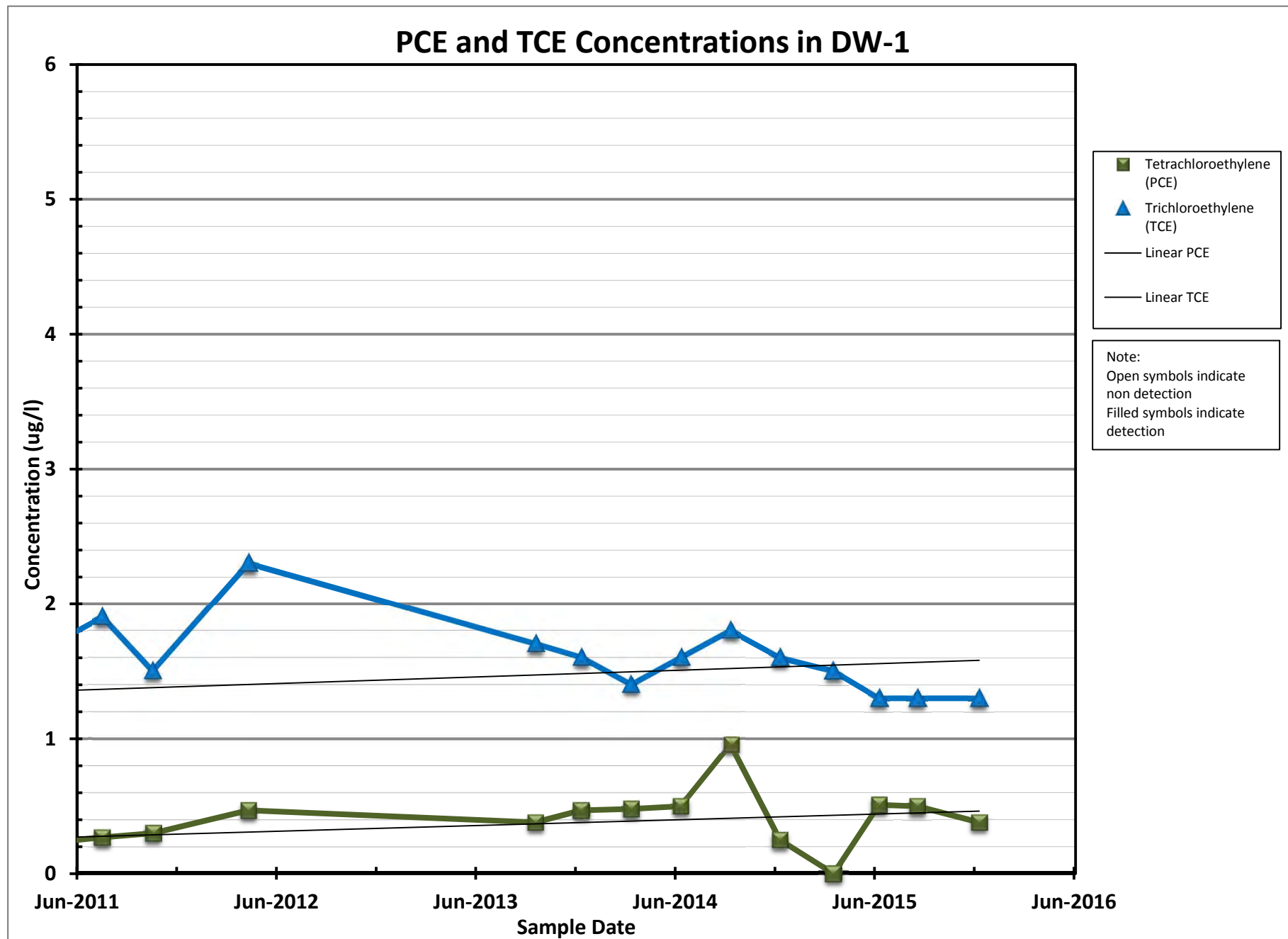


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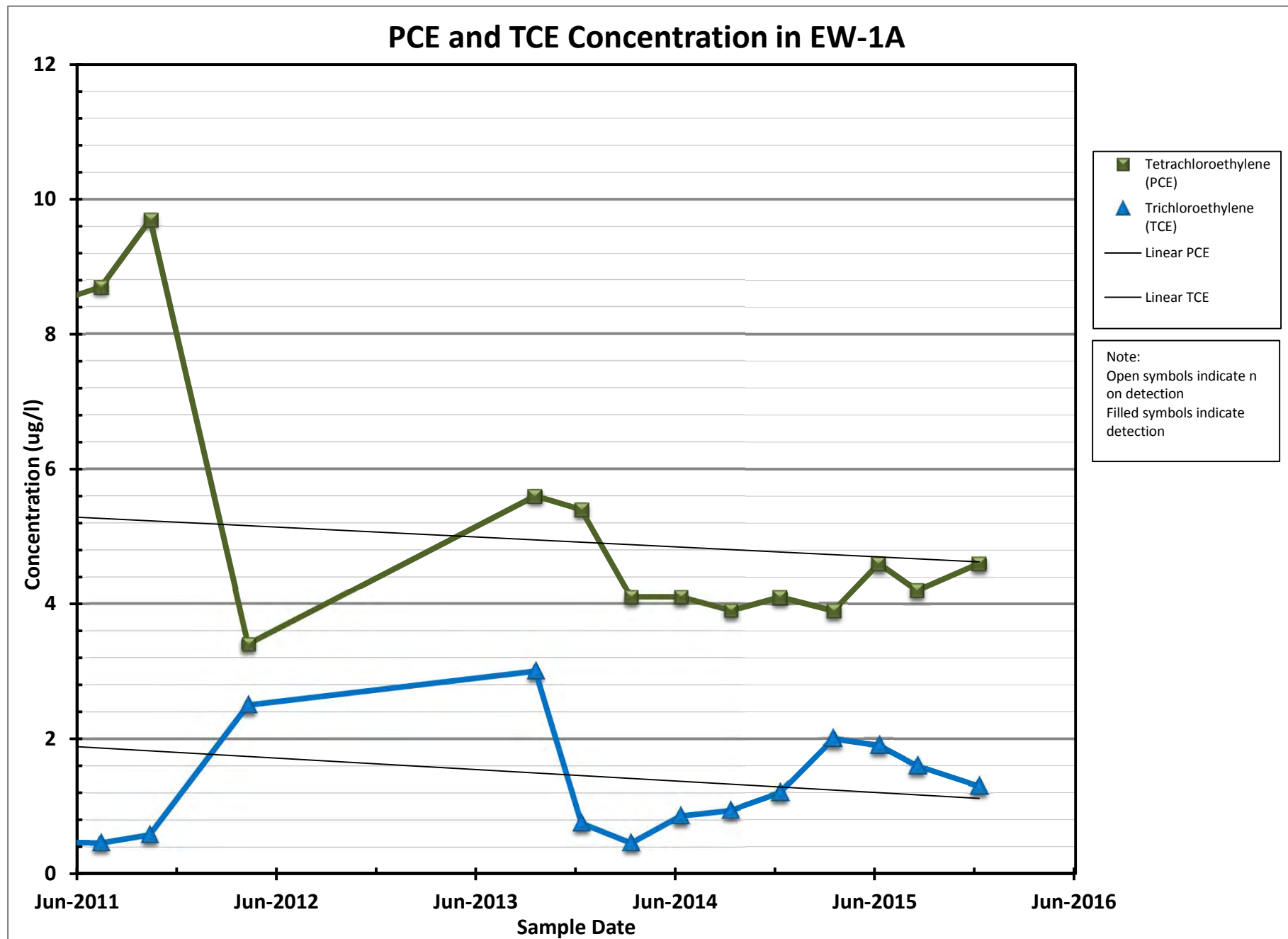


