

**FOURTH FIVE-YEAR REVIEW REPORT FOR
EWAN PROPERTY SUPERFUND SITE
Burlington County, New Jersey**



Prepared by

**U.S. Environmental Protection Agency
Region 2
New York, New York**

A handwritten signature in black ink, appearing to read "P. Evangelista".

**Pat Evangelista, Acting Director
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6/26/19

Date

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CEA	Classification Exemption Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
1,1-DCA	1,1-dichloroethane
DPE	Dual Phase Extraction
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FS	Feasibility Study
FYR	Five-Year Review
HI	Hazard Index
MCL	Maximum Contaminant Level
MW	Monitoring Wells
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NJDEP	New Jersey Department of Environmental Protection
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PRP	Potentially Responsible Parties
RAO	Remedial Action Objectives
RD	Remedial Design
RI	Remedial Investigation
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SVOCs	Semi-volatile organic compounds
TAL	Target Analyte List
TBC	To be considered
TCL	Target Compound List
UU/EE	Unlimited use and unrestricted exposure
VOCs	Volatile Organic Compounds
ug/l	Micrograms/liter

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fourth FYR for the Ewan Property Superfund Site (Site). The triggering action for this policy review is the June 25, 2014 completion date of the previous FYR for the Site. This FYR has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of two remedial phases, or operable units (OUs). Operable Unit 2 (OU2) which is evaluated in this FYR, addresses contaminated groundwater. The Operable Unit 1 (OU1) remedy addressed buried drums, disposal trenches and contaminated soil. OU1 is not part of this FYR because the contaminants have been remediated to provide for UU/UE of soil.

The Site's fourth FYR team included Mazeeda Khan, EPA and Michelle Granger, EPA (remedial project managers), Michael Scorca, EPA (hydrogeologist); Marian Olsen, EPA (human health risk assessor); Michael Clementson, EPA (ecological risk assessor); Douglas Fischer, EPA (attorney); and Natalie Loney, EPA (community involvement coordinator). The potentially responsible parties (PRPs) and the local government officials were notified of the initiation of the 5YR. The review began on 4/1/2019.

Site Background

The Site is located in Shamong Township, Burlington County, New Jersey, off Tuckerton Road, near the intersection of Route 206 (see attached Site Location Map). The Site is shown on the Shamong Township tax map as Block 23, Lots 31.01 and 32.02.

The Site is 43 acres, of which nine acres are fenced. The original bulk disposal-site area, known as Area A, is roughly four acres. The property that constitutes the Site is privately owned. In June 2011, the owner conveyed a Deed of Conservation Easement for the property to the New Jersey Department of Environmental Protection (NJDEP). The Conservation Easement will assure that the conservation value of the property will be conserved and maintained in perpetuity. This Site is located within the Central Pine Barrens Preservation Area of the New Jersey Pinelands, and is viewed as an ecologically sensitive area.

Disposal activities at the Site were reported to have taken place between 1974 and 1976. The Site received industrial waste in the form of bulk liquids and drums from a drum and waste hauler that did business hauling wastes for a number of companies.

In September 1982, a call from a concerned citizen prompted an investigation by local officials and the NJDEP. EPA added the site to the Superfund program's National Priorities List (NPL) in 1984

The NJDEP and EPA's subsequent remedial investigation (RI), determined that disposal at the Site resulted in the contamination of soil and groundwater. Soil and groundwater samples indicated that the source materials contained chlorinated organic compounds, aromatic hydrocarbons and metals. Contaminants include 1,2-dichloroethane, tetra-chloroethene, 1,1,1-trichloroethane, methylene chloride, trichloroethene, carbon tetrachloride, 1,1-dichloroethane (1,1-DCA), chloroform, benzene, ethylbenzene, naphthalene, xylenes, toluene, lead, barium, copper, and chromium. A groundwater contaminant plume, which contained high levels of volatile organic compounds (VOCs), was also identified.

For more details related to the Site background, physical characteristics, geology/hydrogeology, and land/resource please see the documents found in the Site repositories or at <https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0200791> (see section on webpage titled Site Documents and Data).

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: EWAN PROPERTY SUPERFUND SITE		
EPA ID: NJD980761365/NJD0200791		
Region: 2	State: NJ	City/County: Town of Shamong, Burlington County
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	Has the site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name (Federal or State Project Manager): Michelle Granger		
Author affiliation: United States Environmental Protection Agency		

Review period: 6/25/2014 – 6/25/2019
Date of site inspection: 4/24/2019
Type of review: Policy
Review number: 4
Triggering action date: 6/25/2014
Due date (five years after triggering action date): 6/25/2019

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The 1989 OU2 human health risk assessment concluded that actual or threatened releases of hazardous substances from the Site, if not adequately addressed, may present an imminent and substantial endangerment to public health, welfare, or the environment.

The risk assessment evaluated direct exposure to contaminants through direct contact with skin, or from the ingestion of the soil by a young child playing in the area, or by direct ingestion or inhalation of contaminants in groundwater. The major health risk posed by the Site was determined to be the potential ingestion of contaminated groundwater from the aquifer with risks of 1×10^{-3} (or one in a thousand risk of cancer) that exceeds the NCP risk range and a noncancer HI = 1.9 that exceeds the goal of protection of an HI = 1.

An ecological risk assessment was also conducted and indicated that the contaminant concentrations found at the site were below levels of concern.

Response Actions

EPA issued the OU2 Record of Decision (ROD) on September 29, 1989. The major components of the OU2 remedy are:

- Excavation and treatment, via solvent extraction and soil washing, of residually contaminated OU2 soils, followed by placement of the treated soils back onto the Site;
- Collection and treatment of the contaminated groundwater, and reinjection of the treated groundwater into the underlying aquifer/on-site reinfiltration;
- Recontouring and restoration of the disposal areas;
- Construction of an on-site wetlands area; and
- Environmental monitoring to ensure effectiveness of the remedy.

