Basewide Five-Year Review Report for the Dix Area

Joint Base McGuire-Dix-Lakehurst, New Jersey

FINAL
MAY 2018

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Joint Base McGuire-Dix-Lakehurst

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10 May 18
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TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

Page

TABLE OF CONTENTS (continued)

Page

TABLE OF CONTENTS (continued)

Page

TABLE OF CONTENTS (continued)

Page

TABLE OF CONTENTS (continued)

Page

TABLE OF CONTENTS (continued)

Page

TABLE OF CONTENTS (continued)

Page

APPENDICES

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

µg/g	Micrograms per gram
µg/L	Microgram(s) per liter
AA	Alternatives Analysis
ABB	ABB Environmental Services, Inc.
ACO	Administrative Consent Order
AFCEC	Air Force Civil Engineer Center
AFCEE	Air Force Center for Engineering and the Environment
AFFF	Aqueous film forming foam
AOC	Area of concern
ARAR	Applicable or Relevant and Appropriate Requirement
Arcadis	Arcadis U.S., Inc.
ARDC	Armament Research Development Center
AS	Air sparge
AWQC	Ambient Water Quality Criteria
bgs	Below ground surface
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
CB&I	Chicago Bridge and Iron
CDM	Camp Dresser & McKee, Inc.
CEA	Classification Exception Area
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of concern
COPC	Contaminant of potential concern
DCE	Dichloroethene
DD	Decision Document
DDD	Dichlorodiphenyldichloroethane
DDE	Dichlorodiphenyldichloroethylene
DDT	Dichlorodiphenyltrichloroethane
DOD	Department of Defense
EA	EA Engineering, Science, and Technology, Inc.
EI	Environmental Investigation
EM Federal	EM Federal Corporation
EPA	U.S. Environmental Protection Agency
ERA	Ecological risk assessment
ER-L	Effect range low
ERP	Environmental Restoration Program
ESD	Explanation of Significant Differences
FFA	Federal facility agreement
ft	Foot (feet)

ACRONYMS AND ABBREVIATIONS (continued)

FS	Feasibility study
FYR	Five-year review
GWQS	Groundwater Quality Standard
Harding	Harding ESE, Inc.
HHRA	Human health risk assessment
HQ	Hazard quotient
HRC™	Hydrogen Release Compound
ICF Kaiser	ICF Kaiser Engineers, Inc.
IMMR	Inspection, Maintenance, and Monitoring Report
IRIS	Integrated Risk Information System
JB MDL	Joint Base McGuire-Dix-Lakehurst
Kemron	Kemron Environmental Services, Inc.
kg	Kilogram
LEL	Lowest effects level
LTM	Long-term monitoring
LUC	Land use control
LUCIP	Land Use Control Implementation Plan
MCL	Maximum Contaminant Level
mg/kg	Milligram(s) per kilogram
MNA	Monitored natural attenuation
MTBE	Methyl-tert-butyl ether
NCP	National Contingency Plan
NEA	New Egypt Armory
NFAE	No Further Action Equivalent
NJAC	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NPL	National Priorities List
O&M	Operation and maintenance
ORC®	Oxygen Release Compound
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCE	Tetrachloroethene
PDO	Property Disposal Office
PFC	Perfluorinated compound
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate

ACRONYMS AND ABBREVIATIONS (continued)

PIKA	PIKA International
PQL	Practical Quantitation Level
RAB	Restoration Advisory Board
RACR	Remedial action completion report
RAGS	Risk Assessment Guidance for Superfund
RAO	Remedial action objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial investigation
ROD	Record of Decision
SCC	Soil cleanup criterion
SEL	Severe effects level
Shaw	Shaw Environmental, Inc.
SRS	Soil Remediation Standard
SVE	Soil vapor extraction
SVOC	Semivolatile organic compound
SWQS	Surface Water Quality Standard
TBC	To-be-considered
TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
TPH	Total petroleum hydrocarbons
USACE	U.S. Army Corps of Engineers
USAF	U.S. Air Force
USC	United States Code
UST	Underground storage tank
UU/UE	Unlimited use and unrestricted exposure
VISL	Vapor Intrusion Screening Level
VOC	Volatile organic compound
WRA	Well Restriction Area

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EXECUTIVE SUMMARY

This is the first Basewide Five-Year Review (FYR) for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites that require a FYR at the Dix Area of Joint Base McGuire-Dix-Lakehurst (JB MDL). The purpose of this FYR is to review information for specific sites within the Dix Area to determine if their remedies are, and will continue to be, protective of human health and the environment. The triggering action for this FYR is the completion of the *Second FYR Report for the Dix EPIC-8 Landfill*, dated 15 May 2013. JB MDL is completing all CERCLA FYRs at this time so that all Dix FYRs will be on the same schedule.

Per the FYR process, a public notice was provided in the *Burlington County Times* (25, 26, and 28 May 2017) and the *Asbury Park Press* (26-28 May 2017) to inform the public that the review was in process. At the conclusion of the FYR, another notice will be published to notify the public that the FYR has been completed and the report is available at the local site repositories (Burlington County Library) and electronically at http://afcec.publicadmin-record.us.af.mil/.

The U.S. Army Fort Dix was combined with McGuire Air Force Base and the Naval Air Engineering Station Lakehurst to become the JB MDL on 1 October 2009. In this report, the former U.S. Army Fort Dix portion of the JB MDL will be referred to as the Dix Area.

The seven CERCLA sites addressed in this review are LF010 (Sanitary Landfill), LF017 (EPIC-8 Landfill), LF033 (Property Disposal Office [PDO] Landfill), SS005B (4300/4400 Area), SS007 (MAG-1 Area), SS025 (Armament Research Development Center [ARDC] Test Site), and TU026 (New Egypt Armory). While Site LF010 was listed on the National Priorities List (NPL) from 1987 through 2012, it is now classified as a deleted CERCLA NPL site. The other six sites are classified as CERCLA non-NPL sites.

Remedies for the sites subject to FYR were selected in a series of Records of Decision (RODs) and Decision Documents (DDs) signed between 1991 and 2015. Remedies selected for the sites subject to FYR are summarized in Table ES-1, below.

Table ES-1: Remedies Selected in the Records of Decision for Areas and Sites Subject to Five-Year Review

Site	Remedy	Most Recent FYR Completion Date, Number
LF010	Landfill Capping; Gas Venting; Engineering and Land Use Controls; Long-Term Monitoring	September 2015 (4th)
LF017	Engineering and Land Use Controls	May 2013 (2nd)
LF033	Sediment Excavation; Stream Restoration; Long-Term Monitoring; Land Use Controls	September 2013 (1st)
SS005B	Air Sparging/Soil Vapor Extraction; Long-Term Monitoring; Land Use Controls	September 2013 (1st)
SS007	Soil Excavation; Bioaugmentation; Monitored Natural Attenuation; Long-Term Monitoring; Land Use Controls	September 2013 (1st)
SS025	Soil Excavation; Long-Term Monitoring; Land Use Controls	September 2013 (1st)
TU026	Soil Excavation; Land Use Controls	Not Applicable

No issues affecting current protectiveness were identified during the FYR. However, two issues that could affect future protectiveness were identified, one at Site LF010 and one at Site SS007.

A solar panel array was installed on the capped portion of Site LF010 in late 2016-early 2017. Following construction of the solar panel array, widespread, persistent ponding of water has been observed on the landfill cap. Seeping was also observed along a landfill side-slope at the time of the site inspection, but has not been observed following maintenance of the drainage outlets in early 2018. Drainage patterns should be reassessed and improved to minimize ponding, and maintenance must be performed regularly to protect the integrity of the cap. If issues with cap function are identified, these must be addressed to prevent mobilization of contaminants from the landfill.

Concentrations exceeding applicable standards have recently been reported in the most downgradient sentinel well at Site SS007, and the extent of the trichloroethene (TCE) plume associated with the site is not well defined. The monitoring network should be evaluated to ensure that it includes sentinel wells meeting New Jersey Department of Environmental Protection requirements to confirm future protectiveness, and to provide better delineation of the site-related groundwater plume.

Recommendations that do not affect protectiveness were also identified for Sites LF010, LF017, SS005B, SS007, and SS025 during the FYR. At Site LF010, it is recommended that the analyte list for groundwater monitoring be refined and that data screening continue in accordance with the ROD and the 10x rule for regulatory standards. An Explanation of Significant Differences will be prepared for Site LF010 and implemented with regulatory concurrence, to record the refined analyte list for groundwater. At Site LF017, it is recommended that the overgrown vegetation on the perimeter fence be trimmed and damaged portions of the fence be repaired. Continued monitoring of groundwater at Site SS005B and surface water at Site SS025 is recommended to assess concentrations of tetrachloroethene (PCE) exceeding applicable standards.

A monitored natural attenuation (MNA) evaluation is currently in progress at Site SS007, and the bioaugmentation system has been shut off. Potential rebound and concentrations exceeding applicable standards were observed during early 2017 sampling events. MNA or an alternative remedy, such as the proposed groundwater recirculation with ex situ treatment, should be implemented if necessary to achieve cleanup goals in an acceptable timeframe.

No issues that affect current remedy performance or protectiveness at any of the sites were identified during the FYR process, including the document review, data review, and site inspections. The remedy for Site LF010 is protective of human health and the environment in the short-term, and the remedies for the other six sites are protective of human health and the environment. Exposure pathways have been interrupted, and the remedial action objectives and cleanup goals are expected to be met. Several recommendations that may affect future protectiveness or do not affect protectiveness are identified in this FYR Report, as summarized above.

These findings are summarized and protectiveness statements for each site are presented in tabular format in the FYR Summary Forms.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Joint Base McGuire-Dix-Lakehurst, Dix Area, New Jersey		
EPA ID: NJ2210020275 (Site LF010), NJ4213720275		
Region: 2	**State:** NJ	**City/County:** Burlington and Ocean Counties
SITE STATUS		
NPL Status: Deleted (LF010, Delisted September 2012) Non-NPL (LF017, LF033, SS005B, SS007, SS025, TU026)		
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: Other Federal Agency ***[If "Other Federal Agency," enter Agency name]*:** United States Air Force		
Author name (Federal or State Project Manager): EA Engineering, Science, and Technology, Inc., PBC on behalf of AFCEC/CZOE, Dix Area Federal Project Manager: Nicole Brestle, U.S. Air Force		
Author affiliation: Contractor		
Review period: 15 May 2013 - 15 May 2018		
Date of site inspection(s): 25-26 July 2017		
Type of review: Statutory		
Review number: Varies by site—LF010 (No. 5), LF017 (No. 3), LF033 (No. 2), SS005B (No. 2), SS007 (No. 2), SS025 (No. 2), TU026 (No. 1)		
Triggering action date: 15 May 2013 (second FYR for LF017)		
Due date *(five years after triggering action date)*: 15 May 2018		

Five-Year Review Summary Form (continued)

Issues/Recommendations

Site(s) without Issues/Recommendations Identified in the Five-Year Review:
Sites LF017, LF033, SS005B, SS025, and TU026

Issues and Recommendations Identified in the Five-Year Review:

Site: *LF010*	**Issue Category: Operations and Maintenance**			
	Issue: As of the date of the site inspection in July 2017, widespread, persistent ponding of water was observed on the landfill cap following construction of the solar panel array. Apparent seeping was also observed along a landfill side-slope.			
	Recommendation: Drainage patterns must be reassessed, methods of improving drainage must be assessed and implemented, and vegetative maintenance must be performed regularly to protect the integrity of the cap. The area of potential seeps along the landfill side-slope should be monitored, and any apparent future seeping should be further investigated to determine whether it indicates that the landfill cap system is not functioning as designed. If issues with cap function are identified, they must be addressed to prevent mobilization of contaminants from the landfill.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility	State	7/31/2018

Site: *SS007*	**Issue Category: Monitoring**			
	Issue: Concentrations exceeding applicable standards have recently been reported in the most downgradient sentinel well, and the extent of the trichloroethene plume associated with the site is not well defined.			
	Recommendation: The monitoring network should be evaluated to ensure that it includes sentinel wells meeting New Jersey Department of Environmental Protection requirements to confirm future protectiveness and to provide better delineation of the site-related groundwater plume.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility	State	12/31/2018

Five-Year Review Summary Form (continued)

Protectiveness Statement(s)	
Site: LF010	*Protectiveness Determination:* Short-term Protective
Protectiveness Statement: The remedy at Site LF010 is protective of human health and the environment in the short-term because all exposure pathways have been interrupted and remedial action objectives and cleanup goals are expected to be met.	
Site: LF017	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at Site LF017 is protective of human health and the environment.	
Site: LF033	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at Site LF033 is protective of human health and the environment.	
Site: SS005B	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at Site SS005B is protective of human health and the environment.	
Site: SS007	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at Site SS007 is protective of human health and the environment.	
Site: SS025	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at Site SS025 is protective of human health and the environment.	
Site: TU026	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at Site TU026 is protective of human health and the environment.	

Sitewide Protectiveness Statement
Protectiveness Determination: Protective
Protectiveness Statement: The remedies at all Sites are protective of human health and the environment. The remedy at Site LF010 is protective of human health and the environment in the short-term because all exposure pathways have been interrupted and remedial action objectives and cleanup goals are expected to be met.

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FIVE-YEAR REVIEW REPORT
FOR
JOINT BASE MCGUIRE-DIX-LAKEHURST

1. INTRODUCTION

1.1 AUTHORITY STATEMENT/PURPOSE

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of remedial actions in order to determine if the remedies are and will continue to be protective of human health and the environment and are functioning as intended by the decision documents (DDs). The methods, findings, and conclusions of reviews are documented in the FYR. In addition, the FYR identifies issues found during the review, if any, and documents recommendations to address them.

This is the first Basewide FYR for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites that require a FYR at the Dix Area of Joint Base McGuire-Dix-Lakehurst (JB MDL), Burlington and Ocean Counties, New Jersey. The Dix Area of JB MDL was formerly known as Fort Dix.

The U.S. Air Force (USAF) is conducting this FYR pursuant to CERCLA Section §121(c) 42 United States Code (USC) Section 9621(c), Executive Order 12580 paragraphs 2(d) and 2(e), and the National Contingency Plan (NCP). CERCLA §121(c) states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section 9604 or 9606 of this title, the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The Executive Order 12580 paragraphs 2(d) and 2(e), in summary, state that remedial responsibilities, and therefore FYR responsibilities, are given to the Federal agency or department having jurisdiction, custody, or control.

The U.S. Environmental Protection Agency (EPA) interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) §300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

The USAF prepared this FYR in accordance with the *Comprehensive Five-Year Review Guidance*, Office of Solid Waste and Emergency Response Directive 9355.7-03B-P (June 2001) and Department of Defense Guidance for CERCLA FYRs. This report will become part of the site file.

The triggering action for this statutory review is 15 May 2013, which is the completion date of the second FYR for Site LF017. FYRs for other sites subject to FYR have been completed more recently; therefore, the completion date for the LF017 FYR serves as the triggering action.

The seven CERCLA sites addressed in this review are LF010 (Sanitary Landfill), LF017 (EPIC-8 Landfill), LF033 (Property Disposal Office [PDO] Landfill), SS005B (4300/4400 Area), SS007 (MAG-1 Area), SS025 (Armament Research Development Center [ARDC] Test Site), and TU026 (New Egypt Armory [NEA]) (Table 1). While Site LF010 was listed on the National Priorities List (NPL) from 1987 through 2012, it is now classified as a deleted CERCLA NPL site. The other six sites are classified as CERCLA non-NPL sites.

CERCLA and the NCP require that the FYR period begin with the initiation of remedial action for remedial actions that leave hazardous substances, pollutants, or contaminants onsite above levels that allow for unlimited use and unrestricted exposure (statutory reviews). Initial FYRs were completed in 1999 for Site LF010; in 2008 for Site LF017; and in 2013 for Sites LF033, SS005B, SS007, and SS025. Subsequent FYRs were completed for Site LF010 in 2005, 2010, and 2015, and for Site LF017 in 2013. This is the first FYR for Site TU026.

This report is based in part on information contained in site-specific reports and information that is part of the Administrative Record file for the Dix Area and available for public review at the Burlington County Library in Westhampton, New Jersey or electronically at http://afcec.publicadmin-record.us.af.mil/. Data from annual and semiannual monitoring events conducted between 1 January 2013 and 30 May 2017 are reviewed in this report.

This report is divided into separate chapters for each individual Site at the Dix Area that requires an FYR.

1.2 SITE HISTORY

JB MDL is located in Burlington County and Ocean County, New Jersey. The Dix Area encompasses approximately 30,638 acres and is approximately 20 miles southeast of Trenton. The Dix Area is located within the Pinelands National Reserve, and adjacent non-federal lands to the north and south are included in the Pinelands Preservation Area and Forest Management Area. The groundwater in the surficial aquifer at Dix is currently classified by the New Jersey Department of Environmental Protection (NJDEP) as Class I-PL (Pinelands).

U.S. Army Fort Dix was combined with McGuire Air Force Base and the Naval Air Engineering Station Lakehurst to become JB MDL on 1 October 2009. In this report, the former U.S. Army Fort Dix portion of JB MDL will be referred to as the Dix Area.

The mission of JB MDL is to provide mission-ready Warfighters to support Unified Combatant Commanders in global military operations and unrivaled installation management for America's only tri-service joint base. The Dix Area is bordered by McGuire to the north and Lakehurst to the east. The Dix Area is a permanent Class 1 Army installation, and consists of a Cantonment Area, a Training Area, and a Range and Impact Area. The Dix Area is currently utilized for the training of reserve components. In fiscal year 1998, the Dix Area was realigned to the U.S. Army Reserve Command. The Dix Area is one of the Army's Power Projection Platforms with capability to mobilize, train, equip, and deploy units anywhere in the world.

The Dix Area Sanitary Landfill (Site LF010) was placed on the NPL on 1 July 1987. Because Fort Dix was a "Federal Facility" and CERCLA releases had been confirmed, the EPA and the Army entered into a federal facility agreement (FFA) on 19 July 1991, under CERCLA Section 120. The FFA was signed between the U.S. Army, EPA, and NJDEP (EPA Region 2 and U.S. Army 1991). The FFA established roles and responsibilities for EPA and the Army, and laid out a procedural framework and timetable for developing, implementing, and monitoring appropriate response actions at the Dix Area in accordance with CERCLA and the Superfund Amendments and Reauthorization Act, the NCP, and the Resource Conservation and Recovery Act (RCRA). The NPL listing and FFA requirements applied solely to the Dix Area Sanitary Landfill (Site LF010); this site was delisted from the NPL in 2012. The other six sites addressed in this FYR are classified as CERCLA non-NPL sites.

JB MDL is currently a secured facility and is an active base used in a manner consistent with commercial and industrial exposure standards. There are no plans to change the current use of the sites included in this FYR. In addition, there is no current or planned use of these sites for residential housing, child care centers, or growth of edible crops for consumption.

Brief descriptions of the status (through 2016) of active petroleum, munitions, and CERCLA non-NPL sites at JB MDL that are not included in this FYR are provided in Sections 1.2.1-1.2.3. Additional information and maps of these sites are available in the Land Use Control Implementation Plan (LUCIP) for JB MDL.

1.2.1 Petroleum Sites Not Currently Subject to Five-Year Review

Although these sites do not require FYRs under CERCLA, they are subject to periodic review via New Jersey Biennial Certification requirements.

Site NW044, Building 5136

Site NW044 is being remediated actively with air-sparge (AS)/soil vapor extraction (SVE) technology. The AS/SVE well network at the site includes 8 AS wells and 3 SVE wells. Prior to startup of the AS/SVE system, baseline groundwater sampling was conducted in Fall 2015 (reported in the 2015 Inspection, Maintenance, and Monitoring Report [IMMR] for the Dix Area). System startup was completed in Spring 2016, and post-start up groundwater performance monitoring sampling rounds were completed in April 2016 and October 2016, with additional sampling rounds planned for 2017. The NW044 performance monitoring sampling includes 3 monitoring wells (1 source area well and 2 plume wells) analyzed for benzene, toluene, ethylbenzene, and xylenes (BTEX).

Site NW045, Building 5339

At NW045, the #2 fuel oil underground storage tank (UST) was removed in September 1998 as part of the UST Upgrade/Removal Program between 1996 and 1998, and Oxygen Release Compound (ORC®) was injected at the Site in December 2011 as an interim remedial measure. A draft remedial action completion report (RACR) for Site NW045 was submitted to NJDEP in March 2018. The data collected in 2015 and 2016 indicate all remedial goals have been met by achieving compliance with the applicable New Jersey soil and groundwater standards. Upon approval of the RACR, a Response Complete status will have been achieved and a site closeout letter will be submitted to document the abandonment of monitoring wells, thus completing the requirements for site closure.

Site TU011, Golf Course Clubhouse

As of 2016, the TU011 monitoring program included 4 monitoring wells (2 source area wells and 2 sentinel wells) analyzed for BTEX. Source area well FDGCC-MW5 is located near a former gasoline UST that was removed in 1985, and the downgradient sentinel well is monitoring well GLF-16. The other source area well, FDGCC-MW1, is located near a former #2 fuel oil UST that was removed in 1997, and the downgradient sentinel well is monitoring well GLF-73. TU011 sampling is conducted semiannually at these monitoring well locations.

A significant increase in BTEX concentrations in monitoring well FDGCC-MW5 was observed during the October 2015 sampling event. However, concentrations decreased in the subsequent sampling events conducted in February 2016 (which was not a scheduled IMMR event, but was conducted to assess the October 2015 concentration spike) and April 2016 to similar levels as observed in the April 2015 sampling event. However, the BTEX concentrations then again increased in the October 2016 sampling event. A soil investigation was completed in this area of the site in July 2016. Residual low-level impacts to smear zone soil were observed that could be acting as a lingering source contributor for the observed groundwater impacts. Response options such as SVE are being evaluated for this area of the site to address the smear zone soil and groundwater impacts. The 2016 IMMR (Arcadis U.S., Inc. [Arcadis] 2017) indicated that a separate work plan document was being prepared.

Site TU019A, Taxi Stand

Site TU019A is being remediated actively with AS/SVE technology. The AS/SVE well network at the site includes 12 AS wells and 9 SVE wells. Prior to startup of the AS/SVE system, baseline groundwater sampling was conducted in Fall 2015 (reported in the 2015 IMMR [Arcadis 2016a]). System startup was completed in Spring 2016, and post-start up groundwater performance monitoring sampling rounds were completed in April 2016 and October 2016, with additional sampling rounds planned for 2017. The TU019A performance monitoring sampling includes 4 monitoring wells (2 source area wells, 1 plume well, and 1 sentinel well) analyzed for BTEX.

Site TU578, POL Area

Monitored natural attenuation (MNA) is underway at TU578. As of 2016, the TU578 sampling program included 6 monitoring wells (2 source area wells, 3 sentinel wells, and 1 upgradient well) analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and/or MNA parameters. TU578 sampling is conducted semiannually at these monitoring well locations. No further action was recommended for soil based on the results of the interim removal action that was completed to residential standards, and the NJDEP provided approval in their letter dated 9 October 2014. The Interim RACR for Site TU578 was included in an attachment to the 2016 IMMR (Arcadis 2017). The 2016 IMMR (Arcadis 2017) also indicated that the remedy at TU578 has been demonstrated to be working in accordance with the approved RAWP, based on 18 months of implementation, monitoring, and data collection (three semiannual sampling events) in support of the MNA remedy. NJDEP concurred with the Interim RACR in December 2017.

Site TU579, Firestone Building 4201

MNA is underway at TU579. As of 2016, the TU579 sampling program included 3 monitoring wells analyzed for VOCs, SVOCs, and/or MNA parameters. TU579 sampling is conducted semiannually at all locations. Groundwater impacts have not been observed during implementation of the MNA program at this site; therefore, well designations (i.e., source area, plume, and sentinel) have not been assigned to the wells at this site. No further action was recommended for soil based on the remedial investigation (RI), which showed no contaminants of concern (COCs) detected at concentrations exceeding residential standards. The NJDEP provided approval of this recommendation in their letter dated 9 October 2014. A draft RACR for Site TU579 was submitted to NJDEP in March 2018. Upon approval of the RACR, a Response Complete status will have been achieved and a site closeout letter will be submitted to document the abandonment of monitoring wells, thus completing the requirements for site closure.

Site TU924, Building 0199

In 1998, two USTs (one diesel and one gasoline) and 13 cubic yards of impacted soil were removed from the site. Monitoring data have demonstrated a decreasing trend in COC concentrations since the removal action was completed. Groundwater data collected in 2015 indicate compliance with the applicable New Jersey groundwater standards. A draft RACR for Site TU924 was submitted to NJDEP in March 2018. Upon approval of the RACR, a Response Complete status will have been achieved and a site closeout letter will be submitted to document the abandonment of monitoring wells, thus completing the requirements for site closure.

Site TU969, Building 5390

As of 2016, the TU969 monitoring program included semiannual sampling of 3 monitoring wells (1 source area well, 1 plume well, and 1 sentinel well) analyzed for BTEX and methyl-tert-butyl ether (MTBE).

Site TU970, Building 6045

Site TU970 is being remediated actively with AS/SVE technology. The AS/SVE well network at the site includes 9 AS wells and 3 SVE wells. Prior to startup of the AS/SVE system, baseline groundwater sampling was conducted in Fall 2015 (reported in the 2015 IMMR [Arcadis 2016a]). System startup was completed in Spring 2016, and post-start up groundwater performance monitoring sampling rounds were completed in April 2016 and October 2016, with additional sampling rounds planned for 2017. The TU970 performance monitoring sampling includes 3 monitoring wells (1 source area well and 2 plume wells) analyzed for BTEX.

1.2.2 Munitions Sites Not Currently Subject to Five-Year Review

Site FR004, Dix Practice Mortar Range Site

The RI Report for Site FR004 is scheduled to be submitted in 2017. It is expected that no further action will be proposed for this site.

Site SR002, Dix Small Arms Range

A removal action (involving approximately 73,623 tons of soil) was recently completed to stabilize lead *in situ* and then excavate the treated soil. The contractor collected samples to verify that the residual contaminant concentrations were below the residential cleanup goals. Soils were transported to Burlington County Soil Recycling Center. The site was restored (backfill, hydroseed, and erosion control).

1.2.3 Other CERCLA Non-NPL Sites Not Currently Subject to Five-Year Review

Site NW042, 0900 Area

The Proposed Plan for this site is currently under development, and recommends *in situ* soil mixing as the preferred remedial alternative for soil at the 0900 Area. This remedy will reduce the concentrations of the COCs in soil to levels that will achieve compliance with the residential cleanup goals. By meeting the applicable residential cleanup goals, the remedy will be protective of human health and the environment, and will make the site acceptable for unlimited use and unrestricted exposure (UU/UE).

Site AT024, Fire Tank Training Area

No remedial action is required at Site AT024 to be protective of human health and the environment. Based on results of human and ecological risk assessments, and comparison of sampling data with the most stringent NJDEP cleanup criteria, the site is suitable for No Further Action/Unrestricted Use. A Proposed Plan selecting a No Action remedy was prepared and approved by NJDEP. A draft Record of Decision (ROD) for No Action was prepared but was not signed by the outgoing Army commander prior to Joint Basing in 2009. A No Action ROD using the Air Force ROD format is in progress.

Site DA022, Boiler Blowdown Area

No remedial action is required at Site DA022 to be protective of human health and the environment. Based on results of human and ecological risk assessments, and comparison of sampling data with the most stringent NJDEP cleanup criteria, the site is suitable for No Further Action/Unrestricted Use. A Proposed Plan selecting a No Action remedy was prepared and approved by NJDEP. A draft ROD for No Action was prepared but was not signed by the outgoing Army commander prior to Joint Basing in 2009. A No Action ROD using the Air Force ROD format is in progress.

Site LF016, Range Landfill

While there is no CERCLA basis for taking action at LF016 (there are no unacceptable human health risks or hazards and Dix Site LF016 does not pose a threat to ecological receptors), there is a requirement to take action under New Jersey response laws. The selected response action includes groundwater monitoring and institutional controls (a Classification Exception Area [CEA]) to address copper, nickel, and zinc in groundwater at concentrations exceeding the New Jersey Class-I PLs (and Dix Area background values). A Proposed Plan has been completed and a ROD is in process. Because the site has been determined to be acceptable for UU/UE, five-year reviews will not be required for this site.

Site SA018, ANC-2 Landfill

No CERCLA action is necessary to protect human health or the environment at Site SA018. This is based on the absence of COCs at this site (in all media) and lack of unacceptable risks or hazards under CERCLA to human health or ecological receptors. Also, no action is necessary under New Jersey response laws as no constituents in any media exceed applicable state remediation standards (nickel and mercury concentrations in groundwater do not exceed Dix Area background values). A Proposed Plan has been completed and a ROD for a No Action remedy is in process.

1.2.4 Ongoing Assessment of Perfluorinated Compounds and 1,4-Dioxane

A preliminary assessment of perfluorinated compounds (PFCs) at the Dix Area was conducted in 2015 (HydroGeoLogic, Inc. 2015), as part of the USAF's Enterprise Process to investigate these compounds. PFCs, such as perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA), are used in the formulation of aqueous film forming foam (AFFF), which the USAF has used in fire training exercises, suppressing aircraft and other vehicle fires, and in aircraft hangar fire suppression systems. Although PFOS/PFOA are not CERCLA hazardous substances and there are no promulgated federal or New Jersey standards for these compounds, New Jersey has established preliminary drinking water guidance values for PFOS/PFOA, and EPA has issued lifetime health advisories for PFOS/PFOA in drinking water. None of the seven CERCLA sites included in this FYR were identified as AFFF areas in the preliminary assessment; therefore, these sites were not included in subsequent investigations assessing PFC concentrations.

A systematic assessment of potential 1,4-dioxane impacts in groundwater is also planned for sites with documented releases of chlorinated solvents, in particular, historical releases of 1,1,1-

trichloroethane (TCA), TCA degradation products 1,1-dichloroethane or 1,1-dichloroethene, or, trichloroethene (TCE) in groundwater. Although there are no promulgated federal standards for 1,4-dioxane, NJDEP issued an interim Groundwater Quality Standard (GWQS) and Practical Quantitation Level (PQL) for this compound in 2015. Sampling is planned to begin in 2018 and will target wells in the former chlorinated solvent source areas including Sites LF010, SS005B, SS007, and SS025 (included in this FYR) and downgradient locations as needed. Results will be addressed in subsequent FYRs, as applicable.

1.3 GEOLOGY AND HYDROGEOLOGY

The Dix Area is located within the Atlantic Coastal Plain Physiographic Province, a wedge-shaped sequence of unconsolidated marine and non-marine sediment, including clays, silts, sands, and gravels, which is 1,300-6,000 feet (ft) thick atop a gently southeastward dipping bedrock surface. The subsurface geological formations under the site include the following formations:

- The Cohansey Sand, the uppermost formation exposed at the surface, represents the upper portion of the surficial aquifer. The Cohansey Formation is primarily sand with some gravel and clay and marl lenses.

- The Kirkwood Formation consists of interbedded sands and clays and is present at the surface in parts of the Dix Area.

- The Vincentown Formation consists of silty fine-grained sand and is separated from the overlying Kirkwood Formation by a thin, more permeable interface zone consisting of poorly sorted particles ranging from silts to gravels. The upper part of the Vincentown Formation was previously identified as the Manasquan Formation.

The Kirkwood and Cohansey Formations form a single unconfined aquifer under the Dix Area, which is an important current and future source of groundwater for residents of New Jersey (New Jersey Geological Survey 2009). Underlying the Kirkwood-Cohansey Aquifer are the Mt. Laurel-Wenonah Aquifer, the Englishtown Aquifer, and the Potomac-Raritan-Magothy Aquifer. The Kirkwood-Cohansey Aquifer is the only aquifer where contaminant concentrations have been identified at the Dix Area.

1.3.1 Groundwater Use in the Vicinity

Potable water in the cantonment area of the Dix Area is supplied by an off-base creek (the surface water withdrawal is treated for potable use) and four deep supply wells installed in the Potomac-Raritan-Magothy Aquifer. The Potomac-Raritan-Magothy Aquifer is situated beneath several major confining units at a depth in excess of 1,000 ft below ground surface (bgs). Fifteen potable supply wells are also located in the Range and Impact Area at the Dix Area, north/east and not downgradient of the FYR sites with impacted groundwater (Arcadis 2016b).

A Sitewide CEA and Well Restriction Area (WRA) has been established by the NJDEP for the Dix Area of JB MDL (NJDEP 2014). The CEA includes portions of the Kirkwood-Cohansey aquifer at sites where contaminants are present in groundwater at concentrations exceeding applicable standards. Of the sites reviewed in this FYR, the following are included in the CEA: LF010, LF033, SS005B, SS007, and SS025. A CEA is maintained for groundwater at a site in which COCs are present at concentrations exceeding the applicable standards. The CEA is an institutional control documenting the groundwater quality conditions at the site. If COCs are also present in groundwater at concentrations exceeding health-based standards, the WRA is also required to prevent groundwater use. The applicable standards for individual sites, used in evaluating the CEA, are discussed in the sections below. Each site where COCs are present in groundwater at concentrations exceeding applicable standards will remain in the CEA (and WRA if applicable) until remediation is accomplished.

CEA requirements are incorporated into the LUCIP for JB MDL, which is provided as an appendix to the Joint Base General Plan. USAF policy on land use controls (LUCs) associated with environmental restoration activities was issued in a memorandum dated 17 January 2001, from the Deputy Under Secretary of Defense (Environmental Security). The intent of the policy is to ensure land use activities in the future remain compatible with land use restrictions imposed during the environmental restoration process and that the land use restrictions thereby continue to provide protection of human health and the environment. In the unlikely event that the sites covered by this FYR are no longer under the control and ownership of the Federal government in the future, appropriate deed restrictions would be implemented to ensure the remedies remain protective of human health and the environment.