Figure 9

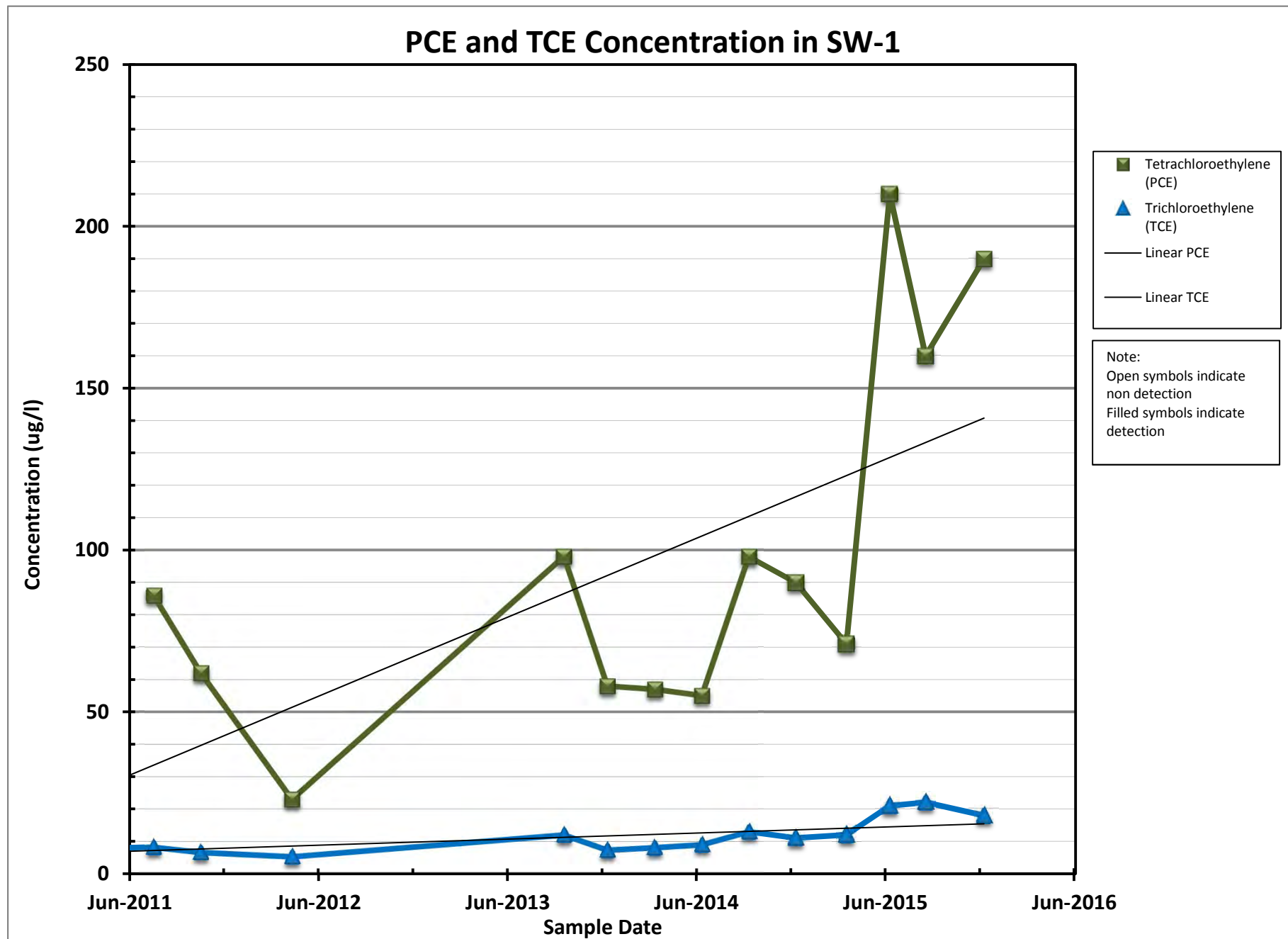


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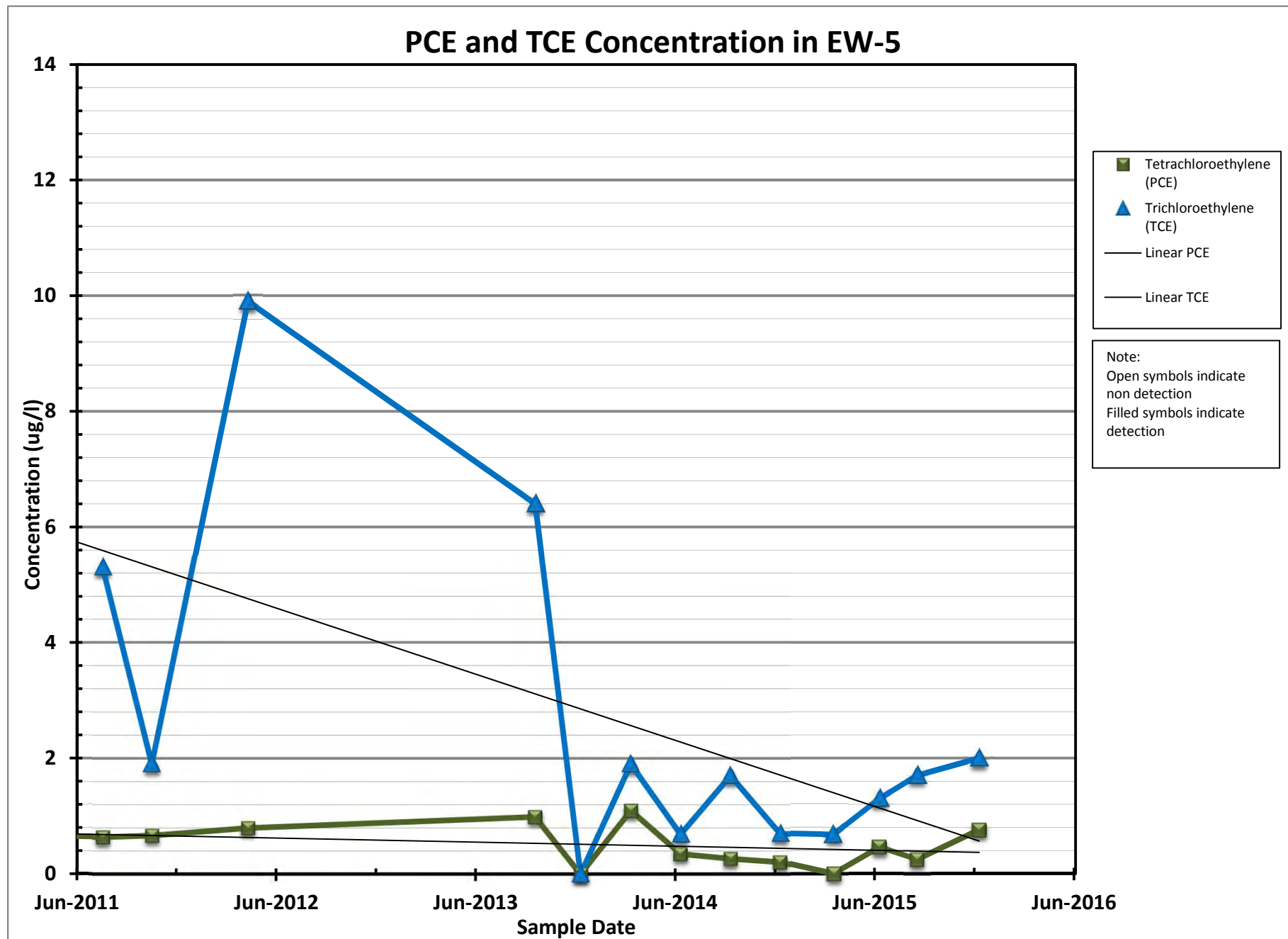


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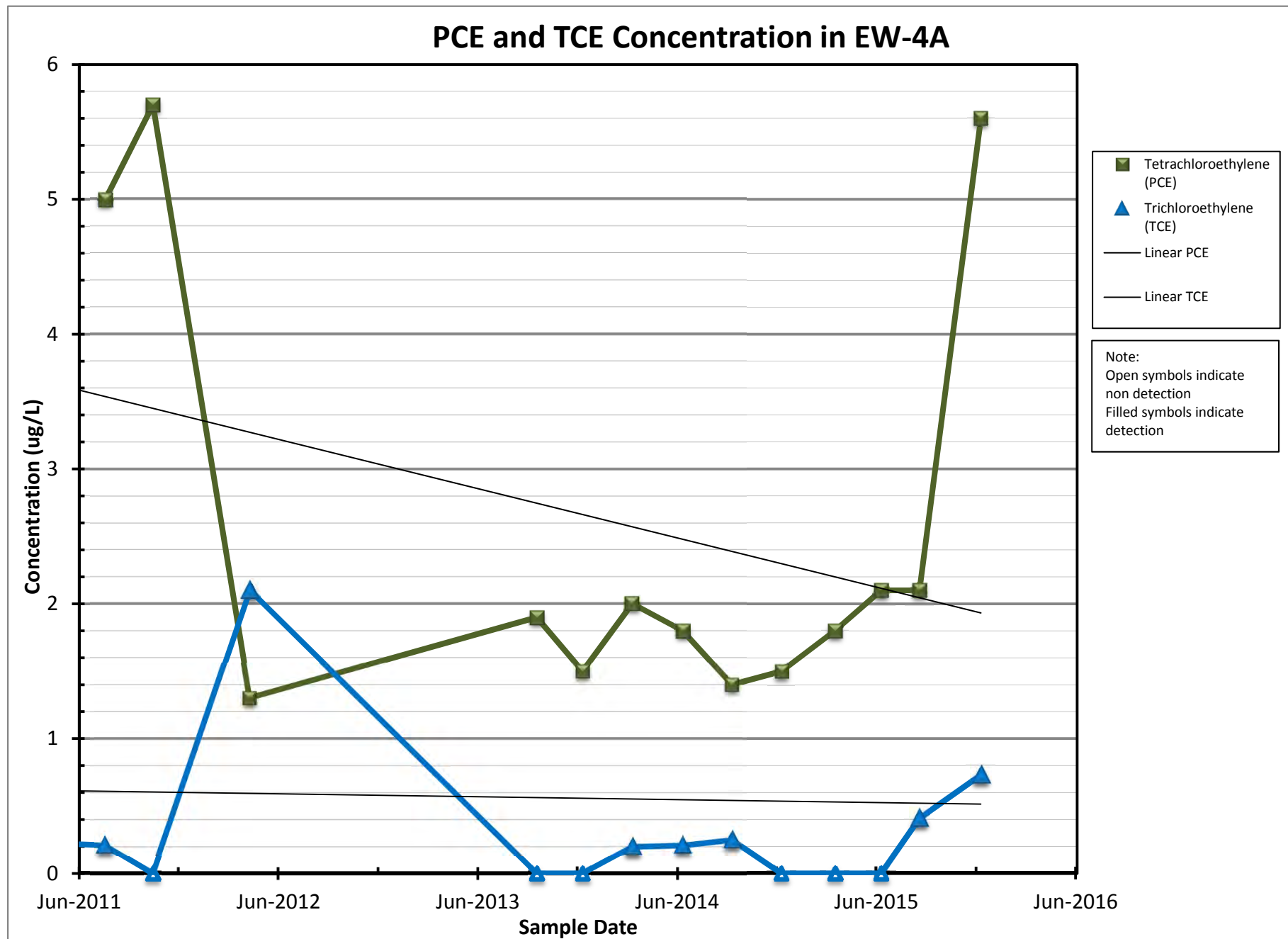


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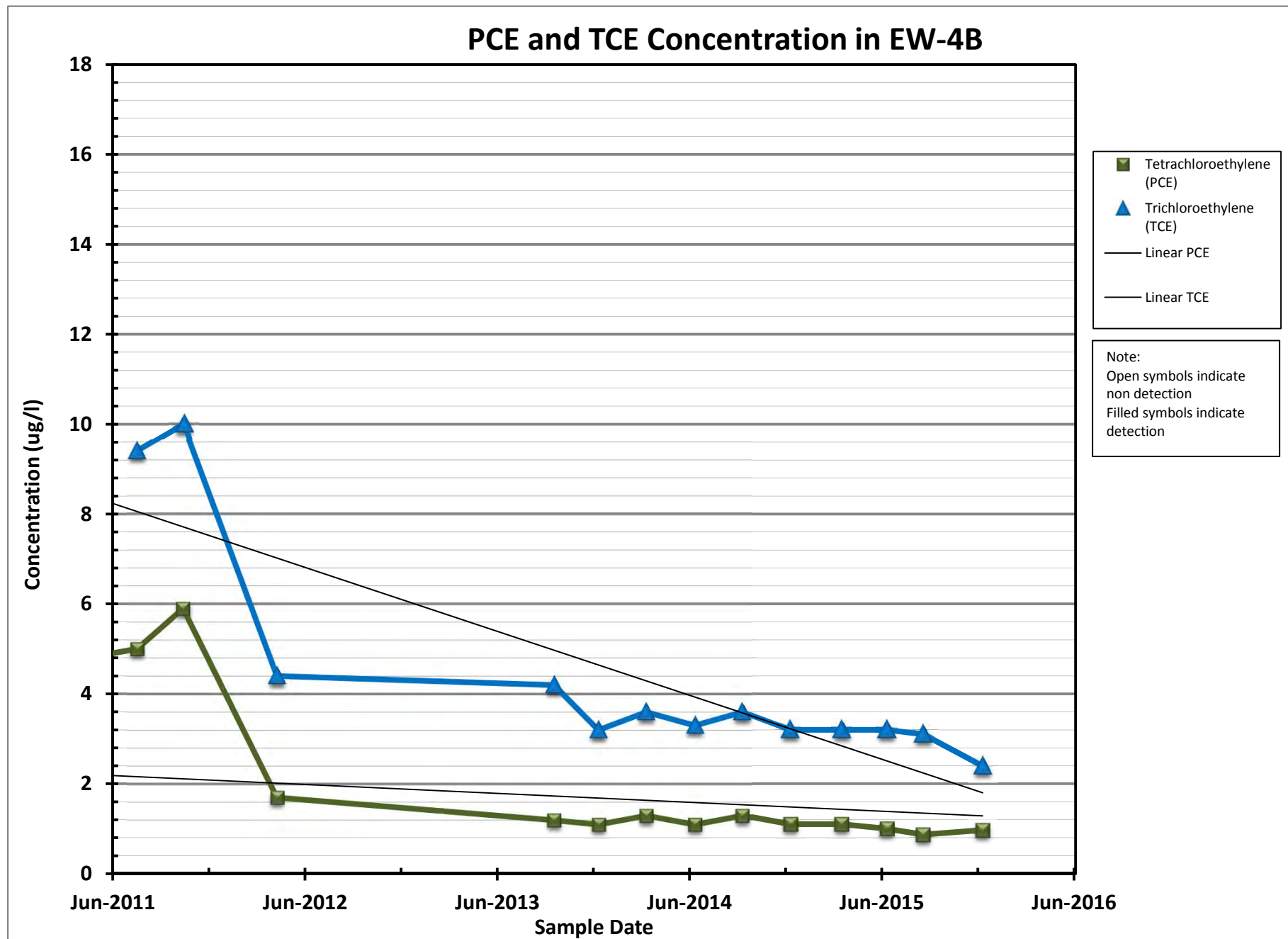