The remediation goals for groundwater, as identified in the OU2 ROD, are also the applicable or relevant and appropriate requirements (ARARs) for the Site, consisting of federal Maximum Contaminant Levels (MCLs) for drinking water, as well as the New Jersey Class I-PL standards of the New Jersey Safe Drinking Water Act, and the New Jersey Administrative Code (N.J.A.C.

7:9-6.6(a)) criteria for the treated effluent. Since the ROD was issued, the New Jersey Administrative Code criteria for discharges to Pinelands groundwater have been amended, and are now codified at N.J.A.C. 7:9C-1.7. The final OU2 remedial design report (RD Report) presented additional remediation goals that were developed for contaminants not identified in the OU2 ROD but were subsequently detected in Site groundwater, as well as updated New Jersey Administrative Code standards. For inorganic compounds in groundwater, the RD Report established site-specific background levels which were developed from upgradient well data, consistent with New Jersey Administrative Code standards.

Status of Implementation

On July 13, 1994, EPA issued an explanation of significant differences (ESD) which explained a change in remedial strategy from the OU2 ROD with respect to soils. Specifically, EPA modified both OUs by calling for the excavation of all contaminated soils. A Classification Exemption Area (CEA) was established in 1999 and recertified in 2015. The purpose of a CEA is to define a groundwater contamination plume that could impact human health, and to place restrictions on the installation and use of groundwater supply wells within a CEA until applicable groundwater standards have been restored and later recertified in October 2015.

The groundwater extraction, treatment and re-infiltration system was designed to achieve the following objectives:

- establish hydraulic control of the contaminant plume via a closed loop system;
- aquifer restoration to meet Maximum Contaminant Levels (MCLs), as well as the New Jersey Class 1-PL standards, by the extraction of aqueous-phase contaminants for ex-situ treatment; and
- re-infiltration of the treated effluent within the plume boundaries.

A group of potentially responsible parties (PRPs) performed the remedial design and remedial action (RD/RA) of the OU2 remedy pursuant to an administrative order issued by EPA in 1995.

The treatment process was designed to remove VOCs, SVOCs, metals and conventional parameters (e.g., suspended solids, turbidity, biological oxygen demand, etc.). As the influent conditions changed over time, the flexible design allowed various components and operation of the system to be discontinued or modified since 1999.

Systems Operations/Operation & Maintenance

The full-scale treatment system operated from 1999 until 2006, when sampling results indicated that cleanup goals had been achieved at most of the Site's monitoring wells. Throughout the PRPs' implementation of the OU2 groundwater remedy, the remedy operated as designed, and consistently met the performance goals for the treated effluent. An extensive sampling network and monitoring program has been established which includes over 70 groundwater monitoring points that are sampled and monitored regularly.

On July 9, 2014, EPA approved the decommissioning and demolition of the groundwater remedial extraction, treatment, and recharge system because contaminant levels had been reduced to a point that active remediation was no longer required. The groundwater treatment system demolition activities were completed in 2015. Site restoration activities were completed in the spring of 2016.

In March 2016, EPA requested that the PRPs analyze for 1,4-dioxane during the April 2016 sampling event, due to the adoption of the revised NJDEP interim specific ground water quality criterion of 0.4 micrograms per liter (µg/L). 1,4-dioxane was not detected in any of the 19 wells sampled during the April 2016 tri-annual groundwater monitoring event. 1,4-dioxane was also analyzed in the August 2016 annual sampling event to provide a more comprehensive evaluation of Site groundwater quality. 1,4-dioxane was not detected in any of the 53 wells sampled during the August 2016 annual groundwater monitoring event, confirming that 1,4-dioxane is not a constituent of concern for the Site. Based upon these results, analysis for 1,4-dioxane will no longer be required.

In March 2017, EPA approved a revised Site monitoring program (see attached Table 2) reducing the groundwater sampling frequency from tri-annual to semiannual and reducing the number of wells sampled during the semiannual event and annual events. This program consists of the following elements: semi-annual sampling of 17 monitoring wells for VOCs and SVOCs; one annual sampling of 41 groundwater monitoring wells for indicator parameters and natural attenuation parameters and one well for VOCs and SVOCs; and one 2.5-year sampling event of 61 groundwater monitoring wells for indicator parameters and natural attenuation parameters, and one well for VOCs and SVOCs only.

Potential site impacts from climate change have been assessed, and the performance of the remedy is currently not at risk due to the expected effects of climate change in the region and near the site.

Institutional Control Verification

In 1999 NJDEP established a CEA at the Site. NJDEP recertified the CEA in October 2015. The CEA remains in place.

III. PROGRESS SINCE THE LAST REVIEW

This section includes the protectiveness determinations and statements from the last FYR as well as the recommendations from the last FYR and the current status of those recommendations.

Table 1: Protectiveness Determinations/Statements from the 2014 FYR

OU #	Protectiveness Determination	Protectiveness Statement
2	Protective	The remedy at the Ewan OU2 Site is protective of human health and the environment.

There were no issues and recommendations in the last FYR.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

On October 1, 2018, the EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at 42 Superfund sites in New York, New Jersey, Puerto Rico, and the U.S. Virgin Islands, including the Ewan site. The announcement can be found at the following web address:

https://www.epa.gov/sites/production/files/2018-10/documents/five_year_reviews_fy2019_for_web_posting.pdf.

In addition to this notification, a public notice was made available on the following webpage: https://www.shamong.net/vertical/sites/%7B23FE350B-4C74-4538-8594-9B75E8AB3E35%7D/uploads/Ewan_Property_5yrNotice_2019_final.pdf on 6/3/2019, stating that EPA is conducting a FYR for the site. The results of the review, as described in this report, will be available at the following website: <https://www.epa.gov/superfund/ewan-property>, as well as the Site information repository located at Municipal Clerks Office Shamong Township Municipal Building 105 Willow Grove Road Shamong, New Jersey 08088 and the EPA Region 2 offices, 290 Broadway, New York, New York 10007-1866.