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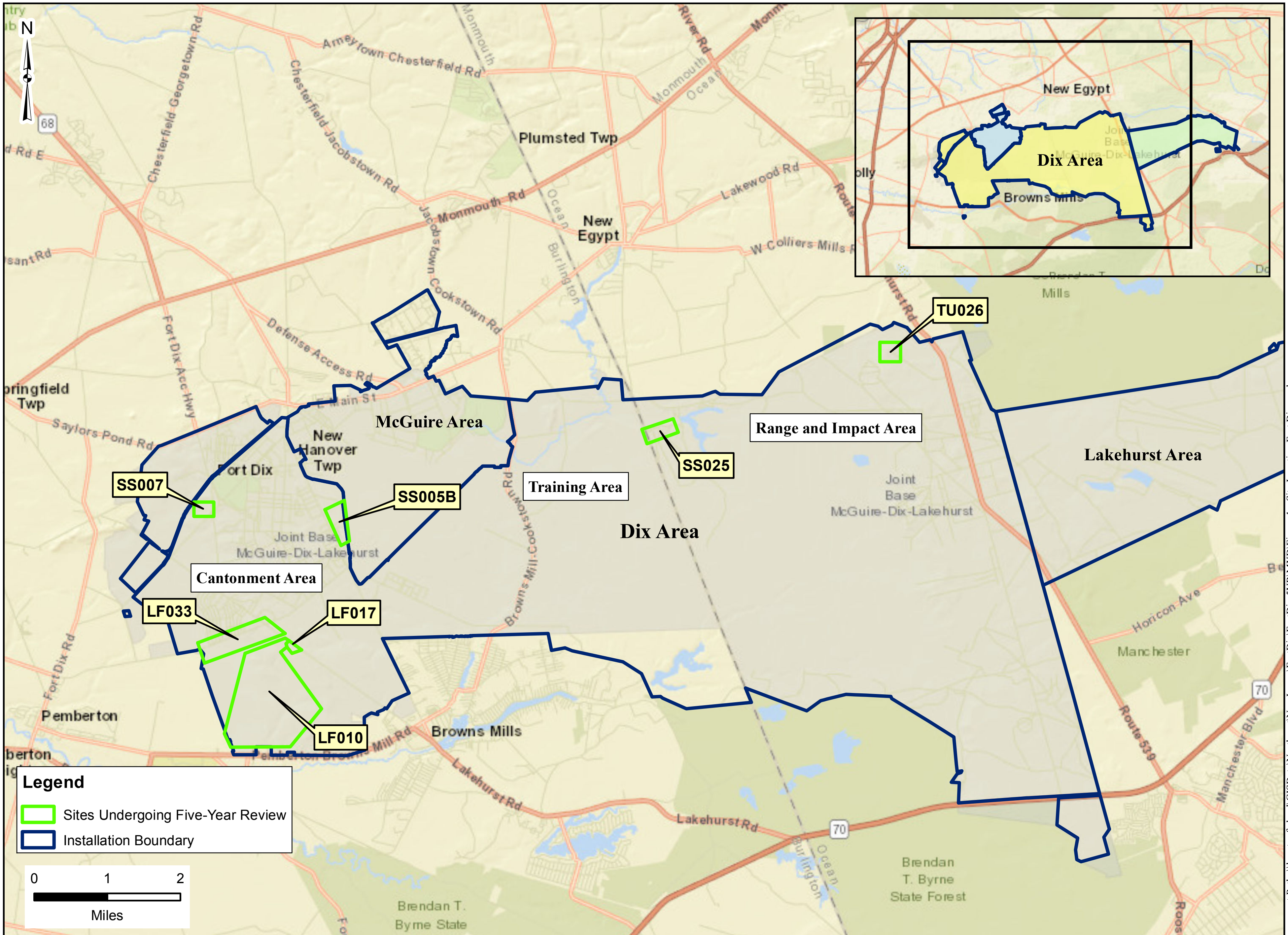

Document Path: \\lovetonfederal\GISData\Northeast\NewJersey\FortDix\FortDix 5YR\MXD\Figure 1 - Site Location Fort Dix.mxd

EA Engineering, Science, and Technology, Inc., PBC

DIX AREA FIVE-YEAR REVIEW
JOINT BASE MCGUIRE-DIX-LAKEHURST, NEW JERSEY

FIGURE 1

SITE LOCATIONS

Table 1. Summary of Sites Included in the Basewide JB MDL-Dix FYR (2018)

				Site Status	
Site ID	**Site Name**	**Record of Decision/Decision Document Date (as applicable), and ESD (as applicable)**	**Most Recent Five-Year Review**	**Remedial Status**	**O&M, LTM, and ICs**
LF010	Dix Area Sanitary Landfill	Record of Decision - 24 September 1991	Fourth FYR, September 2015	Remedy in Place. Landfill capping was completed in 1996. Land use controls are in place and maintenance is conducted regularly. Long-term monitoring began in 1994 and continues annually.	O&M LTM ICs
LF017	EPIC-8 Landfill	Decision Document - 10 October 2002	Second FYR, May 2013	Remedy in Place. Fencing and land use controls are in place.	O&M ICs
LF033	PDO Landfill	Decision Document - 3 June 2004	First FYR, September 2013	Remedy in place. Remedial Action Completion Report was submitted in 2017. Removal of mercury contaminated sediments and wetland/stream restoration was completed in 2007. Land use controls are in place. Groundwater, surface water, and sediment were monitored semiannually through 2016.	O&M LTM ICs
SS005B	4300/4400 Area	Decision Document - 26 June 2003	First FYR, September 2013	Remedy in place. Air sparge/soil vapor extraction was completed in 2005. Land use controls are in place. Surface water and sediment were monitored through 2012. Groundwater is monitored semiannually.	LTM ICs
SS007	Magazine-1 Area	Decision Document - August 2002 ESD - 13 June 2011	First FYR, September 2013	Remedy in place. Soil excavation was performed in 2005 and 2010. Land use controls are in place. Sediment sampling was conducted in 1999 and 2013. Groundwater bioaugmentation system was shut down in 2015 to allow evaluation of monitored natural attenuation. Groundwater is monitored semiannually.	O&M LTM ICs
SS025	ARDC Test Site	Decision Document - May 2003	First FYR, September 2013	Remedy in place. Soil excavation was completed in 2007. Land use controls are in place. Groundwater and sediment were monitored semiannually through 2015. Surface water is monitored semiannually.	LTM ICs
TU026	New Egypt Armory	Record of Decision - 3 June 2015 ESD - 2 December 2016	Not Applicable	Remedy in place. Soil excavation was completed in 2015. Land use control is in place.	ICs

Notes:

ESD = Explanation of Significant Differences

FYR = Five-Year Review

IC = Institutional Control

LTM = Long-Term Monitoring

O&M = Operation and Maintenance

2. SITE LF010, DIX AREA SANITARY LANDFILL

2.1 SITE CHRONOLOGY

A timeline of major events at Site LF010, the Dix Area Sanitary Landfill, is presented in Table LF010-1. Tables and figures for Site LF010 are provided at the end of this Chapter.

2.2 BACKGROUND OF SITE LF010, DIX AREA SANITARY LANDFILL

2.2.1 Physical Characteristics

Site LF010, the Dix Area Sanitary Landfill, is located in the southwest section of JB MDL (Figure 1). The landfill covers approximately 113 acres and is located about 2,200 ft from the fenced boundary of JB MDL. The landfill is bounded by Pointville Road to the north, Pemberton-Browns Mills Road to the south, Pipeline Road to the west, and Juliustown-Browns Mill Road to the east (Figure LF010-1a).

Older portions of the landfill have been re-vegetated with ash and pine trees, while the newer portions of the landfill are covered by high grass or low vegetation. As of 2017, a solar panel array has been installed on top of the landfill cap (Figure LF010-1b). The area immediately surrounding the landfill consists of a hardwood swamp and densely vegetated hardwood forest.

Two streams flow near the landfill: Cannon Run, located on the east side of the landfill, flows south into the North Branch of Rancocas Creek, and an unnamed stream, located northwest of the landfill, flows to the west into the North Branch of Rancocas Creek. A swamp that drains into Budd’s Run is located to the west of Pipeline Road. The terrain is gradually sloping toward the south, from a topographic elevation of approximately 160 ft above mean sea level at the northern portion of the landfill, to approximately 75 ft above mean sea level near the swampy area south of the landfill. Depth to groundwater ranges from approximately 1 to 50 ft bgs across the site. Groundwater flow at Site LF010 is generally to the south-southwest (Figure LF010-2).

2.2.2 Land and Resource Use

The Dix Area Sanitary Landfill began operation in 1950; it was officially closed on 6 July 1984. Prior to landfill development, the area was used for Army training. Between 1950 and 1984, the landfill was used and operated by the Fort Dix Military Reservation. McGuire Air Force Base also used the landfill from 1968 until it was closed.

Three military housing subdivisions are located north of the landfill, beyond the forested PDO Landfill Site LF033. The town of Browns Mills is approximately 2 miles east of the landfill, immediately east of JB MDL. To the south of the Dix Area Sanitary Landfill are two abandoned farms, approximately 12 homes, several county buildings, the County Hospital, and the Burlington County Juvenile Detention Center and shelter. Pemberton Township municipal buildings, sewage disposal plant, public water supply wells, and several homes are located to the southwest of the landfill. The public water supply wells are located within 3 miles southwest of the landfill boundary.

The Sanitary Landfill is included within the Dix Basewide New Jersey CEA. The CEA serves as an institutional control by providing notice that the groundwater does not meet the standards required by the groundwater classification.

2.2.3 History of Contamination

Access to the landfill was not controlled until 1980; therefore, records of disposal practices, waste types, and quantities are incomplete. Wastes that have been reportedly disposed of at the landfill include domestic waste, paints and thinners, demolition debris, ash, and solvents (U.S. Army 1991).

Landfill operations consisted of excavating a series of parallel trenches to a depth of approximately 10 ft below grade. The trenches were then filled with waste materials and covered with approximately 2 ft of soil cover. In general, trench excavation and waste disposal began at the northern portion of the landfill (in the 1950s) and continued in a southerly direction to the landfill's southern boundary until 1984. After 1969, landfill capacity was increased by depositing wastes to an elevation of approximately 10 ft above grade, thereby doubling the depth of wastes disposed of in each trench. These newer sections of the landfill, where refuse was disposed of at elevations above the original grade, suffered from extensive soil erosion and wash-outs, exposing waste materials.

In addition to the landfill, a pit in the southwest area of the site was reported by the Army to be used for an estimated period of 4 months in 1982 to dispose of mess hall grease and possibly grease trap cleansers. The pit covered approximately one-half acre to a depth of 6 ft. Disposal into the grease pit was discontinued in 1982. Prior to disposal in the grease pit, mess hall grease was disposed of throughout the landfill.

2.2.4 Initial Response

An interim New Jersey Pollutant Discharge Elimination System permit was issued for the Dix Area Sanitary Landfill on 29 May 1984. On 6 July 1984, the Army ceased the disposal of waste at the landfill in compliance with the landfill closure date. The landfill was ranked for inclusion on the NPL on 14 September 1984, was placed on the NPL on 1 July 1987, and remained on the NPL until September 2012. On 16 September 1985, the Army entered into an Administrative Consent Order (ACO) with NJDEP and EPA. The ACO required the Army to conduct an RI/feasibility study (FS) and to implement the selected remedial alternative approved by NJDEP and EPA.

On 19 July 1991 the Army and the EPA entered into the FFA, under CERCLA Section 120. The FFA superseded the ACO and provided the formal basis for selection of the remedy and the implementation of the ROD for the Dix Area Sanitary Landfill Site at JB MDL.

In 1979 and 1982, a series of groundwater monitoring wells were installed around the perimeter of the landfill. To further define groundwater impacts, 8 additional wells were installed in 1983 and 11 wells were installed in 1984. Results from sampling of these wells are summarized in Section 2.2.5.

2.2.5 Basis for Taking Action

During the early 1980s, VOCs and heavy metals were detected in the groundwater samples collected from wells located immediately to the south, southeast, and southwest of the landfill. These compounds included methylene chloride, dichloroethane, TCA, TCE, tetrachloroethene (PCE), methyl ethyl ketone, methyl isobutyl ketone, mercury, cadmium, and other heavy metals.

During the RI/FS, an analysis was conducted to determine the potential for any impact to public health and the environment, which may result if the contamination associated with the Dix Area Sanitary Landfill were not controlled. In conducting this assessment, the focus was on the human health and environmental effects that could result from exposure to contaminants associated with the landfill in various media (air, surface water, sediment, soil, and groundwater).

During the evaluation of site risks, chemicals detected at the site were screened to select indicator chemicals for the Dix Area Sanitary Landfill Site. These chemicals were selected as the most representative of site conditions and expected to contribute the greatest risks to human health and the environment. The indicator chemicals for the site include 1,2-dichloroethane, benzene, vinyl chloride, TCE, PCE, chlorobenzene, 2-butanone, toluene, trans-1,2-dichloroethene (DCE), bis(2-ethylhexyl)phthalate, 1,4-dichlorobenzene, TCA, ethylbenzene, nickel, mercury, cadmium, zinc, chromium, and manganese.

The human health assessment included in the RI/FS concluded that possible future use of the Cohansey aquifer as a source of potable water presents potential concerns for human health, whereas the environmental assessment concluded that significant impacts to wildlife and vegetation were not expected to occur (see Section 2.6.2.1).

2.3 REMEDIAL ACTIONS AT SITE LF010, DIX AREA SANITARY LANDFILL

2.3.1 Remedy Selection

The selected remedy provided in the ROD (U.S. Army 1991) consists of the following requirements:

- Installation of a cap on the southern 53 acres of the landfill consisting of vegetative, drainage, and low-permeability layers. Maintenance of 2 ft of existing final cover on the remaining portion of the landfill.

- Installation of a landfill gas venting and air monitoring system to determine if methane gas and VOC emissions require treatment.

- Installation of a chain-link fence around the perimeter of the landfill to restrict access. Implementation of landfill closure requirements in accordance with New Jersey Closure Requirements, New Jersey Administration Code (NJAC) 7:26 -2A et seq., and RCRA guidance.

- Long-term groundwater, surface water, and air monitoring (30 years) pursuant to the New Jersey State closure requirements. Performance of a yearly statistical analysis on the chemical analysis results to determine the trend of the overall contamination levels.

- Long-term operation and maintenance (O&M) to provide inspection of and repairs to the landfill cap.

- Implementation of institutional controls in the form of deed and water restrictions on future uses of the landfill and groundwater in the immediate vicinity of the landfill.

- Development and implementation of a Soil Erosion and Sediment Control Plan in accordance with the Soil Erosion and Sediment Control Act Regulations of 1975 (New Jersey Statutes Annotated 4:24 -40 et seq., and NJAC 2:90-1.1 et seq.)

- Using the data obtained in the monitoring program, review of the risk assessment and subsequent revision of the risk assessment if the trend shows significant changes in water quality. These reviews and revisions will be performed within 3 years of commencement of a remedial action and at least every 5 years thereafter. Any changes in actual exposure scenarios will be addressed in the revised risk assessments. Risk assessments will use EPA guidance and policy effective at the time of the review.

- If significant increases in unacceptable risk to human health and the environment are determined in the revised risk assessments, additional remedial actions will be proposed.

The remedial action objectives (RAOs) established for LF010 in the ROD (U.S. Army 1991) are as follows:

- To prevent contaminants migrating from the landfill from affecting drinking water supplies of the local population

- To prevent landfill contaminant migration/exposure via Cannon Run and Budd's Run (swamp) from restricting State-designated downstream surface water uses on the North Branch of Rancocas Creek (i.e., fishing, swimming, and future water supply)

- To protect people who perform military-related or unauthorized recreational activities on the JB MDL property from potentially harmful effects due to landfill contaminants

- To satisfy all appropriate local, state, and federal requirements for landfill closure

- To prevent significant adverse environmental impacts on the surrounding flora and fauna caused by contaminant release from the landfill

- To satisfy all site-specific Applicable or Relevant and Appropriate Requirements (ARARs) as practicable.

2.3.2 Remedy Implementation

Phase I of the remediation was completed early in fiscal year 1992; Phase II was completed in fiscal year 1997. The U.S. Army Corps of Engineers (USACE) served as Contractor to the Army at the Dix Area Sanitary Landfill Site.

The Army, its design contractor Law Environmental, the USACE, NJDEP, and EPA reviewed, monitored, and inspected all design and construction activities, and determined all activities were completed in accordance with the approved documents. EPA made a final inspection of the completed work on 28 March 1998.

The Dix Sanitary Landfill was included in a multi-site CEA approved in September 2003 (Shaw Environmental, Inc. [Shaw] 2003), and subsequently in the Dix Area Sitewide CEA (NJDEP 2014). In addition to the CEA and engineering controls (fence, signs, landfill cap), the LUCIP includes restrictions on the following uses for Site LF010: surface disturbance, subsurface disturbance, and residential use. Annual long-term monitoring (LTM) events, including sampling of the onsite wells, were performed during the FYR period to comply with the CEA, and annual inspections are also conducted under the LUCIP (see also Section 2.3.3). The monitoring program is described further in Section 2.4.

2.3.3 System Operation and Maintenance

O&M activities conducted at the landfill include annual LTM activities (collection and analysis of groundwater, sediment, and surface water samples), mowing, limiting erosion, and maintaining site security.

Formal semiannual inspections of the landfill are performed in the spring and fall each year by the O&M contractor, and include the following:

- Inspect and maintain the landfill cap's vegetative cover
- Conduct an annual mowing event in the fall
- Inspect existing grades and slopes of the landfill to ensure the integrity of the landfill's erosion control measures
- Inspect and maintain drainage control structures to prevent ponding and erosion of the cap's vegetative cover
- Inspect all other physical structures associated with the landfill's operation and security, such as gas-vents, roads, perimeter fence, and monitoring wells.

Informal site inspections are also performed by a JB MDL representative every 30 days and after large rain events or episodes of severe weather. Routine annual landfill maintenance, including mowing, was last conducted in October 2017. Corrective actions for the site are implemented as soon as possible to minimize incremental damage caused to landfill features. On the landfill cap, tree and brush growth is not allowed for protection of the cap's liner system. Areas of settlement and damage by burrowing animals are repaired as needed. The infiltration pond is maintained by cleaning debris and accumulated sediment to maintain proper infiltration and prevent clogging of the outlet control structure and emergency spillway.

The landfill cap and soil cover were reported to be in good condition during the FYR period. No slumping, subsidence, erosion, or cracks in the landfill cap were reported. The O&M contractor noted evidence of minor burrowing activity, as well as the presence of animals, including deer and turkeys, within the site fence. Animal burrows beneath the perimeter fence were filled, and the animal activity did not impact the landfill cap or the protectiveness of the remedy. The perimeter fence was repaired as needed to maintain its integrity, and vegetation found along and on the fence was regularly removed. Removal of woody, perennial shrub growth from the landfill cap was performed. Landfill gas vents were repaired when they are found to be damaged, and debris was removed as appropriate. JB MDL personnel were notified when secondary gates in the perimeter fence were found open or unlocked. Management and reporting for this site is completed annually in accordance with the Dix Area Basewide Inspection, Maintenance, and Monitoring Work Plan (Plexus Scientific 2014) and biennially through CEA documentation.

In 2016/2017, a solar panel array was installed on top of the landfill cap (Figure LF010-1b). The array occupies approximately 50 acres of the 53-acre landfill cap. As documented in the lease for the solar farm, the solar array was designed to have minimal impacts on the existing cap. Following construction of the array, the company operating the solar farm assumed responsibility for the following cap maintenance-related activities within the solar array area: mowing and maintenance of the cap's vegetative cover as needed, maintaining existing grades and slopes and erosion control measures, maintaining drainage control structures to prevent ponding and erosion of the cap's vegetative cover, and conducting annual site visits to inspect the solar system and note any environmental impacts caused by the operation of the solar array. JB MDL's O&M contractor conducts the following activities on behalf of JB MDL: formal semiannual inspections; annual monitoring of groundwater, surface water, and sediment; maintenance activities listed above for the solar lessee (including annual mowing in the fall), for areas outside of the solar array; and maintenance of remedy-associated physical structures including gas vents, perimeter fence, and monitoring wells (USAF 2015).

As reported by the contractor responsible, the annual O&M costs at Site LF010 (including mowing, inspections, and annual sampling) were approximately $60,000 during the FYR period.

2.4 PROGRESS SINCE THE LAST REVIEW AT SITE LF010, DIX AREA SANITARY LANDFILL

The fourth FYR for Site LF010 was submitted on 21 September 2015 (USACE 2015a). The 2015 FYR protectiveness statement for LF010 was as follows: "The remedy is considered to be protective of human health and the environment." The FYR stated that continued implementation of the institutional controls and CEA will ensure both the short and long term protectiveness of the remedy. As indicated in the FYR, none of the COCs (indicator chemicals) that are outlined in the ROD had migrated beyond the site boundary and the remedy was considered to be functioning as required. As a result, no issues were identified for the Dix Area Sanitary Landfill that affect protectiveness.

Issues and recommendations identified in the 2015 FYR that do not affect protectiveness, and the follow-up actions taken, are summarized below:

Remedy Component	Issue/Recommendation from the 2015 FYR (not affecting protectiveness)	Completed ?	Follow-Up Action Taken
LTM	The current LTM plan for the Dix Area Sanitary Landfill includes sampling points within the watershed of Budd's Run, and within the creek itself due to a request from EPA. These sampling points include SW/SD-1, SW/SD-2, SW/SD-9, LTM-27, and LTM-28. Because of the location of these sampling points, a sediment release from PDO could potentially trigger a response action at the Sanitary Landfill, which would not be appropriate. This was recognized in the addendum to the second FYR, where it is stated that "Due to the proximity of SD/SW9 both upgradient of the Sanitary Landfill and downgradient of the adjacent PDO landfill, it is concluded that the elevated levels of mercury at SD/SW9 is attributed to the PDO landfill and not the Sanitary Landfill." It should be noted that Budd's Run is not specified in the ROD as a compliance point. The recommended action is to remove sampling points in Budd's Run and its watershed from the Dix Area Sanitary Landfill LTM Plan, but retain them in the Landfill LTM Plan for PDO Landfill.	Yes	As of 2016, monitoring at the referenced locations (SW/SD-1, SW/SD-2, SW/SD-9, LTM-27, and LTM-28) is no longer performed in association with LF010.
LTM	Two of the designated sentinel wells at the Dix Area Sanitary Landfill have recently shown minor detections of COCs. By definition, a sentinel well must be located in front of the plume, in the direction of plume movement, and not affected by COCs. In the Fall 2014 sampling, LTM-14 exhibited 13 micrograms per liter (µg/L) of Nickel (ARAR = 10.9 µg/L), and LTM-11 showed 15 µg/L of copper (ARAR = 8.53 µg/L). The ARARs for both detections are based on the 2012 background groundwater study. In both instances the detections are considered sporadic; neither affects protectiveness nor represents an upward trend. It is recommended that designations for 5 wells be reassigned. The USAF will submit a Sentinel Well proposal to the NJDEP under separate cover following the submittal of this FYR.	Yes	New sentinel well designations were implemented in 2017, as proposed in the 2015 IMMR and approved by NJDEP in March 2016. Well LTM-14 was reclassified as an AOC well, whereas LTM-11 was retained as a sentinel well based on an assessment of recent data..
LTM	There are nine COCs that have had a change in value since the DD was signed in 1991. Those COCs are highlighted with an (*) asterisk on Table 5. It is recommended that an evaluation of the nine analytes be completed and an Explanation of Significant Differences (ESD) assigning new ARARs if necessary. *Note: The COCs indicated in Table 5 were TCA, 1,4-dichlorobenzene, total xylenes, trans-1,2-dichloroethene, copper, iron, mercury, silver, and zinc.*	No	Data for these groundwater COCs will continue to be screened against new standards that are less than 1/10 the ROD standards. An ESD will be prepared and implemented with NJDEP concurrence.

Additional details on progress made based on the recommendations from the last FYR are provided in the sections below.

2.4.1 Long-Term Monitoring

The following monitoring activities were completed at LF010 during the FYR period:

- Five annual LTM events were conducted at LF010 during the review period, during Fall 2013 and 2014, and Spring 2015, 2016, and 2017.

- Approximately 20 monitoring wells were sampled for groundwater during each LTM event, and groundwater samples were analyzed for VOCs and/or total metals. Co-located sediment and surface water samples were analyzed for total metals, with select samples also analyzed for VOCs or pesticides. As indicated below, the monitoring program undergoes continual refinement; however, the overall monitoring program has not changed dramatically over the past 5 years. The monitoring wells and sediment/surface water locations sampled during each LTM event are indicated in the data tables in Appendix A.

2.4.2 Refinement of the Long-Term Monitoring Program

<u>Sampling Points Within the Budd's Run Watershed</u>

As recommended in the 2015 FYR, monitoring at locations SW/SD-1, SW/SD-2, SW/SD-9, LTM-27, and LTM-28 in Budd's Run and its watershed in association with LF010 ceased as of 2016. NJDEP indicated concurrence with this change in comments issued in response to the 2015 IMMR (Arcadis 2016a).

<u>Reassignment of Sentinel Well Designations</u>

The Draft Sentinel Well Proposal for the JB MDL-Dix Sanitary Landfill (LF010) was submitted to NJDEP on 29 September 2015, and NJDEP comments were received on 2 October 2015. After discussion with the NJDEP during monthly status meetings, sentinel well re-designation recommendations were made in the 2015 IMMR. The sentinel well re-designations were approved by NJDEP in March 2016. The 2015 IMMR (Arcadis 2016a) and 2016 IMMR (Arcadis 2017), including the list of new well designations, were approved by NJDEP on 30 August 2016 and 8 December 2017, respectively.

New well designations are as follows:

- Area of Concern (AOC) wells (LTM-12, LTM-13, LTM-14, LTM-18, LTM-19, LTM-20, LTM-22, LTM-23, LTM-30, LTM-32)

- Sentinel wells (LTM-9, LTM-10, LTM-11, LTM-17, LTM-31, LTM-34, LTM-36, LTM-40, LTM-42, LTM-44, LTM-45).

These changes were discussed with NJDEP during monthly status meetings, and implemented beginning with the April 2017 sampling event.

The 2016 IMMR also recommended limiting future sampling events to the COCs listed in the approved ROD, and constituents that have exceeded the higher of the Dix Area background values and the New Jersey PQLs in 2016 and/or 2017. Following NJDEP approval of the 2016 IMMR in December 2017, this approach was discussed during a meeting with NJDEP on 6 February 2018, and preliminary concurrence with this approach was achieved.

2.5 FIVE-YEAR REVIEW PROCESS FOR SITE LF010, DIX AREA SANITARY LANDFILL

2.5.1 Administrative Components

The FYR was prepared by JB MDL, in consultation with NJDEP. The team included Curtis Frye (JB MDL Remediation Program Manager), Nicole Brestle (Remediation Project Manager, Dix Area), and Haiyesh Shah (NJDEP Case Manager). This is a federal facility-lead site.

2.5.2 Community Involvement

Public notice of the beginning of the FYR process was published for 3 days in the *Asbury Park Press* (26-28 May 2017) and the *Burlington County Times* (25, 26, and 28 May 2017). The FYR was also discussed at the Restoration Advisory Board (RAB) meeting on 19 July 2017. Annual community planners meetings, including Department of Defense (DOD) representatives and contractors, are held each fall to review the JB MDL LUCIP and discuss upcoming projects at JB MDL potentially impacted by the established LUCs. Any FYR findings that impact base planning with respect to LUCs would be addressed during these meetings, as required. No public comments were received in association with the FYR. Comments received from EPA and NJDEP regarding LF010, and associated responses, are included in Appendix B.

Once the FYR is completed, additional public notices will be published, the RAB mailing lists will be notified, and the results will be made available at the local site repositories, which are at the Burlington County Library (5 Pioneer Boulevard, Westhampton, New Jersey) and online at http://afcec.publicadmin-record.us.af.mil/. In addition, efforts will be made to reach out to local public officials to inform them of the results.

2.5.3 Document Review

This FYR consisted of a review of relevant documents, including the RODs/DDs, Biennial Certification Reports for the groundwater CEA, the LUCIP for JB MDL, annual IMMRs, landfill inspection reports, and remedial action reports. The documents, data, and information that were reviewed in completing this FYR are summarized in Appendix C.

2.5.4 Data Review

A long-term groundwater, surface water, and sediment monitoring program was implemented as part of the remedy at the Sanitary Landfill. Data for five LTM events (October 2013 through April 2017) were available from the period of review for this FYR report. Results from these monitoring events are included in tabular format in Appendix A, and concentration versus time charts are provided in Appendix D. The monitoring results and trends are briefly described below.

<u>Groundwater</u>

Groundwater samples from Site LF010 are analyzed for VOCs and total metals. In addition to the indicator chemicals defined for the site (Section 2.2.5), the LTM sampling events also included analysis of additional VOCs and metals. Wells currently included in the monitoring program include sentinel wells and AOC wells, as described in Section 2.4.2.

The data from the FYR period were compared to site screening criteria for groundwater, as shown in Appendix A. For most analytes, the applicable criteria are the higher of the New Jersey PQLs or the Dix Area background groundwater concentrations (where applicable) (EA Engineering, Science, and Technology, Inc. [EA] 2012a). In cases of analytes for which the ROD included specific criteria, the ROD criteria are used unless they are 1) less than the Dix Area background value or 2) more than 10 times greater than the higher of the current PQL or background value (in accordance with the "10x rule"). Results from sentinel wells are screened against the higher of the PQLs or the background concentrations, as the 10x rule is not applicable for sentinel wells.

Twelve metals (arsenic, barium, chromium, cobalt, copper, manganese, mercury, nickel, potassium, silver, sodium, and zinc) were detected in groundwater at total concentrations exceeding applicable criteria at least once during the review period. Of these twelve, five are indicator chemicals for LF010 (chromium, manganese, mercury, nickel, and zinc) and four are considered nutrient metals (manganese, potassium, sodium, and zinc).

Nine VOCs (1,2,4-trichlorobenzene, 1,2-dibromo-3-chloropropane, 1,4-dichlorobenzene, 2-butanone, acetone, benzene, chlorobenzene, cis-1,2-DCE, and PCE) were also detected in groundwater at concentrations exceeding applicable criteria at least once during the review period. Of these nine, five are indicator chemicals for Site LF010 (1,4-dichlorobenzene, 2-butanone, benzene, chlorobenzene, and PCE).

Figure LF010-3 illustrates groundwater exceedances for VOCs and select metals reported in 2016 and 2017 to provide a summary of recent groundwater exceedances at the site. Exceedances occurred along the west and south sides of the landfill, as well as near its northern extent. Graphs of concentrations of select constituents exceeding applicable standards over the last 5 years are provided in Appendix D. Concentrations of VOCs exceeding applicable standards along the west side of the landfill were generally stable or decreasing during the review period, as illustrated in the graphs. Acetone and 2-butanone concentrations in AOC well LTM-18, located west of the capped portion of the landfill, decreased substantially during the review period. Benzene and chlorobenzene concentrations along the central-west side of the landfill (AOC wells LTM-20 and LTM-22) were relatively stable without apparent trend. In well LTM-32, along the southwest boundary of the landfill, benzene concentrations were relatively stable, while an increase in chlorobenzene concentrations was observed from 2015 to 2017. Total metals concentrations exceeding applicable standards near the northern edge of the landfill were also stable or decreasing, as illustrated in graphs of chromium and nickel concentrations in AOC wells LTM-30 and LTM-2 (sampled until 2015). However, increased metals concentrations were observed along the west side of the landfill, and graphs indicate substantial increases in nickel and zinc concentrations in well LTM-23, as well as increases in zinc concentrations in well LTM-19 in 2016, before sampling of this well ceased.

Intermittent exceedances of applicable standards for non-nutrient metals in sentinel wells continue to occur, despite the re-assignment of sentinel well designations (see Section 2.4.2). Most recently, during the April 2017 sampling, an exceedance of the standard for copper (31 µg/L, compared to the background value of 8.53 µg/L) in well LTM-45 was reported; data from sampling of this well in spring 2018 will be used to confirm this exceedance. Additionally, barium concentrations exceeding the PQL (200 µg/L) but not exceeding the ROD criterion (1,000 µg/L) were consistently reported in sentinel well LTM-10 in 2013-2017. During the previous FYR (USAF 2015), copper at 15 µg/L in Fall 2014 in sentinel well LTM-11, just upgradient of well LTM-45, was noted as an issue (see Section 2.4); however, no exceedances were reported in this well in 2015-2017, and this well retains its sentinel well designation. Nutrient metals exceeding applicable standards and/or PQLs in currently designated sentinel wells include manganese, potassium, and sodium.

The approved 2016 IMMR (Arcadis 2017) indicates that during future monitoring events at Site LF010, analyses will be limited to the COCs listed in the approved DD (the ROD) and constituents that have exceeded applicable standards in 2016-2017. Based on this, the following constituents would be analyzed, in addition to the 19 indicator chemicals listed in the ROD: acetone, cis-1,2-DCE, arsenic, barium, cadmium, cobalt, copper, potassium, and sodium. This approach would exclude analysis of the following analytes that exceeded applicable standards during the review period: 1,2,4-trichlorobenzene and 1,2-dibromo-3-chloropropane (exceedances in 1 well in 2015) and silver (two exceedances in Fall 2013).