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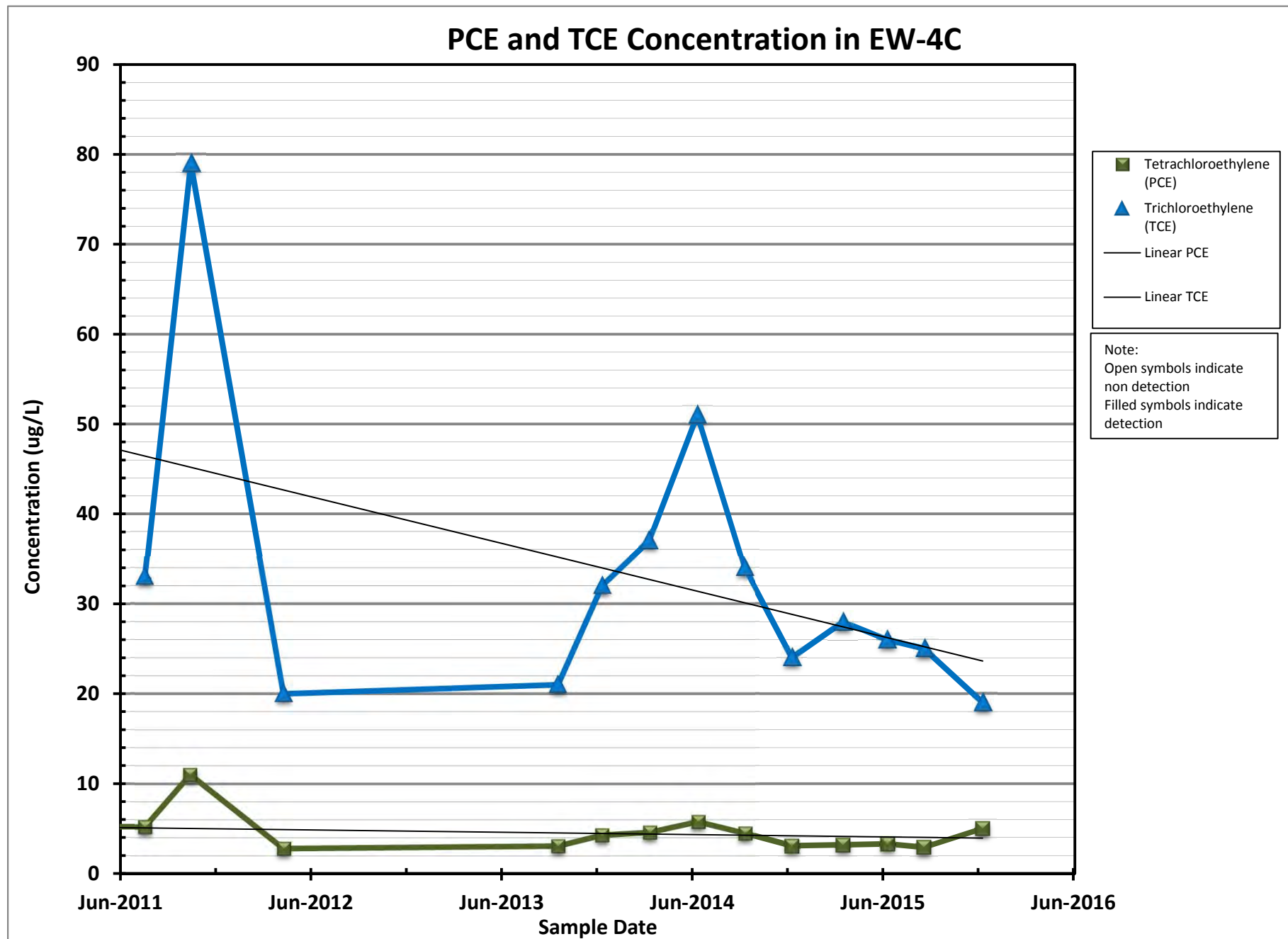


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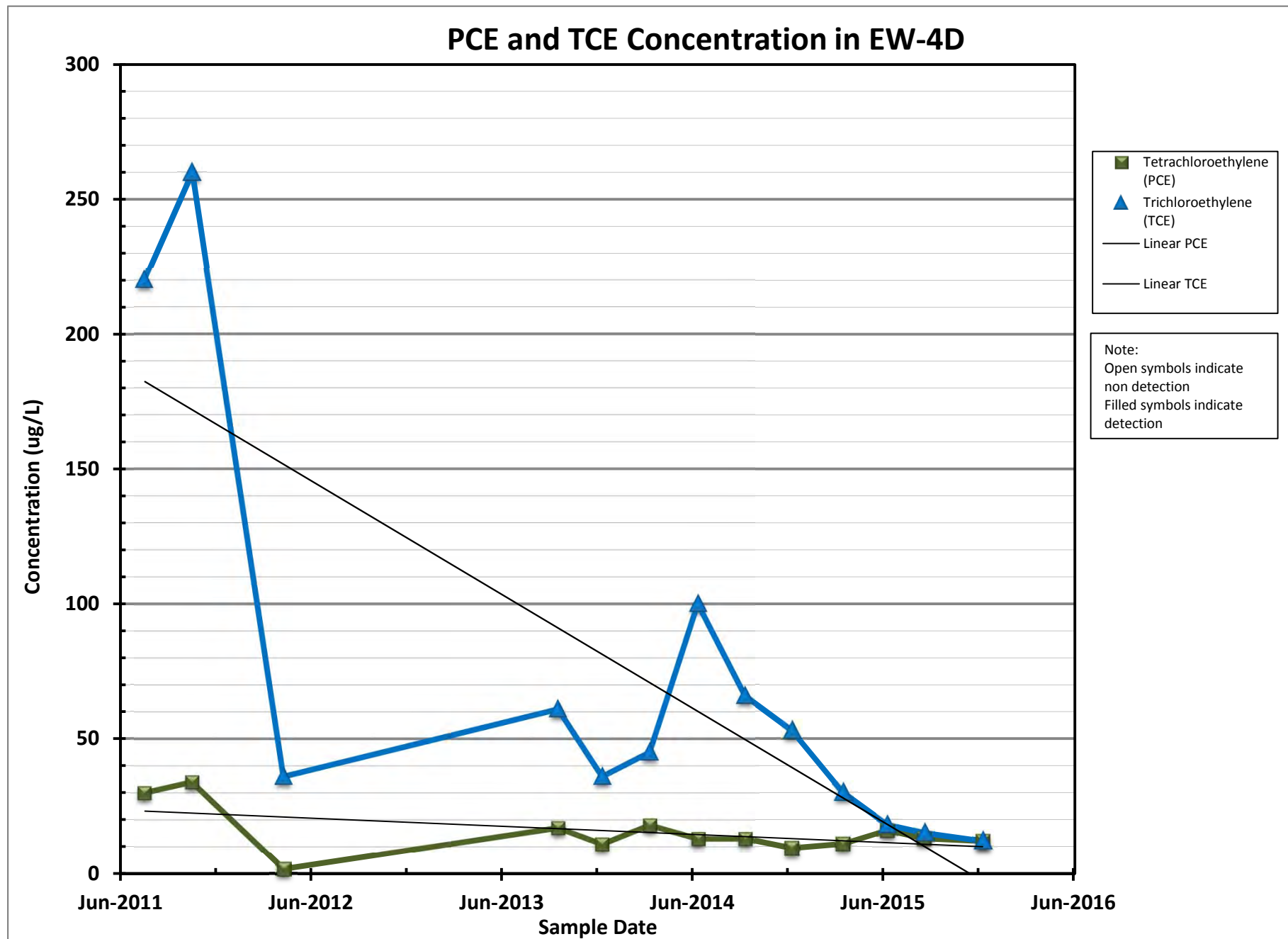