Data Review

Review of overall groundwater quality trends through October 2018 indicates that residual groundwater contamination present in the former source area within the reinfiltration basins is meeting Remedial Objectives and CEA Compliance Criteria with the exception of fluctuating concentrations of 2-methynaphthalene detected in one shallow monitoring well (TC-30, Fig. 5). Two additional monitoring wells (TP-12 and TC-22, Figs. 3 and 4, respectively) located just outside the reinfiltration basins have also shown fluctuating concentrations of 1,1-DCE and benzene above and below the Remedial Objectives, respectively. Results from the most recent round of sampling (i.e., October 2018) showed that no VOC or SVOC concentrations in groundwater were detected above Remedial Objectives in any monitoring well sampled, including TP-12, TC-22 and TC-30.

No VOCs were detected above the remedial goals in wells TC-32R and TC-37, which previously showed fluctuating VOC concentrations above and below remedial goals. 1,1-dichloroethene (1,1-DCE) was not detected in any of the wells sampled in October 2018. 1,1-DCE was detected in TP-12 at a concentration of 0.628 µg/L in April 2018, well below the remedial goal of 2 µg/L. 1,1-DCE was previously detected above the remedial goal in well TP-12 in December 2016 (2.59 µg/L), August 2016 (2.25 µg/L), April 2017 (2.25 µg/L) and October 2017 (3.54 µg/L) (Figure 3). Ethylbenzene was detected in well TC-33 (Fig. 6) at an estimated concentration of 0.611J µg/L, well below the remedial goal of 700 µg/L.

Benzene was detected in well TC-22 at an estimated concentration of 0.291 µg/L, below the remedial goal of 1 µg/L. Benzene was previously detected at or above the remedial goal in well TC-22 in April 2018 (1.20 µg/L) and in October 2017 (1.81 µg/L). Sporadic concentrations of 2-methylnaphthalene have been observed in well TC-30. In October, 2018, the concentration of 2-methylnaphthalene detected in well TC-30 was 2.71 µg/L, well below the remedial goal of 15 µg/L. Three previous 2-methylnaphthalene exceedances have occurred in well TC-30 since September 2013: in April 2015 (24 µg/L), August 2015 (3 µg/L), and October 2017 (93 µg/L).

The recorded pH values were outside of the remedial goal range of 4.2 to 5.8 in 12 of 14 monitoring wells sampled. Recorded pH values ranged from 5.77 to 6.67 pH units. Background pH values in historical reports typically ranged from 4.5 to 5.5 pH units. The former treatment system included pH adjustment through chemical addition. Overall pH values in Site groundwater are anticipated to return to levels within the remedial goal range through advection now that treatment system pH adjustment and reinfiltration are no longer occurring.

In addition, nine domestic well samples, one sample from the Shamong Township Recreational Center Well (located near the Township ballfield), and one surface water sample were collected by the PRPs' contractor at properties located approximately 3,000 feet south and southeast of the Site. These off-site locations are located hydraulically downgradient of the Ewan site, and are the closest downgradient wells in the site vicinity. Sampling activities were conducted on March 21 and March 25, 2016. In addition to the groundwater samples from the eight residence and the ballfield well, a surface water sample was also collected from the pond at one residence. A summary of the sample locations is provided on Figure 1. Samples were analyzed for target compound list (TCL) VOCs and SVOCs, including 1,4-dioxane, and target analyte list (TAL) metals.

No VOCs were detected in any of the offsite samples collected on March 21 and 25, 2016, except for a concentration of methyl tert-butyl ether (1.22 µg/L) detected in sample Monitoring Well 275 (MW-275), and a concentration of chloroform (1.20 µg/L) detected in the ballfield well (BF-1). Both of these detections are well below the applicable MCLs for methyl tert-butyl ether (70 µg/L) and chloroform (80 µg/L).

No SVOCs, including 1,4-dioxane, were detected in any of the off-site samples collected. All TAL metals were either not detected or detected below federal and New Jersey MCLs with the exception of aluminum and iron. The aluminum and iron concentrations are attributed to background groundwater quality associated with the aquifer. The sample results have demonstrated that there has been no impact to off-site groundwater or surface water downgradient of the Ewan Site.

Site Inspection

The inspection of the Site was conducted on 4/24/2019. In attendance were Mazeeda Khan from EPA, David Russell and Christopher Wong from the PRP contractor AECOM, Lori Mills (co-lawyer) from PRP Group, and Micheal Di Corce (Mayor) and Susan Onorato (Administrator) from Shamong Township. The purpose of the inspection was to assess the protectiveness of the remedy.

The 40 acre Site has no structures on it and no paved roads. There is a gravel road leading from Tuckerton Avenue to the Site. The Site is secured with chain link fence with 9 gates to access the wells. No issues were observed during the site visit.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

Based upon the extensive data collected and evaluated, the remedy functioned as intended by the OU2 ROD and the ESD, groundwater contamination is controlled, and there are substantial overall decreasing trends in concentrations of Site contaminants in the groundwater. Analysis of the off-site residential and potable well sampling continues to demonstrate the absence of any Site-related impacts on tested downgradient wells.

As stated previously, a CEA has been in place at the Site since December 1999. The PRPs' updated the CEA in October 2015.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Question B Summary:

- a. Groundwater.** Review of the most recent rounds of groundwater data show that the maximum concentrations detected across all properties were below the federal and state MCLs with two exceptions, aluminum and iron, which are associated with background groundwater quality in the aquifer.
- b. Vapor Intrusion.** The groundwater treatment plant was the only building located on the Site. In April 2013, the plant was decommissioned and demolished. Evaluation of the most recent groundwater concentrations at the Site indicate no sample results exceeded the groundwater screening criteria for vapor intrusion identified in the Vapor Intrusion Screening Level (VISL) Calculator. The VISL Screening level concentrations are based on: default residential or nonresidential exposure scenarios; a target cancer risk level of one per million (10^{-6}); and, a target hazard quotient of one for potential non-cancer effects. Therefore, the vapor intrusion pathway is not a concern.