Surface Water and Sediment

Sediment and surface water samples from Site LF010 were analyzed for total metals, pesticides, and VOCs. In addition to the indicator chemicals defined for the site (Section 2.2.5), the LTM sampling events also included analysis of additional metals, pesticides, and VOCs. Locations SW/SD-1 and SW/SD-2 were sampled in 2013-2015, after which sampling of these locations in Budd's Run ceased due to potential impacts from an upgradient site (PDO Landfill, Site LF033), in accordance with the recommendation from the previous FYR (USACE 2015a) (see Section 2.4). Location SW/SD-3 was sampled during all five events, and location SW/SD-7 was sampled during all events except for the most recent, April 2017, when dry conditions were encountered at this location.

Surface water and sediment data from the FYR period were compared to site screening criteria for each media, as shown in Appendix A. For surface water, the site screening criteria are the higher of the New Jersey PQLs or the Fort Dix background surface water concentrations (where applicable) (ABB Environmental Services, Inc. [ABB] 1996). For sediment, the site screening criteria are the higher of the New Jersey Freshwater Ecological Screening Criteria (Lowest Effects Level [LEL]) or the Fort Dix background sediment concentrations (where applicable) (ABB 1996).

Fourteen metals (antimony, arsenic, calcium, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, sodium, vanadium, and zinc) and one pesticide (dichlorodiphenyldichloroethylene [DDE]) were detected in surface water at total concentrations exceeding applicable criteria at least once during the review period. Of the fourteen metals with exceedances, five are indicator chemicals for LF010 (chromium, manganese, mercury, nickel, and zinc). No exceedances of the New Jersey Surface Water Quality Standards (SWQS) for Freshwater Aquatic Organisms (Acute or Chronic) were reported during the review period in surface water from location SW-3. An exceedance of the Chronic Freshwater SWQS for lead was reported at location SW-7, adjacent the northern/upgradient portion of LF010, in 2013; however, lead concentrations in 2014 and 2015 were below the SWQS in samples from this location.

Twelve metals (aluminum, arsenic, barium, cadmium, calcium, copper, iron, lead, magnesium, mercury, potassium, and zinc) were detected in sediment at concentrations exceeding applicable criteria at least once during the review period. Of these twelve, four are indicator chemicals for LF010 (cadmium, manganese, mercury, and zinc). Metals exceeding the New Jersey Ecological Screening Criteria (LEL) included arsenic, cadmium, copper, lead, mercury, and zinc. Of these, only arsenic and zinc in the sample from location SD-3 in 2015 and arsenic in the sample from location SD-7 in 2016 exceeded the Ecological Screening Criteria (Severe Effects Level [SEL]), indicating that concentrations are not generally highly elevated.

Figure LF010-4 illustrates surface water and sediment exceedances for VOCs and select metals detected in 2015-2017 in samples from locations SW/SD-3 and SW/SD-7, which are the sampling points not in Budd's Run. Graphs of concentrations of select constituents exceeding applicable standards over the last 5 years are provided in Appendix D. Concentrations of metals exceeding applicable standards in surface water and sediment at location SW/SD-3 were generally variable but without apparent trends during the review period, as illustrated in the graphs for arsenic, lead, and zinc. Meanwhile, metals concentrations in sediment at location SD-7 generally increased during the review period, often from less than to greater than applicable standards, while metals concentrations in surface water from location SW-7 decreased, often from greater than to less than applicable standards.

2.5.5 Site Inspection

A site inspection at LF010 was conducted by EA, JB MDL, and NJDEP personnel on 25 and 26 July 2017. During the inspection, the condition of the landfill cap following the installation of the new solar panel array in 2016-2017 was assessed. Widespread ponding of water, as well as abundant vegetative growth, was observed between the rows of solar panels, as documented in Appendix E. Apparent seeping, associated with orange-colored water with a sheen, was also observed on the eastern side slope of the landfill (Figure LF010-1b). JB MDL and NJDEP personnel participating in the site inspection indicated that these issues had also been observed in Spring and early Summer 2017.

2.5.6 Interviews

During the FYR process, interviews were conducted with stakeholders, including representatives from the regulatory agencies overseeing the remedies at the Dix Area and community representatives aware of the remedial activities. The purpose of the interviews was to document any perceived problems or successes with the remedies that have been implemented to date. Interviews were conducted in August 2017. Detailed interview records are included in Appendix E.

Haiyesh Shah, NJDEP Case Manager, stated concerns regarding issues noted during the July 2017 site inspection at LF010 (Section 2.5.5), specifically in relation to the overgrown vegetation, ponding of water, and apparent seep areas along the east side of the landfill. He did not indicate any concerns regarding the remedy in place, the environmental monitoring program, or established communication channels.

Douglas Pocze, EPA Region 2 Federal Facilities Chief, did not indicate any concerns regarding the remedy in place at Site LF010, the environmental monitoring program, established communication channels, or site maintenance procedures. Branwen Ellis, Environmental Specialist at the New Jersey Pinelands Commission; Matthew Czik, Assistant Public Health Coordinator for Ocean County and RAB member; and Robin Sutton, Environmental Health Coordinator for Burlington County, did not indicate any concerns regarding the remedy or communication channels. Joseph Rhyner, Chief of the Environmental Element at JB MDL also did not indicate any concerns.

Michael Tamn, the RAB Community Co-Chair, and Tom Besselman and Frank Storm, RAB members, indicated that they feel well informed about the remedial activities and progress at the Dix Area.

Tim Llewellyn of Arcadis also provided interview responses related to Arcadis' implementation of the Dix Area remedies. He indicated that whereas maintenance activities at Site LF010 were previously straightforward, compliance issues were documented by Arcadis and USAF during the construction phase of the solar array, and corrective actions have been initiated by the solar array contractor. He also indicated that an ESD for Site LF010 is being considered for the purpose of adding additional constituents, not specifically mentioned in the ROD, to the monitoring program for this site.

2.5.7 Institutional Controls Verification

Institutional controls required for this site are listed in Section 2.3, and described further in Section 2.3.2. Required institutional controls, including the Dix Area Sitewide CEA (described in Section 2.3.2) and other LUCs, are in place and documented in the LUCIP for JB MDL. The most recent Biennial Certification Monitoring Report for the Dix Area Sitewide CEA was submitted to NJDEP on 5 April 2016, and a new biennial report is in preparation for submittal as of April 2018. LUC documentation is updated annually.

2.6 TECHNICAL ASSESSMENT OF THE REMEDY AT LF010, DIX AREA SANITARY LANDFILL

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

A review of site documentation, including results from annual groundwater, surface water, and sediment sampling and the semiannual site inspections (O&M contractor and USACE), as well as the findings of the site inspection conducted in July 2017 in association with this FYR, indicate that the remedy is functioning as intended by the ROD. Overall, the implementation of the remedial actions has met the RAOs stated in the ROD.

The installation of a landfill cap on the southern 53 acres of the Dix Area Sanitary Landfill has achieved the RAOs by minimizing the migration of contaminants to groundwater and surface water, preventing significant adverse damage associated with contaminant release, and protecting people from potentially harmful effects due to landfill contaminants.

Monitoring data from the 5-year review period indicate metals and VOCs in groundwater exceeding applicable standards, primarily along the west and south sides of the landfill. Constituents exceeding standards include a subset of the 19 site indicator chemicals identified in the ROD, as well as other VOCs and metals. Qualitative analysis indicates that concentrations in groundwater were generally stable or decreasing during the review period, with the exception of increased metals concentrations along the west side of the landfill and increasing chlorobenzene concentrations in well LTM-32 from 2015 to 2017 (Appendix D). Metals exceedances, and one pesticide exceedance, were also reported in surface water and sediment from locations SW/SD-3 and SW/SD-7 during the review period. However, no exceedances of the New Jersey SWQS for Freshwater Aquatic Organisms were reported. Metals concentrations in surface water from both locations and in sediment from location SD-3 showed no trend or a decreasing trend, while metals concentrations in sediment at location SD-7 increased. Overall, the monitoring data do not indicate issues with the remedy.

O&M of the cap and drainage structures was effective prior to the installation of a solar array on the landfill surface. Following construction of the solar array, additional maintenance will be required to address the widespread ponding of water observed on the landfill surface, in order to maintain the effectiveness of the cap. The security fence has been well maintained. The landfill gas venting and air monitoring system is no longer sampled and analyzed, with concurrence from EPA and NJDEP, after it was determined there was no longer a need to monitor for methane gas or VOC emissions. Institutional controls have been documented per the ROD, as verified above.

The remedy implemented at Site LF010 has generally been effective at controlling the risk to receptors. The CEA minimizes human exposure to potentially contaminated groundwater, and the landfill cap further decreases the potential for human exposure and decreases contaminant mobility. Concentrations of non-nutrient metals exceeding the applicable criteria for sentinel wells (higher of Dix Area groundwater background or New Jersey PQLs) were reported during the review period in the wells designated as sentinel wells per the 2016 IMMR (Arcadis 2017). Metals exceeding criteria in sentinel wells include barium and copper, along with the nutrient metals manganese, potassium, sodium, and zinc. These wells monitor whether any contamination is migrating toward the downgradient receptors. The reported exceedances are sporadic, and do not affect protectiveness or represent an upward trend. In sediments, metals concentrations are generally similar in sediment upgradient and downgradient of the landfill. Based on this and the lack of exceedances of the SWQS for surface water, the current remedy is considered protective of ecological receptors. No exceedances of non-metal constituents were reported in the proposed sentinel wells or in sediment or surface water at locations SW/SD-3 or SW/SD-7 in 2015-2017.

2.6.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of remedy selection still valid?

2.6.2.1 Changes in Risk Assessment Methodologies

There have been no major changes in human health risk assessment (HHRA) or ecological risk assessment (ERA) methodology since the signing of the ROD that would impact the protectiveness of the LF010 Sanitary Landfill remedy.

The RI/FS for the Dix Area Sanitary Landfill included a Health and Environmental Assessment (Camp Dresser & McKee, Inc. [CDM] 1989). The primary documents used to conduct the human health assessment summarized in the ROD included the following EPA guidance documents: 1986 *Superfund Public Health Evaluation Manual* (EPA 1986c) and *Development of Statistical Factors Used in Exposure Assessments* (EPA 1985). The human health assessment did not identify unacceptable risks for current exposure pathways; however, it did identify potential concerns associated with possible future groundwater or surface water use. These guidance documents were subsequently replaced by guidance, including the Risk Assessment Guidance for Superfund (RAGS), released in 1989-1991 (EPA 1989a, 1991a, 1991c, and supplemented by subsequent RAGS documents (EPA 2004 and 2009). Additionally, in September 2011, EPA released a new version of the Exposure Factors Handbook (EPA 2011). This handbook provides a summary of the available statistical data on various factors used in assessing human exposure (e.g., drinking water consumption). However, an update of the HHRA for this site is not required at this time, given the status of the landfill and the remedy in place, including LUCs (see also Section 2.6.2.2).

In 1997, EPA published *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA 1997a), followed by the more generic *Guidelines for Ecological Risk Assessment* (EPA 1998). Because the 1989 Health and Environmental Assessment for the Sanitary Landfill (CDM 1989) preceded formal EPA guidance for ERAs, the environmental assessment was based on available toxicity data and estimated exposure levels. The assessment focused on compounds and metals believed to be derived from landfill leachate. The environmental assessment concluded that, based on the observed concentrations of these compounds in nearby surface water and sediments, significant impacts to wildlife and vegetation associated with the landfill were not expected to occur, and any impacts to the biotic communities would be limited to areas where the volatiles and/or metals were detected at concentrations greater than the ambient water quality criteria (AWQC). No exceedances of current New Jersey SWQS for Freshwater Aquatic Organisms (Acute or Chronic) were reported during the review period in surface water from location SW-3 (downgradient of LF010), and only one exceedance was reported at location SW-7, as discussed in Section 2.5.4 (see table in Appendix A). Any current ecological risks would most likely be driven by exposure to moderately elevated levels of metals in sediment by benthic (sediment-dwelling) organisms. The majority of metals exceeding New Jersey Ecological Screening Criteria exceed only the LEL, and not the SEL (see Section 2.5.4). Because concentrations of metals are typically similar in sediments downgradient of the landfill, relative to upgradient, the current remedy is considered to protect against landfill-related impacts to ecological receptors. Although risk assessment methodologies presented in EPA guidance have evolved since the environmental assessment was conducted for the Sanitary Landfill, the changes and current concentrations are such that an ERA using the updated methodology would not be expected to lead to identification of issues with the protectiveness of the remedy.

2.6.2.2 Changes in Exposure Pathways

There have been no changes in physical conditions or land use at the site that would result in the development of new exposure pathways to human or ecological receptors. Additionally, no newly identified contaminants, contaminant sources, or toxic byproducts of the remedy were identified during the FYR process.

The 1989 human health assessment for the Sanitary Landfill considered the following current exposure pathways, based on use of the landfill by military personnel for training exercises as well as the possibility that children could enter the site: periodic inhalation of VOCs in the ambient atmosphere, periodic direct contact with soils including incidental ingestion, and periodic direct contact with surface water in the North Branch of Rancocas Creek. It also considered possible future exposure pathways including use of Creek water or groundwater as a potable water supply. Only the potential future use of groundwater or surface water was found to be associated with potentially unacceptable risk. Controls in place under the LUCIP and as part of the ROD remedy for the Sanitary Landfill prevent groundwater use and residential land use, and also restrict soil disturbance; although outdoor training and recreation are not restricted at the landfill under the LUCIP, maintenance of the solar array on the capped portion of the landfill is now expected to be the primary driver for people entering the site.

Daily intakes were developed as part of the health assessment by determining the population exposed, the route of exposure (dermal, inhalation, and ingestion), the duration of exposure, and the level of exposure. More recently, EPA provided default exposure parameters for use in risk assessment in the *Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors,* released in 2014 (EPA 2014). However, use of these default exposure parameters are not expected to change the overall results determined for the Sanitary Landfill, for either the current or possible future exposure pathways considered. A majority of the exposure parameters assumed in the Health and Environmental Assessment are similar to the recent default exposure parameters set forth by EPA (EPA 2014). The one change in default exposure parameters that may result in changes to overall results is the difference assumed for default body weight. The EPA revised the default adult body weight from 70 kilograms (kg) to 80 kg. The increase in body weight results in lower overall cancer risks and non-cancer hazards. Because the exposure pathways evaluated in the Health and Environmental Assessment remain the most relevant and there are no changes to the risk assessment conceptual site model, and because no groundwater or surface water use is occurring or planned, an update to the risk assessment is not warranted.

2.6.2.3 Contaminants of Concern and Changes in Standards and To-Be-Considered Guidance

The primary ARARs from the ROD for LF010 are summarized below:

- Safe Drinking Water Act
  - National Primary Drinking Water Standards, 40 CFR Part 141
  - Safe Drinking Water Act, NJAC 7:10-l et. Seq.

The EPA Maximum Contaminant Levels (MCLs) remain relevant and appropriate for protecting the public in the event the groundwater is used in the future as a potable drinking water source. LTM of the groundwater will continue to ensure the landfill cap remains protective of human health and the environment.

- Clean Water Act
  - Water Quality Criteria, 40 CFR Part 131
  - New Jersey GWQS, NJAC 7:9-6.6 (b) before 2004 and NJAC 7:9C after 2004: last amended in 2010 and readopted in 2014
  - New Jersey SWQS, NJAC 7:9B et. Seq., formerly NJAC 7:9-4.1.

Clean Water Act requirements remain ARARs to protect and enhance the groundwater and surface water quality at the site. Ambient water quality standards establish concentration limits for pollutants to protect surface waters for their designated use and maintain the surface water quality.

- Closure and Post-Closure
  - NJAC 7:26 Chapter 26 Solid Waste (formerly NJAC 7:26-1).

These requirements govern the closure and post-closure care of a sanitary landfill. This requirement includes requirements for maintenance of groundwater monitoring wells and a program for monitoring the wells in accordance with NJAC 7:14A.

No applicable ARARs were found to have changed since the previous review period, although some have changed since the ROD was finalized, as discussed below.

The groundwater ARARs listed in the ROD include EPA MCLs (Safe Drinking Water Act) and NJDEP Groundwater Quality Criteria (Clean Water Act). Although not included in the ROD, the New Jersey GWQS for Class I-PL (Pinelands) groundwaters are considered applicable for the surficial aquifer at JB MDL. Per NJAC 7:9C-1.5(d), groundwater quality in the Cohansey and Kirkwood Formations in the Pinelands area is to be restored to or preserved in its natural state, using background water quality as the criteria. The PQLs, defined as the lowest concentrations that can be reliably achieved by laboratories under routine operating conditions, are typically utilized as Class I-PL standards, unless background groundwater concentrations have been defined and are greater than the PQLs. The most recent background groundwater concentrations for the Dix Area were finalized in 2012 (EA 2012a). As shown in the tables in Appendix A, the current Class I-PL standards (i.e., PQLs) and 2012 background concentrations are, for certain chemicals, lower than the ARARs listed in the ROD. Analytes for which the current PQL or background value is at least 10 times less than the lowest groundwater criterion listed in the ROD are TCA, 1,4-dichlorobenzene, trans-1,2-dichloroethene, xylenes, copper, silver, and zinc. In the case of mercury, the lowest criterion listed in the ROD was the EPA MCL, 2.0 μg/L, which has not changed since the ROD. The Dix Area background value for mercury in groundwater (EA 2012a) was measured against the certified reporting limit at the time (0.243 μg/L), and the study concluded that background concentrations of mercury did not exceed this concentration. This published background value is greater than the current PQL of 0.05 μg/L for mercury, but is not more than 10 times less than the EPA MCL. Therefore, 2 μg/L remains the applicable standard for mercury at Site LF010. The PQLs are not risk-based standards, and the decreased PQLs reflect improved analytical sensitivity. No changes in groundwater ARARs that affect the protectiveness of the remedy were identified.

The surface water ARARs listed in the ROD include federal AWQC and New Jersey SWQS (NJAC 7:9B) (for inorganic analytes only). Additionally, NJAC 7:9B-1.14(b) indicates that surface waters in the Pinelands "shall be maintained as to quality in their existing state or that quality necessary to attain or protect the designated uses, whichever is more stringent." As specified in the RAOs for LF010, the State-designated uses of surface waters near the site include use as a future water supply. The New Jersey Class I-PL groundwater standards (PQLs) are therefore also used to screen surface water data from LF010, as they represent the "background water quality" criterion applied to waters in the Pinelands. The current AWQCs and SWQSs, as well as the PQLs, for most analytes are lower than the ARARs listed in the ROD. In cases where the AWQCs and SWQSs are lower than the PQLs, these concentrations are not considered to be reliably detectable by analytical laboratories. Therefore, the higher of the PQLs or the Fort Dix background surface water value (ABB 1996) are used to screen monitoring data for each analyte in surface water.

No RAOs or compound-specific ARARs were listed for sediment in the ROD for LF010. The remedy specified in the ROD included sediment monitoring only during the design phase. Sediment data are screened against the New Jersey Ecological Screening Criteria, and the Fort Dix background concentrations for sediment (ABB 1996).

For all media analyzed, there have been no changes to the ARARs, promulgated remedial standards, or to-be-considered (TBC) guidance that affect the protectiveness of the remedy.

2.6.2.4 Changes in Toxicity and Other Contaminant Characteristics

Human health toxicity values for COCs identified in the Revised Health and Environmental Assessment were reviewed in accordance with the EPA toxicity hierarchy (EPA 2003). The EPA Integrated Risk Information System (IRIS) is the Tier I source for toxicity information (EPA 2017a). IRIS and other tiered toxicity sources presented on the EPA Regional Screening

Level table (EPA 2017b) were reviewed to determine if revisions had been made to the factors used to calculate risk in the Health and Environmental Assessment.

Tables LF010-2, showing carcinogenic COCs, and Table LF010-3, showing non-carcinogenic COCs, were adapted from the ROD. These tables list the COCs and the corresponding toxicity values (carcinogenic slope factors and reference doses) from both the ROD and the EPA's IRIS database in July 2017 and other tiered toxicity sources listed on the EPA Regional Screening Level Table. Note that many of the toxicity values have changed since 1991. An increase in an oral slope factor will produce an increase in risk for the same onsite concentration. Conversely, a decrease in the oral reference dose will produce an increased hazard quotient (HQ) for the same onsite concentration. Groundwater and surface water are, in most cases, screened against PQLs or background values that are not risk-based and therefore not affected by changes in toxicity values.

The changes in toxicity factors for the COCs do not affect the protectiveness of the remedy for human health. The RAOs selected were based upon ARARs and the LUCs minimize human contact with site media, so the remedy is still considered protective at this time. A revised risk assessment is not required since contact with soil and the use of groundwater at LF010 is restricted by LUCs, including a CEA. A CEA is required according to NJAC 7:9-6 whenever an approved remedy will not meet the current constituent standards for groundwater for the term of the remediation. The establishment of a CEA is the NJDEP's institutional control to protect human health and the environment until standards are achieved. A revised risk assessment is also not required because recent monitoring data (2016/2017) revealed COCs at concentrations less than those evaluated in the Health and Environmental Assessment.

With respect to protection of the environment, the pathway for ecological receptor exposure to groundwater remains incomplete with the possible exception of groundwater discharge to surrounding surface water and sediment. Surface water and sediment samples were collected from Budd's Run and its watershed in 2016/2017. The latest NJDEP ecological risk screening values were published in 2009, and were used for comparison of 2016/2017 measured site concentrations for surface water and sediment. A revised risk assessment is not necessary, and the remedial action remains protective of the environment.

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

As described in the 2016 IMMR (Arcadis 2017), a solar panel array was constructed on the landfill cap area in 2016-2017. While the change in land use does not directly affect protectiveness, widespread, persistent ponding of water on the landfill cap between rows of solar panels indicates potential future impacts to the protectiveness of the remedy, if the ponding is not corrected. A work plan to address this ponding of water has been submitted by the solar contractor and approved by NJDEP (Conti Enterprises, Inc. 2018), and includes both landfill cap repairs and future operation and maintenance of repaired areas, including semiannual inspections. The work plan also describes maintenance activities conducted to unclog drainage outlets around the landfill in early 2018. Following the maintenance, the area where apparent seeping was observed along a landfill side-slope during the site inspection in July 2017 was reportedly observed to have been drained by the unclogged drainage outlets. Inspections of the drainage outlets and the area of potential seeps observed in 2017 will be added to the semiannual inspections conducted by the solar contractor, per the work plan.

As stated in Section 1.2.1, an assessment of potential 1,4-dioxane impacts is planned for groundwater at Site LF010 and downgradient locations as needed. Results will be addressed in subsequent FYRs, as applicable.

There is no other information to call into question the protectiveness of the remedy.

2.6.4 Technical Assessment Summary

The review of documents, ARARs, risk assumptions, and results of the site inspection indicates that the remedy at Site LF010 is functioning as intended by the ROD. Modifications to the maintenance procedures, and possible modifications of the drainage system, may be required to correct water ponding on the landfill cap. However, the remedy remains protective.

Although risk assessment methodologies presented in EPA guidance have evolved since the Health and Environmental Assessment was conducted for Site LF010, the nature of the changes is such that a risk assessment using the updated methodology would not be expected to lead to identification of issues with the protectiveness of the remedy. No changes in exposure pathways were noted during the review period (2013–2017).

Refinement of the analyte list for groundwater LTM to include constituents that have recently exceeded applicable standards would help clarify the LTM requirements. Screening data in accordance with the ROD and the 10x rule for ARARs is appropriate to verify protectiveness.

2.7 ISSUES, RECOMMENDATIONS, AND FOLLOW-UP ACTIONS AT LF010, DIX AREA SANITARY LANDFILL

<table>
<tr><td rowspan="3">Site: LF010</td><td colspan="4">Issue Category: Operations and Maintenance</td></tr>
<tr><td colspan="4">Issue: As of the date of the site inspection in July 2017, widespread, persistent ponding of water was observed on the landfill cap following construction of the solar panel array. Apparent seeping was also observed along a landfill side-slope.</td></tr>
<tr><td colspan="4">Recommendation: Drainage patterns must be reassessed, methods of improving drainage must be assessed and implemented, and vegetative maintenance must be performed regularly to protect the integrity of the cap. The area of potential seeps along the landfill side-slope should be monitored, and any apparent future seeping should be further investigated to determine whether it indicates that the landfill cap system is not functioning as designed. If issues with cap function are identified, they must be addressed to prevent mobilization of contaminants from the landfill.</td></tr>
<tr><th>Affect Current Protectiveness</th><th>Affect Future Protectiveness</th><th>Party Responsible</th><th>Oversight Party</th><th>Milestone Date</th></tr>
<tr><td>No</td><td>Yes</td><td>Federal Facility</td><td>State</td><td>7/31/2018</td></tr>
</table>

The following is an additional recommendation to refine the monitoring program that does not affect current or future protectiveness and was identified during the FYR:

- It is recommended that the analyte list for groundwater LTM be refined to include constituents that exceeded applicable standards during the last two rounds of annual sampling (2016 and 2017), to help clarify LTM requirements, and that data screening continue in accordance with the ROD and the 10x rule for ARARs. Following review of the analyte list by NJDEP, an ESD will be prepared and implemented with NJDEP concurrence, to record the refined analyte list for groundwater.

This recommended action should be completed within the next 5 years, before the next FYR is submitted.

2.8 PROTECTIVENESS STATEMENT FOR SITE LF010, DIX AREA SANITARY LANDFILL

Protectiveness Statement	
Site: LF010	*Protectiveness Determination:* Short-term Protective
Protectiveness Statement: The remedy at Site LF010 is protective of human health and the environment in the short-term because all exposure pathways have been interrupted and RAOs and cleanup goals are expected to be met.	

2.9 NEXT REVIEW

The next FYR for LF010, the Dix Area Sanitary Landfill shall be submitted by May 2023.

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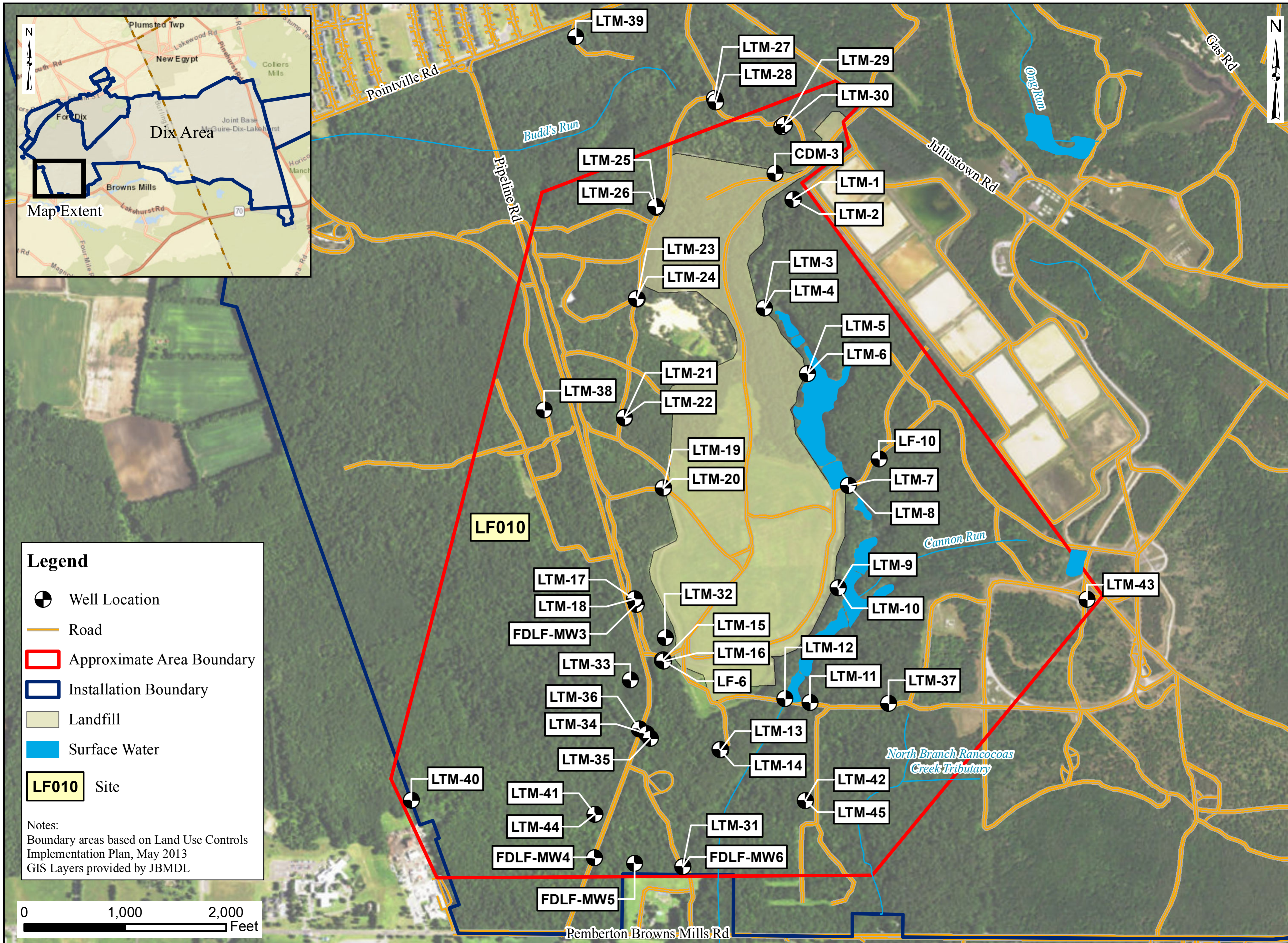
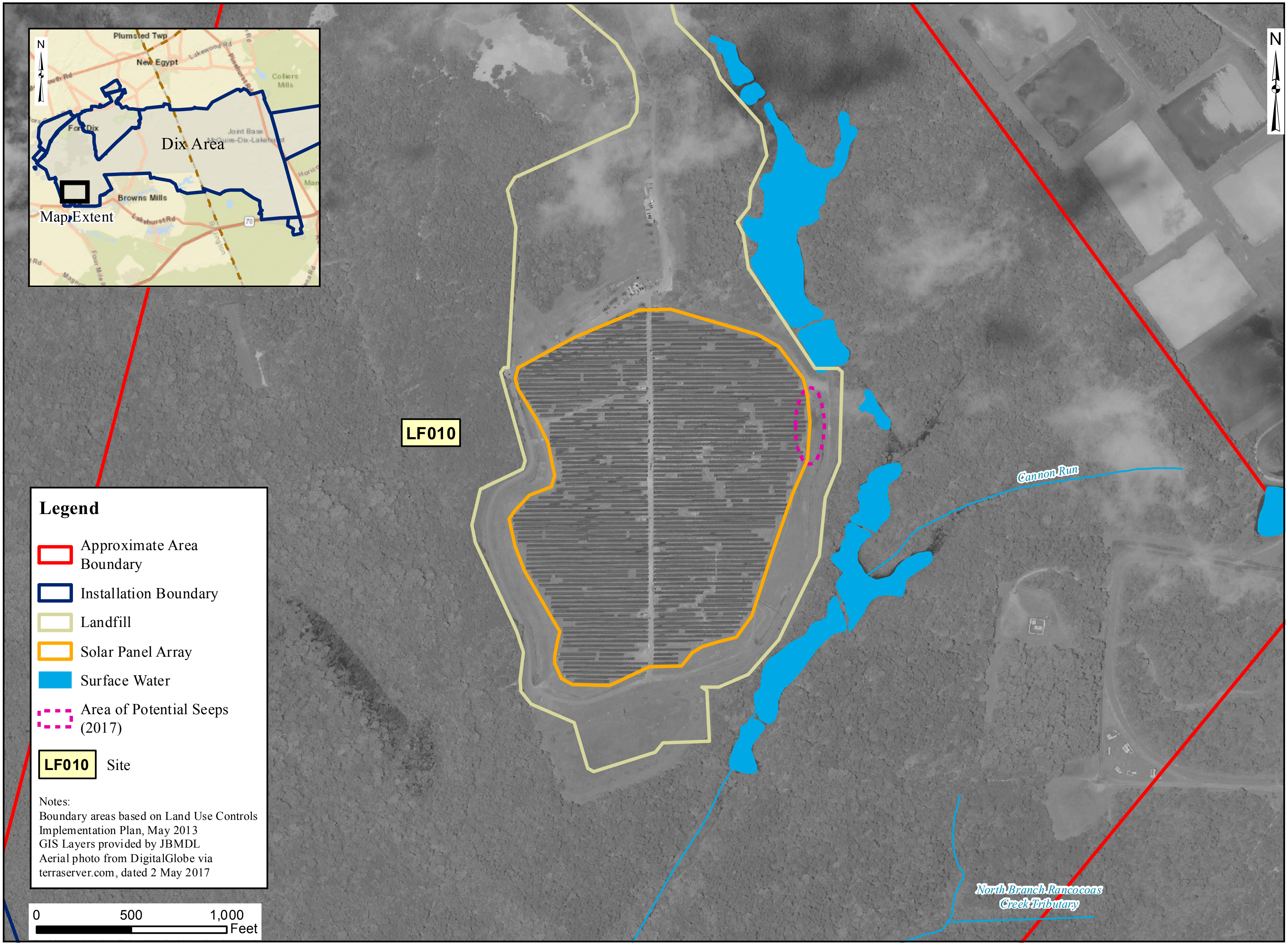


EA Engineering, Science, and Technology, Inc., PBC

DIX AREA FIVE-YEAR REVIEW
JOINT BASE MCGUIRE-DIX-LAKEHURST, NEW JERSEY

FIGURE LF010-1a
LF010 SITE FEATURES



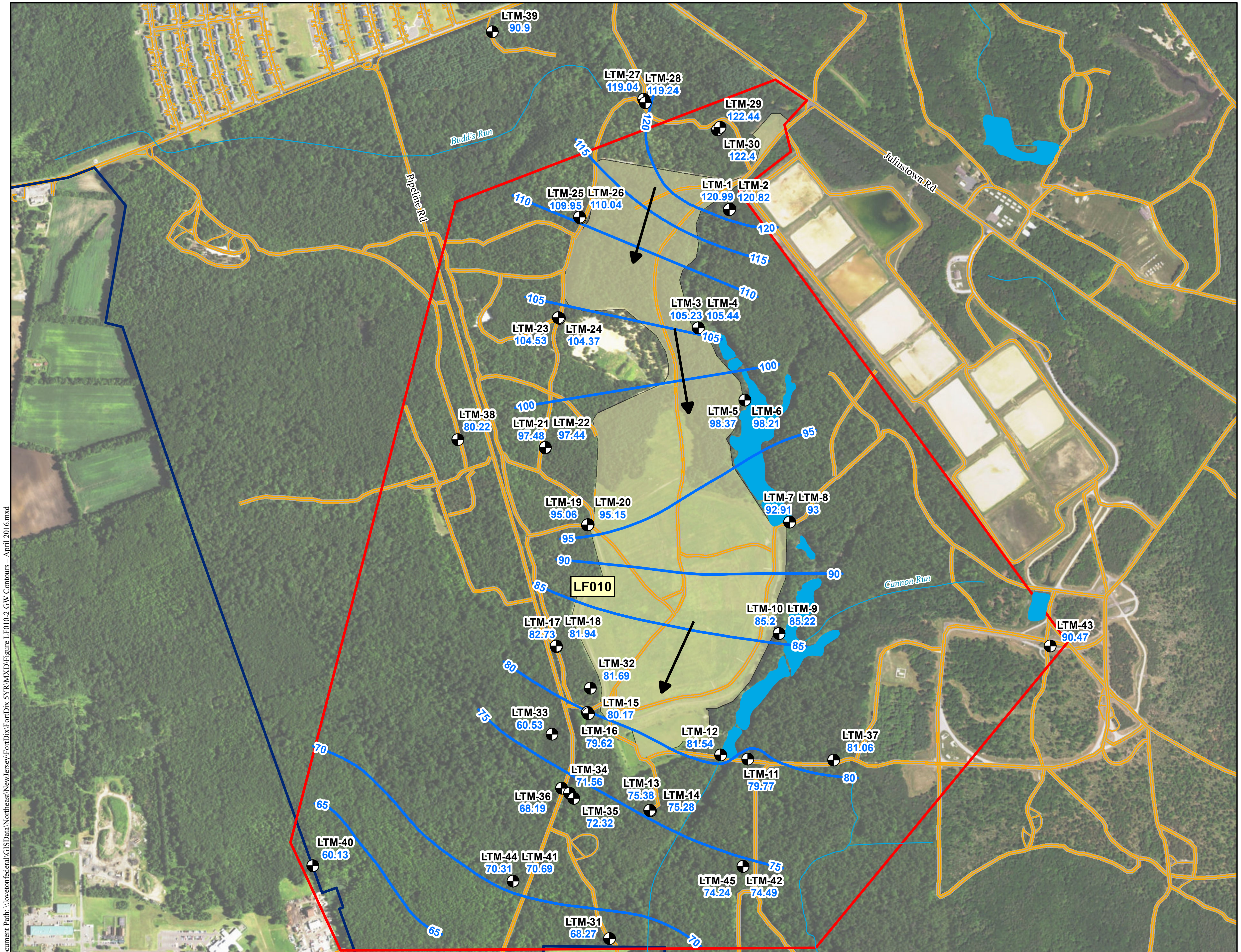
Document Path: \\lovetonfederal\GISData\Northeast\NewJersey\FortDix\FortDix 5YR\MXD\Figure LF010-1b Site Features with Solar Panels.mxd

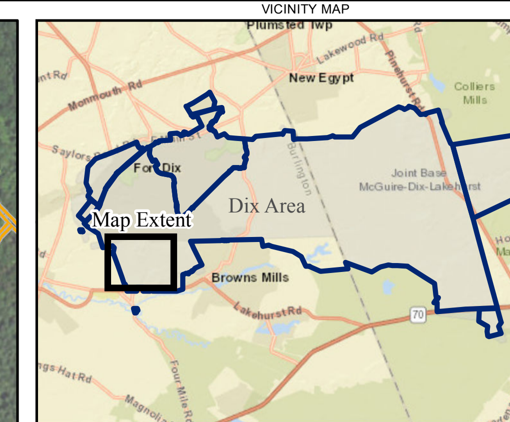
EA Engineering, Science, and Technology, Inc., PBC

DIX AREA FIVE-YEAR REVIEW
JOINT BASE MCGUIRE-DIX-LAKEHURST, NEW JERSEY

FIGURE LF010-1b

LF010 SITE FEATURES WITH SOLAR PANELS





Legend

- Monitoring Well
- Approximate Groundwater Flow Direction
- Groundwater Elevation Contour
- Road
- Approximate Area Boundary
- Installation Boundary
- LF010 Site
- 100.00 Groundwater Elevation (Feet Above Mean Sea Level)

Notes:
Wells not used in contouring: LTM-33, LTM-36, LMT-38, LTM-39, LTM-43.
Boundary areas based on Land Use Controls Implementation Plan, May 2013.
GIS Layers provided by JBMDL.