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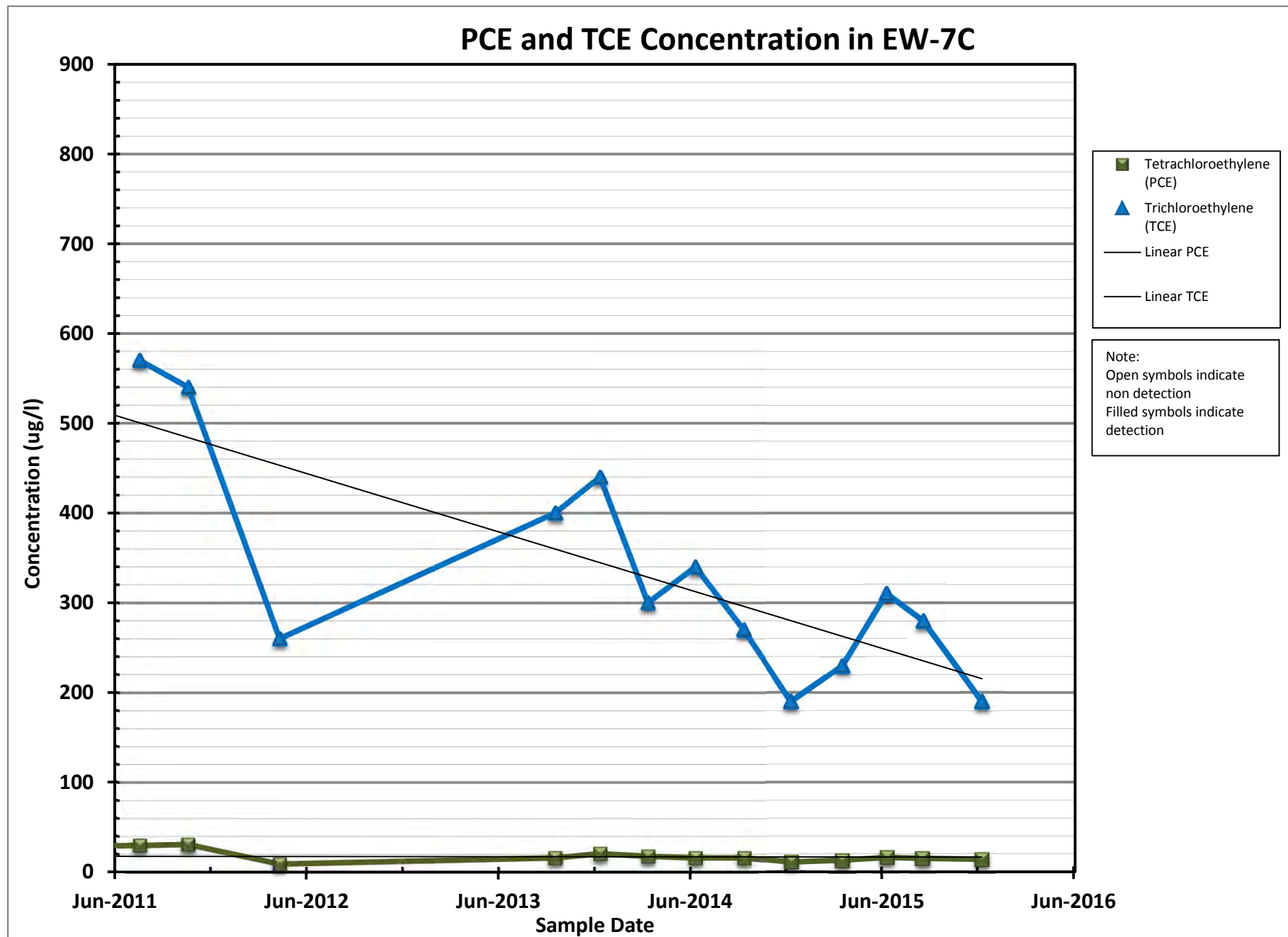


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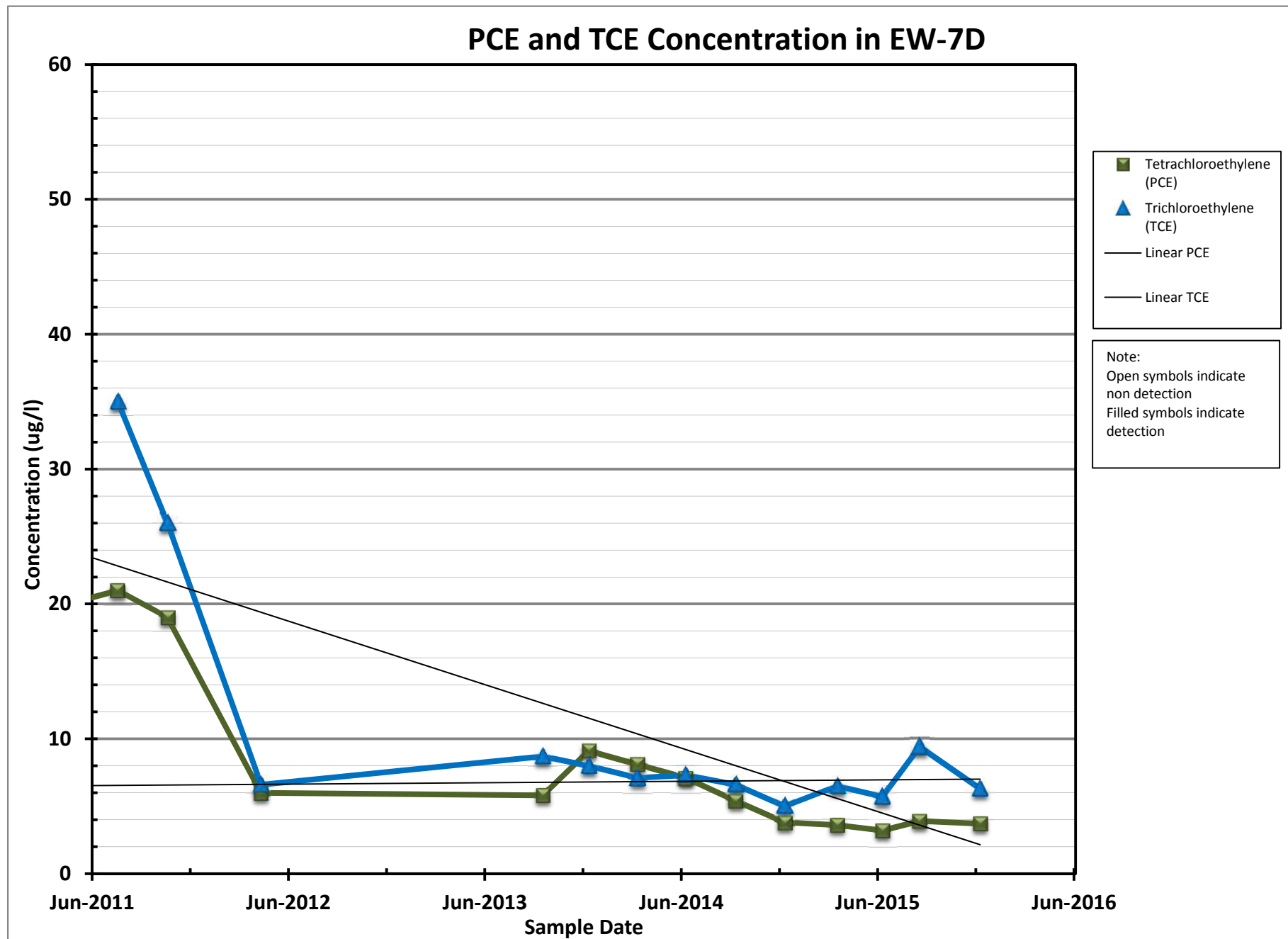


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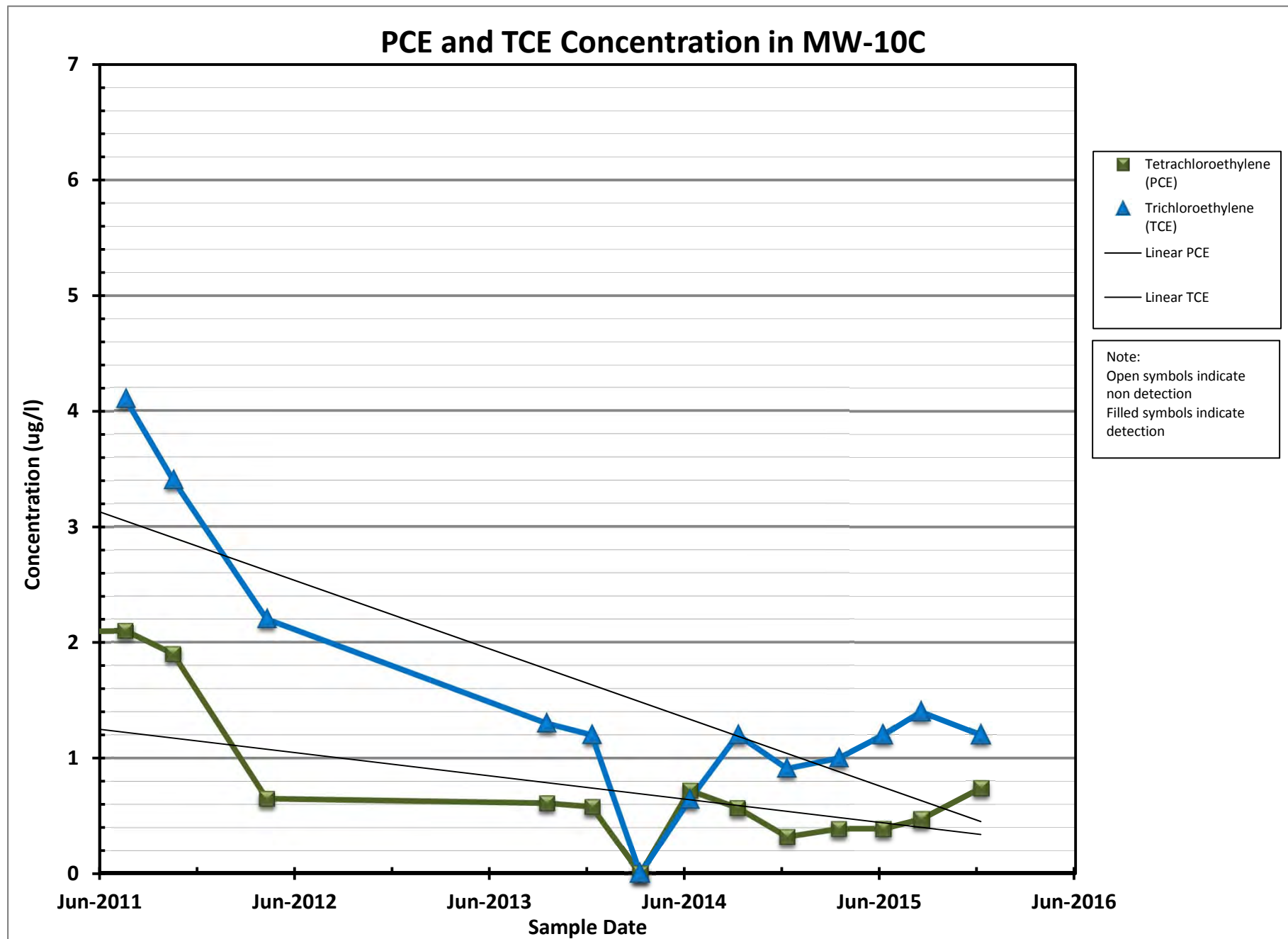