Changes in Standards and TBCs

The ROD for OU2 identified remedial goals for Site groundwater quality. There have been no changes to any of the ARARs that affect EPA's determination that the remedy is protective of human health and the environment.

Changes in Toxicity and Other Contaminant Characteristics

Since the last FYR the toxicity information for benzo(a)pyrene and chemicals associated with relative potency factors were updated based on the new Integrated Risk Information System (IRIS) chemical file. The toxicity value for benzo[a]pyrene and chemicals with associated relative potency factors were updated based on the new IRIS file in 2017. The changes in the toxicity values do not change the protectiveness of the remedy.

Changes in Risk Assessment Methods

There have been no changes in the risk assessment methodologies that would affect the protectiveness of the remedy.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No new information has called into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU2

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)	
<i>Operable Unit:</i> OU2	<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The remedy at the Ewan Properties Site is protective of human health and the environment.	

Sitewide Protectiveness Statement
<i>Protectiveness Determination:</i> Protective
<i>Protectiveness Statement:</i> The remedy at the Ewan Properties Site is protective of human health and the environment.

VIII. NEXT REVIEW

The next five-year review report for the Ewan Superfund Site is required five years from the completion date of this review.

APPENDIX A – Tables

TABLE 1:

**Groundwater Monitoring Program
Ewan Superfund Site
Shamong, New Jersey**

Sampling Round	Sampling Frequency		
	Semi-Annual Groundwater Sampling	Annual Groundwater Sampling	2.5 Year Groundwater Sampling
Analytical Parameters:	VOCs/SVOCs	Indicator** & Natural Attenuation Parameters***	Indicator** & Natural Attenuation Parameters***
Well	17 Wells	41 Wells	61 Wells
MW-1 +++		X	X
MW-2 +++			X
MW-3 +++		X	X
MW-4 +++			X
MW-5 +++			X
MW-6 +++			X
MW-7 +++			X
EP-1			X
EP-2			X
EP-3			X
TC-3	X	X	X
TC-6*		X	X
TC-12			X
TC-14*		X	X
TC-18*		X	X
TC-19		X	X
TC-20*			X
TC-21*		X	X
TC-22	X	X	X
TC-23		X	X
TC-24R			X
TC-25	X	X	X
TC-28			X
TC-29		X	X
TC-30	X	X	X
TC-31		X	X
TC-32R ††	X	X	X
TC-33	X	X	X
TC-34			X
TC-35*		X	X
TC-36†	X	X	X
TC-37†	X	X	X
TC-1R		X	X
TC-2		X	X
TC-3		X	X
TC-6			X
TC-7*		X	X
BC-2			
BC-5*			X
BC-11			X
BC-15*			X
BC-16		X	X
BC-17*		X	X
BC-18		X	X
FK-1			
FK-4*			X
FK-10			X
F-1			
F-2			X
F-3	X	X	X
MP-7	X	X	X
MP-9		X	X
MP-12	X	X	X
FP-9	X		
FP-12	X	X	X
FP-13	X	X	X
F-3			
TC-8		X	X
TC-9		X	X
TC-10	X	X	X
TC-11		X	X
TC-12	X	X	X
TC-13*		X	X
TC-14	X	X	X
TC-15		X	X
TC-16		X	X

CEA Compliance Well: Site Low-Flow Sampling Procedure will be used to collect samples from CEA Compliance wells for analyses.

The 2.5-Year event will be conducted in place of an annual event.

Indicator Parameters include: TCL VOCs, SVOCs, TAL metals using EPA SW-846 method; ammonia, chloride, fluoride, nitrate, phosphate and sulfide.

Natural Attenuation Parameters include: sulfide, ferric iron, ferrous iron, TOC, metabolic acids and gases, redox potential, dissolved oxygen, conductivity, turbidity, alkalinity, pH and temperature.

Natural Attenuation Parameters will be analyzed during the annual or 2.5-year events only. Level IV laboratory deliverables with data validation using EPA Region II data validation protocols will be conducted on the annual or 2.5-year event only.