N

0 500 1,000 Feet

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FIGURE LF010-2
Site LF010 Groundwater Contours – April 2016
Dix Area Five-Year Review
Joint Base McGuire-Dix-Lakehurst, New Jersey

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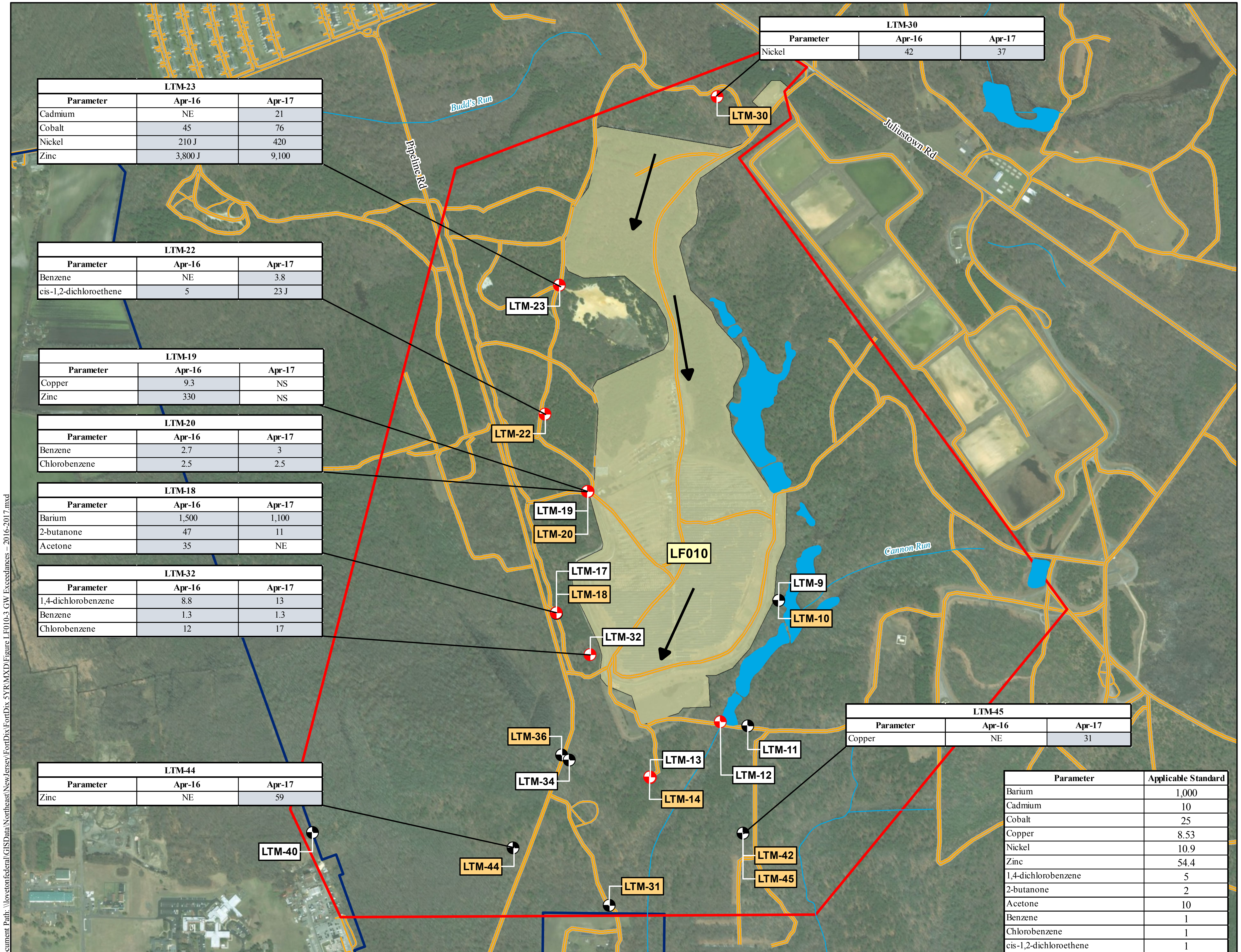

LTM-30		
Parameter	**Apr-16**	**Apr-17**
Nickel	42	37

LTM-23		
Parameter	**Apr-16**	**Apr-17**
Cadmium	NE	21
Cobalt	45	76
Nickel	210 J	420
Zinc	3,800 J	9,100

LTM-22		
Parameter	**Apr-16**	**Apr-17**
Benzene	NE	3.8
cis-1,2-dichloroethene	5	23 J

LTM-19		
Parameter	**Apr-16**	**Apr-17**
Copper	9.3	NS
Zinc	330	NS

LTM-20		
Parameter	**Apr-16**	**Apr-17**
Benzene	2.7	3
Chlorobenzene	2.5	2.5

LTM-18		
Parameter	**Apr-16**	**Apr-17**
Barium	1,500	1,100
2-butanone	47	11
Acetone	35	NE

LTM-32		
Parameter	**Apr-16**	**Apr-17**
1,4-dichlorobenzene	8.8	13
Benzene	1.3	1.3
Chlorobenzene	12	17

LTM-45		
Parameter	**Apr-16**	**Apr-17**
Copper	NE	31

LTM-44		
Parameter	**Apr-16**	**Apr-17**
Zinc	NE	59

Document Path: \\lovetonfederal\GISData\Northeast\NewJersey\FortDix\FortDix 5YR\MXD\Figure LF010-3 GW Exceedances – 2016-2017.mxd

VICINITY MAP

Legend

- Sentinel Well Sampled in 2016 and 2017
- Area of Concern (AOC) Well Sampled in 2016 and 2017
- Approximate Groundwater Flow Direction
- Road
- Approximate Area Boundary
- Installation Boundary
- Surface Water
- LF010 Site
- LTM-9 Shallow Monitoring Well
- LTM-10 Deep Monitoring Well

Notes:
Shallow monitoring wells are screened across the water table, and deep monitoring wells are screened in the lower portion of the surficial aquifer.

All concentrations are in micrograms per liter (µg/L).
Only values exceeding the applicable standard are shown.
Exceedances are also shaded.
Exceedances of applicable standards for arsenic, manganese, potassium, and sodium were reported but are not shown on the figure.
J = Estimated: The analyte was positively identified; the quantitation is an estimation
ND = Not Detected
NE = No Exceedance
NS = Not Sampled
Boundary areas based on Land Use Controls Implementation Plan, May 2013.
GIS Layers provided by JBMDL.

Parameter	Applicable Standard
Barium	1,000
Cadmium	10
Cobalt	25
Copper	8.53
Nickel	10.9
Zinc	54.4
1,4-dichlorobenzene	5
2-butanone	2
Acetone	10
Benzene	1
Chlorobenzene	1
cis-1,2-dichloroethene	1

N

0 500 1,000 Feet

EA Engineering, Science, and Technology, Inc., PBC

FIGURE LF010-3
Site LF010 Groundwater Exceedances – 2016-2017
Dix Area Five-Year Review
Joint Base McGuire-Dix-Lakehurst, New Jersey

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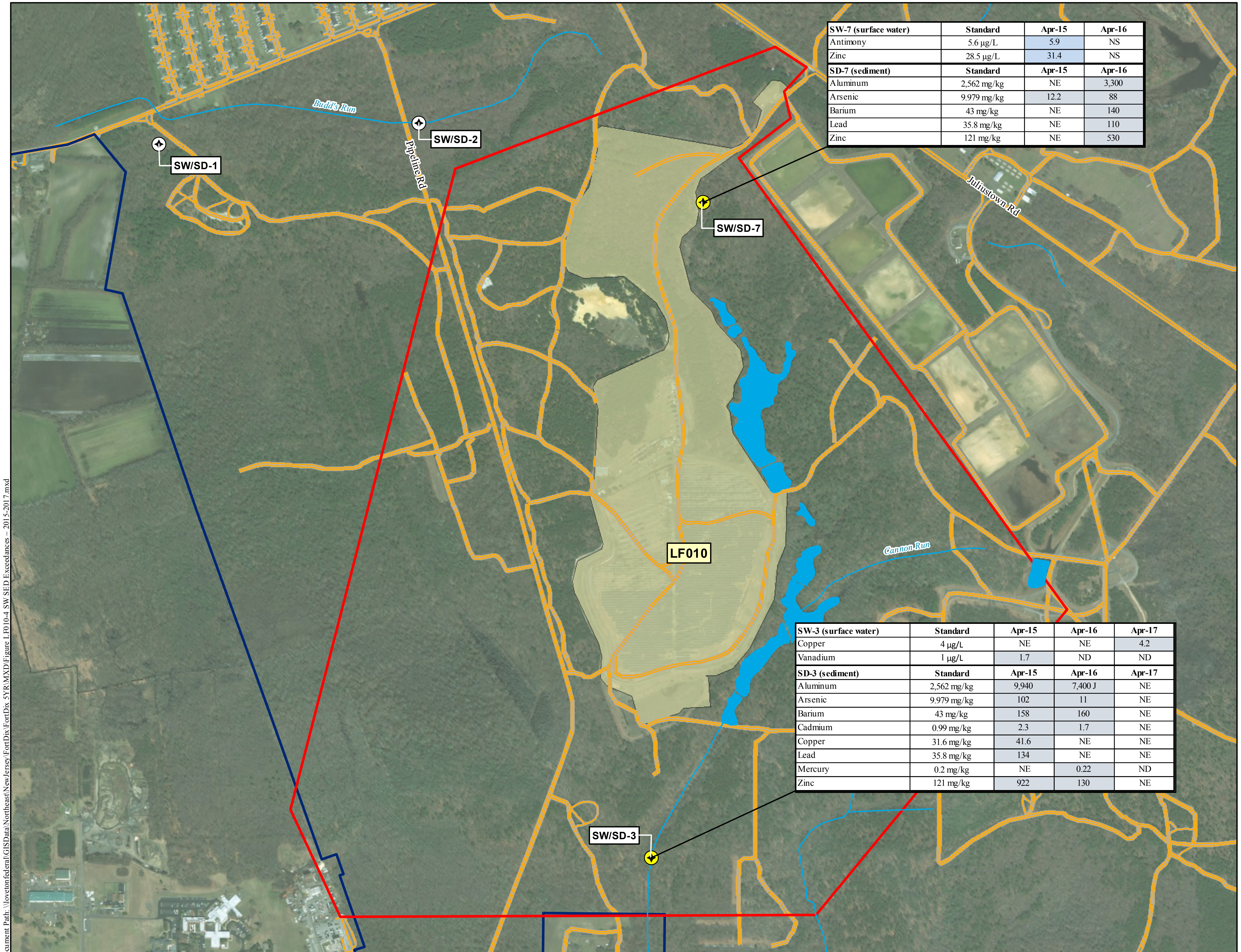

SW-7 (surface water)	Standard	Apr-15	Apr-16
Antimony	5.6 µg/L	5.9	NS
Zinc	28.5 µg/L	31.4	NS
SD-7 (sediment)	**Standard**	**Apr-15**	**Apr-16**
Aluminum	2,562 mg/kg	NE	3,300
Arsenic	9.979 mg/kg	12.2	88
Barium	43 mg/kg	NE	140
Lead	35.8 mg/kg	NE	110
Zinc	121 mg/kg	NE	530

SW-3 (surface water)	Standard	Apr-15	Apr-16	Apr-17
Copper	4 µg/L	NE	NE	4.2
Vanadium	1 µg/L	1.7	ND	ND
SD-3 (sediment)	**Standard**	**Apr-15**	**Apr-16**	**Apr-17**
Aluminum	2,562 mg/kg	9,940	7,400 J	NE
Arsenic	9.979 mg/kg	102	11	NE
Barium	43 mg/kg	158	160	NE
Cadmium	0.99 mg/kg	2.3	1.7	NE
Copper	31.6 mg/kg	41.6	NE	NE
Lead	35.8 mg/kg	134	NE	NE
Mercury	0.2 mg/kg	NE	0.22	ND
Zinc	121 mg/kg	922	130	NE

VICINITY MAP

Legend

- Sediment/Surface Water Sample Location
- Sediment/Surface Water Sample Location Not Sampled 2015-2017
- Road
- Approximate Area Boundary
- Installation Boundary
- Surface Water
- LF010 Site

Notes:
Only values exceeding the applicable standard are shown. Exceedances are also shaded.
Exceedances of applicable standards for calcium, iron, manganese, potassium, and sodium were reported but are not shown on the figure.
J = Estimated: The analyte was positively identified; the quantitation is an estimation
ND = Not Detected
NE = No Exceedance
Boundary areas based on Land Use Controls Implementation Plan, May 2013.
GIS Layers provided by JBMDL.

N

0 500 1,000 Feet

EA Engineering, Science, and Technology, Inc., PBC

FIGURE LF010-4
Site LF010 Surface Water and Sediment Exceedances – 2015-2017
Dix Area Five-Year Review
Joint Base McGuire-Dix-Lakehurst, New Jersey

Document Path: \\lovetonfederal\GISData\Northeast\NewJersey\FortDix\FortDix 5YR\MXD\Figure LF010-4 SW SED Exceedances – 2015-2017.mxd

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Table LF010-1: Chronology of Events at Site LF010

Event	Date
Site proposed for placement in the National Priority List	1 October 1984
Final Placement on the National Priority List	1 July 1987
Remedial Investigation/Feasibility Study completed	1989
U.S. Army and U.S. Environmental Protection Agency sign Federal Facilities Agreement	19 July 1991
Record of Decision signed	24 September 1991
Phase I Remedial Design completed	July 1992
Phase I Construction completed	1992
Long-term monitoring begins	1994
Phase II Remedial Design completed	February 1994
Phase II Construction completed	August 1996
Construction Completion Report	September 1997
First Five-Year Review completed	September 1999
Air Monitoring termination approved	2000
Groundwater Classification Exception Area approved for Sanitary Landfill	2002
Second Five-Year Review completed	September 2005
Third Five-Year Review completed	September 2010
Dix Sanitary Landfill De-Listed from the National Priority List	September 2012
Reduction in long-term monitoring frequency from semi-annual to annual	December 2012
Fourth Five-Year Review completed	September 2015
Solar Panel Array installed on the capped portion of the landfill	January-July 2017

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Table LF010-2: Toxicity Values for Carcinogenic Constituents at Site LF010

Chemical	Oral Slope Factor (ROD) (per mg/kg/d)	Oral Slope Factor (2017) (per mg/kg/d)	Inhalation Slope Factor (ROD) (per mg/kg/d)	Inhalation Unit Risk[(a)] (2017) ($\mu g/m^3$)$^{-1}$
Benzene	2.9E-02	1.5E-02 to 5.5E-02	2.9E-02	2.2E-06 to 7.8E-06
Bis(2-ethylhexyl)phthalate	1.4E-02	1.4E-02	Not Listed	2.4E-06
1,4-Dichlorobenzene	2.2E-02	5.4E-03	Not Listed	1.1E-05
1,1-Dichloroethane	9.1E-02	5.7E-03	Not Listed	1.6E-06
1,2-Dichloroethane	9.1E-02	9.1E-02	9.1E-02	2.6E-05
Tetrachloroethane [(b)]	1.0E-02	2.1E-03	Not Listed	2.6E-07
1,1,1-Trichloroethane	Not Listed	Not Available	1.9E-09	Not Available
Trichloroethene	1.1E-02	4.6E-02	1.3E-02	4.1E-06
Vinyl chloride	2.3E+00	7.2E-01	2.9E-01	4.4E-06

Notes:
$\mu g/m^3$ = microgram per cubic meter
IRIS = Integrated Risk Information System
mg/kg/d = milligrams per kilogram per day
pg = Picogram
ROD = Record of Decision

(a) The U.S. Environmental Protection Agency no longer calculates inhalation slope factors. Inhalation risks are shown in IRIS using air unit risk values. Conversion of air unit risk to an inhalation slope factor is: air unit risk = (SF)(1/70 kg)(20 m^3/d)(10^{-3} mg/pg).

(b) Per Table 4 of the ROD, this chemical is listed as a class B2 carcinogen with the oral slope factor shown. It should be noted that there are two isomers of tetrachlorethane (PCA): 1,1,2,2-PCA (CASRN 79-34-5) and 1,1,1,2-PCA (CASRN 630-20-6). As CASRNs were not included in the ROD, it is not known which isomer was intended. Both isomers are listed as class C carcinogens by the IRIS database. For 1,1,2,2-PCA, IRIS lists the oral slope factor as $2.0E^{-01}$ per mg/kg/d, the air unit risk as $5.8E^{-05}$ per $\mu g/m^3$, and the oral reference dose as $2E^{-02}$ mg/kg/d. For 1,1,1,2-PCA, IRIS lists the oral slope factor as $2.6E^{-02}$ per mg/kg/d, the air unit risk as $7.4E^{-06}$ per pg/m^3, and the oral reference dose as $3E^{-02}$ mg/kg/d.

Table LF010-3: Toxicity Values for Non-Carcinogenic Constituents at Site LF010

Chemical	Oral Reference Dose (ROD) (mg/kg/d)	Oral Reference Dose (2017) (mg/kg/d)	Inhalation Reference Dose (ROD) (mg/m^3)	Inhalation Reference Dose (2017) (mg/m^3)
Organics:				
Benzene	Not listed	4.0E-03	Not Listed	3E-02
Bis(2-ethylhexyl)phthalate	2E-02	2.0E-02	Not Applicable	Not Applicable
2-Butanone	3E-02	6E-01	2.4E-02	5E+00
Chlorobenzene	3E-02	2E-02	5E-03	5E-02
1,4-Dichlorobenzene	1.1E-02	7E-02	Not Listed	8E-01
1,1-Dichloroethane	1E-01	2E-01	1.0E-01	Not Available
Trans-1,2-Dichloroethene	2E-02	2.0E-02	Not Listed	Not Available
Ethylbenzene	1E-01	1E-01	Not Listed	1E+00
Tetrachloroethene	1E-02	6E-03	1.9E-02	4E-02
Toluene	3E-01	8E-02	2.9E-01	5E+00
1,1,1-Trichloroethane	9E-02	2E+00	Not Listed	5E+00
Trichloroethene	1.1E-02	5E-04	1.3E-02	2E-03
Vinyl chloride	Not listed	3E-03	Not Listed	1E-01
Inorganics:				
Cadmium	5E-04	5.0E-04 (water) 1E-03 (diet)	Not Listed	1E-05
Chromium 6+	5E-03	3E-03	Not Listed	1E-04
Chromium 3+	lE+00	l.5E+00	Not Listed	Not Available
Manganese	2.2E-01	2.4E-02	Not Listed	5E-05
Mercury, elemental	Not listed	Not Available	Not Listed	3E-04
Mercuric chloride	3E-04	3E-04	Not Listed	3E-04
Nickel, sol. Salts	2E-02	2E-02	Not Listed	9E-05
Zinc	2E-01	3E-01	Not Listed	Not Available

Notes:
mg/kg/d = Milligrams per kilogram per day
ROD = Record of Decision
mg/m^3 = Milligram per cubic meter

3. SITE LF017, EPIC-8 LANDFILL

3.1 SITE CHRONOLOGY

A timeline of major events at Site LF017, the EPIC-8 Landfill, is presented in Table LF017-1. Tables and figures for Site LF017 are provided at the end of this Chapter.

3.2 BACKGROUND OF SITE LF017, EPIC-8 LANDFILL

3.2.1 Physical Characteristics

Site LF017, the EPIC-8 Landfill, is located in the southwest section of JB MDL (Figure 1). The EPIC-8 Landfill is approximately 5 acres in size, and is surrounded by Browns Mills Road to the east, the JB MDL Sewage Treatment Plant to the west, Pointville Road to the north, and Tower Road to the south (Figure LF017-1).

The region around the landfill is relatively flat, with less than 15 ft of topographic relief throughout the area. A mature white pine forest, planted by JB MDL, covers the landfill. Throughout the 5-acre area, there are 20-30 ft wide parallel ridges, which are a result of the trenching method used to fill and cover the landfill. One long trench, approximately 12 ft deep, remains at the site, and does not appear to have been used.

To the south and southeast of the landfill, infiltration basins were developed for the new JB MDL Sewage Treatment Plant. As reported in the Second FYR Report (USACE 2013), filling of these basins led to a 15-ft rise in the water table, and changed the direction of groundwater flow from the southeast to the east-northeast direction through the landfill. However, the integrity of the landfill was not affected, as the infiltration basins are not used frequently.

3.2.2 Land and Resource Use

The EPIC-8 Landfill was in operation during the 1950s and was a precursor to the adjacent Dix Area Sanitary Landfill. Landfill operations consisted of the trench method, which consisted of excavating a series of parallel trenches to a depth of approximately 10-12 ft below grade. The trenches were then filled with waste materials and covered with approximately 2 ft of soil cover. It is assumed that the operation of the landfill began and ended in the 1950s, as the Dix Area Sanitary Landfill began its operations during the 1950s.

Three military housing subdivisions are located beyond the forested area to the north of the EPIC-8 Landfill. The town of Browns Mills is immediately to the east of JB MDL. To the south are two abandoned farms, approximately 12 homes, several county buildings, the County Hospital, and the Burlington County Juvenile Detention Center and shelter. The public water supply wells are located within 4 miles southwest of the landfill boundary.

The EPIC-8 Landfill is included within the Dix Basewide New Jersey CEA. The CEA serves as an institutional control by providing notice that the groundwater does not meet the standards required by the groundwater classification.

3.2.3 History of Contamination

There is no historical information that describes the types of waste disposed of in the landfill; however, historical documents state that there were no restrictions as to what types of materials could have been placed in the trenches.

3.2.4 Initial Response

In 1989, a CERCLA Preliminary Assessment/Site Investigation was performed to identify potential environmental concerns (EA 1989). Four monitoring wells were installed downgradient and upgradient of the landfill. Data collected were below established criteria, i.e., health-based concentration limits. In 1992, an enhanced Preliminary Assessment was conducted for 42 of the Areas Requiring Environmental Evaluation, including the EPIC-8 Landfill (Roy F. Weston, Inc. 1992). The enhanced Preliminary Assessment recommended that an additional round of sampling be completed, as only one round of sampling was performed as part of the previous Site Investigation. An Environmental Investigation (EI) was completed in 1997 (ICF Kaiser Engineers, Inc. [ICF Kaiser] 1997), an Alternatives Analysis (AA) was completed in 1998 (ICF Kaiser 1998), and three additional monitoring wells were installed at Site LF017. The EI/AA is discussed further in Section 3.2.5. At the completion of the EI/AA, the perimeter fence was installed as an engineering control. No removal actions were undertaken prior to the DD.

3.2.5 Basis for Taking Action

As part of the EI/AA, groundwater and soil data from LF017 were compared to relevant screening criteria as well as background concentrations developed for the Dix Area (ABB 1996). Soil results showed that concentrations of all inorganics were below the New Jersey non-residential soil cleanup criteria (SCCs), and that only one polycyclic aromatic hydrocarbon (PAH), benzo(a)pyrene (1.5 micrograms per gram [μg/g]), was reported at a concentration exceeding the non-residential SCC of 0.66 μg/g. Groundwater results showed inorganics (aluminum, barium, mercury, iron, manganese, lead, chromium, and nickel) exceeding background; elevated carbon disulfide and chloroform; and gross alpha emissions exceeding federal MCLs in three monitoring wells (EP8-36, EP8-38, MW-1U). Regulatory review of the above groundwater data in 1995 led to four recommendations for further work at the site. The recommendations included resampling wells that showed elevated chloroform, employing a LTM requirement, collecting additional soil samples to confirm the presence of SVOCs, and collecting additional samples and analyzing them for gross alpha emissions.

Additional soil and groundwater samples were collected in 1996. The results of the soil sampling demonstrated that SVOC concentrations were less than the non-residential SCCs. Groundwater results showed that inorganics concentrations were less than the previous sampling round; however, it was suggested that this could have been attributed to the change in groundwater flow direction, as the Dix Sewage Treatment Plant Infiltration Basins were installed in 1995 adjacent to the landfill (USACE 2013). Therefore, it was suggested that the 1993 sampling results were more appropriate for evaluating risk associated with the landfill. Chloroform, the primary VOC of concern, was not detected in the second sampling event. The additional sampling also demonstrated that the gross alpha emissions were below the EPA

MCLs, and that the turbidity of the original samples caused the high concentrations detected. The data were compiled in the EI report (ICF Kaiser 1997).

A risk assessment conducted as part of the EI/AA evaluated the potential for any impact to human health and the environment that might result if institutional controls were not employed. The HHRA did not identify unacceptable risks for contact with surface soil, although iron in groundwater was found to pose a potential risk for both children and adults using the groundwater as drinking water (a hypothetical future scenario). However, the risk was driven by iron, which is naturally elevated in groundwater at JB MDL. Risks from exposure to surface soils by ecological receptors were also found to be minimal. Based on the results of the risk assessments, the selected remedy focused on preventing future contact with waste in the landfill. No further action beyond institutional controls, access controls, and O&M was proposed for the EPIC-8 landfill.

3.3 REMEDIAL ACTIONS AT SITE LF017, EPIC-8 LANDFILL

3.3.1 Remedy Selection

The selected remedy provided in the Draft ROD and the Final DD (EM Federal Corporation [EM Federal] 2002) consists of the following:

- Site access controls that limit potential human exposure to site-related contaminants, including:
  - Annual inspection and maintenance, as needed, of the chain-link fence around the perimeter of the landfill
  - Land use restrictions as part of the Base Master Plan.

The remedy also specifies the need for FYRs.

The RAO established in the Draft ROD and the Final DD for LF017 is as follows:

- To eliminate the potential exposure of wastes buried at the EPIC-8 Landfill to humans.

3.3.2 Remedy Implementation

Installation of the perimeter chain-link fence occurred in 1997, prior to finalization of the DD in 2002. An undated letter documenting amendment of the Fort Dix Installation Master Plan for the EPIC-8 Landfill Site, to prevent transfer or disturbance of the site without addressing the waste, was provided to the NJDEP in lieu of a deed notice (Administrative Record W177087). In addition to the engineering controls (fence, signs, soil cover), the LUCIP includes restrictions on the following uses for Site LF017: surface disturbance, subsurface disturbance, and residential use.

As described in Section 3.3.3, formal annual inspections and O&M, as needed, are conducted to confirm that the fence, signs, and landfill cover remain in place, and thus meet the requirements of the DD and the LUCIP.

3.3.3 Systems Operation and Maintenance

In general, O&M of the landfill consists of periodic trimming of vegetation along the perimeter fence, fence repair, and annual inspections of the perimeter fence and the landfill cover.

Formal annual inspections of LF017 (EPIC-8 Landfill) are performed each fall, by the O&M contractor. The perimeter fence was consistently reported to be intact and the natural soil and vegetation cover was found to have good integrity during the FYR period. No erosion or subsidence was noted during the annual inspections. The O&M contractor did note wild grouse at the landfill, as well as broken and uprooted trees and a ravine/drainage swale along the western side of the landfill. The only corrective action recommended during the FYR period was trimming of vegetation along the perimeter fence in Summer 2015; this issue did not affect the integrity or security of the landfill. Management and reporting for this site is completed annually in accordance with the Dix Area Basewide Inspection, Maintenance, and Monitoring Work Plan (Plexus Scientific 2014).

Per JB MDL, the annual O&M costs at Site LF017 averaged approximately $1,500 during the FYR period.

3.4 PROGRESS SINCE THE LAST REVIEW AT SITE LF017, EPIC-8 LANDFILL

The second FYR for LF017 was submitted on 15 May 2013 (USACE 2013). The 2013 FYR protectiveness statement for LF017 was as follows: "The remedy continues to be protective of human health and the environment."

No issues were identified in the previous FYR that may impact the current protectiveness of the remedy in place. Issues and recommendations identified in the 2013 FYR that do not affect protectiveness, and the follow-up actions taken, are summarized below:

Remedy Component	Issue/Recommendation from the 2013 FYR (not affecting protectiveness)	Completed?	Follow-Up Action Taken
O&M	Significant overgrowth of vegetation was observed on and within the perimeter fence in certain areas. Recommend the overgrown vegetation on the perimeter fence be trimmed and the fence be maintained.	Yes	During the first annual inspection following the 2013 FYR, performed in Fall 2014, the perimeter fence was found intact and without major issues. Light to moderate vegetation was observed on the fence, and the inspection report stated that the vegetation would need to be trimmed back again in Summer 2015 (Plexus Scientific 2014).

3.5 FIVE-YEAR REVIEW PROCESS FOR SITE LF017, EPIC-8 LANDFILL

3.5.1 Administrative Components

The FYR was prepared by JB MDL, in consultation with NJDEP. The team included Curtis Frye (JB MDL Remediation Program Manager), Nicole Brestle (Remediation Project Manager, Dix Area), and Haiyesh Shah (NJDEP Case Manager). This is a federal facility-lead site.