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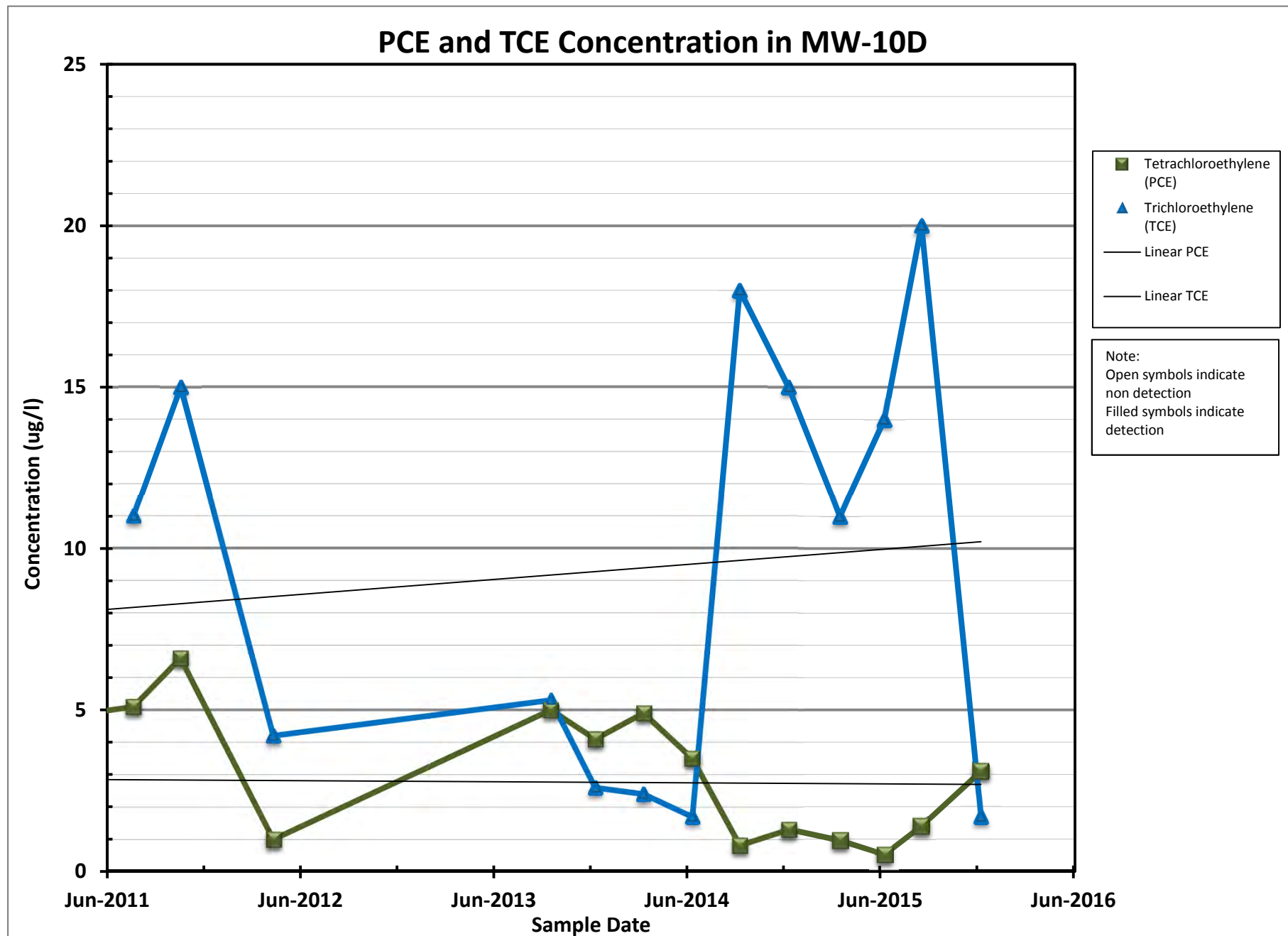


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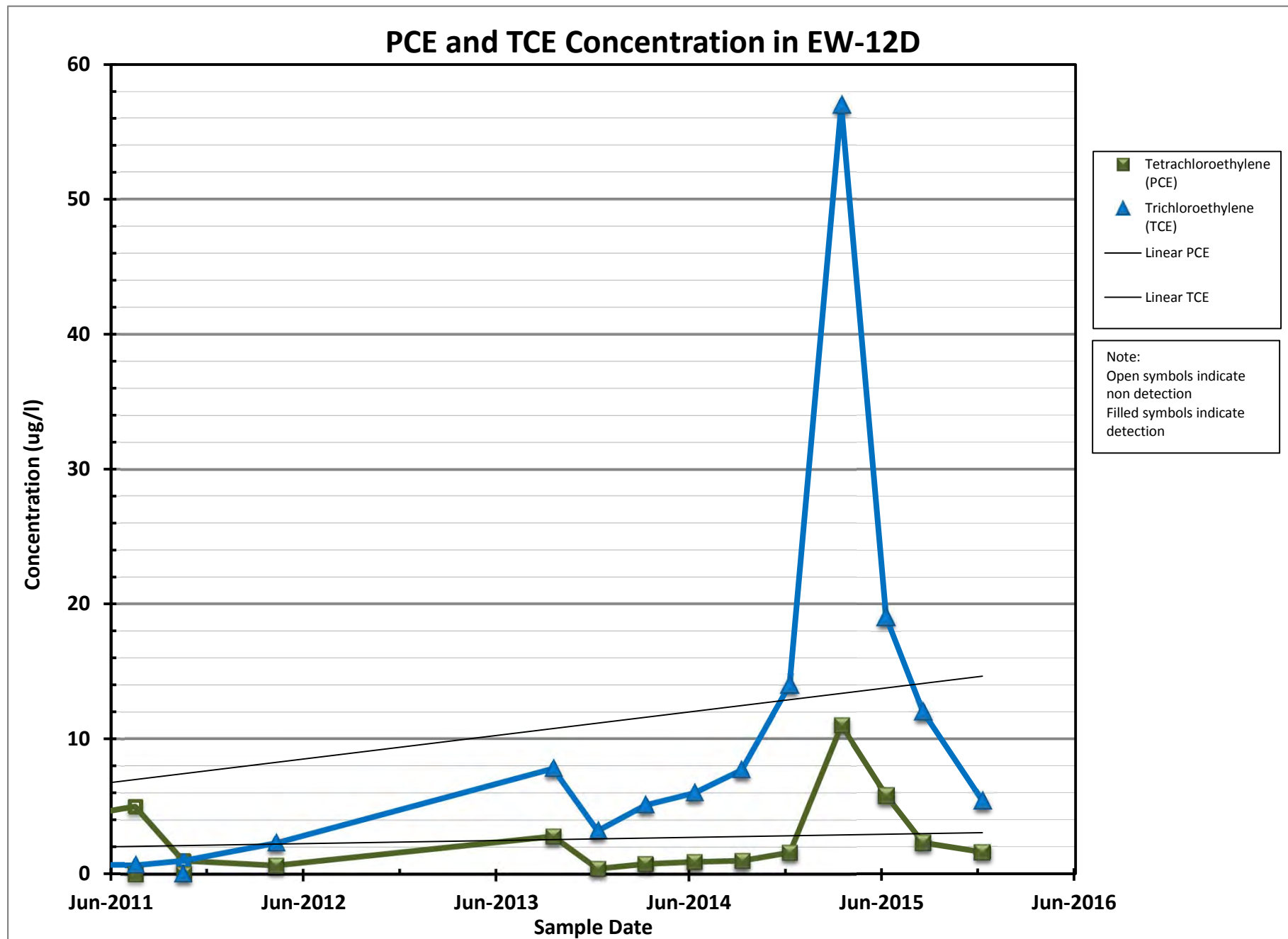