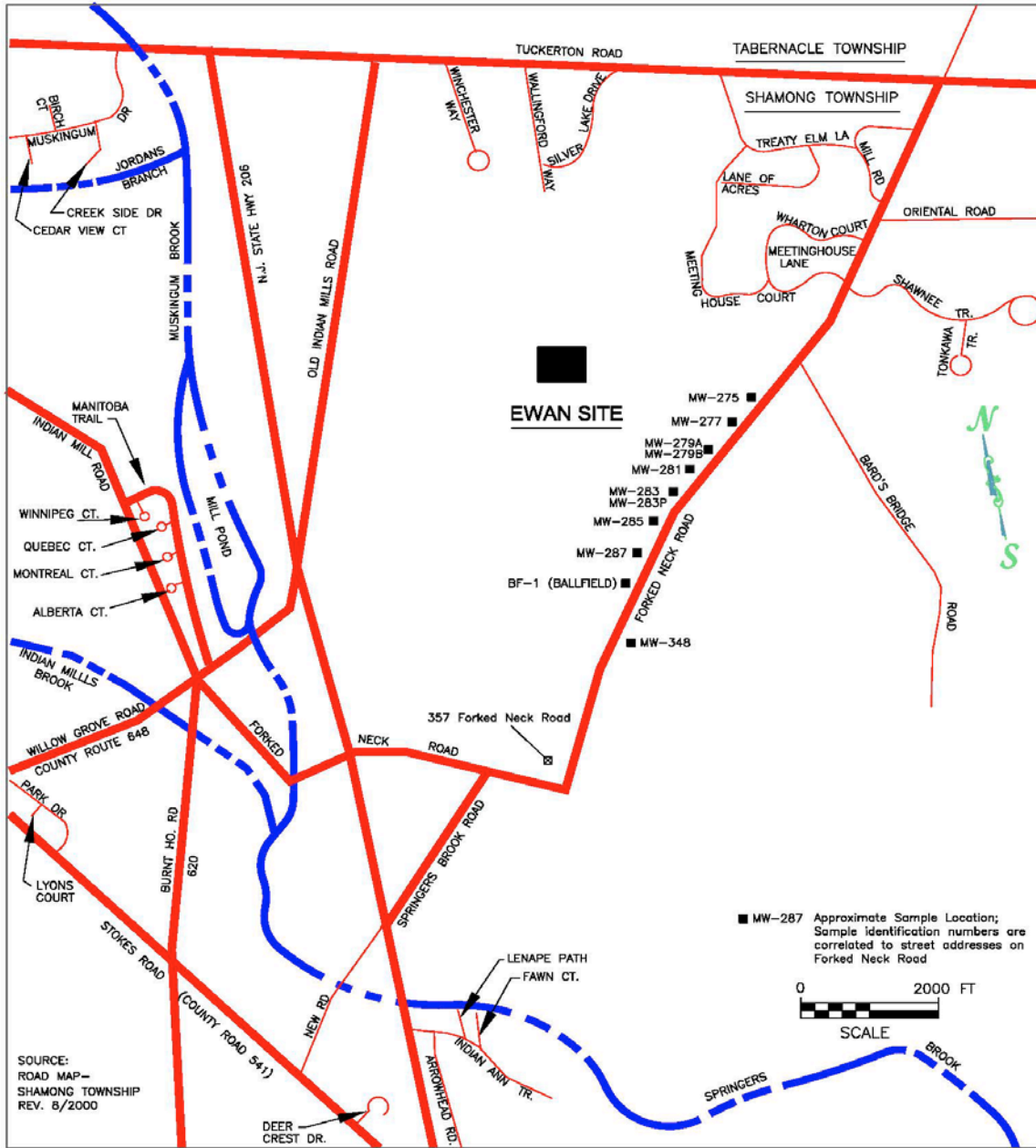
Wells TC-36 and TC-37 were installed in May 2012 and added to the groundwater monitoring program in June 2012.

Well TC-32R was installed in January 2013 to replace TC-32 and added to the groundwater monitoring program in February 2013.

Extraction wells EW-1 through EW-7 converted to monitoring wells MW-1 through MW-7 on August 15, 2015.

APPENDIX B – FIGURES

FIGURE 1 – Sample Location Map



510 CARNEGIE CENTER
PRINCETON, NEW JERSEY 08540

ENVIRONMENTAL / CONSULTING ENGINEERS

	PROJECT: EWAN PROPERTY SUPERFUND SITE	TITLE: SAMPLE LOCATION MAP	
	ENGINEERING SERVICES AND OPERATIONS AND MANAGEMENT SHAMONG TOWNSHIP, BURLINGTON CO. NJ	SCALE: 1"=2000'	DATE: 04/2016
		PROJECT NO. 60488171	FIGURE NO. 2-1