3.5.2 Community Involvement

Public notice of the beginning of the FYR process was published for 3 days in the *Asbury Park Press* (26-28 May 2017) and the *Burlington County Times* (25, 26, and 28 May 2017). The FYR was also discussed at the RAB meeting on 19 July 2017. Annual community planners meetings, including DOD representatives and contractors, are held each fall to review the JB MDL LUCIP and discuss upcoming projects at JB MDL potentially impacted by the established LUCs. Any FYR findings that impact base planning with respect to LUCs would be addressed during these meetings, as required. No public comments were received in association with the FYR. NJDEP did not have any comments regarding Site LF017 (Appendix B).

Once the FYR is completed, additional public notices will be published, the RAB mailing lists will be notified, and the results will be made available at the local site repositories, which are at the Burlington County Library (5 Pioneer Boulevard, Westhampton, New Jersey) and online at http://afcec.publicadmin-record.us.af.mil/. In addition, efforts will be made to reach out to local public officials to inform them of the results.

3.5.3 Document Review

This FYR consisted of a review of relevant documents, including the RODs/DDs, Biennial Certification Reports for the groundwater CEA, the LUCIP for JB MDL, annual IMMRs, landfill inspection reports, and remedial action reports. The documents, data, and information that were reviewed in completing this FYR are summarized in Appendix C.

3.5.4 Data Review

No environmental data were collected from Site LF017 during the review period.

3.5.5 Site Inspection

A site inspection at LF017 was conducted by EA, JB MDL, and NJDEP personnel on 25 and 26 July 2017. Significant overgrowth of vegetation was observed on and within the Site LF017 perimeter fence, and damage to the fence was observed in places (Appendix E).

3.5.6 Interviews

During the FYR process, interviews were conducted with stakeholders, including representatives from the regulatory agencies overseeing the remedies at the Dix Area and community representatives aware of the remedial activities. The purpose of the interviews was to document any perceived problems or successes with the remedies that have been implemented to date. Interviews were conducted in August 2017. Detailed interview records are included in Appendix E.

Haiyesh Shah, NJDEP Case Manager, did not indicate any concerns regarding the remedy in place at LF017, the environmental monitoring program, or established communication channels.

Branwen Ellis, Environmental Specialist at the New Jersey Pinelands Commission; Matthew Czik, Assistant Public Health Coordinator for Ocean County and RAB member; and Robin Sutton, Environmental Health Coordinator for Burlington County did not indicate any concerns regarding the remedy or communication channels. Joseph Rhyner, Chief of the Environmental Element at JB MDL also did not indicate any concerns. Michael Tamn, the RAB Community Co-Chair, and Tom Besselman and Frank Storm, RAB members, indicated that they feel well informed about the remedial activities and progress at the Dix Area.

Tim Llewellyn of Arcadis did not indicate any concerns regarding the path forward, which includes annual LUC inspections, for Site LF017.

3.5.7 Institutional Controls Verification

Institutional controls required for this site are listed in Section 3.3 and are described further in Section 3.3.2. Required institutional controls are in place and documented in the LUCIP for JB MDL, and LUC documentation is updated annually.

3.6 TECHNICAL ASSESSMENT OF THE REMEDY AT SITE LF017, EPIC-8 LANDFILL

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

A review of site documentation, including results from annual site inspections, as well as the findings of the site inspection conducted in July 2017 in association with this FYR, indicate that the remedy is functioning as intended by the DD; however, the maintenance of the perimeter fence requires some improvement. Overall, the implementation of institutional controls and signage has met the RAO stated in the DD of eliminating potential human exposure to wastes buried in the landfill.

O&M activities required for this site consist of maintenance of the natural soil cover, including repair of any erosion, periodic trimming of vegetation, fence repair and annual site inspection. However, during the site inspection in July 2017, overgrowth of vegetation and minor damage to the fence were observed (Appendix E).

3.6.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of remedy selection still valid?

3.6.2.1 Changes in Risk Assessment Methodologies.

There have been no major changes in HHRA or ERA methodology since the signing of the DD that would impact the protectiveness of the LF017 – EPIC-8 Landfill remedy.

The Fort Dix EI report (ICF Kaiser 1997) included human health and ecological risk assessments for the EPIC-8 Landfill. The primary documents used to conduct the HHRA included the following EPA guidance documents: *Guidelines for Carcinogenic Risk Assessment* (EPA 1986a), *Guidelines for the Health Risk Assessment of Chemical Mixtures* (EPA 1986b), *RAGS Volume I: Human Health Manual (Part A)* (EPA 1989a); *RAGS Volume I: Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors* (EPA 1991a); *Exposure Factors Handbook* (EPA 1989b); *Guidelines for Exposure Assessment* (EPA 1992a); *Supplemental Guidance to RAGS: Calculating the Concentration Term* (EPA 1992b); and *Dermal Exposure Assessment: Principles and Applications* (EPA 1992c). The HHRA did not identify unacceptable risks for current exposure pathways; however, it identified potential concerns associated with possible future groundwater use. The methodologies outlined in the guidance documents used have not been updated or changed, with the following exceptions.

In September 2011, EPA released a new version of the Exposure Factors Handbook (EPA 2011). This handbook provides a summary of the available statistical data on various factors used in assessing human exposure (e.g., drinking water consumption). The updates to the final document do not impact the risk assessment methodologies that were implemented in the HHRA summarized in the DD. Therefore, an update to the risk assessment is not warranted.

Additionally, EPA released two risk assessment guidance documents for the assessment of dermal and inhalation exposures since the completion of the EI report (ICF Kaiser 1997). The *RAGS Volume I: Human Health Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)* (EPA 2004) and *Part F, Supplemental Guidance for Inhalation Risk Assessment* (EPA 2009) present risk assessment methodology for the assessment of dermal and inhalation exposures. The dermal pathway for exposure to surface soil at LF017 was not evaluated in the EI because EPA had not recommended dermal absorption factors for PAHs and iron (the contaminants of potential concern [COPCs] in surface soil). EPA RAGS E guidance presents dermal absorption factors for these analytes. However, contact with surface soil was limited to hunters and trespassers, which are low-contact receptors with risk results well below a level of concern. As a result, the publication of these guidance documents does not affect the protectiveness of the remedy for LF017.

The ERA included in the EI report (ICF Kaiser 1997) was based on the *RAGS – Volume II Environmental Evaluation Manual* (EPA 1989c) and an article titled "*Ecological Assessment of Superfund Sites: an Overview*" (EPA 1991b). The ERA compared toxicity reference values to exposure point concentrations and to modeled doses to wildlife. A lack of available toxicity data for some COPCs (e.g., PAHs) led to a degree of uncertainty. The DD (EM Federal 2002) summarized that potential adverse effects to ecological receptors via exposure to surface soils are minimal, and that the selected remedy is not driven by ecological risk. In 1997, EPA published

Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (EPA 1997a), followed by the more generic *Guidelines for Ecological Risk Assessment* (EPA 1998). Although risk assessment methodologies presented in EPA guidance have evolved since the EI and DD were completed for LF017, the changes are such that an ERA using the updated methodology would not be expected to lead to identification of issues with the protectiveness of the remedy.

3.6.2.2 Changes in Exposure Pathways

There have been no changes in physical conditions or land use at the site that would result in the development of new exposure pathways to human or ecological receptors. Additionally, no newly identified contaminants, contaminant sources, or toxic byproducts of the remedy were identified during the FYR process.

The HHRA conducted as part of the RI considered the following human health exposure pathways for the EPIC-8 Landfill, based on limited use by hunters and random trespassers: incidental ingestion of soils; in addition, hypothetical future residential use of groundwater from the Kirkwood-Cohansey aquifer was considered. Only the potential future use of groundwater was found to be associated with potentially unacceptable risk; however, the risk was driven by iron, which is naturally elevated in groundwater at JB MDL. Controls in place under the LUCIP and as part of the DD remedy for the EPIC-8 Landfill prevent groundwater use and residential land use, and also restrict soil disturbance. It is noted that the dermal exposure to surface soil at LF017 was not evaluated in the EI because EPA had not recommended dermal absorption factors for PAHs and iron (the COPCs in surface soil). Since the finalization of the EI, EPA RAGS E guidance presents dermal absorption factors for these analytes. However, contact with surface soil was limited to hunters and trespassers, which are low contact receptors with risk results well below a level of concern. As a result, the dermal exposure pathway is not expected to change the overall risk conclusions for LF017.

Daily doses were developed as part of the HHRA, in accordance with the available guidance. More recently, EPA provided default exposure parameters for use in risk assessment in the *Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors* was released in 2014 (EPA 2014). A majority of the exposure parameters assumed in the EI are similar to the recent default exposure parameters set forth by EPA (EPA 2014). The one change in default exposure parameters that may result in changes to overall results is the difference assumed for default body weight. The EPA revised the default adult body weight from 70 kg to 80 kg. The increase in body weight results in lower overall cancer risks and non-cancer hazards. Use of these updated default exposure parameters are not expected to change the overall results determined for the EPIC-8 Landfill, for either the current or hypothetical exposure pathways considered. Because the current exposure pathways that were considered remain the most relevant, and no groundwater use is occurring or planned, an update to the risk assessment is not warranted.

3.6.2.3 Contaminants of Concern and Changes in Standards and To-Be-Considered Guidance

The ARARs for the EPIC-8 Landfill identified in both the Draft ROD and Final DD state that the location-specific ARARs are New Jersey Pinelands Commission requirements. CERCLA sites within industrial areas, including many areas on U.S. Army bases, follow industrial clean-up criteria for all media of concern. Because it was determined that all risks were considered to be acceptable for the EPIC-8 Landfill, a clean-up action was not warranted, nor were any monitoring requirements or numerical standards identified in the ROD; therefore, chemical-specific ARARs were not evaluated further.

3.6.2.4 Changes in Toxicity and Other Contaminant Characteristics

Toxicity values for COPCs were reviewed in accordance with the EPA toxicity hierarchy (EPA 2003). The EPA IRIS is the Tier I source for toxicity information (EPA 2017a). IRIS and other tiered toxicity sources presented on the EPA Regional Screening Level table (EPA 2017b) were reviewed to determine if revisions had been made to the factors used to calculate risk in the Fort Dix EI report (ICF Kaiser 1997).

Table LF017-2, showing non-carcinogenic and carcinogenic COPCs, was adapted from the EI report. This table lists the COCs and the corresponding toxicity values (carcinogenic slope factors and reference doses) from both the report and the EPA's IRIS database in July 2017. An increase in the oral slope factor will have an effect on the calculated risk. In addition, a decrease in the oral reference dose will produce an increased HQ. Changes in toxicity information are noted in Table LF017-2. For PAHs, the oral slope factors have decreased since completion of the EI report. This would result in lower cancer risks for PAHs in surface soil. For iron, the oral reference dose has increased since completion of the EI Report. This would result in a decrease in the non-cancer HQ. Based on the changes in toxicity factors for the COPCs, the remedy is still considered protective at this time. A revised risk assessment is not required since contact with soil and the use of groundwater at LF017 is restricted by LUCs, and changes in toxicity values would result in lower overall site risks.

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

There is no other information to call into question the protectiveness of the remedy.

3.6.4 Technical Assessment Summary

The review of documents, ARARs, risk assumptions, and results of the site inspection indicates that the remedy at Site LF017 is functioning as intended by the DD. Based on observations during the July 2017 site inspection, however, improved vegetative maintenance and fence repair are required to ensure the protectiveness of the perimeter fence.

Although risk assessment methodologies presented in EPA guidance have evolved since the EI was conducted for Site LF017, the nature of the changes is such that a risk assessment using the updated methodology would not be expected to lead to identification of issues with the protectiveness of the remedy. No changes in exposure pathways were noted during the review period (2013–2017).

3.7 ISSUES, RECOMMENDATIONS, AND FOLLOW-UP ACTIONS AT LF017, EPIC-8 LANDFILL

No issues that affect current or future protectiveness were identified. The following is a recommendation to improve the effectiveness of the remedy that does not affect current protectiveness and was identified during the FYR:

- Significant overgrowth of vegetation was observed on and within the perimeter fence, and damage to the fence was observed in places. Recommend the overgrown vegetation on the perimeter fence be trimmed and the fence be maintained.

This recommended action should be completed and documented within the next 5 years, before the next FYR is submitted.

3.8 PROTECTIVENESS STATEMENT FOR SITE LF017, EPIC-8 LANDFILL

Protectiveness Statement	
Site: LF017	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at Site LF017 is protective of human health and the environment.	

3.9 NEXT REVIEW

The next FYR for LF017, the EPIC-8 Landfill, shall be submitted by May 2023.

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EA Engineering, Science, and Technology, Inc., PBC

DIX AREA FIVE-YEAR REVIEW
JOINT BASE MCGUIRE-DIX-LAKEHURST, NEW JERSEY

FIGURE LF017-1

LF017 SITE FEATURES

Table LF017-1: Chronology of Events at Site LF017

Event	Date
Preliminary Assessment/Site Inspection	1989
Enhanced Preliminary Assessment	March 1992
Installation of infiltration basins for sewage treatment plant	1995
Environmental Investigation	1993-1997
Institutional Controls implemented	1997
Alternatives Analysis	1998
Final Decision Document signed	10 October 2002
First Five-Year Review completed	September 2008
Second Five-Year Review completed	September 2013

Table LF017-2: Toxicity Values for Carcinogenic and Non-Carcinogenic Constituents at Site LF017

Chemical	Oral Slope Factor (mg/kg/day) (EI Report)	Oral Slope Factor (mg/kg/day) (2017)	Reference Dose (mg/kg/day) (EI Report)	Reference Dose (mg/kg/day) (2017)
Organics:				
Benzo(a)pyrene	7.3E+00	1E+00	Not Listed	3E-04
Benzo(b)fluoranthene	7.3E-01	1E-01	Not Applicable	Not Applicable
Dibenz(a,h)anthracene	7.3E+00	1E+00	Not Applicable	Not Applicable
Inorganics:				
Aluminum	Not Applicable	Not Applicable	1E+00	Not Available
Chromium	Not Applicable	Not Applicable	5E-03	Cr(III): 1.5E+00 Cr(VI): 3E-03
Iron	Not Applicable	Not Applicable	3E-01	7E-01
Manganese	Not Applicable	Not Applicable	2E-02	2.4E-02

Notes:
EI = Environmental Investigation
mg/kg/d = milligrams per kilogram per day

4. SITE LF033, PDO LANDFILL

4.1 SITE CHRONOLOGY

A timeline of major events at Site LF033, the PDO Landfill, is presented in Table LF033-1. Tables and figures for Site LF033 are provided at the end of this Chapter.

4.2 BACKGROUND OF SITE LF033, PDO LANDFILL

4.2.1 Physical Characteristics

Site LF033, the PDO Landfill, is located southwest of the Pemberton-Pointville Road and Juliustown-Brown Mills Road intersection in the southwest section of JB MDL (Figure 1). The PDO Landfill is situated approximately 2,000 ft northwest of LF017 and approximately 1,000 ft north of LF010.

The nearest surface water feature consists of a narrow stream located approximately 600 ft to the southwest and topographically downgradient of the PDO Landfill. The stream is identified as Budd’s Run on Figure LF033-1, consistent with documents relating to Site LF010, but has also been alternatively identified as Coatee Run and as an unnamed stream in previous documents regarding Site LF033 (e.g., CB&I 2013a). The stream flows into the North Branch of the Rancocas Creek approximately 4 miles southwest of the PDO Landfill. Immediately downgradient of the PDO Landfill is a wetland area that was determined to be the headwater (or spring) of the stream. The wetland area and stream were the focus of the remedial actions and are referred to as Site LF033.

4.2.2 Land and Resource Use

The PDO Landfill is approximately 5 acres in size and was used as a former coal storage area and disposal area until the mid-1970s. Two small buildings were present in the northern portion of the landfill, based on a 1951 aerial photograph, and refuse was visible along the southern slopes. A photograph from 1977 indicates that the buildings had been removed and refuse was still visible along the southern slopes. Because of the absence of drawings or records describing the dimensions of the PDO Landfill, the area was approximately delineated based on aerial photographs and visual observations recorded during the EI field investigation (ICF Kaiser 1997).

The area is currently designated as a Training Area, which is undeveloped and primarily used for military training as well as recreational uses. The area is overgrown with shrubs, oak, and pine. Military housing subdivisions are located north of the PDO Landfill, the Dix Area Sanitary Landfill (Site LF010) is located to the south, farms are located to the west, and the McGuire Area flightline is to the northeast.

The PDO Landfill is included within the Dix Basewide New Jersey CEA. The CEA serves as an institutional control by providing notice that the groundwater does not meet the standards required by the groundwater classification.

4.2.3 History of Contamination

Historically, the PDO Landfill was used as a coal storage area and disposal area. Although typical landfill activities, such as trenching, were not conducted at the site, debris consisting primarily of domestic waste and demolition building materials were buried or dumped along the steep southern edge of the landfill.

4.2.4 Initial Response

Soil and groundwater investigations were conducted in the 1990s. An EI was completed in 1997 (ICF Kaiser 1997), and an AA was completed in 1998 (ICF Kaiser 1998). The results of these investigations and analyses are summarized below. No removal actions were undertaken prior to the DD.

4.2.5 Basis for Taking Action

A soil sampling effort consisting of collecting four surface soil samples was conducted in July 1993. Samples were analyzed for metals and organic compounds (including pesticides, polychlorinated biphenyls [PCBs], and VOCs). Based on the results, no additional action was required to address soil at the PDO Landfill.

A groundwater investigation consisting of sampling three deep wells and six shallow monitoring wells was conducted in 1993 and 1995. Samples collected in 1993 were analyzed for metals and organic compounds (including pesticides, PCBs, and VOCs). Samples collected in 1995 were analyzed for metals and pesticides. Inorganic constituents were compared to background and the PQL. Several constituents (e.g., calcium, manganese) were detected at concentrations exceeding background concentrations in groundwater; however, they are considered nutrients. Mercury was detected at concentrations that were of concern. In 1995, mercury was detected in wells PDO-38 and PDO-40 at concentrations of 1.74 μg/L and 7.2 μg/L, respectively. The concentrations were slightly higher than in 1993. However, mercury was not detected in any of the other wells. No organic compounds were detected in 1993 that were of concern. No pesticides were detected in samples collected in 1995. The detections of mercury at concentrations exceeding the PQL triggered the need for additional action for groundwater at the PDO Landfill.

Three sediment samples were collected in 1993 and six additional samples were collected in 1996. Samples were analyzed for metals and organic compounds including pesticides, PCBs, and VOCs. Concentrations of chemicals were first compared to background sediment concentrations. If the background was exceeded, then the concentration of the chemical was compared to the effect range low (ER-L), to assess the potential for effects to benthic organisms from chemicals in sediments. Reported concentrations of several inorganic constituents exceeded background in two locations (SWSE-09 and SWSE47). At the other seven locations, chemicals were in concentrations near their respective background. Mercury was detected at concentrations exceeding the ER-L in eight of nine samples. Arsenic was detected at concentrations exceeding the ER-L in two of nine samples.

The NJDEP issued guidance in 1998 for protection of organisms in freshwater sediments. The LEL is used as a screening value in baseline ecological evaluations. Removing mercury below its LEL is considered to be protective of benthic organisms that may inhabit sediments in the stream that passes through the site. The LEL for mercury is 0.2 μg/g.

In 1996, *Chironomus tentans* and *Hyalella azteca* were used to perform bioassays on six sediment samples. Bioassays are used to evaluate the toxicity of chemicals in site-specific sediment and can account for synergistic/antagonistic effects and the effects of chemical mixtures. In combination with sediment chemistry analysis, sediment bioassays assist in the clarification of which COPCs present in the sediment are associated with adverse effects to ecological receptors. The toxicity test results using sediment collected from the stream at the PDO Landfill suggested that a chemical, or potentially a combination of chemicals, appeared to be causing adverse effects in benthic organisms (*Chironomus tentans* and *Hyalella azteca*) in laboratory bioassays.

Three surface water samples were collected in 1993 and six additional samples were collected in 1996. Samples collected in 1993 were analyzed for metals and organic compounds including pesticides, PCBs, and VOCs. In 1996, samples were analyzed for metals and pesticides. Concentrations of chemicals were compared to background surface water concentrations. Calcium, potassium, magnesium, and sodium were detected at concentrations exceeding background concentrations in nearly all samples; however, these chemicals are considered nutrients. Mercury, the only inorganic COC, was detected at concentrations exceeding background in all three samples collected in 1993 but was not detected in any of the six samples collected in 1996. Some pesticides and VOCs were detected in one sample in 1993. However, no pesticides were detected in 1996.

During the EI, an analysis was conducted to determine the potential for impact to public health and the environment that might result if the contamination associated with the PDO Landfill were not controlled. In conducting this assessment, the focus was on the human health and environmental effects that could result from exposure to contaminants associated with contaminants in various media (air, surface water, sediments, soil, and groundwater). The risk assessment process for the PDO Landfill involved performing an HHRA and an ERA as part of the 1997 EI. The HHRA results indicated no unacceptable risks to human health. The ERA indicated potential adverse effects to ecological receptors due to mercury.

During the evaluation of site risks, chemicals that were detected at the site were screened to select indicator chemicals for the PDO Landfill site. These chemicals were selected as those most representative of site conditions and as those expected to contribute the greatest risks to human health and the environment. The only indicator chemical for the site is mercury. The ERA concluded that there is a potential for risks to benthic organisms in the stream from mercury in sediment, and sediment toxicity test results suggested that a chemical, or potentially a combination of chemicals, appeared to be causing adverse effects in benthic organisms (*Chironomus tentans* and *Hyalella azteca*) in laboratory bioassays.

4.3 REMEDIAL ACTIONS AT SITE LF033, PDO LANDFILL

4.3.1 Remedy Selection

The selected remedy provided in the Final DD (EM Federal 2003a) consists of the following:

- Mitigating exposure to ecological receptors and human visitors by the excavation of sediment “hot spots” containing mercury above cleanup criteria.

- Restoring excavated areas of the stream and impacted wetlands to their original condition.

- Semiannual groundwater, surface water, and sediment monitoring to ensure that the remedy is protective of human health and the environment.

- Establishing a CEA to restrict groundwater use, implemented through the Base Master Plan. The restriction may be removed if concentrations of mercury decrease to New Jersey GWQS.

The RAO established in the DD for LF033 is as follows:

- To protect the Pinelands ecosystem. Based on exceedances of screening levels in sediment and groundwater, results of the sediment bioassay, and results of the risk assessments; mercury in groundwater and sediment is to be addressed.

4.3.2 Remedy Implementation

The following summarizes the remedial activities completed between 2004 and 2007 at the PDO Landfill:

- Delineated wetlands, mercury impacted sediments in the wetland area, and stream hot-spot locations

- Collected surface water samples to determine if surface water was impacted

- Diverted the stream, excavated contaminated sediment, collected post-excavation confirmatory samples, and restored the stream bed and wetland areas

- Installed new monitoring wells PDO-100, PDO-101, and PDO-102

- Initiated a LTM program for groundwater, surface water, and sediments.

In addition to the delineation sampling for the stream sediment hot spots, mercury delineation was also conducted at the wetland area located at the head of the stream. The delineation sampling in this area was conducted on a 50-ft grid spacing and the wetland soils were analyzed for mercury. Each of the results was below the NJDEP soil remediation standard (SRS) of 23 milligrams per kilogram (mg/kg).

During Summer 2007, following stream diversion, the top 6 inches of mercury-contaminated sediments were removed from the streambed in identified mercury hot-spots. Post-excavation samples (84 in total) were collected from every 30 ft on excavation sidewalls. Additional excavation was performed in November 2007 in 10 locations were mercury concentrations exceeded the applicable standard, and additional post-excavation samples indicated no exceedances of the applicable standard. Approximately 264 tons of sediment was removed from the stream, dried, and disposed of offsite. Restoration activities included backfilling, grading, and planting in accordance with the approved mitigation plan (Chicago Bridge and Iron [CB&I] 2013a).

The PDO Landfill was included in a multi-site CEA approved in September 2003 (Shaw 2003), and subsequently in the Dix Area Sitewide CEA (NJDEP 2014). In addition to the CEA, the LUCIP includes restrictions on residential use of Site LF033. LTM of site groundwater is performed to comply with the CEA. The monitoring program is described further in Section 4.4.

In 2017, the USAF submitted a No Further Action Equivalent (NFAE) request, recommending discontinuation of sampling of all media at LF033, based on recent data indicating that remedial goals have been met for groundwater, sediment, and surface water at the site. NJDEP approved the NFAE request in March 2017. This request is discussed further in Section 4.4.1.

4.3.3 Systems Operation and Maintenance

Until 2017, O&M of the PDO Landfill remedy consisted of the collection and analysis of groundwater, sediment, and surface water samples. Semiannual monitoring was conducted during the FYR period, through 2016, prior to submission of the NFAE request. Management and reporting for this site is completed annually in accordance with the Dix Area Basewide Inspection, Maintenance, and Monitoring Plan (Plexus Scientific 2014) and biennially through CEA documentation.

4.4 PROGRESS SINCE THE LAST REVIEW AT SITE LF033, PDO LANDFILL

The first FYR for Site LF033 was submitted on 30 September 2013 (CB&I 2013a). The 2013 FYR protectiveness statement for LF033 was as follows: "Because the remedial actions at the PDO Landfill are protective, the site is protective of human health and the environment. Continued implementation of the institutional controls and Long-Term Maintenance Plan will ensure the long-term protectiveness of the remedy. Currently, none of the COCs that are outlined in the ROD have migrated beyond the site boundary, and the remedy is considered to be functioning as required." Note that the term "ROD" in the first FYR is believed to refer to the Final DD (EM Federal 2003a).

No issues were identified in the previous FYR that may impact the current protectiveness of the remedy in place. Issues and recommendations identified in the 2013 FYR that do not affect protectiveness, and the follow-up actions taken, are summarized below:

Remedy Component	Issue/Recommendation from the 2013 FYR (not affecting protectiveness)	Completed?	Action Taken
Surface Water Monitoring	Low-level mercury is detected in surface water at concentrations above the standard. Mercury concentrations in surface water show an overall downward trend over the six-year monitoring period. These results indicate the flux of mercury in runoff is decreasing. Continued semiannual monitoring is recommended to monitor the decrease to below the SWQS.	Yes	Surface water monitoring was completed semiannually during the review period until 2017 when the NFAE request was submitted.
Sediment Excavation and Monitoring	Low-level mercury is detected in sediment at concentrations above the standard. As previously described, mercury has reappeared in stream sediment several years after the sediment excavation was completed with an average concentration of 0.30 mg/kg in comparison to the headwaters wetland soil average concentration of 0.41 mg/kg. Sediment concentrations were highest in 2010 and 2011, but concentrations were lower in 2012 and 2013. The recent results may indicate the beginning of a downward trend; however, sufficient data are not available to establish the trend. Continued semiannual monitoring is recommended.	Yes	Sediment monitoring was completed semiannually during the review period until 2017 when the NFAE request was submitted.
Groundwater Monitoring	Low-level mercury is detected in groundwater in two monitoring wells (PDO-38 and PDO-40) at concentrations above the standard. The source of the mercury in these wells is unknown. Recommendations include 1) conducting a hydrogeologic investigation, 2) expanding the background study to better define mercury concentrations in the Kirkwood and Cohansey Formations, 3) determining the need for additional wells to provide better delineation or background data, and 4) continuing LTM in accordance with the CEA.	Yes	Groundwater monitoring was completed semiannually during the review period until 2017 when the NFAE request was submitted. Beginning in Fall 2013, reported mercury concentrations in groundwater were below the applicable standard of 0.5 µg/L. Therefore, additional groundwater investigation was not required.

Additional details on progress made based on the recommendations from the last FYR are provided in the sections below.

4.4.1 Long-Term Monitoring

The following monitoring activities were completed at LF033 during the FYR period:

- LTM events were conducted semiannually at LF033, in spring and fall, from 2013-2016.
- Four surface water and sediment monitoring locations and up to five groundwater monitoring wells (see data tables in Appendix A) were sampled during each LTM event, and samples were analyzed for mercury.

In March 2017, NJDEP concurred with a recommended path forward of NFAE for LF033, based on evaluation of recent data from the site. These data indicated no mercury in groundwater at concentrations exceeding the applicable standard of 0.5 µg/L (Fall 2015, Spring 2016, or Fall 2016), mean mercury concentrations in sediment for Spring and Fall 2016 below the applicable standard (200 µg/kg), and mean mercury concentrations in surface water from location SW1410 for Fall 2015 and Spring and Fall 2016 below the applicable standard (0.144 µg/L). In an email (included in Appendix C of the 2016 IMMR), NJDEP (Haiyesh Shah) indicated on 15 March 2017 that no sampling of any media is required going forward (beginning in 2017) at Site LF033. In February 2018, the USAF submitted to NJDEP a Draft RACR for LF033. Upon approval of the RACR, a Response Complete status will have been achieved and a site closeout letter will be submitted to document the abandonment of monitoring wells, thus completing the requirements for site closure.

4.5 FIVE-YEAR REVIEW PROCESS FOR SITE LF033, PDO LANDFILL

4.5.1 Administrative Components

The FYR was prepared by JB MDL, in consultation with NJDEP. The team included Curtis Frye (JB MDL Remediation Program Manager), Nicole Brestle (Remediation Project Manager, Dix Area), and Haiyesh Shah (NJDEP Case Manager). This is a federal facility-lead site.

4.5.2 Community Involvement

Public notice of the beginning of the FYR process was published for 3 days in the *Asbury Park Press* (26-28 May 2017) and the *Burlington County Times* (25, 26, and 28 May 2017). The FYR was also discussed at the RAB meeting on 19 July 2017. Annual community planners meetings, including DOD representatives and contractors, are held each fall to review the JB MDL LUCIP and discuss upcoming projects at JB MDL potentially impacted by the established LUCs. Any FYR findings that impact base planning with respect to LUCs would be addressed during these meetings, as required. No public comments were received in association with the FYR. NJDEP did not have any comments regarding Site LF033 (Appendix B).

Once the FYR is completed, additional public notices will be published, the RAB mailing lists will be notified, and the results will be made available at the local site repositories, which are at the Burlington County Library (5 Pioneer Boulevard, Westhampton, New Jersey) and online at http://afcec.publicadmin-record.us.af.mil/. In addition, efforts will be made to reach out to local public officials to inform them of the results.

4.5.3 Document Review

This FYR consisted of a review of relevant documents, including the RODs/DDs, Biennial Certification Reports for the groundwater CEA, the LUCIP for JB MDL, annual IMMRs, landfill inspection reports, and remedial action reports. The documents, data, and information that were reviewed in completing this FYR are summarized in Appendix C.

4.5.4 Data Review

A long-term groundwater, surface water, and sediment monitoring program was implemented as part of the remedy at the PDO Landfill. Data for eight LTM events (March 2013 through September 2016) were available from the period of review for this FYR report. Results from these monitoring events are included in tabular format in Appendix A, and concentration versus time charts are provided in Appendix D. The monitoring results and trends are briefly described below.

Groundwater

Groundwater samples from wells PDO-38 and PDO-40 at Site LF033 were analyzed for mercury during the FYR period through 2016, after which the NFAE request was submitted.

The data from the FYR period were compared to the applicable standard of 0.5 µg/L for groundwater, as shown in Appendix A. Groundwater concentrations exceeding the standard were reported in March 2013, but not during subsequent monitoring events through 2016 (Figure LF033-2 and Appendix D). Fluctuations prior to 2015 were hypothesized to be attributable (at least in part) to sample turbidity. Based on filtration testing performed in Spring 2014, the O&M contractor recommended that future groundwater samples from LF033 be filtered using an 0.10 micron filter (PIKA-Arcadis 2014). With implementation of field filtering to 0.10 micron, mercury concentrations in groundwater samples remained consistently below 0.5 µg/L.

Surface Water and Sediment

Surface water and sediment samples were collected for mercury analysis semiannually from four monitoring stations at Site LF033 (SW/SE220, SW/SE330, SW/SE860, and SW/SE1410) through 2016, after which the NFAE request was submitted.

The data from the FYR period were compared to the applicable standards of 0.144 µg/L for mercury in surface water and 0.2 mg/kg for mercury in sediment, as shown in Appendix A. Exceedances of the standards for surface water and/or sediment were reported from at least one location during each sampling event, except for the Fall 2016 sampling event (Figure LF033-2). An anomalously high mercury concentration (61 µg/L; duplicate 15 µg/L) was reported in the sample collected from location SW1410 in Fall 2014; however, all other mercury concentrations in surface water reported during the review period were below 1 µg/L. Mercury concentrations in surface water appeared to show a slightly decreasing trend (independent of the anomalously high value in 2014), while sediment concentrations were variable with no apparent trend (Appendix D).

As stated in Section 4.4.1, mean mercury concentrations reported in Spring and Fall 2016 in both surface water and sediment are below applicable standards. Specifically, compliance averaging of the sediment data for these two most recent sampling rounds, for the four sediment monitoring locations, yielded an arithmetic mean of 0.138 mg/kg mercury. Compliance averaging of surface water data using the three most recent sampling rounds, October 2015, April 2016, and

September 2016, at location SW1410 (where recent exceedances were reported), yielded an arithmetic mean of 0.134 µg/L mercury.

4.5.5 Site Inspection

A site inspection at LF033 was conducted by EA, JB MDL, and NJDEP personnel on 25 and 26 July 2017. No issues were identified during the site inspection (Appendix E).

4.5.6 Interviews

During the FYR process, interviews were conducted with stakeholders, including representatives from the regulatory agencies overseeing the remedies at the Dix Area and community representatives aware of the remedial activities. The purpose of the interviews was to document any perceived problems or successes with the remedies that have been implemented to date. Interviews were conducted in August 2017. Detailed interview records are included in Appendix E.