Figure 20

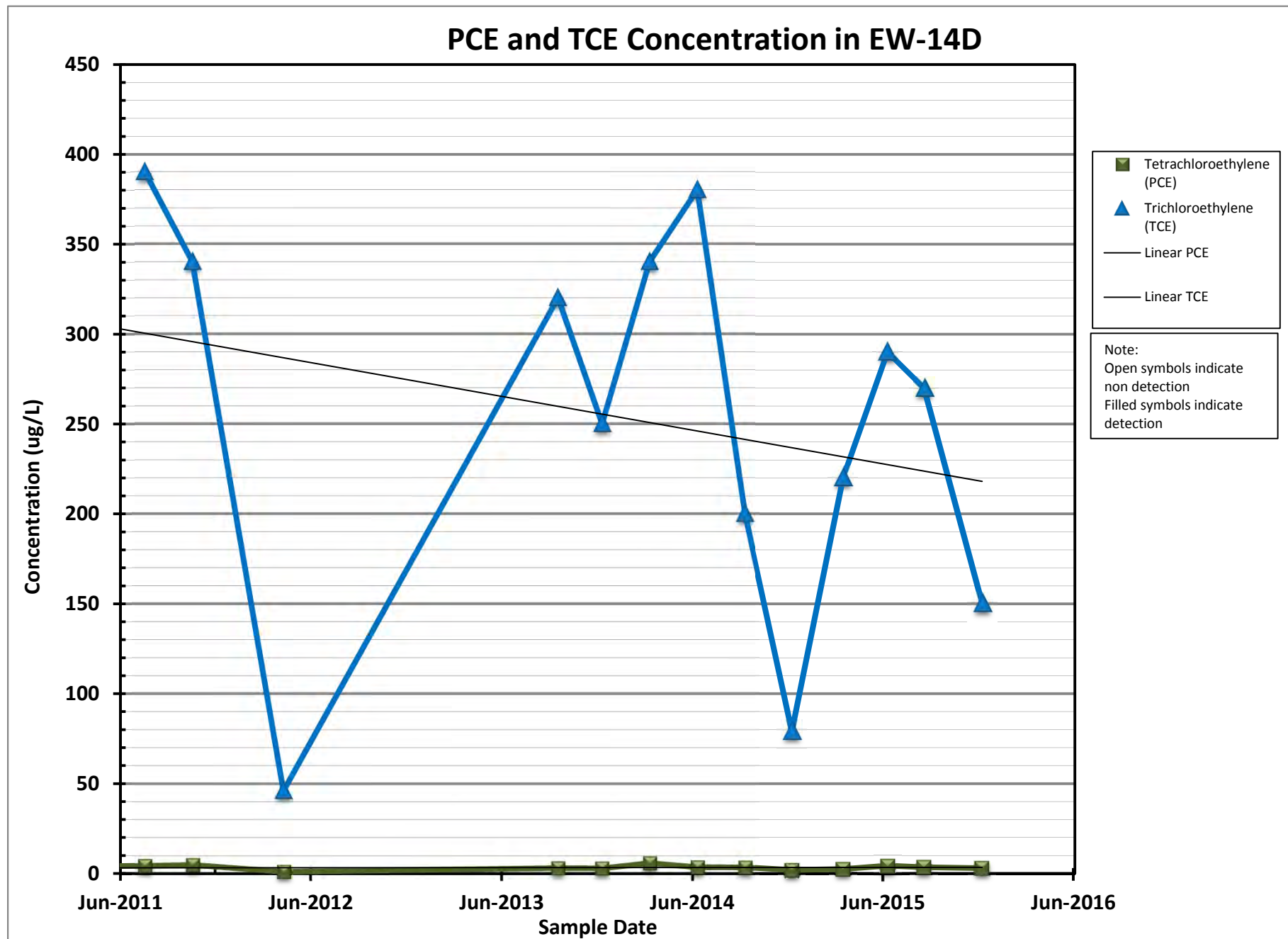


Figure 21

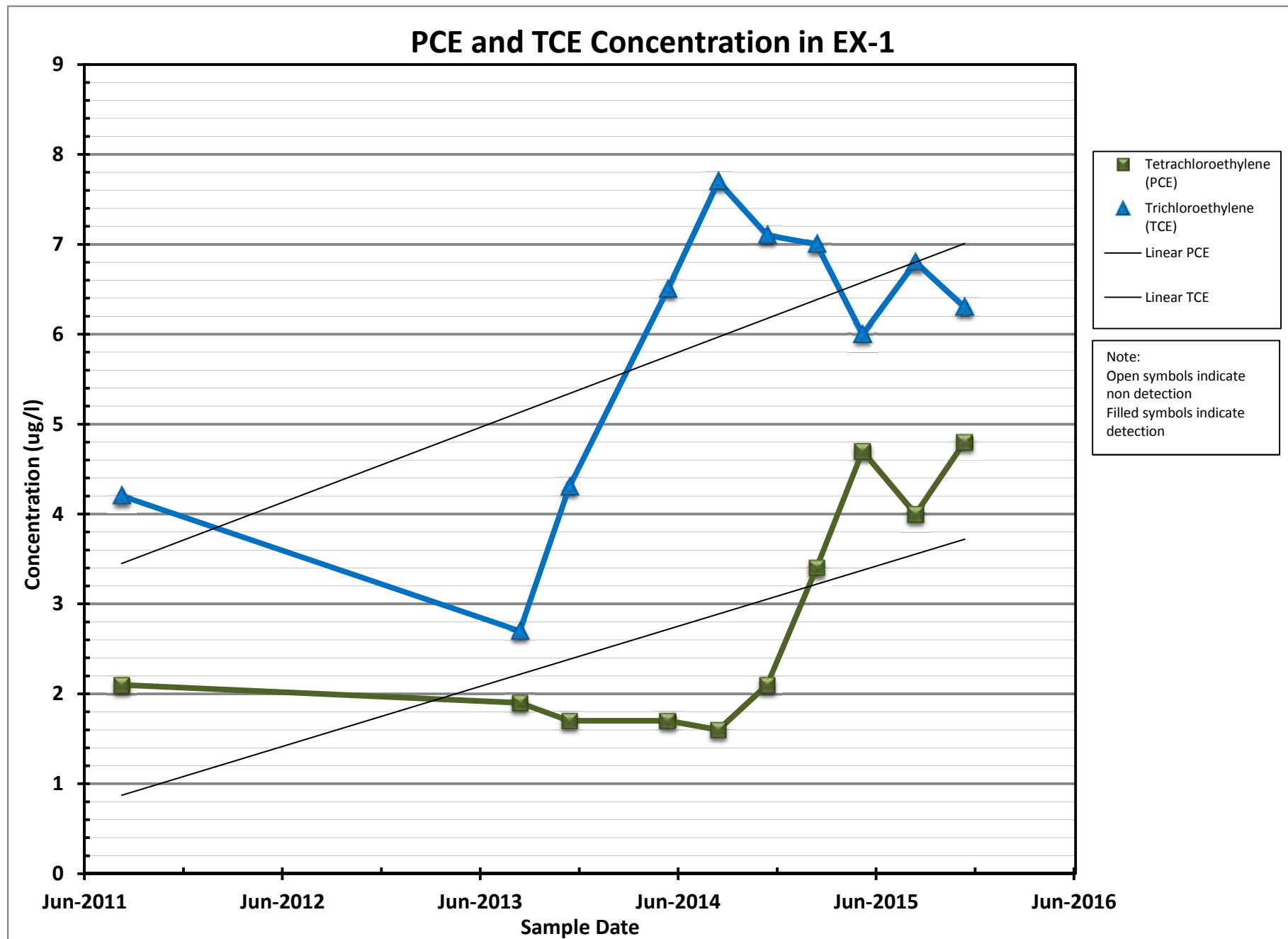


Figure 22

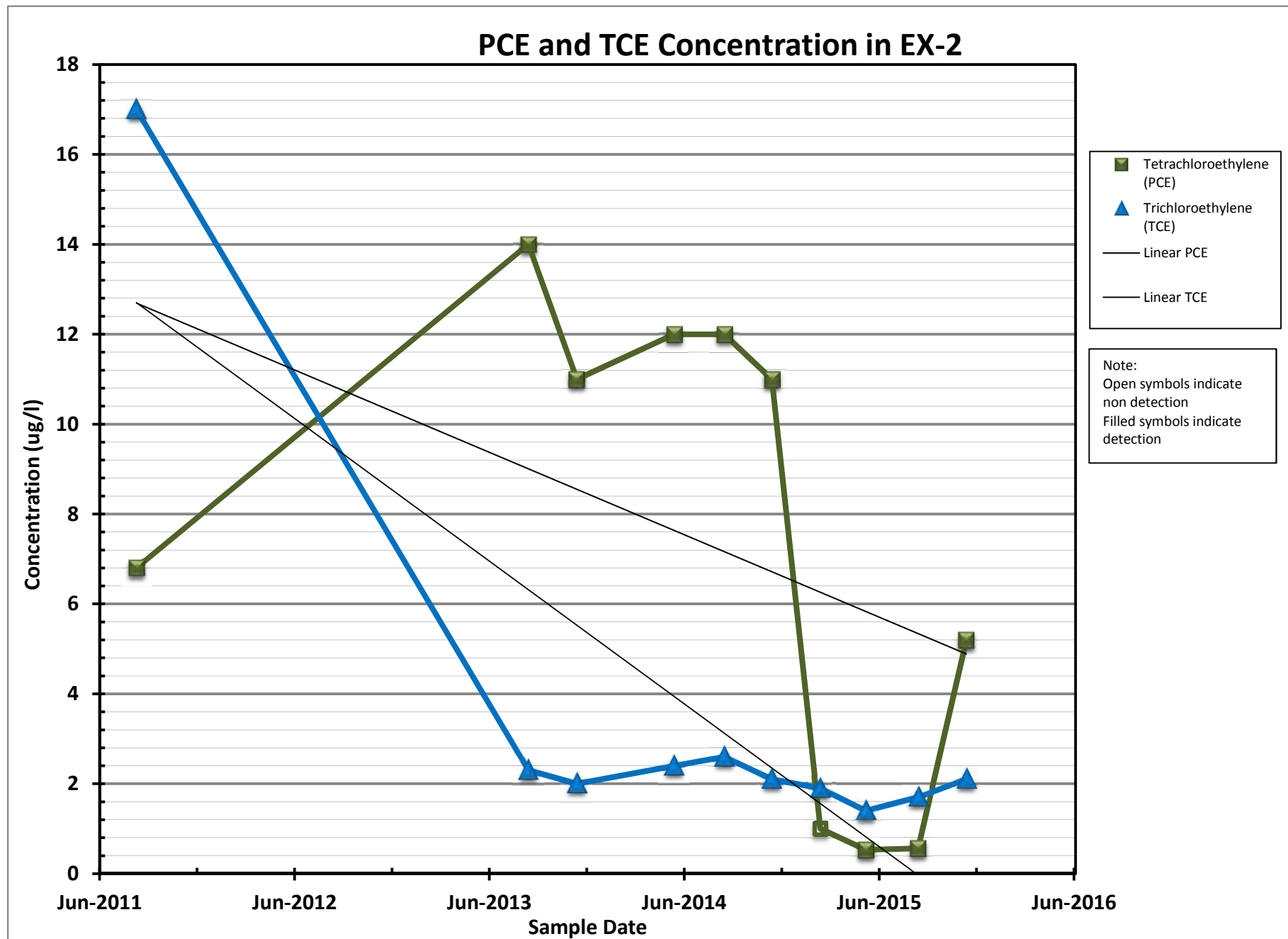


Figure 23

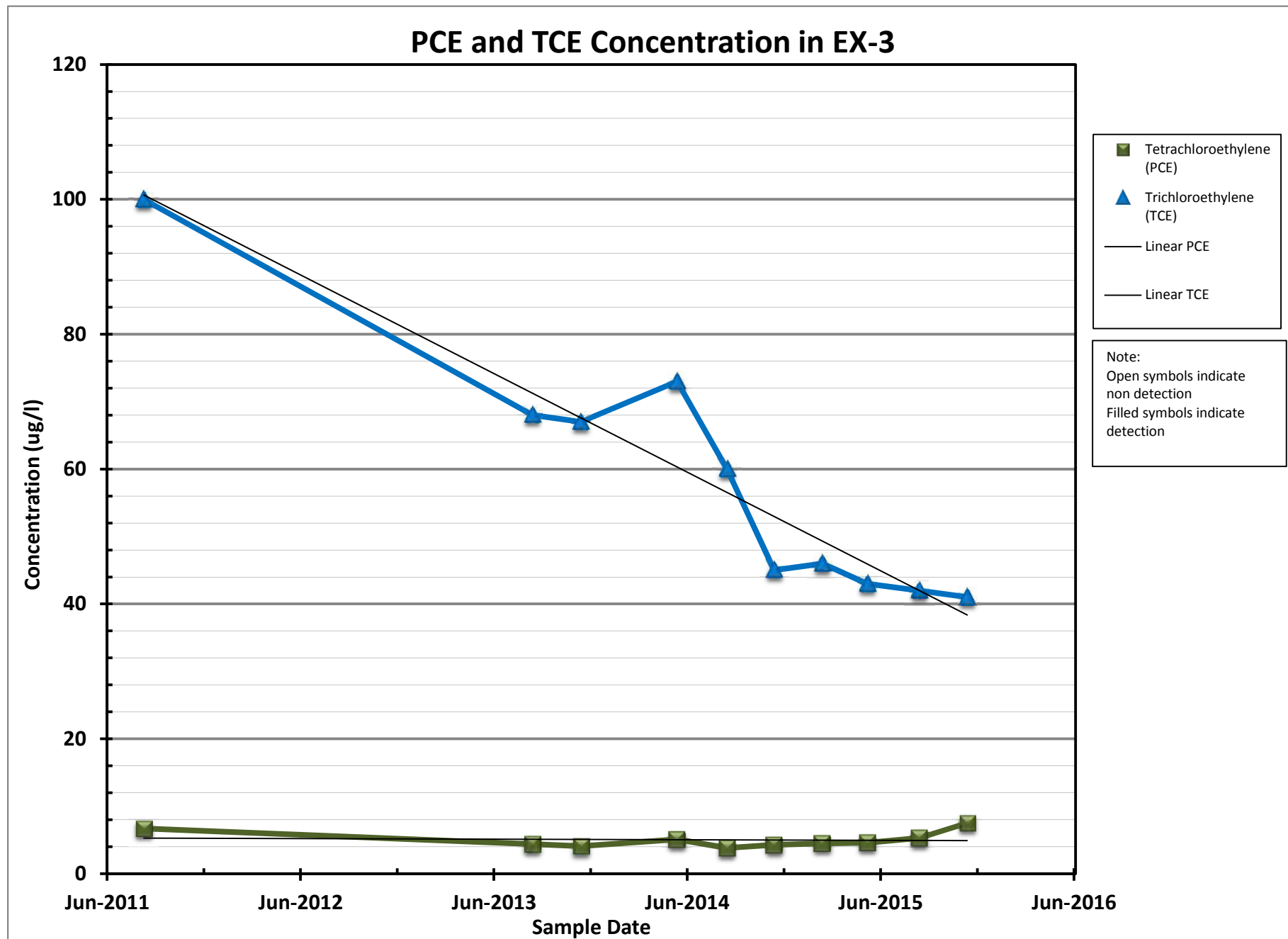


Figure 24

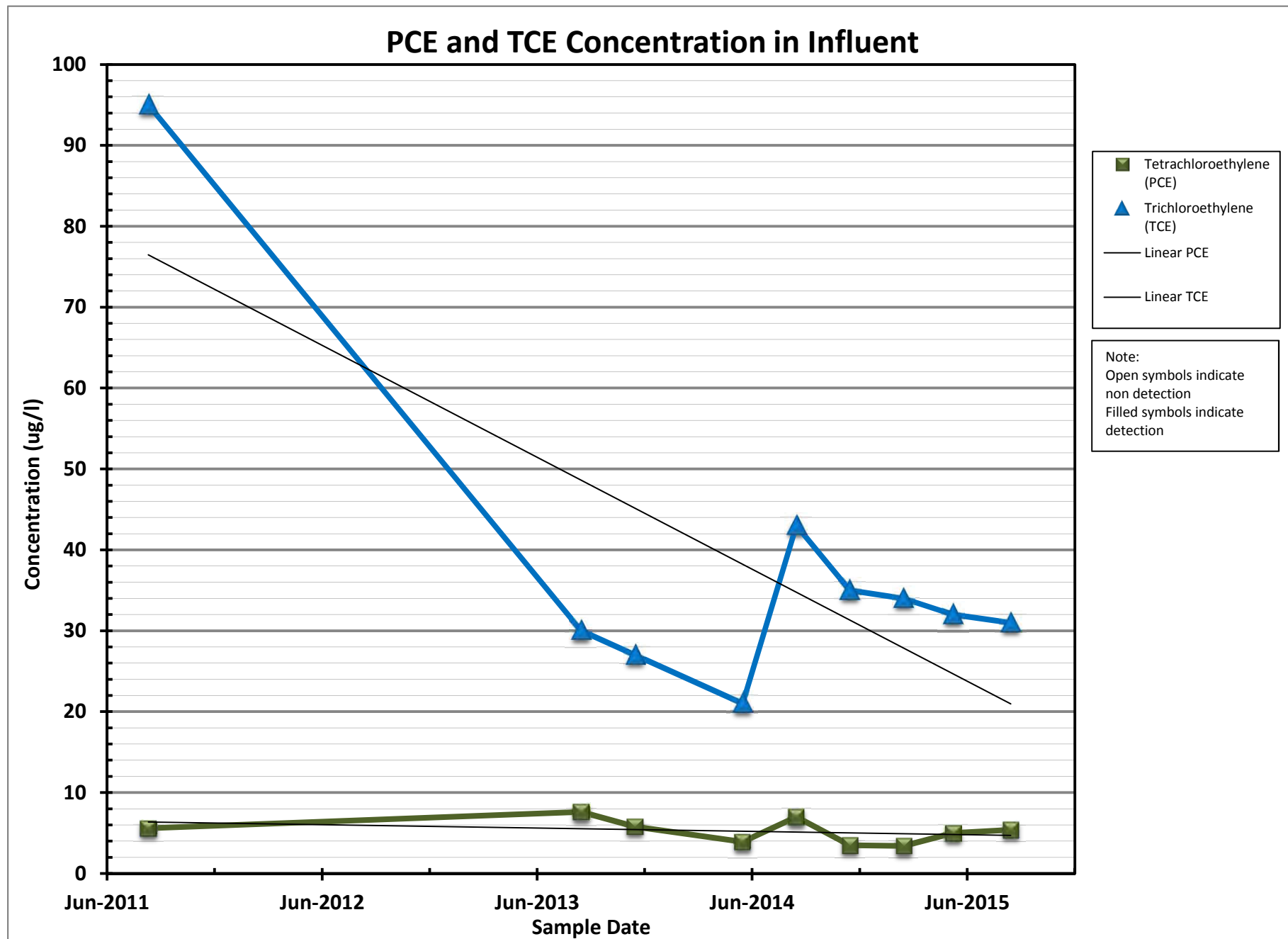