FIGURE 2 – CEA Boundaries

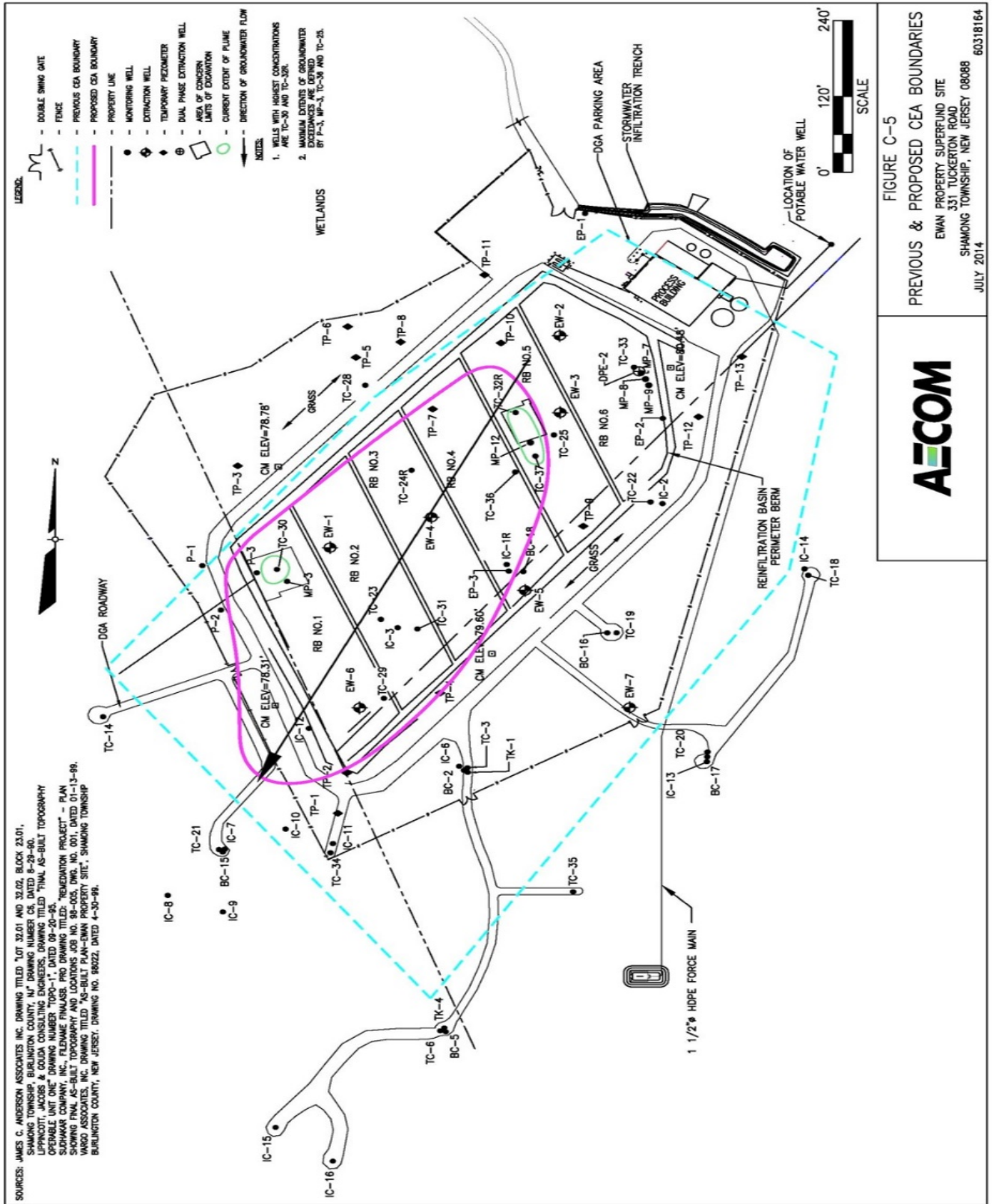


Figure 3 – Well TP-12

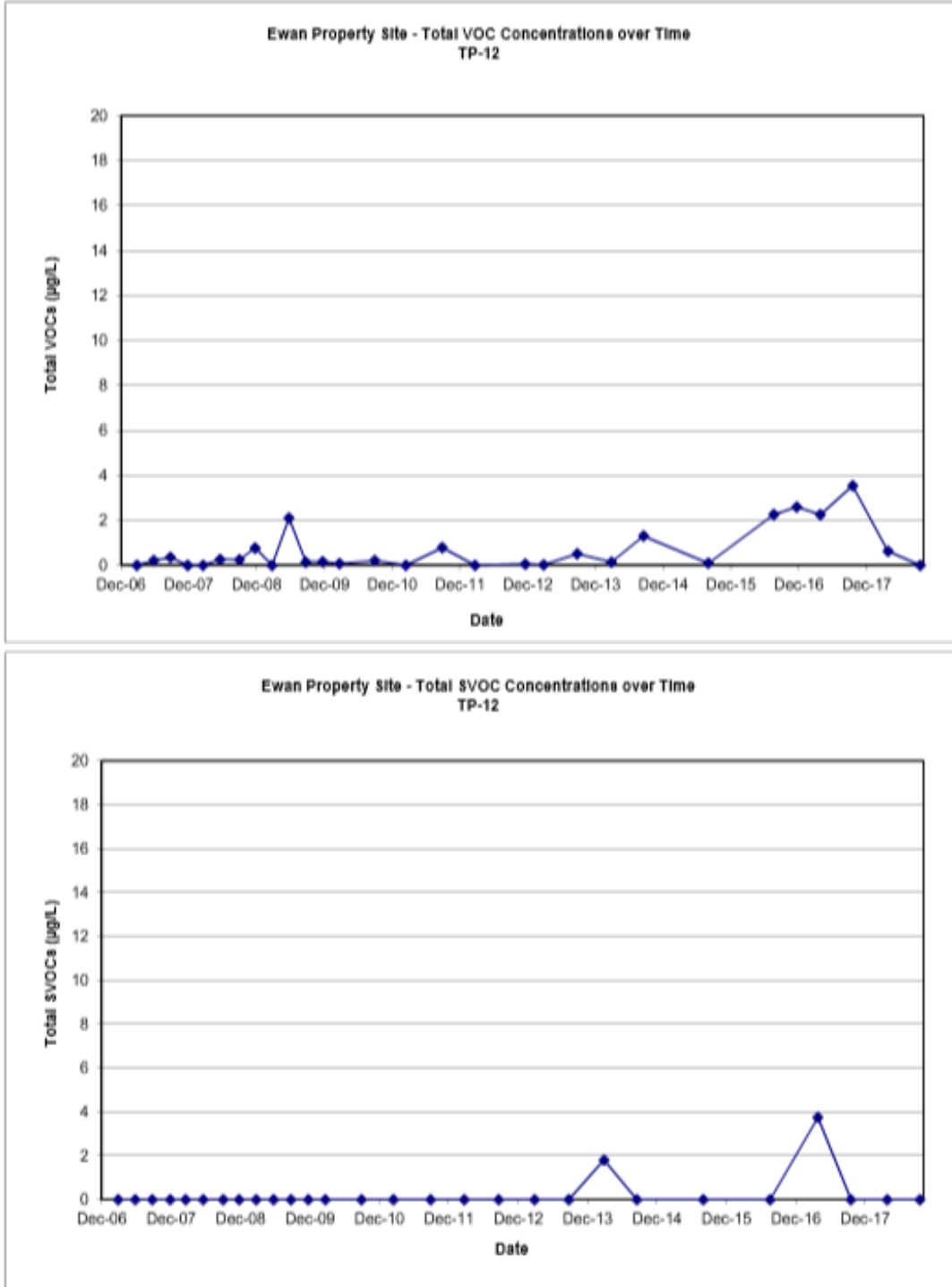