None of the individuals interviewed (see Section 3.5.6 and Appendix E) indicated concerns regarding Site LF033.

4.5.7 Institutional Controls Verification

Institutional controls required for this site are listed in Section 4.3, and described further in Section 4.3.2. The required institutional controls, including the Dix Area Sitewide CEA (described in Section 2.3.2), are in place and documented in the LUCIP for JB MDL. The most recent Biennial Certification Monitoring Report for the Dix Area Sitewide CEA was submitted to NJDEP on 5 April 2016, and a new biennial report is in preparation for submittal as of April 2018. LUC documentation is updated annually.

4.6 TECHNICAL ASSESSMENT OF THE REMEDY AT SITE LF033, PDO LANDFILL

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

A review of site documentation, including results from annual groundwater, surface water, and sediment sampling, as wells as the findings of the site inspection conducted in July 2017 in association with this FYR, indicate that the remedy at the PDO Landfill is functioning as intended by the DD. The removal of contaminated sediment, stream restoration, and subsequent monitoring have achieved the RAO for protection of the Pinelands ecosystem.

The remedy implemented at Site LF033 is effective at controlling the risk to receptors. Semiannual groundwater, surface water, and sediment data from LTM indicate concentrations are below applicable standards and thus are in compliance with remedial goals. The CEA provides further protection against human exposure to potentially contaminated groundwater. The RACR submitted in 2017 for Site LF033 documents achievement of the remedial goals and requests NFAE for the site (Arcadis 2017).

4.6.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of remedy selection still valid?

4.6.2.1 Changes in Risk Assessment Methodologies

There have been no major changes in HHRA or ERA methodology since the signing of the DD that would impact the protectiveness of the LF033 – PDO Landfill remedy.

The Fort Dix EI report (ICF Kaiser 1997) included human health and ecological risk assessments for the PDO Landfill. The primary documents used to conduct the HHRA included the following EPA guidance documents: *Guidelines for Carcinogenic Risk Assessment* (EPA 1986a), *Guidelines for the Health Risk Assessment of Chemical Mixtures* (EPA 1986b), *RAGS Volume I: Human Health Manual (Part A)* (EPA 1989a); *RAGS Volume I: Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors* (EPA 1991a); *Exposure Factors Handbook* (EPA 1989b); *Guidelines for Exposure Assessment* (EPA 1992a); *Supplemental Guidance to RAGS: Calculating the Concentration Term* (EPA 1992b); and *Dermal Exposure Assessment: Principles and Applications* (EPA 1992c). The methodologies outlined in these documents have not been updated or changed, with the following exceptions.

In September 2011, EPA released a new version of the Exposure Factors Handbook (EPA 2011). This handbook provides a summary of the available statistical data on various factors used in assessing human exposure (e.g., drinking water consumption). The updates to the final document do not impact the risk assessment methodologies that were implemented in the HHRA assessment summarized in the DD. Therefore, an update to the risk assessment is not warranted.

Additionally, EPA released two risk assessment guidance documents for the assessment of dermal and inhalation exposures since the completion of the EI (ICF Kaiser 1997). The *RAGS Volume I: Human Health Manual, Part E, Supplemental Guidance for Dermal Risk Assessment)* (EPA 2004) and *Part F, Supplemental Guidance for Inhalation Risk Assessment* (EPA 2009) present risk assessment methodology for the assessment of dermal and inhalation exposures. The dermal pathways for exposure to surface water and sediment at LF033 were evaluated in the EI, although the dermal pathway for surface soil was not evaluated because EPA had not recommended a dermal absorption factor for dieldrin (the COPC in surface soil). EPA RAGS E guidance presents dermal absorption factors for dieldrin. However, contact with surface soil was limited to hunters and trespassers, which are low contact receptors with risk results well below a level of concern. As a result, the publication of these guidance documents does not affect the protectiveness of the remedy for LF033.

The ERA included in the EI report (ICF Kaiser 1997) was based on the *RAGS – Volume II Environmental Evaluation Manual* (EPA 1989c) and an article titled "*Ecological Assessment of Superfund Sites: an Overview*" (EPA 1991b). The ERA compared toxicity reference values to exposure point concentrations and to modeled doses to wildlife. The ERA identified the potential for adverse effects to benthic organisms in the unnamed stream, due to pesticides and mercury in surface water and sediment. In 1997, EPA published *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA 1997a), followed by the more generic *Guidelines for Ecological Risk Assessment* (EPA 1998). Although risk assessment methodologies presented in EPA guidance have evolved since the EI and DD were completed for LF033, the changes and current concentrations are such that an ERA using the updated methodology would not be expected to lead to identification of issues with the protectiveness of the remedy.

4.6.2.2 Changes in Exposure Pathways

There have been no changes in physical conditions or land use at the site that would result in the development of new exposure pathways to human or ecological receptors. Additionally, no newly identified contaminants, contaminant sources, or toxic byproducts of the remedy were identified during the FYR process.

The HHRA conducted as part of the RI considered the following human health exposure pathways for the PDO Landfill, based on limited use of the Landfill by hunters and random trespassers, and exposure of hunters and nearby residents to the adjacent stream: incidental ingestion of soils, dermal contact with surface water in the stream, and dermal contact and incidental ingestion of stream sediment. It is noted that the dermal exposure to surface soil at LF033 was not evaluated in the EI because EPA had not recommended dermal absorption factors for dieldrin (the COPC in surface soil). Since the finalization of the EI, EPA RAGS E guidance presents dermal absorption factors for this analyte. However, contact with surface soil was limited to hunters and trespassers, which are low contact receptors with risk results well below a level of concern. As a result, the dermal exposure pathway is not expected to change the overall risk conclusions for LF033. Hypothetical future residential use of groundwater from the Kirkwood-Cohansey aquifer was also considered in the HHRA. Only the potential future use of groundwater was found to be a potential concern for human health, due to non-carcinogenic hazards associated with mercury exposure by child residents. Controls in place under the LUCIP and as part of the DD remedy for the PDO Landfill prevent groundwater use and residential land use, to avoid potential unacceptable risks associated with changes in land and groundwater use. Contaminated sediment was excavated as part of the DD remedy, to address potential risks to ecological receptors.

Daily doses were developed as part of the HHRA, in accordance with the available guidance. More recently, EPA provided default exposure parameters for use in risk assessment in the *Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors* was released in 2014 (EPA 2014). A majority of the exposure parameters assumed in the EI are similar to the recent default exposure parameters set forth by EPA (EPA 2014). The one change in default exposure parameters that may result in changes to overall results is the difference assumed for default body weight. The EPA revised the default adult body weight from 70 kg to 80 kg. The increase in body weight results in lower overall cancer risks and non-cancer hazards. Because the current exposure pathways that were considered remain the most relevant, and no groundwater use is occurring or planned, an update to the risk assessment is not warranted.

4.6.2.3 Contaminants of Concern and Changes in Standards and To-Be-Considered Guidance

The LF033 DD did not specify cleanup standards for mercury in sediment, groundwater, or surface water; however, the Remedial Action Work Plan (Shaw 2004) proposed cleanup criteria for each of these media, as described below. In March 2017, JB MDL provided analysis indicating that no further monitoring at LF033 is required because the cleanup standards have been met in accordance with NJDEP's *Technical Guidance for Attainment of Remediation Standards and Site-Specific Criteria*.

Based on the risk assessment findings, sediment is the primary medium of concern at PDO Landfill. The NJDEP has established guidance for the evaluation of sediment at contaminated sites. The *Guidance for Sediment Quality Evaluations* (NJDEP 1998) establishes screening level criteria that can be used as the basis for remedial decision-making. These criteria were identified as the standards that determine the protectiveness of the remedy in the Remedial Action Work Plan (Shaw 2004). For mercury in sediment, the most stringent of the sediment screening criteria was compared to the Dix Area background concentration of mercury in sediment. The greater of the background concentration and the sediment screening criterion was identified as the clean-up standard.

The *Guidance for Sediment Quality Evaluations* (NJDEP 1998) references the LELs and the SELs from Persaud et al. (1993) as the Freshwater Sediment Screening Guidelines for inorganic constituents. The LEL and SEL for mercury are 0.2 mg/kg and 2.0 mg/kg, respectively. Background values for mercury in sediment have not been established. Therefore, the clean-up standard for mercury in sediment was defined as the more protective of the Freshwater Sediment Screening Guidelines, which is 0.2 mg/kg (Shaw 2004). The 2009 NJDEP Ecological Screening Criteria also specify a LEL of 0.2 mg/kg; this ARAR has not changed.

A groundwater ARAR of 0.5 µg/L, equal to the GWQS (NJAC 7:9C) Class I-PL standard (PQL), was selected for groundwater in the Remedial Action Work Plan (Shaw 2004). The Dix Area background groundwater (EA 2012a) was measured against the certified reporting limit at the time (0.243 µg/L), and the study concluded that the background groundwater concentration of mercury did not exceed this reporting limit. Subsequent to this background study, a new PQL of 0.05 µg/L for mercury was promulgated in 2014. The PQLs are not risk-based standards, and the decreased PQL reflects improved analytical sensitivity; the EPA MCL for mercury remains 2 µg/L. Thus, the protectiveness of the previous ARAR for mercury has not changed; however, the Class I-PL mercury standard has changed. The applicable screening criterion for groundwater at LF033 remains 0.5 µg/L, as specified in the Remedial Action Work Plan.

Although surface water was not identified in the DD as a medium requiring action at LF033, the selected remedy included surface water monitoring. The NJDEP has developed SWQS (NJAC 7:9B), which apply to all surface waters of the State. The stream that traverses the site empties into tributaries of the Pinelands, and is therefore given the surface water classification of Pinelands Waters (PL). Surface water quality criteria for PL waters are to be maintained as to the quality of their existing state or that quality necessary to attain or protect against designated uses; because these concentrations are unattainable, the groundwater PQLs are used for comparison. The SWQS for mercury at the time of the Remedial Action Work Plan (Shaw 1994) was 0.144 µg/L. As stated above, the current PQL for mercury is 0.05 µg/L. The PQL is not risk based and is not more than an order of magnitude less than the SWQS at the time of the Remedial Action Work Plan. In accordance with the NJDEP Order-of-Magnitude Guidance (NJDEP 2009a), the standard of 0.144 µg/L remains applicable.

The clean-up standards described above are sufficiently protective to meet the RAOs for the PDO Landfill.

4.6.2.4 Changes in Toxicity and Other Contaminant Characteristics

Toxicity values for COPCs were reviewed in accordance with the EPA toxicity hierarchy (EPA 2003). The EPA IRIS is the Tier I source for toxicity information (EPA 2017a). IRIS and other tiered toxicity sources presented on the EPA Regional Screening Level table (EPA 2017b) were reviewed to determine if revisions had been made to the factors used to calculate risk in the Fort Dix EI report (ICF Kaiser 1997).

Table LF033-2, showing non-carcinogenic and carcinogenic COPCs, was adapted from the EI report. This table lists the COPCs and the corresponding toxicity values (carcinogenic slope factors and reference doses) from both the report and the EPA's IRIS database in July 2017. An increase in the oral slope factor will have an effect on the calculated risk. In addition, a decrease in the oral reference dose will produce an increased HQ. Changes in toxicity information are noted below to demonstrate that the values have not changed significantly since the analyses were initially conducted in the mid-1990s. It is noted that since the completion of the EI Report, EPA has identified methylene chloride as a mutagenic compound, which indicates potential concerns for early life exposures to this analyte (EPA 2005). However, methylene chloride is only a COPC in surface water. Risk results for methylene chloride were well below a level of concern. Based on the changes in toxicity factors for the COPCs, the remedy is still considered protective at this time.

Additionally, the LELs and SELs for mercury in sediment from Persaud et al. (1993), which are referenced in the *Guidance for Sediment Quality Evaluations* (NJDEP 1998) have not changed since the establishment of the DD, and are consistent with the LEL specified in the 2009 NJDEP Ecological Screening Criteria. No new background levels for mercury in sediment have been established. Therefore, the remedy is still considered protective. A revised risk assessment is not required for LF033 because ARARs have been met, and because the use of groundwater at LF033 is restricted by the CEA.

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

There is no other information to call into question the protectiveness of the remedy.

4.6.4 Technical Assessment Summary

The review of documents, ARARs, risk assumptions, and results of the site inspection indicates that the remedy at Site LF033 is functioning as intended by the DD. The removal of contaminated sediment, stream restoration, and subsequent monitoring have achieved the RAO for protection of the Pinelands ecosystem. The RACR submitted in 2017 for Site LF033 documents achievement of the remedial goals and requests NFAE for the site (Arcadis 2017).

Although risk assessment methodologies presented in EPA guidance have evolved since the EI was conducted for Site LF033, the nature of the changes is such that an assessment using the updated methodology would not be expected to lead to identification of issues with the protectiveness of the remedy. No changes in exposure pathways were noted during the review period (2013–2017).

4.7 ISSUES, RECOMMENDATIONS, AND FOLLOW-UP ACTIONS AT SITE LF033, PDO LANDFILL

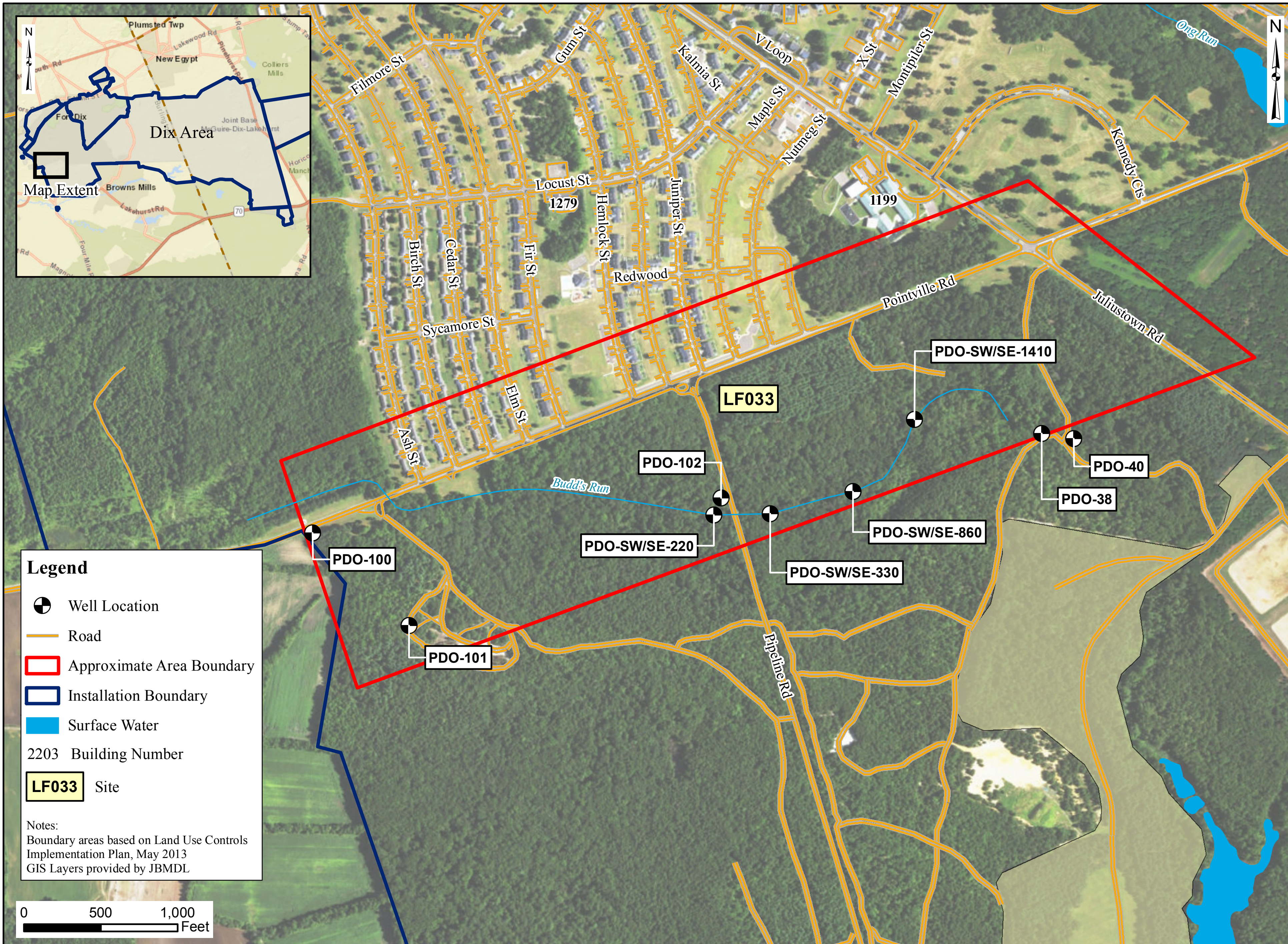
No issues that affect current or future protectiveness were identified. NJDEP concurred with a proposal for NFAE for Site LF033 in 2017. Upon approval of the RACR for LF033, a Response Complete status will have been achieved.

4.8 PROTECTIVENESS STATEMENT FOR SITE LF033, PDO LANDFILL

Protectiveness Statement	
Site: LF033	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at Site LF033 is protective of human health and the environment.	

4.9 NEXT REVIEW

If required based on the status of the site, the next FYR for Site LF033, the PDO Landfill, shall be submitted by May 2023. If the RACR for Site LF033 is approved by 2023, no additional FYRs are anticipated for this site.



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DIX AREA FIVE-YEAR REVIEW
JOINT BASE MCGUIRE-DIX-LAKEHURST, NEW JERSEY

FIGURE LF033-1
LF033 SITE FEATURES

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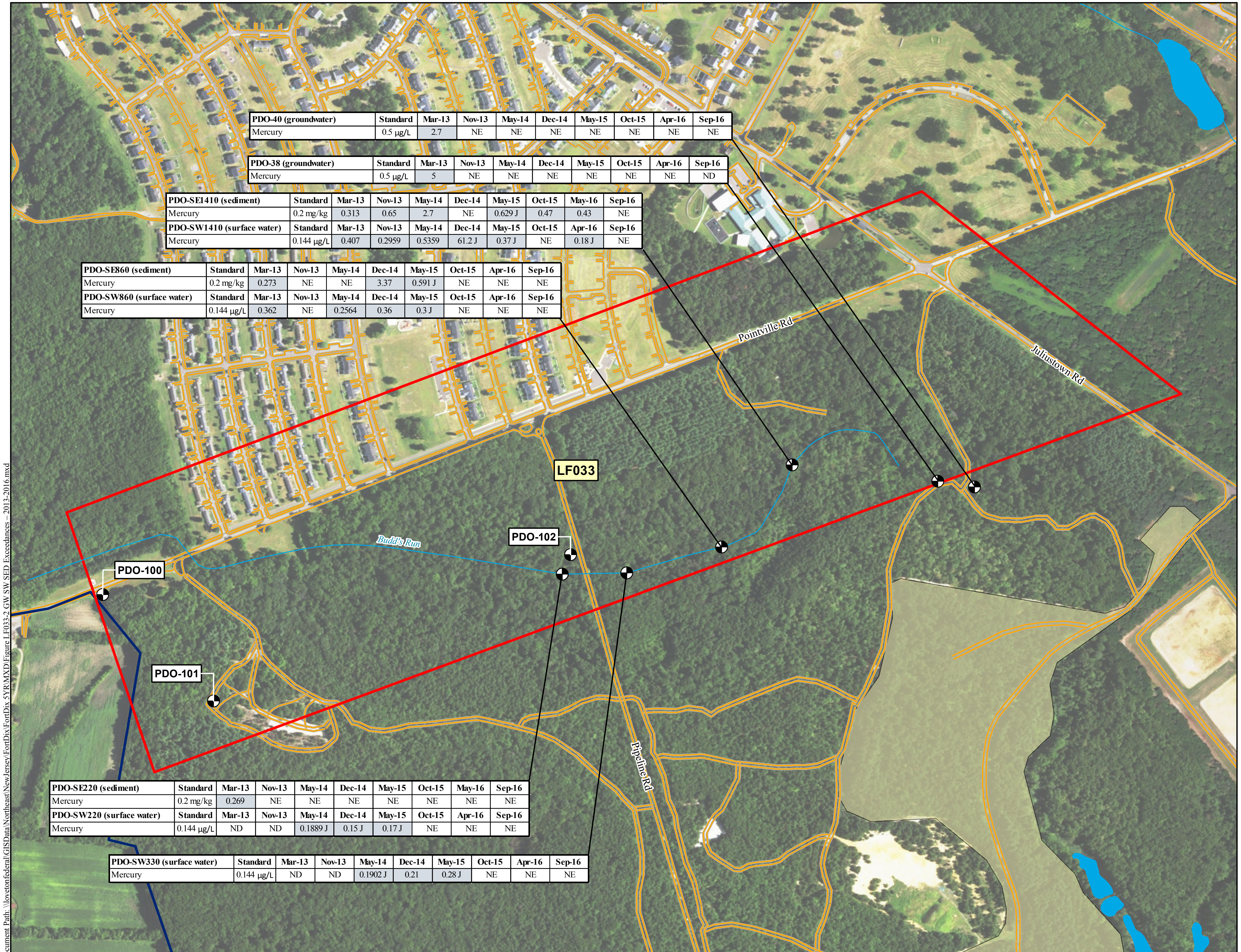


PDO-40 (groundwater)	Standard	Mar-13	Nov-13	May-14	Dec-14	May-15	Oct-15	Apr-16	Sep-16
Mercury	0.5 µg/L	2.7	NE	NE	NE	NE	NE	NE	NE

PDO-38 (groundwater)	Standard	Mar-13	Nov-13	May-14	Dec-14	May-15	Oct-15	Apr-16	Sep-16
Mercury	0.5 µg/L	5	NE	NE	NE	NE	NE	NE	ND

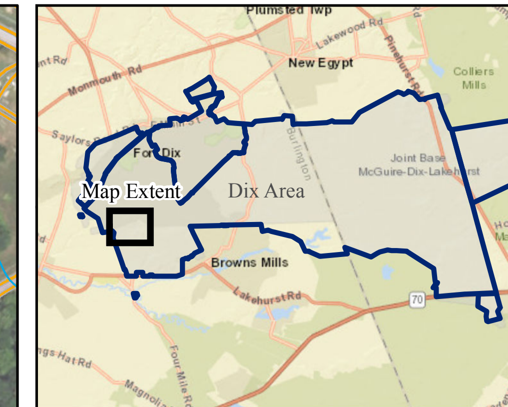
PDO-SE1410 (sediment)	Standard	Mar-13	Nov-13	May-14	Dec-14	May-15	Oct-15	May-16	Sep-16
Mercury	0.2 mg/kg	0.313	0.65	2.7	NE	0.629 J	0.47	0.43	NE
PDO-SW1410 (surface water)	**Standard**	**Mar-13**	**Nov-13**	**May-14**	**Dec-14**	**May-15**	**Oct-15**	**Apr-16**	**Sep-16**
Mercury	0.144 µg/L	0.407	0.2959	0.5359	61.2 J	0.37 J	NE	0.18 J	NE

PDO-SE860 (sediment)	Standard	Mar-13	Nov-13	May-14	Dec-14	May-15	Oct-15	Apr-16	Sep-16
Mercury	0.2 mg/kg	0.273	NE	NE	3.37	0.591 J	NE	NE	NE
PDO-SW860 (surface water)	**Standard**	**Mar-13**	**Nov-13**	**May-14**	**Dec-14**	**May-15**	**Oct-15**	**Apr-16**	**Sep-16**
Mercury	0.144 µg/L	0.362	NE	0.2564	0.36	0.3 J	NE	NE	NE

PDO-SE220 (sediment)	Standard	Mar-13	Nov-13	May-14	Dec-14	May-15	Oct-15	May-16	Sep-16
Mercury	0.2 mg/kg	0.269	NE	NE	NE	NE	NE	NE	NE
PDO-SW220 (surface water)	**Standard**	**Mar-13**	**Nov-13**	**May-14**	**Dec-14**	**May-15**	**Oct-15**	**Apr-16**	**Sep-16**
Mercury	0.144 µg/L	ND	ND	0.1889 J	0.15 J	0.17 J	NE	NE	NE

PDO-SW330 (surface water)	Standard	Mar-13	Nov-13	May-14	Dec-14	May-15	Oct-15	Apr-16	Sep-16
Mercury	0.144 µg/L	ND	ND	0.1902 J	0.21	0.28 J	NE	NE	NE

VICINITY MAP



Legend

- Monitoring Well
- Road
- Approximate Area Boundary
- Installation Boundary
- Surface Water
- LF033 Site

Notes:
Only values exceeding the applicable standard are shown.
Exceedances are also shaded.
ND = Not Detected
NE = No Exceedance
Boundary areas based on Land Use Controls Implementation Plan, May 2013.
GIS Layers provided by JBMDL.

N

0 500 1,000 Feet

EA Engineering, Science, and Technology, Inc., PBC

FIGURE LF033-2
Site LF033 Groundwater, Surface Water, and Sediment Exceedances – 2013-2016
Dix Area Five-Year Review
Joint Base McGuire-Dix-Lakehurst, New Jersey

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Table LF033-1: Chronology of Events at Site LF033

Event	Date
Preliminary Assessment/Site Investigation	1989
Environmental Investigation	1993 - 1997
Environmental Investigation/Alternatives Analysis	1998
Final Proposed Plan	April 1998
Multi-Site Groundwater Classification Exception Area approved	September 2003
Final Decision Document signed	3 June 2004
Final Remedial Action Work Plan	August 2004
Groundwater monitoring well installation	June 2005
Fort Dix PDO Landfill sediment cleanup application (No. 1991-0820.034) signed by the Pinelands Commission	September 2005
Pinelands Commission and New Jersey Department of Environmental Protection approved the Freshwater Wetland General Permit No.4	December 2005
New Jersey Department of Environmental Protection approved the Stream Encroachment Permit for water diversion	October 2005
Pinelands Commission and New Jersey Department of Environmental Protection approved the Wetland Mitigation Plan	October 2005
Mercury contaminated sediments excavated	July-November 2007
Excavated material removed from the site	April 2007
First Five-Year Review completed	September 2013
Long-Term Monitoring	May 2007 to September 2016
Remedial Action Completion Report and No Further Action equivalent request submitted to New Jersey Department of Environmental Protection	Anticipated 2018

Table LF033-2: Toxicity Values for Carcinogenic and Non-Carcinogenic Constituents at Site LF033

Chemical	Oral Slope Factor (mg/kg/day) (EI Report)	Oral Slope Factor (mg/kg/day) (2017)	Reference Dose (mg/kg/day) (EI Report)	Reference Dose (mg/kg/day) (2017)
Organics:				
Bis(2-ethylhexyl)phthalate	1.4E-02 (groundwater)	1.4E-02	2E-02 (groundwater)	2E-02
Dieldrin	1.6E+01 (soil)	1.6E+01	5.0E-05 (soil)	5E-05
Carbon tetrachloride	1.3E-01 (surface water)	7E-02	7.0E-04 (surface water)	4E-03
Chloroform	6.2E-03 (surface water)	3.1E-02	9.8E-03 (surface water)	1E-02
4,4'-DDD	2.7E-01 (surface water)	2.4E-01	Not Applicable	Not Applicable
4,4'-DDE	3.8E-01 (surface water)	3.4E-01	Not Applicable	Not Applicable
4,4'-DDT	3.8E-01 (surface water)	3.4E-01	4.5E-04 (surface water)	5E-04
Methylene chloride	7.7E-03 (surface water)	2E-03	5.9E-02 (surface water)	6E-03
Inorganics:				
Aluminum	Not Applicable	Not Applicable	1E+00 (surface water, sediment, groundwater)	1E+00
Arsenic	1.5E+00 (sediment)	1.5E+00	3E-04 (sediment)	3E-04
Beryllium	4.3E+00 (sediment)	Not Available	5E-03 (sediment)	2E-03
Cadmium	Not Applicable	Not Applicable	5E-04 (sediment)	5E-04
Iron	Not Applicable	Not Applicable	3E-01 (surface water, sediment)	7E-01
Manganese	Not Applicable	Not Applicable	1.3E-03 (surface water) 2E-02 (sediment, groundwater)	2.4E-02
Mercury	Not Applicable	Not Applicable	2.1E-05 (surface water) 3E-04 (sediment, groundwater)	3E-04
Zinc	Not Applicable	Not Applicable	9.0E-02 (surface water)	3E-01

Notes:
EI = Environmental Investigation
mg/kg/d = milligrams per kilogram per day

5. SITE SS005B, 4300/4400 AREA

5.1 SITE CHRONOLOGY

A timeline of major events at Site SS005B, the 4300/4400 Area, is presented in Table SS005B-1. Tables and figures for Site SS005B are provided at the end of this Chapter.

5.2 BACKGROUND OF SITE SS005B, 4300/4400 AREA

5.2.1 Physical Characteristics

Site SS005B, the 4300/4400 Area, is located in the western portion of JB MDL, just west of the McGuire Area (Figure 1). The ground surface at the 4300/4400 Area is relatively flat. Approximately one-third of the site is paved, including parking lots and a concrete flight deck, and buildings are located along the western site boundary (Figure SS005B-1). South Run flows in an easterly direction across the northern portion of the site.

Soils underlying the site consist of fine to coarse sand with trace amounts of silt and clay belonging to the Cohansey and Kirkwood Formations. Groundwater elevations are generally higher in the southern portion of the site and lower in the northern portion (Figure SS005B-2).

5.2.2 Land and Resource Use

Three sites (Sites 1, 2, and 3) were previously defined at SS005B, based on the presence of separate groundwater contamination plumes (Figure SS005B-1).

Sites 1, 2, and 3 were formerly used for motor vehicle maintenance. Buildings and structures associated with Site 1 and Site 2 have been demolished and the area has been redeveloped. The area formerly occupied by Site 1 and Site 2 currently is completely covered by a concrete apron used as a flight deck for Marine Corps helicopters. Site 3 has not been redeveloped. Current site conditions are shown on Figure SS005B-1.

To the north of South Run, in the northern portion of the site, is a sewage treatment plant. To the east and southeast of the site are taxiways and associated infrastructure. To the west and southwest are base housing facilities and Willow Pond.

5.2.3 History of Contamination

Potential historical sources of contamination at the 4300/4400 Area include USTs, drum storage areas where solvents were likely handled, and vehicle wash racks.

5.2.4 Initial Response

Groundwater investigations were conducted between 1993 and 1999 and identified three PCE groundwater plumes with concentrations exceeding New Jersey GWQS. An EI was completed in 1997 (ICF Kaiser 1997), an AA was completed in 1998 (ICF Kaiser 1998), and an AA

Addendum was completed in 2001 (IT Corporation 2001). The results of these investigations and analyses are summarized below. No removal actions were undertaken prior to the DD.

5.2.5 Basis for Taking Action

Historical soil sampling results indicated (low) volatile contaminant levels (TCE and PCE) below the New Jersey GWQS. The lateral extent of impacted groundwater was defined in three separate plumes originating at the G-4 Maintenance Motor Pool (Site 1), the 39th Engineering Battalion Motor Pool (Site 2), and 195th Battalion Motor Pool (Site 3) (Figure SS005B-1).

As part of the EI, an analysis was conducted to determine the potential for impact to public health and the environment that might result if the contamination associated with the 4300/4400 Area were not controlled. In conducting this assessment, the focus was on the human health and environmental effects that could result from exposure to contaminants associated with contaminants in various media (air, surface water, sediments, soil, and groundwater). No unacceptable risks were identified for human exposure to media other than groundwater (discussed below), and no ecological concerns were associated with chemical in surface water or sediment; therefore, remedial alternatives for surface water, sediment, and soil were not developed. However, protection of ecological receptors was a component of the RAOs because of the site's designation as a Pinelands habitat.

Although groundwater use is unlikely, residential exposure pathways were evaluated as part of the HHRA. Based on the samples collected for the EI, estimated cancer risks and non-cancer hazards from residential exposures to groundwater (from PCE and TCE) were greater than acceptable levels and required the analysis of remedial alternatives. Non-cancer hazard indices were also exceeded due to manganese and iron concentrations; however, concentrations of these metals were consistent with Dix Area background groundwater concentrations and were not further evaluated.

5.3 REMEDIAL ACTIONS AT SITE SS005B, 4300/4400 AREA

5.3.1 Remedy Selection

The selected remedy provided in the Final DD (EM Federal 2003b) consists of the following requirements:

- AS with SVE
- Monitoring of groundwater, sediment, and surface water in South Run Creek
- Institutional controls, including a CEA/Water Use Restriction.

The RAOs established in the DD for SS005B are as follows:

- Mitigate exposure to PCE and TCE in groundwater (the COCs identified in the HHRA) to humans under residential exposure conditions.

- Protect areas designated as Pinelands. Mitigate discharge of PCE and TCE into South Run Creek.

5.3.2 Remedy Implementation

The following remedial actions have been completed:

- Baseline groundwater sample collection in 2004
- Installation of AS wells AS-1 and AS-2 at Site 1 and Site 2, respectively, in 2004
- Retrofit of 2 existing monitoring wells, DIO-24S (Site 1) and DIO-18S (Site 2), to be soil venting wells in 2004
- Operation of AS/SVE equipment at Site 1 and Site 2 for 6 months from January-June 2005
- Removal of the AS/SVE equipment and electrical power supply wires from the site after completion of the remedial action
- Monitoring of surface water and sediment, as well as groundwater at Site 2, from 2005 to 2013
- Monitoring of groundwater at Sites 1 and 3 since 2005.

The 4300/4400 Area was included in a multi-site CEA approved in September 2003 (Shaw 2003), and subsequently in the Dix Area Sitewide CEA (NJDEP 2014). Monitoring of site groundwater was performed during the FYR period to comply with the CEA. The monitoring program is described further in Section 5.4.