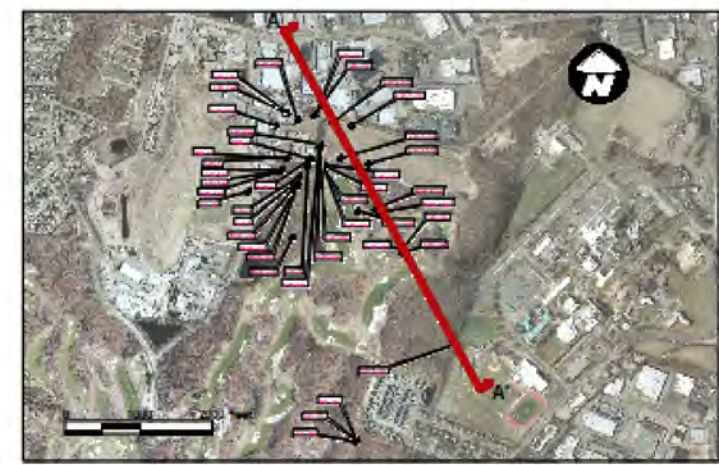
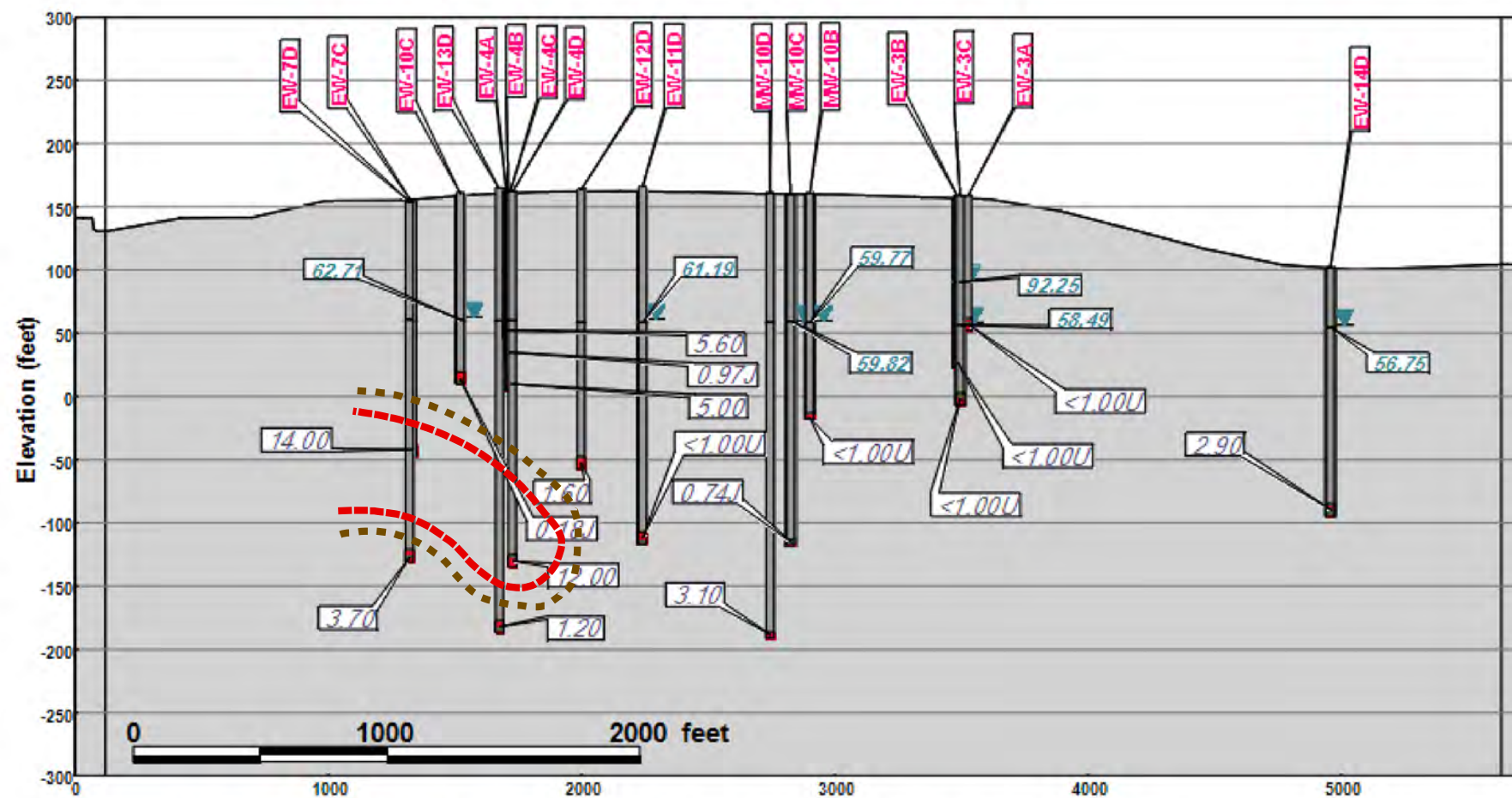
Figure 25





A

A'



Cross Section Location Map

Cross Section Legend

Wells

- Casing
- Screen

Well Labels:

EW-11D

▼ Groundwater Elevation (ft amsl)

Result Labels:

Groundwater Elevation (ft amsl)