FIGURE 4 – Well TC-22

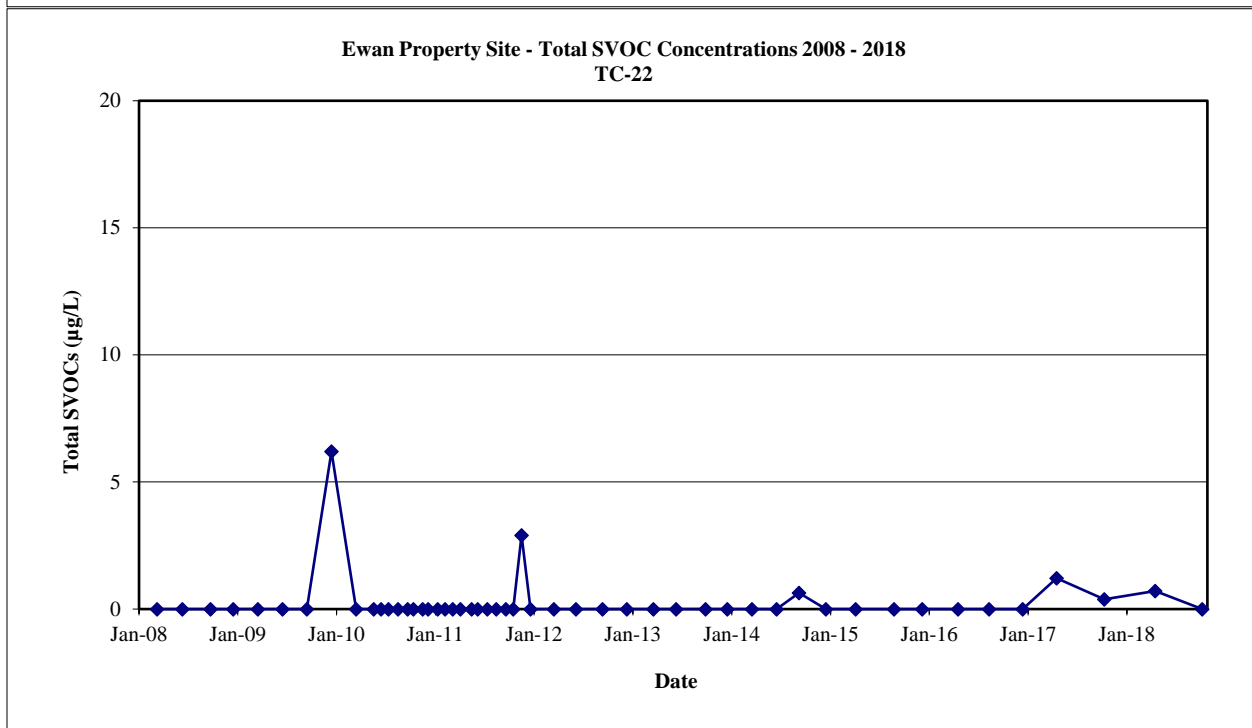
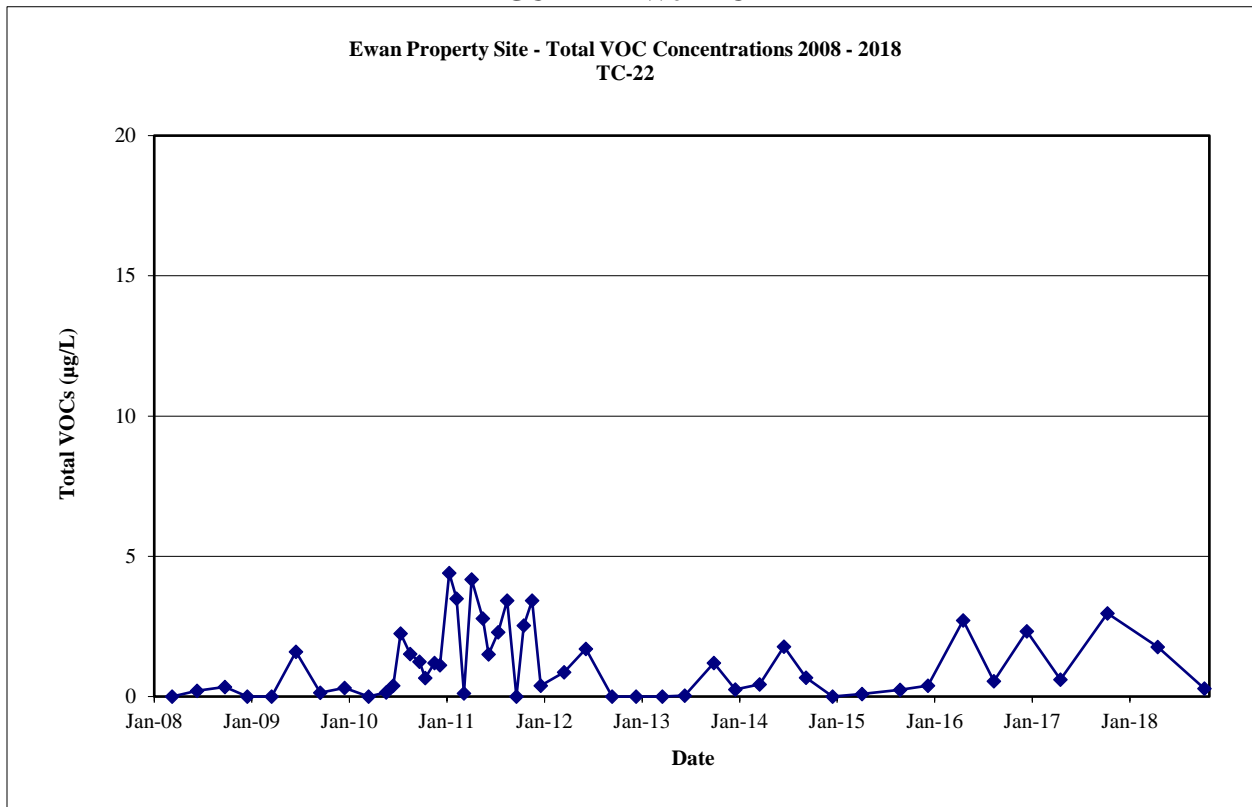