5.3.3 System Operation and Maintenance

Current O&M of the 4300/4400 Area remedy consists of the semiannual collection and analysis of groundwater samples. Management and reporting for this site is completed annually in accordance with the Dix Area Basewide Inspection, Maintenance, and Monitoring Plan (Plexus Scientific 2014) and biennially through CEA documentation.

5.4 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW AT SITE SS005B, 4300/4400 AREA

The first FYR for Site SS005B was submitted on 30 September 2013 (CB&I 2013b). The 2013 FYR protectiveness statement for SS005B was as follows: “The remedial actions at the 4300/4400 Area are protective of human health and the environment. Continued implementation of LTM for groundwater will ensure the long-term protectiveness of the remedy. Contaminants have not migrated beyond the site boundary and the remedy is considered to be functioning as required.”

No issues were identified in the previous FYR that may impact the current protectiveness of the remedy in place. Issues and recommendations identified in the 2013 FYR that do not affect protectiveness, and the follow-up actions taken, are summarized below:

Remedy Component	Issue/Recommendation from the 2013 FYR (not affecting protectiveness)	Completed?	Action Taken
Groundwater Monitoring	Low-level concentrations of PCE, TCE, and DCE remain in groundwater above applicable standards in some wells at Sites 1 and 3. Decreasing concentration trends are present. Continued LTM of chlorinated VOCs in groundwater at Sites 1 and 3 is recommended. Monitoring may be discontinued after at least two rounds of sampling indicate no exceedances of GWQS.	Yes	Semiannual monitoring of groundwater at Sites 1 and 3 was performed during the FYR period.
Groundwater Monitoring	Monitoring at Site 2 indicates no contaminants are present above the GWQS at the monitoring wells associated with this site. Concentrations in these wells have been below the GWQS since 2011. Discontinuance of monitoring at Site 2 is recommended.	Yes	Groundwater monitoring at Site 2 was discontinued after Spring 2013.
Groundwater Monitoring	JB MDL is in the process of inventorying monitoring wells at the Base including those at the 4300/4400 Area. Monitoring wells will be repaired or abandoned as needed. Wells recommended for abandonment include DIO-10, DIO-19D, DIO-20S, and DIO-21D at Site 1; DIO-24S, DIO-25D, DIO-28, DIO-22S, and DIO-23D at Site 2; and DIO-31S, DIO-32D, DIO-30D, DIO-34D, and DIO-35S at Site 3.	Yes	The listed wells at Sites 1 and 2 were reported to have been abandoned as of Spring 2014, and the listed wells at Site 3 were reported to have been abandoned as of Fall 2014 (PIKA-Arcadis 2014).
Sediment and Surface Water Monitoring	LTM indicates chlorinated VOCs have not been detected in surface water and sediment during 5 years of monitoring. Discontinuance of surface water and sediment monitoring is recommended.	Yes	Sediment and surface water monitoring was discontinued after 2012.

Additional details on progress made based on the recommendations from the last FYR are provided in the sections below.

5.4.1 Long-Term Monitoring

The following monitoring activities were completed at SS005B during the FYR period:

- Groundwater monitoring events were conducted semiannually at SS005B, in spring and fall, during the review period.

- Four wells at Sites 1 and 3 (DIO-18S, DIO-29S, DIO-33S, and DIO-40S) were sampled during each monitoring event, and groundwater samples were analyzed for VOCs.

- In Spring 2013, well DIO-24S (Site 2) was sampled. In September 2013, NJDEP issued a letter concurring with the recommendation to discontinue monitoring at Site 2, and approving NFAE for Site 2.

As stated in the table above, surface water and sediment monitoring was discontinued as of 2012 in accordance with the recommendations of the 2013 FYR.

5.5 FIVE-YEAR REVIEW PROCESS FOR SITE SS005B, 4300/4400 AREA

5.5.1 Administrative Components

The FYR was prepared by JB MDL, in consultation with NJDEP. The team included Curtis Frye (JB MDL Remediation Program Manager), Nicole Brestle (Remediation Project Manager, Dix Area), and Haiyesh Shah (NJDEP Case Manager). This is a federal facility-lead site.

5.5.2 Community Involvement

Public notice of the beginning of the FYR process was published for 3 days in the *Asbury Park Press* (26-28 May 2017) and the *Burlington County Times* (25, 26, and 28 May 2017). The FYR was also discussed at the RAB meeting on 19 July 2017. Annual community planners meetings, including DOD representatives and contractors, are held each fall to review the JB MDL LUCIP and discuss upcoming projects at JB MDL potentially impacted by the established LUCs. Any FYR findings that impact base planning with respect to LUCs would be addressed during these meetings, as required. No public comments were received in association with the FYR. NJDEP did not have any comments regarding Site SS005B (Appendix B).

Once the FYR is completed, additional public notices will be published, the RAB mailing lists will be notified, and the results will be made available at the local site repositories, which are at the Burlington County Library (5 Pioneer Boulevard, Westhampton, New Jersey) and online at http://afcec.publicadmin-record.us.af.mil/. In addition, efforts will be made to reach out to local public officials to inform them of the results.

5.5.3 Document Review

This FYR consisted of a review of relevant documents, including the RODs/DDs, Biennial Certification Reports for the groundwater CEA, the LUCIP for JB MDL, annual IMMRs, landfill inspection reports, and remedial action reports. The documents, data, and information that were reviewed in completing this FYR are summarized in Appendix C.

5.5.4 Data Review

A long-term, groundwater, surface water, and sediment monitoring program was implemented as part of the remedy at the 4300/4400 Area. Surface water and sediment monitoring was discontinued prior to the review period (see Section 5.4). Data for nine groundwater monitoring events (April 2013 through March 2017) were available from the period of review for this FYR report. Results from these monitoring events are included in tabular format in Appendix A, and concentration versus time charts are provided in Appendix D. The monitoring results and trends are briefly described below.

Groundwater

Groundwater samples were collected from 4 monitoring wells during each monitoring event and analyzed for VOCs. Wells currently included in the monitoring program include sentinel wells (DIO-29S and DIO-40S) and source area wells (DIO-18S and DIO-33S).

The data from the FYR period were compared to the New Jersey PQLs, as shown in Appendix A. The DD identified cleanup standards of 1.0 µg/L for PCE and TCE, the COCs in groundwater, and these standards are equal to the current PQLs. The DD did not identify cleanup standards for other VOCs.

Of the groundwater COCs (TCE and PCE), PCE was detected in groundwater at concentrations exceeding the PQL during the review period. Chloroform and trichlorofluoromethane (Freon 11) were also detected at low concentrations exceeding applicable standards; however, these analytes are not considered site-related. VOCs detected at concentrations exceeding the remediation standards are shown on Figure SS005B-3. An exceedance of PCE in sentinel well DIO-29S was reported in 2013; no other exceedances of the PQLs for site-related contaminants were reported in the sentinel wells, although a PCE concentration equal to the PQL was reported in a duplicate sample from well DIO-29S in 2016. No trends are apparent in the groundwater monitoring data for PCE, with variable concentrations up to approximately 4 µg/L (Appendix D).

5.5.5 Site Inspection

A site inspection at SS005B was conducted by EA, JB MDL, and NJDEP personnel on 26 July 2017. No issues were identified during the site inspection (Appendix E).

5.5.6 Interviews

During the FYR process, interviews were conducted with stakeholders, including representatives from the regulatory agencies overseeing the remedies at the Dix Area and community representatives aware of the remedial activities. The purpose of the interviews was to document any perceived problems or successes with the remedies that have been implemented to date. Interviews were conducted in August 2017. Detailed interview records are included in Appendix E.

None of the individuals interviewed (see Section 3.5.6 and Appendix E) indicated concerns regarding Site SS005B.

5.5.7 Institutional Controls Verification

As indicated in Section 5.3, a CEA is required for this site. As described in Section 5.3.2, the required CEA is in place and documented in the LUCIP for JB MDL. The most recent Biennial Certification Monitoring Report for the Dix Area Sitewide CEA was submitted to NJDEP on 5 April 2016, and a new biennial report is in preparation for submittal as of April 2018. LUC documentation is updated annually.

5.6 TECHNICAL ASSESSMENT OF THE REMEDY AT SITE SS005B, 4300/4400 AREA

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

A review of site documentation, including results from annual groundwater monitoring as well as the findings of the site inspection conducted in July 2017 in association with this FYR, indicate that the remedy at the 4300/4400 Area is functioning as intended by the DD. The remedy meets the RAO for mitigating residential exposure to groundwater containing PCE and TCE, and also meets the RAO for protection of areas designated as Pinelands.

Surface water and sediment monitoring results indicated no PCE or TCE detections from 2007-2012, confirming that discharge of groundwater containing these VOCs into South Run Creek is insignificant. PCE concentrations in groundwater during the review period were consistently less than 5 µg/L, relative to a PQL of 1 µg/L and the maximum concentration of 30 µg/L in well DIO-18S during the pre-remediation baseline sampling event in 2004. Although no distinct trends in PCE concentrations in groundwater were apparent during the review period (Appendix D), the long-term trend appears to be downward.

The remedy implemented at Site SS005B has been effective at controlling the risk to receptors. The CEA minimizes human exposure to potentially contaminated groundwater, and surface water and sediment results from the previous FYR period confirm that South Run is not affected by site contaminants. Occasional PCE concentrations equal to or exceeding the PQL in sentinel well DIO-29S are not indicative of a lack of protectiveness, given the magnitude of the exceedances and location of this well within the site.

5.6.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of remedy selection still valid?

5.6.2.1 Changes in Risk Assessment Methodologies

There have been no major changes in HHRA or ERA methodology since the signing of the DD that would impact the protectiveness of the SS005B – 4300/4400 Area remedy.

The Fort Dix EI report (ICF Kaiser 1997) included human health and ecological risk assessments for the 4300 and 4400 Areas. The primary documents used to conduct the HHRA included the following EPA guidance documents: *Guidelines for Carcinogenic Risk Assessment* (EPA 1986a), *Guidelines for the Health Risk Assessment of Chemical Mixtures* (EPA 1986b), *RAGS Volume I: Human Health Manual (Part A)* (EPA 1989a); *RAGS Volume I: Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors* (EPA 1991a); *Exposure Factors Handbook* (EPA 1989b); *Guidelines for Exposure Assessment* (EPA 1992a); *Supplemental Guidance to RAGS: Calculating the Concentration Term* (EPA 1992b); and *Dermal Exposure Assessment: Principles and Applications* (EPA 1992c). No unacceptable human health risks were identified for the 4300/4400 Area. The methodologies outlined in the guidance documents used have not been updated or changed, with the following exceptions.

In September 2011, EPA released a new version of the *Exposure Factors Handbook* (EPA 2011). This handbook provides a summary of the available statistical data on various factors used in assessing human exposure (e.g., drinking water consumption). The updates to the final document do not impact the risk assessment methodologies that were implemented in the HHRA assessment summarized in the DD. Therefore, an update to the risk assessment is not warranted.

Additionally, EPA released two risk assessment guidance documents for the assessment of dermal and inhalation exposures since the completion of the EI (ICF Kaiser 1997). The *RAGS Volume I: Human Health Manual, Part E, Supplemental Guidance for Dermal Risk Assessment)* (EPA 2004) and *Part F, Supplemental Guidance for Inhalation Risk Assessment* (EPA 2009) present risk assessment methodology for the assessment of dermal and inhalation exposures. Not all subsurface soil COPCs were evaluated for dermal exposures, and groundwater dermal and inhalation exposure pathways were only evaluated qualitatively. The only soil COPCs not evaluated for dermal exposures were inorganics, which have a low dermal absorption from the skin. Given the limited absorption of inorganics from soil, the assessment of this exposure pathway would not change the overall risk results for the excavation workers. Additionally, VOCs in groundwater are also expected to have a low dermal absorption because they are expected to volatize before they have the chance to absorb through the skin surface. The inhalation of VOCs from groundwater is a potential risk concern for residents who use groundwater as a tap water source. However, the HHRA determined potential risk concerns for ingestion of groundwater due to VOCs (PCE and TCE). The inclusion of the inhalation exposure pathway would not change the overall conclusions for groundwater exposure in the HHRA. Therefore, the publication of these guidance documents does not affect the protectiveness of the remedy for SS005B.

The ERA included in the EI report (ICF Kaiser 1997) was based on the *RAGS – Volume II Environmental Evaluation Manual* (EPA 1989c) and an article titled "*Ecological Assessment of Superfund Sites: an Overview*" (EPA 1991b). The ERA compared toxicity reference values to exposure point concentrations and to modeled doses to wildlife. As stated in the DD (EM Federal 2003b), the results of the ERA did not trigger remediation; however, protection of ecological receptors was a component of the RAOs because of the site's designation as a Pinelands habitat. In 1997, EPA published *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA 1997a), followed by the more generic *Guidelines for Ecological Risk Assessment* (EPA 1998). Although risk assessment methodologies presented in EPA guidance have evolved since the EI and DD were completed for SS005B, the changes are such that an ERA using the updated methodology would not be expected to lead to identification of issues with the protectiveness of the remedy, particularly given that sediment and surface water monitoring were discontinued after the last FYR due to a lack of VOC detections over the previous 5 years of monitoring.

5.6.2.2 Changes in Exposure Pathways

There have been no changes in physical conditions or land use at the site that would result in the development of new exposure pathways to human or ecological receptors. Additionally, no newly identified contaminants, contaminant sources, or toxic byproducts of the remedy were identified during the FYR process.

Human health exposure pathways that were considered in the HHRA for the 4400 Area were based on potential excavation activity at the site, leading to incidental ingestion of and dermal contact with subsurface soils, and potential youth visitors contacting surface water in South Run. Hypothetical future residential use of groundwater from the Kirkwood-Cohansey aquifer was also considered. Only the groundwater ingestion exposure pathway was considered quantitatively in the HHRA. No COPCs were identified for the 4300 Area; therefore, no exposure pathways were considered for that portion of the site. As noted in Section 5.6.2.1, not all subsurface soil COPCs were evaluated for dermal exposures, and groundwater dermal and inhalation exposure pathways were only evaluated qualitatively. However, the inclusion of these exposure pathways into the risk calculations would not change the overall results for the HHRA. Additionally, the HHRA did not evaluate potential vapor intrusion of VOCs from groundwater to the indoor air of current buildings or future buildings at the site. Groundwater samples collected in 2016 and 2017 reveal PCE levels that are below the EPA Vapor Intrusion Screening Level (VISL) for groundwater (EPA 2016). TCE was non-detect in these groundwater samples. Therefore, the vapor intrusion exposure pathway would not be a potential concern for human health and would not change the overall conclusions of the HHRA. Currently, controls in place under the LUCIP and as part of the DD remedy for the 4300/4400 Area prevent groundwater use and eliminate current or potential future exposure pathways for groundwater.

Daily doses were developed as part of the HHRA, in accordance with the available guidance. More recently, EPA provided default exposure parameters for use in risk assessment in the *Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors* was released in 2014 (EPA 2014). A majority of the exposure parameters assumed in the EI are similar to the recent default exposure parameters set forth by EPA (EPA 2014). The one change in default exposure parameters that may result in changes to overall results is the difference assumed for default body weight. The EPA revised the default adult body weight from 70 kg to 80 kg. The increase in body weight results in lower overall cancer risks and non-cancer hazards. Because the current exposure pathways that were considered remain the most relevant, and no groundwater use is occurring or planned, an update to the risk assessment is not warranted.

5.6.2.3 Contaminants of Concern and Changes in Standards and To-Be-Considered Guidance

The DD identified the PQLs (1.0 µg/L) as the cleanup standards for PCE and TCE in groundwater. These PQLs have not changed since the DD. The PQLs for these VOCs are not risk-based but are equal to the NJDEP GWQSs for Class II groundwaters and are less than the EPA MCLs. Therefore, the PQLs are sufficiently protective to meet the RAOs for the 4300/4400 Area.

5.6.2.4 Changes in Toxicity and Other Contaminant Characteristics

Toxicity values for COPCs were reviewed in accordance with the EPA toxicity hierarchy (EPA 2003). The EPA IRIS is the Tier I source for toxicity information (EPA 2017a). IRIS and other tiered toxicity sources presented on the EPA Regional Screening Level table (EPA 2017b) were reviewed to determine if revisions had been made to the factors used to calculate risk in the Fort Dix EI report (ICF Kaiser 1997).

Table SS005B-2, showing updated toxicity values for the COPCs, was adapted from the EI report. This table lists the COPCs and the corresponding toxicity values (carcinogenic slope factors and reference doses) from both the report and the EPA's IRIS database in July 2017. An increase in the oral slope factor will have an effect on the calculated risk. In addition, a decrease in the oral reference dose will produce an increased HQ. Although the toxicity values for PCE and TCE have been updated since the establishment of the DD, these revisions do not affect the clean-up criteria for groundwater at the 4300/4400 Area because the PQLs are not risk-based values. It is noted that since completion of the EI report, EPA has identified TCE as a mutagenic compound, which indicates potential concerns for early life exposures to this analyte (EPA 2005). Recent groundwater sampling reveals TCE below a level of concern for the use of groundwater as a tap water source. Therefore, the identification of TCE as a mutagenic compound would not require a revised risk assessment.

Based on the changes in toxicity factors for the COPCs, the remedy is still considered protective at this time. A revised risk assessment is not required since use of groundwater at SS005B is restricted by a CEA.

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

There is no other information to call into question the protectiveness of the remedy.

5.6.4 Technical Assessment Summary

The review of documents, ARARs, risk assumptions, and results of the site inspection indicates that the remedy at Site SS005B is functioning as intended by the DD. PCE concentrations in groundwater exceed PQLs, but with an overall decreasing trend, and the CEA prevents exposure to groundwater. Surface water and sediment in South Run are not impacted by PCE remaining in groundwater.

Although risk assessment methodologies presented in EPA guidance have evolved since the EI was conducted for Site SS005B, the nature of the changes is such that an assessment using the updated methodology would not be expected to lead to identification of issues with the protectiveness of the remedy. No changes in exposure pathways were noted during the review period (2013–2017).

5.7 ISSUES, RECOMMENDATIONS, AND FOLLOW-UP ACTIONS AT SITE SS005B, 4300/4400 AREA

No issues that affect current or future protectiveness were identified. The following is a recommendation that addresses the effectiveness of the remedy but does not affect current protectiveness and was identified during the FYR:

- Low-level concentrations of PCE remaining in groundwater exceed applicable standards in some wells at Sites 1 and 3. Continued semiannual monitoring of chlorinated VOCs in groundwater at Sites 1 and 3 is recommended. Monitoring may be discontinued after at least two rounds of sampling indicate no exceedances of applicable standards.

5.8 PROTECTIVENESS STATEMENT FOR SITE SS005B, 4300/4400 AREA

Protectiveness Statement(s)	
Site: SS005B	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at Site SS005B is protective of human health and the environment.	

5.9 NEXT REVIEW

The next FYR for Site SS005B, the 4300/4400 Area, shall be submitted by May 2023.

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DIX AREA FIVE-YEAR REVIEW
JOINT BASE MCGUIRE-DIX-LAKEHURST, NEW JERSEY

FIGURE SS005B-1

SS005B SITE FEATURES

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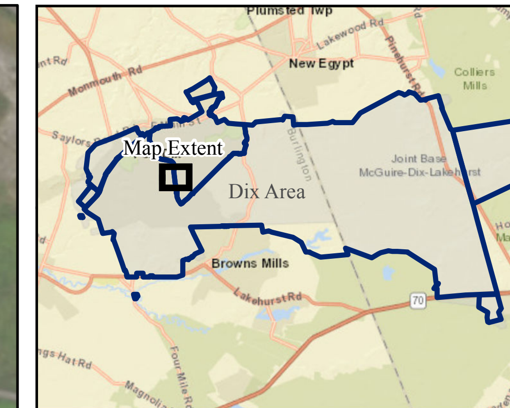
VICINITY MAP



Legend

- Monitoring Well
- Approximate Groundwater Flow Direction
- Road
- Approximate Area Boundary
- Installation Boundary
- Surface Water
- SS005B Site
- 100.00 Groundwater Elevation (Feet Above Mean Sea Level)

Notes:
Boundary areas based on Land Use Controls Implementation Plan, May 2013.
GIS Layers provided by JBMDL.

N

0 200 400 Feet

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FIGURE SS005B-2
Site SS005B Groundwater Elevations – September 2016
Dix Area Five-Year Review
Joint Base McGuire-Dix-Lakehurst, New Jersey

Document Path: \\lovetonfederal\GISData\Northeast\NewJersey\FortDix\FortDix 5YR\MXD\Figure SS005B-2 GW Elevations – September 2016.mxd

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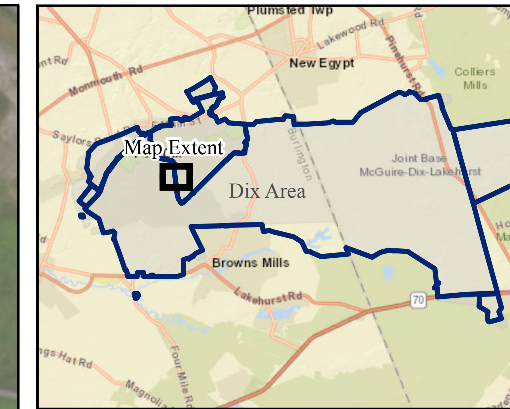
DIO-18S (groundwater)	Standard	Feb-13	Nov-13	May-14	Dec-14	Apr-15	Oct-15	Apr-16	Sep-16	Mar-17
Tetrachloroethene	1 µg/L	2.4	3.6	1.3	NE	3	1.3	ND	3.6	NE
Trichlorofluoromethane (Freon 11)	1 µg/L	1.2	NE	NE	NE	NE	ND	ND	ND	ND

DIO-29S (groundwater)	Standard	Feb-13	Nov-13	May-14	Dec-14	Apr-15	Oct-15	Apr-16	Sep-16	Mar-17
Chloroform	1 µg/L	NA	ND	ND	ND	ND	ND	NE	2.2	ND
Tetrachloroethene	1 µg/L	NE	1.6	NE	NE	NE	NE	NE	NE	NE

DIO-33S (groundwater)	Standard	Feb-13	Nov-13	May-14	Dec-14	Apr-15	Oct-15	Apr-16	Sep-16	Mar-17
Chloroform	1 µg/L	NA	ND	ND	5	2	NE	2.3	NE	ND
Tetrachloroethene	1 µg/L	2.6	1.9	ND	3	4	3.7	2.6	NE	1.3

Document Path: \\lovetonfederal\GISData\Northeast\NewJersey\FortDix\FortDix 5YR\MXD\Figure SS005B-3 GW Exceedances – 2013-2017.mxd

VICINITY MAP



Legend

- Sentinel Well
- Source Area Well
- Approximate Groundwater Flow Direction
- Road
- Approximate Area Boundary
- Installation Boundary
- Surface Water
- SS005B Site

Notes:
Only values exceeding the applicable standard are shown.
Exceedances are also shaded.
ND = Not Detected
NE = No Exceedance
Boundary areas based on Land Use Controls Implementation Plan, May 2013.
GIS Layers provided by JBMDL.

N

0 200 400 Feet

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FIGURE SS005B-3
Site SS005B Groundwater Exceedances – 2013-2017
Dix Area Five-Year Review
Joint Base McGuire-Dix-Lakehurst, New Jersey

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Table SS005B-1: Chronology of Events at Site SS005B

Event	Date
Preliminary Assessment/Site Investigation	1989
Environmental Investigation	1993-1997
Alternatives Analysis	1998
Alternatives Analysis Addendum	2001
Final Decision Document signed	26 June 2003
Multi-Site Groundwater Classification Exception Area approved	September 2003
Baseline Groundwater Sampling Event	May 2004
Final Remedial Action Work Plan	May 2004
Air Sparge/Soil Vapor Extraction remedial treatment systems operation	January – June 2005
Surface Water and Sediment Monitoring	July 2005 – March 2012
First Five-Year Review Completed	September 2013
Approval of No Further Action Equivalent for Site 2	September 2013
Long-Term Groundwater Monitoring	July 2005 – Present

Table SS005B-2: Toxicity Values for Carcinogenic and Non-Carcinogenic Constituents at Site SS005B

Chemical	Oral Slope Factor (mg/kg/day) (EI Report)	Oral Slope Factor (mg/kg/day) (2017)	Reference Dose (mg/kg-day) (EI Report)	Reference Dose (mg/kg/day) (2017)
Organics:				
Chloroform	6.1E-03 (groundwater)	3.1E-02	1E-02 (groundwater)	1E-02
1,2-Dichloroethene (total)	Not Applicable	Not Applicable	9E-03 (groundwater)	2E-03
Tetrachloroethene	5.2E-02 (groundwater, surface water)	2.1E-03	1E-02 (groundwater, surface water)	6E-03
Trichloroethene	1.1E-02 (groundwater)	4.6E-02	6E-03 (groundwater)	5E-04
Inorganics:				
Aluminum	Not Applicable	Not Applicable	1E+00 (soil)	1E+00
Arsenic	1.5E+00 (soil)	1.5E+00	3E-04 (soil)	3E-04
Iron	Not Applicable	Not Applicable	3E-01 (sediment, groundwater)	7E-01
Manganese	Not Applicable	Not Applicable	2E-02 (groundwater)	1.4E-01

Notes:
EI = Environmental Investigation
mg/kg/d = milligrams per kilogram per day

6. SITE SS007, MAG-1 AREA

6.1 SITE CHRONOLOGY

A timeline of major events at Site SS007, the MAG-1 Area, is presented in Table SS007-1. Tables and figures for Site SS007 are provided at the end of this Chapter.

6.2 BACKGROUND OF SITE SS007, MAG-1 AREA

6.2.1 Physical Characteristics

Site SS007, the Magazine Area 1 (known as the MAG-1 Area), is located in the northwestern portion of JB MDL (Figure 1). The site is located at the base of a topographic slope, over which surface elevations drop approximately 40-80 ft. Numerous intermittent streams, ponds, and wetlands are located at the base of this escarpment, and appear to represent local groundwater discharge zones. The MAG-1 Area is located near one such stream, which is referred to as the unnamed tributary (Figure SS007-1). The tributary flows through a low area known as the topographical depression and a wetland area, and eventually joins with other small streams to form Indian Run. The site is underlain by unconsolidated sand deposits of the Kirkwood Formation. Depth to groundwater is approximately 5-15 ft bgs, and groundwater flow is to the west-southwest (Figure SS007-2).

The area surrounding the site is primarily forested. The area east and directly west of the site is classified as forested upland, while north, south, and southwest of the site is forested wetland. The majority of land north, west, and south of the MAG-1 Area is undeveloped forest and open fields.

6.2.2 Land and Resource Use

The MAG-1 Area was the site of an ammunitions and weapons magazine storage area and a vapor-degreasing operation. Activities at the area began as early as 1917 and continued until approximately 1965. From approximately 1942 through 1965, vapor-degreasing of small arms was conducted at the MAG-1 Area. The site is currently used as a transfer station for recycled materials and as a storage area.

Approximately a quarter-mile northeast of the site is a golf course. East of the golf course is a developed portion of the JB MDL military installation, consisting of warehouses, offices, military housing, and other buildings.

6.2.3 History of Contamination

The vapor-degreasing operation used TCE to remove Cosmoline, a Vaseline-type petroleum product used for coating rifles. According to the Dames & Moore Phase II RI Report (Dames & Moore 1993), an employee at Fort Dix who participated in the degreasing operations reported that drums of TCE were used until saturated with Cosmoline. The drums of spent material were then transported to a rubble pile along the southern boundary of the MAG-1 Area, where the TCE/Cosmoline mixture was poured into holes in the rubble pile.

6.2.4 Initial Response

Investigations were conducted between 1986 and 1996. The results of these investigations and analyses are summarized below. No removal actions were undertaken prior to the DD.

6.2.5 Basis for Taking Action

Surface soil samples collected during site investigations did not contain significant concentrations of VOCs. PAHs were detected during 1996 investigations, and several inorganic compounds were identified at concentrations greater than Fort Dix background soil concentrations.

Subsurface soil sample analysis indicated detectable concentrations of TCE and its degradation product cis- and trans-1,2-DCE. Analysis of the results indicated that solvent contamination was concentrated in a zone approximately 15-30 ft bgs. Inorganic compounds were detected at concentrations exceeding the Fort Dix background soil concentrations; however, the compounds are not believed to be related to previous site operations.

Site investigation results indicated TCE, 1,2-DCE, and vinyl chloride in shallow groundwater. Data from 1988 to 1999 indicated a downward trend in TCE concentrations, with an increase of 1,2-DCE and vinyl chloride concentrations, suggesting continued biodegradation of TCE.

Risk assessments results, described in the RI Report (ABB 1997), did not indicate unacceptable human health risks associated with current exposure to MAG-1 Area soil, sediment, or surface water, except for some concern associated with benzo(a)pyrene in surface soil and manganese in subsurface soil. Human health concerns were also associated with residential exposure to site groundwater containing TCE, 1,2-DCE, vinyl chloride, iron, and arsenic. These risks are addressed by the RAOs for the site.

The ERA determined that the pesticides dichlorodiphenyldichloroethane (DDD), DDE, dichlorodiphenyltrichloroethane (DDT), and dieldrin, and the inorganics arsenic, chromium, iron, and lead, identified in site sediment might adversely affect aquatic plants and foraging species (e.g., the shrew). Exposure to surface soil or surface water did not pose an unacceptable risk to ecological receptors. The RAOs for the site address potential risks to ecological receptors from pesticides and metals in sediment.

6.3 REMEDIAL ACTIONS AT SITE SS007, MAG-1 AREA

6.3.1 Remedy Selection

The DD (Harding ESE, Inc. [Harding] 2002) describes the scope of the remedial action for soil, sediment, and groundwater. The selected remedy consisted of the following:

- Excavation of 134 cubic yards of surface soil exceeding the remedial goal and treatment of the soil in an offsite asphalt batching system.

- One sediment and surface water sampling event for toxicity testing.

- Injection of Hydrogen Release Compound (HRC™) into the saturated subsurface to stimulate rapid degradation of contaminants such as TCE.

- Natural attenuation of the portion of the groundwater plume not addressed through HRC™ injection.

- Monitoring of groundwater.

- Establishment of a CEA for groundwater and LUCs to limit residential development of the site.

The RAOs, including numerical remediation goals, presented in the DD are as follows:

- Protect potential commercial/industrial workers from exposure to MAG-1 Area surface soil with concentrations of benzo(a)pyrene exceeding 0.66 mg/kg.

- Protect potential human receptors from exposure to TCE, DCE, and vinyl chloride through potable water use of site groundwater at concentrations exceeding remedial goals (1, 2, and 2 µg/L, respectively).

- Protect potential ecological receptors from exposure to MAG-1 Area sediment with concentrations of pesticides that exceed established remedial goals (DDD [0.090 mg/kg], DDE [0.0077 mg/kg], DDT [0.0071 mg/kg], and dieldrin [0.0063 mg/kg]) and concentrations of inorganics that exceed established remedial goals (arsenic [8.2 mg/kg] and lead [46.7 mg/kg]).

The selected remedy for sediment at SS007 was a Limited Action Alternative, consisting of implementing environmental sampling and conducting one FYR. Environmental sampling would consist of collecting sediment and surface water samples for toxicity testing, with results used to evaluate whether there are adverse effects from inorganic or pesticide contamination in wetland sediment on aquatic organisms inhabiting the wetland. If the toxicity testing did not identify adverse effects, additional environmental sampling and a FYR would be the only future actions. If adverse effects from sediment contamination were predicted, contingency actions would focus on reduction of the contaminant concentration. The FYR would be conducted to evaluate whether this alternative is protective of human health and the environment, and whether additional remediation actions or site reviews are warranted.

To enhance biodegradation of contamination in groundwater and aquifer soil at the source area, the DD remedy included injection of HRC™ into the saturated subsurface. HRC™ is a carbon source used to stimulate rapid degradation of contaminants such as TCE. A lab-scale study was recommended to determine the presence and nature of microorganisms in site groundwater and soil capable of biodegradation of the contaminants. A pilot study was then conducted to ensure that the full-scale HRC™ injection design was optimized.

Based on the results of treatability studies conducted to determine the effectiveness of HRC™, bioaugmentation was added to the remedy in place of HRC™ injections, through an ESD (Shaw

2011). The bioaugmentation described in the ESD included use of SDC-9, active groundwater recirculation, and pH adjustment to establish conditions conducive to degradation of TCE.

6.3.2 Remedy Implementation

Excavation of PAH-contaminated surface soil was conducted in 2005 and 2010 at the areas specified in the DD. Post-excavation soil sampling results indicated no further action was required.

The results of sediment toxicity testing conducted during investigations in 1999 indicated that benthic invertebrates in sediments are unlikely to experience significant toxic effects from exposure to site-related contaminants (Harding 2001a). Therefore, no contingency actions are required. Sediment sampling was conducted in 2013 at the same locations as the previous sampling conducted in 1999. The number of exceedances recorded in 2013 was similar to the number recorded in 1999, with compounds exceeding remedial goals for DDE, DDT, arsenic, and lead. The 1999 and 2013 sediment sampling results were reviewed as part of the first FYR for Site SS007, completed in 2013, and the FYR concluded that based on the finding of no adverse ecological effects, no further action is required for sediment.