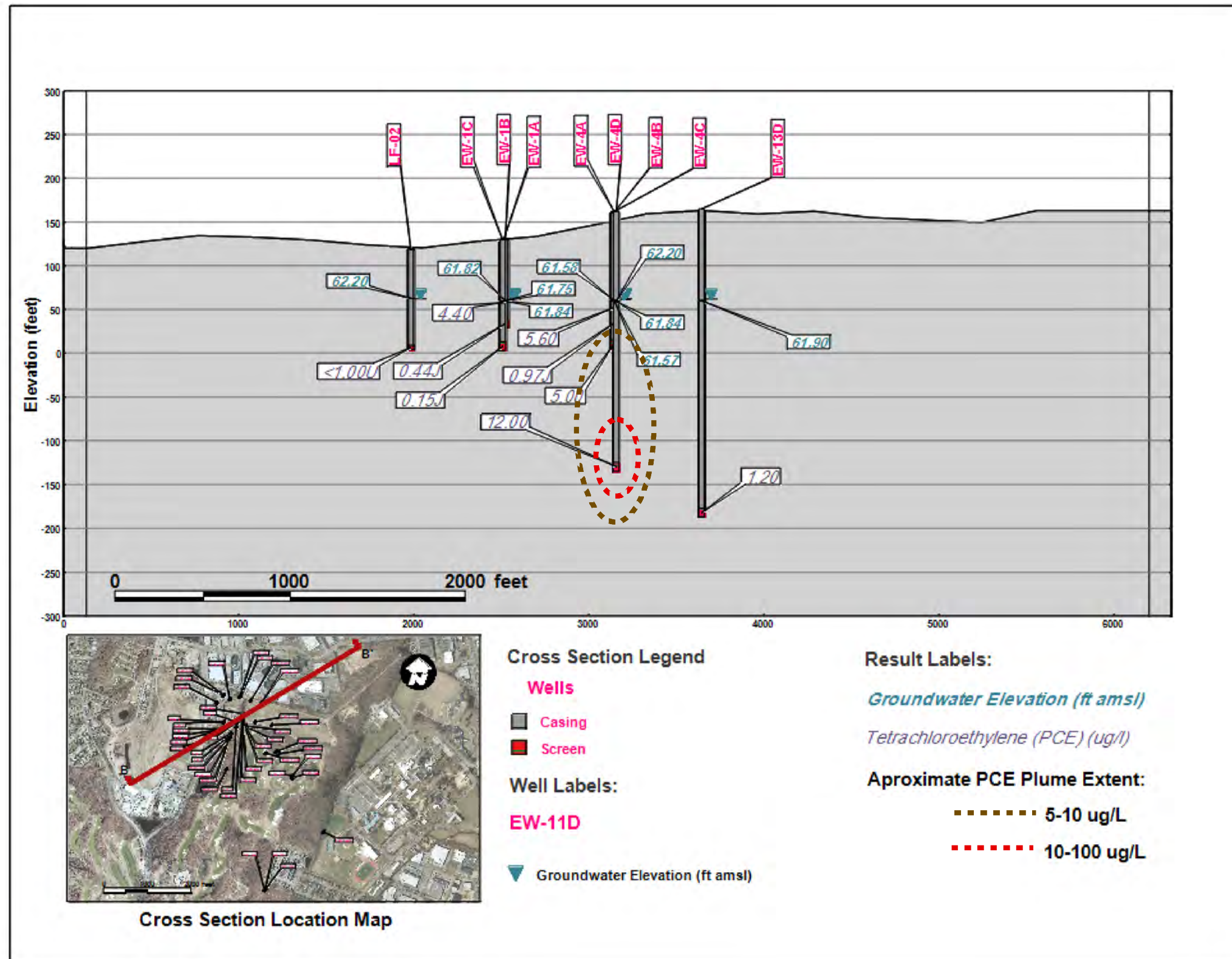
Tetrachloroethylene (PCE) (ug/l)

Aproximate PCE Plume Extent:

- 5-10 ug/L
- 10-100 ug/L

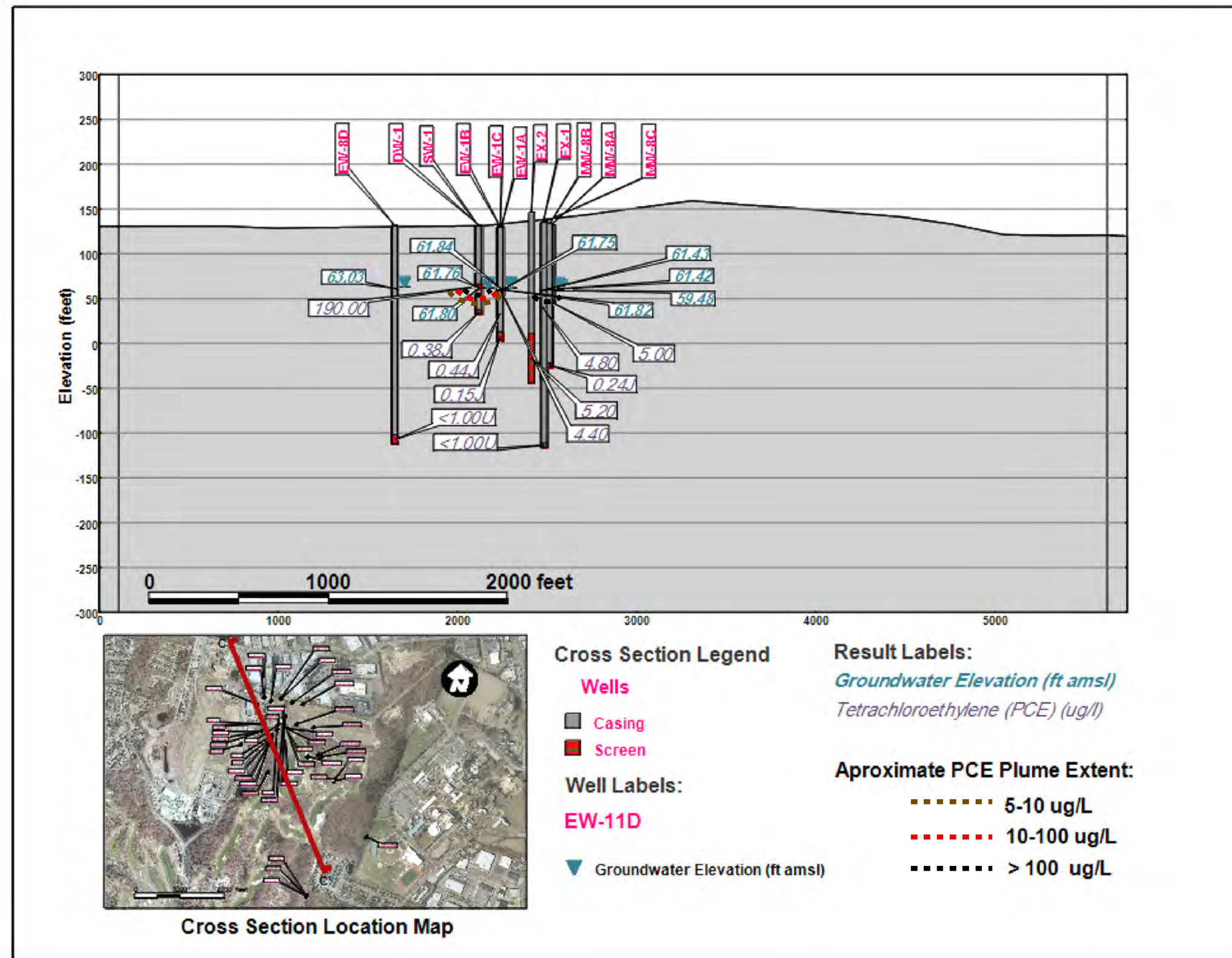
B

B'



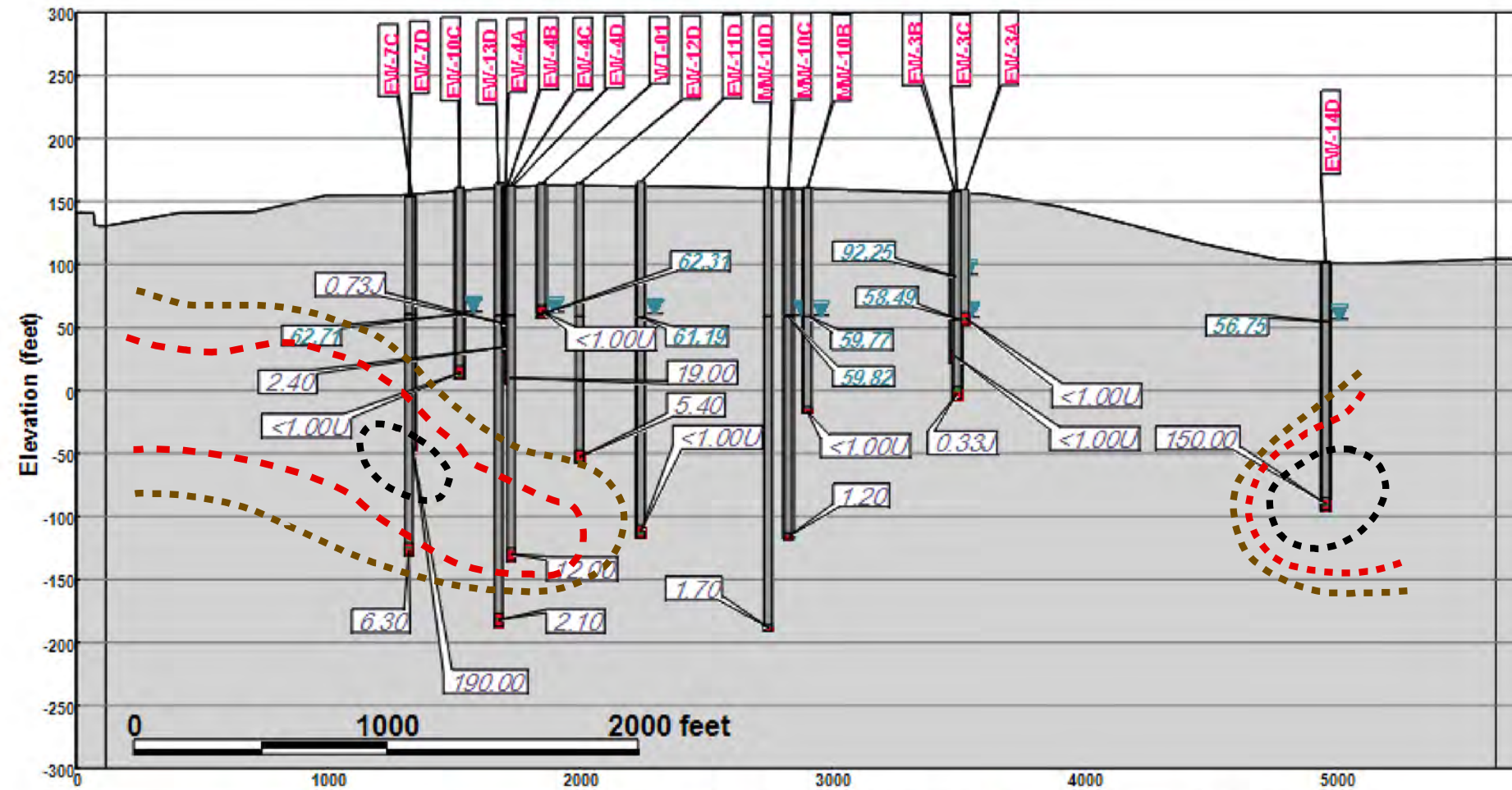
C

C'



A

A'



Cross Section Location Map

Cross Section Legend

Wells

Casing

Screen

Well Labels:

EW-11D

Groundwater Elevation (ft amsl)

Result Labels:

Groundwater Elevation (ft amsl)

Trichloroethylene (TCE) (ug/l)

Approximate TCE Plume Extent:

5-10 ug/L

10-100 ug/L

> 100 ug/L

B

B'