FIGURE 5 – Well TC 30

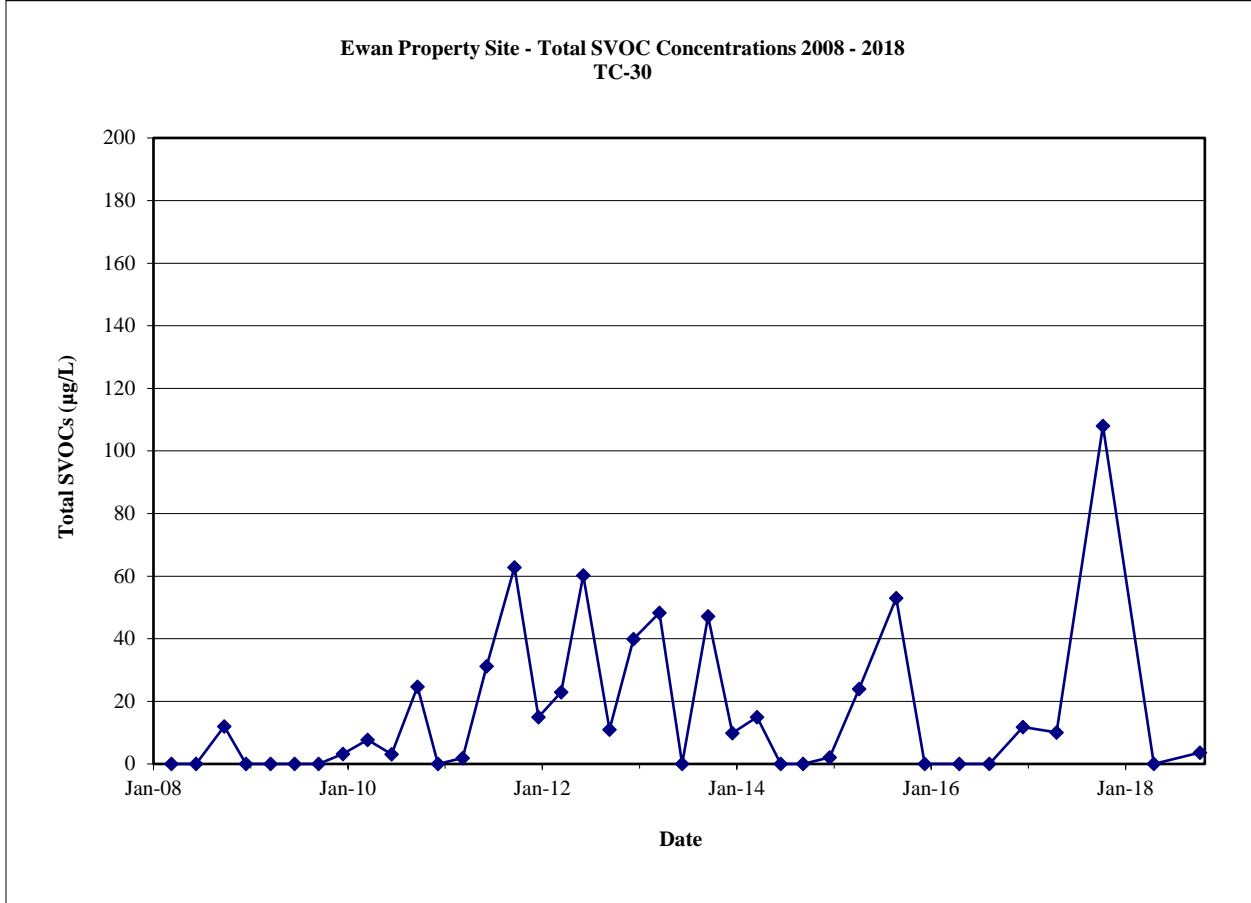
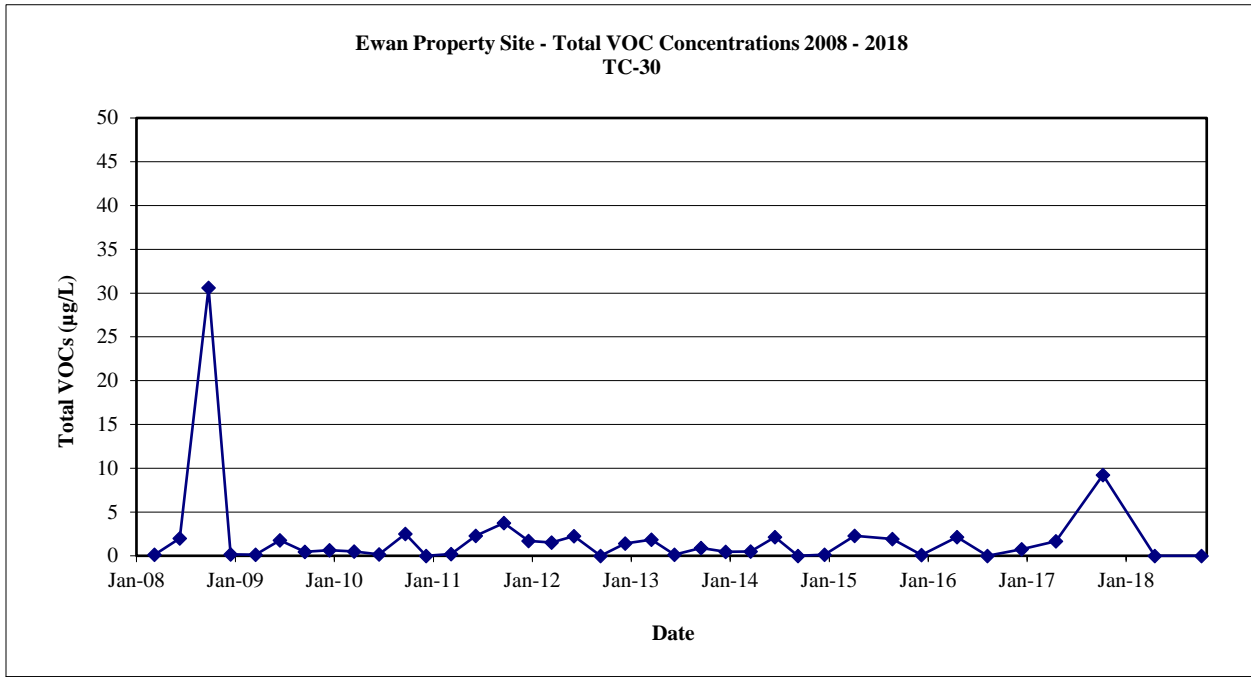


FIGURE 6 – Well TC-33