Groundwater remediation via bioaugmentation operated from October 2011 through September 2015, using an extraction-injection system for the mixing and injection of lactate, nutrients, and buffering solution. The stated remedial goal was to reduce TCE concentrations to less than 500 µg/L in identified "hotspot" areas. Amendments were injected in areas of highest contaminant concentrations in two areas designated as the Kirkwood and Manasquan Treatment Areas. The system created reducing conditions in the aquifer, and promoted degradation of TCE to cis-1,2-DCE. However, significant degradation of cis-1,2-DCE did not appear to be occurring, and reduced injection rates were observed, possibly due to the air lock of the formation by carbon dioxide gas. Therefore, a 1-year MNA evaluation began at the site in 2015. Based on 1 year of monitoring results, the MNA evaluation concluded that chlorinated VOC concentrations remained generally stable or decreasing, with high rates of biological activity continuing in source area wells. Therefore, continued MNA was recommended in 2016 as the path forward for Site SS007, with an estimated timeframe of 30 years (2045) to achieve cleanup goals. A contingency action such as groundwater recirculation with ex situ treatment was suggested if MNA does not achieve cleanup goals in an acceptable timeframe (Arcadis 2016c). At a meeting with NJDEP on 6 February 2018, a proposed path forward was discussed, including installation of a directed groundwater recirculation system that would treat water ex situ and reinject treated water.

The MAG-1 Area site was included in a multi-site CEA approved in September 2003 (Shaw 2003), and subsequently in the Dix Area Sitewide CEA (NJDEP 2014). In addition to the CEA, the LUCIP includes restrictions on the following uses for Site SS007: surface disturbance, subsurface disturbance, and residential use. LTM of site groundwater will begin after the active remedial action for groundwater is complete. The current remedial monitoring program is described further in Section 6.4.1.

6.3.3 Systems Operation and Maintenance

O&M of the remedy currently consists of monitoring to support MNA and in accordance with the CEA. Prior to September 2015, O&M at Site SS007 also included operation of the bioaugmentation groundwater treatment system and performance monitoring. Management and reporting for this site is completed annually in accordance with the Dix Area Basewide Inspection, Maintenance, and Monitoring Plan (Plexus Scientific 2014) and biennially through CEA documentation.

6.4 PROGRESS SINCE THE LAST REVIEW AT SITE SS007, MAG-1 AREA

The first FYR for Site SS007 was submitted on 30 September 2013 (CB&I 2013c). The 2013 FYR protectiveness statement for SS007 was as follows: "The remedial actions at the MAG-1 are protective of human health and the environment. Continued implementation of the groundwater remedial action will ensure the long-term protectiveness of the remedy. Currently, the COCs outlined in the Decision Document have not migrated beyond the site boundary and the remedy is considered to be functioning as required."

No issues were identified in the previous FYR that may impact the current protectiveness of the remedy in place. Issues and recommendations identified in the 2013 FYR that do not affect protectiveness, and the follow-up actions taken, are summarized below:

Remedy Component	Issue/Recommendation from the 2013 FYR (not affecting protectiveness)	Completed?	Action Taken
Groundwater Treatment	Groundwater contamination remains at the site at concentrations above remedial standards, although the groundwater treatment system has been effective at reducing concentrations. Continued groundwater remediation with optimization is recommended. Recommendations for optimization, presented in the Remedial Action Report and referenced in the FYR, included pulsed operation of the treatment system, quarterly performance monitoring, evaluation of the need for injection of additional microbes, focusing treatment including reinjection in hotspots, pH adjustment, monitoring and modeling in support of the CEA, and discontinuation of treatment in the Manasquan Zone unless downgradient concentrations indicate significant upward trends.	Yes	Pulsed system operations (2 weeks every 2 months) and injections focused on two identified hotspots were implemented as of Spring 2014. Quarterly performance monitoring was conducted during operation of the treatment system, and eleven downgradient groundwater monitoring wells were sampled in Spring 2014 to assess conditions outside the treatment areas. Injections in portions of the Manasquan area with low concentrations were discontinued as of 2015. Although pH in portions of the Manasquan Zone near the MAG-66 hotspot remained elevated above 8, no action to lower the pH was documented. The bioaugmentation system was shut off in September 2015 for the MNA evaluation.

Additional details on monitoring performed during the review period, in accordance with the recommendations from the last FYR, are provided in the sections below. Details on the MNA evaluation that began in 2015 are provided in Section 6.3.2.

6.4.1 Groundwater Monitoring

The following monitoring activities were completed at SS007 during the FYR period:

- Fifteen performance and CEA monitoring events were conducted at SS007 during the review period, between February 2013 and May 2017.

- The number of monitoring wells sampled for groundwater during each monitoring event varied between 4 and 25 prior to Fall 2015, and then 10 wells were sampled during each event from Fall 2015 to Spring 2017. Samples collected during each event were analyzed for VOCs and some or all of the following biodegradation monitoring parameters: pH, oxidation-reduction potential, total organic carbon, volatile fatty acids, iron, and dissolved ethene. The monitoring wells sampled during each monitoring event are indicated in the data tables in Appendix A.

- The 10 wells sampled from Fall 2015 to Spring 2017 are shown on Figure SS007-3 and include 3 shallow wells in the source area (MAG-107A, MAG-04, and MAG-66), 1 intermediate well in the source area (MAG-112P), 2 shallow wells in the plume area (MAG-KW6 and MAG-65), 1 intermediate well in the plume area (MAG-204), 1 shallow sentinel well (MAG-204), and 2 intermediate sentinel wells (MAG-104B and MAG-207). Wells sampled during previous events during the review period, but not recently, include MAG-IF4, MAG-KW4, MAG-KW5, MAG-111P, MAG-113P, and MAG-70. These wells are located within the area of currently contaminated groundwater (Figure SS007-1).

6.5 FIVE-YEAR REVIEW PROCESS FOR SITE SS007, MAG-1 AREA

6.5.1 Administrative Components

The FYR was prepared by JB MDL, in consultation with NJDEP. The team included Curtis Frye (JB MDL Remediation Program Manager), Nicole Brestle (Remediation Project Manager, Dix Area), and Haiyesh Shah (NJDEP Case Manager). This is a federal facility-lead site.

6.5.2 Community Involvement

Public notice of the beginning of the FYR process was published for 3 days in the *Asbury Park Press* (26-28 May 2017) and the *Burlington County Times* (25, 26, and 28 May 2017). The FYR was also discussed at the RAB meeting on 19 July 2017. Annual community planners meetings, including DOD representatives and contractors, are held each fall to review the JB MDL LUCIP and discuss upcoming projects at the base potentially impacted by the established LUCs. Any FYR findings that impact base planning with respect to LUCs would be addressed during these meetings, as required. No public comments were received in association with the FYR. A comment received from NJDEP regarding SS007 and associated response are included in Appendix B.

Once the FYR is completed, additional public notices will be published, the RAB mailing lists will be notified, and the results will be made available at the local site repositories, which are at the Burlington County Library (5 Pioneer Boulevard, Westhampton, New Jersey) and online at http://afcec.publicadmin-record.us.af.mil/. In addition, efforts will be made to reach out to local public officials to inform them of the results.

6.5.3 Document Review

This FYR consisted of a review of relevant documents, including the RODs/DDs, Biennial Certification Reports for the groundwater CEA, the LUCIP for JB MDL, annual IMMRs, landfill inspection reports, and remedial action reports. The documents, data, and information that were reviewed in completing this FYR are summarized in Appendix C.

6.5.4 Data Review

Groundwater monitoring is conducted at the MAG-1 Area for performance monitoring and to support CEA documentation. Data for 15 monitoring events (February 2013 through May 2017) were available from the period of review for this FYR report. Results from these monitoring events are included in tabular format in Appendix A, and concentration versus time charts are provided in Appendix D. The monitoring results and trends are briefly described below.

Groundwater

Groundwater samples were collected from up to 25 monitoring wells during each monitoring event and analyzed for VOCs. As described in Section 6.4.1, the 10 wells currently included in the monitoring program include source area, plume, and sentinel wells.

The data from the FYR period were compared to site screening criteria for groundwater, as shown in Appendix A. For most analytes, the applicable criteria for shallow groundwater are the New Jersey PQLs. In cases of analytes for which the DD included specific criteria, the DD criteria are used to screen shallow groundwater data unless they are more than 10 times greater than the current PQL (in accordance with the “10x rule”). Results from shallow sentinel wells are screened against the PQLs, as the 10x rule is not applicable for sentinel wells. For the intermediate-depth wells screened in the Vincentown (also known as Manasquan) Formation, the PQLs and ROD criteria do not apply. Applicable screening criteria for these intermediate wells are the New Jersey GWQSs for Class II groundwater.

Chlorinated VOCs (TCE, DCE, and vinyl chloride) are the primary site-related contaminants. These three VOCs were detected in groundwater at concentrations exceeding the PQLs in February and May 2017, as well as during previous monitoring events during the review period. Other VOCs (e.g., 2-butanone, acetone, MTBE) have also been detected at low concentrations exceeding applicable standards but are not considered primary site-related contaminants. VOCs detected at concentrations exceeding the applicable standards in February and May 2017, and the approximate extents of TCE and cis-1,2-DCE exceeding applicable standards, are shown on Figure SS007-3. TCE concentrations exceeding the applicable criteria were reported in sentinel well MAG-207 in both February and May 2017; no TCE exceedances were reported in this well during previous sampling events in the review period. Additionally, the extent of TCE exceeding a concentration of 1 µg/L is not delineated by the wells sampled in 2017, as no wells with concentrations below applicable standards are currently included in the monitoring program to delineate the northwest, south, or east sides of the plume.

Generally, while the bioaugmentation system remained in operation, TCE concentrations decreased while concentrations of daughter compounds cis-1,2-DCE and vinyl chloride increased within the plume area, as described in Section 6.3.2. Concentrations appeared generally stable or decreasing during late 2015-late 2016, the first year of the MNA evaluation, leading to a recommendation of MNA as the path forward for Site SS007. However, data from late 2016 and 2017 suggest that TCE concentrations may be rebounding, while DCE and vinyl chloride concentrations also continue to increase (Appendix D).

6.5.5 Site Inspection

A site inspection at SS007 was conducted by EA, JB MDL, and NJDEP personnel on 25 and 26 July 2017. No issues were identified during the site inspection (Appendix E). However, issues with VOC exceedances of applicable standards in the sentinel wells and possible rebound in VOC concentrations during recent groundwater monitoring events were discussed during the inspection (see Section 6.5.4). Additionally, site maintenance including restoration of access roads will likely be required if additional treatment is to be implemented at the site.

6.5.6 Interviews

During the FYR process, interviews were conducted with stakeholders, including representatives from the regulatory agencies overseeing the remedies at the Dix Area and community representatives aware of the remedial activities. The purpose of the interviews was to document any perceived problems or successes with the remedies that have been implemented to date. Interviews were conducted in August 2017. Detailed interview records are included in Appendix E.

Haiyesh Shah, NJDEP Case Manager, stated that there is uncertainty regarding the remedy at the MAG-1 Area, specifically with regards to the acceptability of MNA or bioaugmentation at the site. He also indicated concerns regarding the environmental monitoring program, particularly with respect to sentinel wells containing contaminants at concentrations exceeding standards.

Branwen Ellis, Environmental Specialist at the New Jersey Pinelands Commission; Matthew Czik, Assistant Public Health Coordinator for Ocean County and RAB member; and Robin Sutton, Environmental Health Coordinator for Burlington County did not indicate any concerns regarding the remedies or communication channels. Joseph Rhyner, Chief of the Environmental Element at JB MDL also did not indicate any concerns.

Michael Tamn, the RAB Community Co-Chair, and Tom Besselman and Frank Storm, RAB members, indicated that they feel well informed about the remedial activities and progress at the Dix Area. However, Mr. Tamn has concerns regarding the bioaugmentation remedy at the MAG-1 Area, and expansion of groundwater contamination farther downgradient.

Tim Llewellyn of Arcadis indicated that the MNA sampling program at Site SS007 will continue through 2017 and then statistical analysis will be performed and the MNA program will be modified as necessary. He also indicated that a new sentinel well downgradient of well MAG-207 has been added to the monitoring program for SS007.

6.5.7 Institutional Controls Verification

Institutional controls required for this site are listed in Section 6.3, and described further in Section 6.3.2. Required institutional controls, including the Dix Area Sitewide CEA (described in Section 2.3.2) and other LUCs, are in place and documented in the LUCIP for JB MDL. The most recent Biennial Certification Monitoring Report for the Dix Area Sitewide CEA was submitted to NJDEP on 5 April 2016, and a new biennial report is in preparation for submittal as of April 2018. LUC documentation is updated annually.

6.6 TECHNICAL ASSESSMENT AT SITE SS007, MAG-1 AREA

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

A review of site documentation, including results from annual groundwater monitoring as well as the findings of the site inspection conducted in July 2017 in association with this FYR, indicate that the remedy at the MAG-1 Area is generally functioning as intended by the DD and ESD. Soil excavation removed the PAH-contaminated soil, and sediment sampling identified no adverse ecological effects; no further action is required for these media. However, the groundwater remedy is currently undergoing re-evaluation, and may require additional testing and/or design to ensure that the remedy continues to function as intended.

While groundwater remediation using bioaugmentation was active, from October 2011 through September 2015, TCE concentrations decreased while concentrations of daughter products cis-1,2-DCE and vinyl chloride increased. However, because significant degradation of cis-1,2-DCE did not appear to be occurring and reduced injection rates were observed, the bioaugmentation system was shut off and an MNA evaluation was initiated in 2015. Although the first year of monitoring during the evaluation indicated stable or decreasing concentrations, recent data indicate that concentrations may be rebounding, as well as TCE concentrations exceeding applicable criteria in a sentinel well. These observations indicate potential issues with the functioning of the remedy, relative to the intent of the DD and ESD. An alternative remedy, such as the proposed groundwater recirculation system, has been discussed (see Section 6.3.2).

The results of a pore flushing model completed using VOC concentrations reported at SS007 in 2016 reportedly suggested that all wells onsite would achieve cleanup goals within approximately 30 years, which is comparable to the timeframe established in the DD (Arcadis 2016c). However, the apparent rebound in TCE concentrations evident in data from late 2016 and 2017 may necessitate an adjustment of this projected timeframe.

The remedy implemented at Site SS007 has thus far been effective at controlling the risk to receptors. The CEA minimizes human exposure to potentially contaminated groundwater, and post-excavation soil results as well as sediment sampling results indicate that no concerns remain related to human and ecological contact with these media. However, TCE concentrations that have recently increased to exceed applicable criteria in groundwater from the farthest downgradient sentinel well (MAG-207) indicate a potential issue with future protectiveness.

6.6.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy still valid?

6.6.2.1 Changes in Risk Assessment Methodologies

There have been no major changes in HHRA or ERA methodology since the signing of the DD that would impact the protectiveness of the SS007 – MAG-1 Area remedy.

The RI for the MAG-1 Area (ABB 1997) included human health and ecological risk assessments. The primary documents used to conduct the HHRA included the following EPA guidance documents: *RAGS Volume I: Human Health Manual (Part A)* (EPA 1989a); *RAGS Volume I: Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors* (EPA 1991a); *RAGS Volume I: Human Health Manual, Part B Development of Risk-Based Preliminary Remediation Goals* (EPA 1991c); *Guidelines for Exposure Assessment* (EPA 1992a); *Supplemental Guidance to RAGS: Calculating the Concentration Term* (EPA 1992b); and *Dermal Exposure Assessment: Principles and Applications* (EPA 1992c). Potential human health concerns were found to be associated with exposure to surface soil and groundwater. The methodologies outlined in the guidance documents used have not been updated or changed, with the following exceptions.

In September 2011, EPA released a new version of the *Exposure Factors Handbook* (EPA 2011). This handbook provides a summary of the available statistical data on various factors used in assessing human exposure (e.g., drinking water consumption). The updates to the final document do not impact the risk assessment methodologies that were implemented in the HHRA summarized in the DD. Therefore, an update to the risk assessment is not warranted.

Additionally, EPA released two risk assessment guidance documents for the assessment of dermal and inhalation exposures since the completion of the EI (ICF Kaiser 1997). The *RAGS, Volume I: Human Health Manual, Part E, Supplemental Guidance for Dermal Risk Assessment)* (EPA 2004) and *Part F, Supplemental Guidance for Inhalation Risk Assessment* (EPA 2009) present risk assessment methodology for the assessment of dermal and inhalation exposures. The dermal pathways for exposure to soil, surface water, sediment, and groundwater at SS007 were evaluated in the RI, and the inhalation pathway for exposure to soil and groundwater was also considered. The publication of these guidance documents does not affect the protectiveness of the remedy for SS007.

The ERA included in the RI (ABB 1997) was based on the *RAGS – Volume II Environmental Evaluation Manual* (EPA 1989c), *Framework for Ecological Risk Assessment* (EPA 1992d), and ECO Updates (EPA 1991b,d and 1992e,f,g). The ERA compared toxicity reference values to exposure point concentrations and to modeled doses to wildlife. As stated in the DD, the selected remedy included a Limited Action Alternative for sediment, consisting of one round of sediment and surface water monitoring and toxicity testing, which indicated that ecological receptors are unlikely to experience toxic effects from exposure to site-related contaminants (Harding 2001a). In 1997, EPA published *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA 1997a), followed by the more generic *Guidelines for Ecological Risk Assessment* (EPA 1998). These later guidance documents were based on the framework cited above (EPA 1992d), and the ecological risk process is the same in all of these guidance documents. Although risk assessment methodologies presented in EPA guidance have evolved since the RI and DD were completed for SS007, the changes and constituent concentrations reported in sediment sampled in 2013 are such that an ERA using the updated methodology would not be expected to lead to identification of issues with the protectiveness of the remedy.

6.6.2.2 Changes in Exposure Pathways

There have been no changes in physical conditions or land use at the site that would result in the development of new exposure pathways to human or ecological receptors. Additionally, no newly identified contaminants, contaminant sources, or toxic byproducts of the remedy were identified during the FYR process.

The HHRA conducted as part of the RI considered the following human health exposure pathways for the MAG-1 Area, based on use of the site by workers and visiting soldiers, and use of the adjacent stream by hunters or residents: incidental ingestion of and dermal contact with soils, inhalation of vapors or dust in ambient air, and dermal contact with or incidental ingestion of surface water and sediment in the stream. Possible future residential use of groundwater from the Kirkwood-Cohansey aquifer was also considered. The HHRA did not evaluate potential vapor intrusion of VOCs from groundwater to the indoor air of current buildings or future buildings at the site. Groundwater samples collected in 2016 and 2017 revealed TCE and vinyl chloride levels exceeding the EPA VISL for groundwater (EPA 2016). However, no occupied buildings are located above the groundwater plume. Exposure pathways determined to be associated with potential risk, which were addressed in the DD, included human exposures to surface soil and groundwater, as well as ecological exposures to sediment. Soil removal actions were completed in February 2005 and August 2010 to address PAH contamination in surface soil. Therefore, potential exposure pathways via surface soil are no longer complete. Controls in place under the LUCIP and as part of the DD remedy for the MAG-1 Area prevent groundwater use and residential land use, and also restrict soil disturbance. As a result, the vapor intrusion exposure pathway is not a current concern for human health.

Daily doses were developed as part of the HHRA, in accordance with the available guidance. More recently, EPA provided default exposure parameters for use in risk assessment in the *Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors* was released in 2014 (EPA 2014). A majority of the exposure parameters assumed in the HHRA included in the RI are similar to the recent default exposure parameters set forth by EPA (EPA 2014). The one change in default exposure parameters that may result in changes to overall results is the difference assumed for default body weight. The EPA revised the default adult body weight from 70 kg to 80 kg. The increase in body weight results in lower overall cancer risks and non-cancer hazards. Use of these updated default exposure parameters are not expected to change the overall results determined for the MAG-1 Area, for either the current or hypothetical exposure pathways considered. Because the current exposure pathways that were considered remain the most relevant, and no groundwater use is occurring or planned, an update to the risk assessment is not warranted.

6.6.2.3 Contaminants of Concern and Changes in Standards and To-Be-Considered Guidance

No applicable ARARs for Site SS007 were found to have changed since the previous review period, although some have changed since the DD was finalized, as discussed below.

Remedial goals listed in the DD for soil at the MAG-1 Area were determined by comparing the NJDEP non-residential direct contact SCC (NJDEP 1994) and Fort Dix background soil concentrations (ABB 1996). The remedial goal for benzo(a)pyrene was determined to be 0.66 mg/kg, which was the NJDEP non-residential direct contact SCC when the DD (Harding 2002) was finalized. NJDEP replaced the SCC with a non-residential direct contact SRS (0.2 mg/kg) for benzo(a)pyrene in 2008, after the completion of the original soil removal action at the MAG-1 Area, and then issued an updated non-residential direct contact SRS (2 mg/kg) in 2017. Because the current (2017) ARAR (2 mg/kg) is greater than the remedial goal included in the DD for benzo(a)pyrene (0.66 mg/kg), the original remedial goal for benzo(a)pyrene is retained to determine compliance. Remedial goals for PAHs other than benzo(a)pyrene were not specified in the DD. The higher of the New Jersey non-residential direct contact SCCs and SRSs were used to determine compliance for PAHs other than benzo(a)pyrene. The SRSs for other PAHs remained unchanged or were increased in 2017. Therefore, the soil excavation remedy remains protective.

The groundwater ARARs listed in the DD include EPA MCLs and NJDEP Class I (Pinelands) Standards (PQLs). The remedial goals for groundwater at Site SS007 were defined in the DD as the lower of the PQLs or MCLs, or the background levels where higher. The remedial goals for groundwater COCs, as presented in the DD (Harding 2002), were determined to be the following:

- 1,2-DCE – 2 μg/L (PQL)
- TCE – 1 μg/L (PQL)
- Vinyl chloride – 2 μg/L (MCL)
- Arsenic – 8 μg/L (PQL)
- Iron – 8,600 μg/L (background).

The PQLs have been updated since the DD was issued and are contained in N.J.A.C 7:9C (last amended 22 July 2010; readopted without change 4 March 2014), and Dix Area background groundwater concentrations were also updated in 2012 (EA 2012a). Technically, the PQLs apply to groundwater in the Kirkwood Formation at Site SS007, but not groundwater in the Vincentown (Manasquan) Formation, which has been designated as a Class IIA aquifer (Arcadis 2017). The PQL for TCE (1 μg/L) has not changed, and remains the lowest ARAR. Although the MCL for vinyl chloride (2 μg/L) has not changed, the PQL (1 μg/L) is now less than the MCL (the PQL was previously 5 μg/L). The PQL for 1,2-DCE has also decreased from 2 μg/L to 1 μg/L, and the PQL for arsenic has decreased from 8 μg/L to 3 μg/L. Because the differences between the original ARARs and the revised ARARs are less than an order of magnitude, the original remedial goals for these organic groundwater COCs are still considered appropriate to determine compliance. For iron, a background value is no longer available; rather, iron background is evaluated by examining the ratio between iron and aluminum. Therefore, there is no specific value for screening iron results from groundwater monitoring.

Sediment remedial goals were developed in the DD based on the NJDEP non-residential direct contact SCCs, where available, and the Fort Dix background sediment concentrations (ABB 1996) for each constituent. The NJDEP *Guidance for Sediment Quality Evaluations* (NJDEP 1998) was also referenced in the DD; however, sediment quality criteria were not included in the table of remedial goals. For pesticides, no SCCs were available, and background values were used as the remedial goals:

- DDD – 0.09 mg/kg
- DDE – 0.0077 mg/kg
- DDT – 0.0071 mg/kg
- Dieldrin – 0.0063 mg/kg.

The DD also specified remedial goals for metals, the majority of which (except for arsenic and lead) were also based on background values. The background values remain the most appropriate remedial goals for these pesticides and metals. The remedial goals designated in the DD for arsenic (8.2 mg/kg) and for lead (46.7 mg/kg) were based on the SCCs. These remedial goals are within an order of magnitude of the current freshwater New Jersey Ecological Screening Criteria LELs for arsenic (6 mg/kg) and lead (31 mg/kg) in sediment; therefore, the original remedial goals for these sediment constituents are still considered appropriate to determine compliance.

No applicable ARARs were found to have changed since the previous review period.

6.6.2.4 Changes in Toxicity and Other Contaminant Characteristics

Toxicity values for constituents evaluated in the RI (ABB 1997) were reviewed in accordance with the EPA toxicity hierarchy (EPA 2003). The EPA IRIS is the Tier I source for toxicity information (EPA 2017a). IRIS and other tiered toxicity sources presented on the EPA Regional Screening Level table (EPA 2017b) were reviewed to determine if revisions had been made to the factors used to calculate risk in the RI.

Tables SS007-2 and -3, showing non-carcinogenic and carcinogenic COPCs, were adapted from the RI (ABB 1997). These tables list the COPCs and the corresponding toxicity values (carcinogenic slope factors and reference doses) from both the RI and the EPA's IRIS database in July 2017. An increase in the oral slope factor will have an effect on the calculated risk. In addition, a decrease in the oral reference dose will produce an increased HQ. Changes in toxicity information are noted below to demonstrate that the values have not changed significantly since the analyses were initially conducted in the mid-1990s. A revised toxicity assessment resulted in a change of less than an order of magnitude in the soil ARAR for benzo(a)pyrene, as described above. Although the toxicity values for PCE and TCE have been updated since the establishment of the DD, these revisions do not affect the clean-up criteria for groundwater at the MAG-1 Area, because the PQLs are not risk-based values.

It is noted that since the completion of the RI report, EPA has identified TCE and the carcinogenic PAHs (i.e., benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, and indeno(1,2,3-cd)pyrene) as mutagenic compounds, which indicates potential concerns for early life exposures to these analytes (EPA 2005). The carcinogenic PAHs were identified in soil, and a removal action removed the potential concern for soil. The HHRA determined a potential risk concern for residential contact with groundwater as a tap water source. Therefore, the identification of TCE as a mutagenic compound would not change the overall conclusions of the HHRA and would not require a revised risk assessment.

Based on the changes in toxicity factors for the COPCs, the remedy is still considered protective at this time. A revised risk assessment is not required since contact with soil and the use of groundwater at SS007 is restricted by LUCs, including a CEA.

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

There is no other information to call into question the protectiveness of the remedy.

6.6.4 Technical Assessment Summary

The review of documents, ARARs, risk assumptions, and results of the site inspection indicates that the remedy at Site SS007 is generally functioning as intended by the DD and ESD. However, the groundwater remedy is currently undergoing re-evaluation, and may require additional testing and/or design to ensure that the remedy continues to function as intended. Recent data, collected while no active treatment was occurring to allow evaluation of MNA, suggest a potential rebound in VOC concentrations in groundwater. This suggests that the proposed path forward of MNA, with its previously estimated timeframe to achieve RAOs in 30 years, may not function in accordance with the intention of the DD and ESD. An alternative remedy, such as the proposed groundwater recirculation system, has been discussed (see Section 6.3.2). Additionally, exceedances in a sentinel well and poor delineation of the TCE plume in groundwater indicate that the groundwater monitoring network is not providing the needed data to confirm the protectiveness of the remedy.

Although risk assessment methodologies presented in EPA guidance have evolved since the RI was conducted for Site SS007, the nature of the changes is such that an assessment using the updated methodology would not be expected to lead to identification of issues with the protectiveness of the remedy. No changes in exposure pathways were noted during the review period (2013–2017).

6.7 ISSUES, RECOMMENDATIONS, AND FOLLOW-UP ACTIONS AT SS007, MAG-1 AREA

Site: *SS007*	**Issue Category: Monitoring**			
	Issue: Concentrations exceeding applicable standards have recently been reported in the most downgradient sentinel well, and the extent of the TCE plume associated with the site is not well defined.			
	Recommendation: The monitoring network should be evaluated to ensure that it includes sentinel wells meeting NJDEP requirements to confirm future protectiveness and to provide better delineation of the site-related groundwater plume.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Federal Facility	State	12/31/2018

The following is an additional recommendation that would improve the effectiveness of the remedy but does not affect current or future protectiveness and was identified during the five-year review:

- Additional assessment of the remedy path forward for groundwater treatment should be conducted. MNA is being evaluated as a potential remedy for impacted groundwater at the site, with monitoring to assess long-term concentration trends. Recent monitoring data suggest that TCE concentrations in groundwater during the MNA evaluation have rebounded relative to concentrations measured during bioaugmentation. MNA or an alternative remedy, such as the proposed groundwater recirculation with ex situ treatment, should be implemented through an ESD or ROD Amendment if necessary to achieve cleanup goals in an acceptable timeframe.

This recommended action should be completed within the next 5 years, before the next FYR is submitted.

6.8 PROTECTIVENESS STATEMENT FOR SITE SS007, MAG-1 AREA

Protectiveness Statement(s)	
Site: SS007	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at Site SS007 is protective of human health and the environment.	

6.9 NEXT REVIEW

The next FYR for Site SS007, the MAG-1 Area shall be submitted by May 2023.

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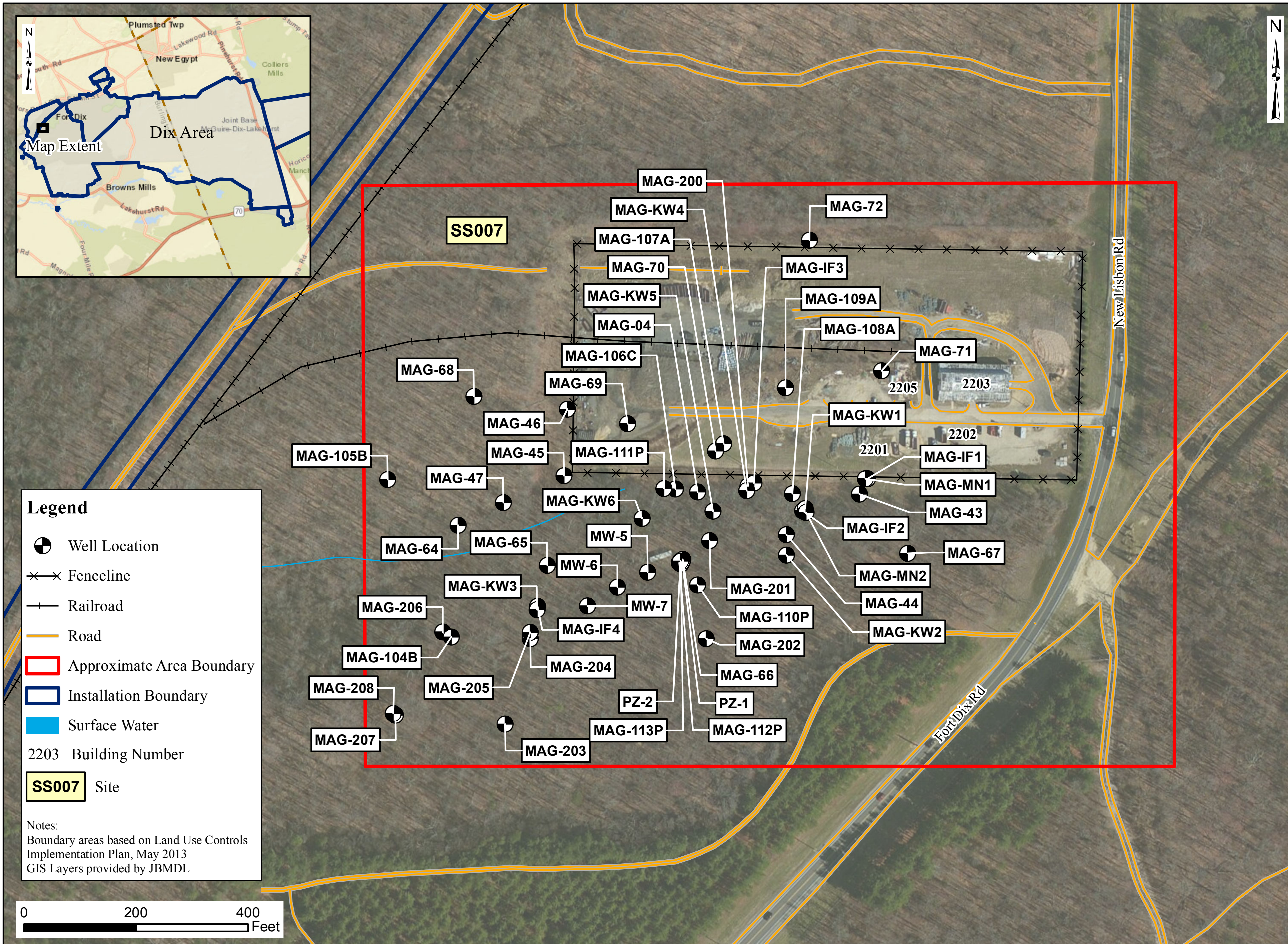

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DIX AREA FIVE-YEAR REVIEW
JOINT BASE MCGUIRE-DIX-LAKEHURST, NEW JERSEY

FIGURE SS007-1

SS007 SITE FEATURES

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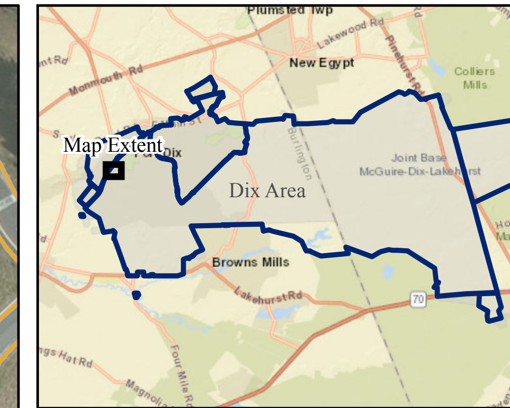
VICINITY MAP



Legend

- Monitoring Well
- Approximate Groundwater Flow Direction
- Groundwater Elevation Contour
- Fenceline
- Railroad
- Road
- Approximate Area Boundary
- Installation Boundary
- Surface Water
- SS007 Site
- 100.00 Groundwater Elevation (Feet Above Mean Sea Level)

Notes:
Boundary areas based on Land Use Controls Implementation Plan, May 2013.
GIS Layers provided by JBMDL.

N

0 200 400 Feet

EA Engineering, Science, and Technology, Inc., PBC

FIGURE SS007-2
Site SS007 Groundwater Contours – November 2016
Dix Area Five-Year Review
Joint Base McGuire-Dix-Lakehurst, New Jersey

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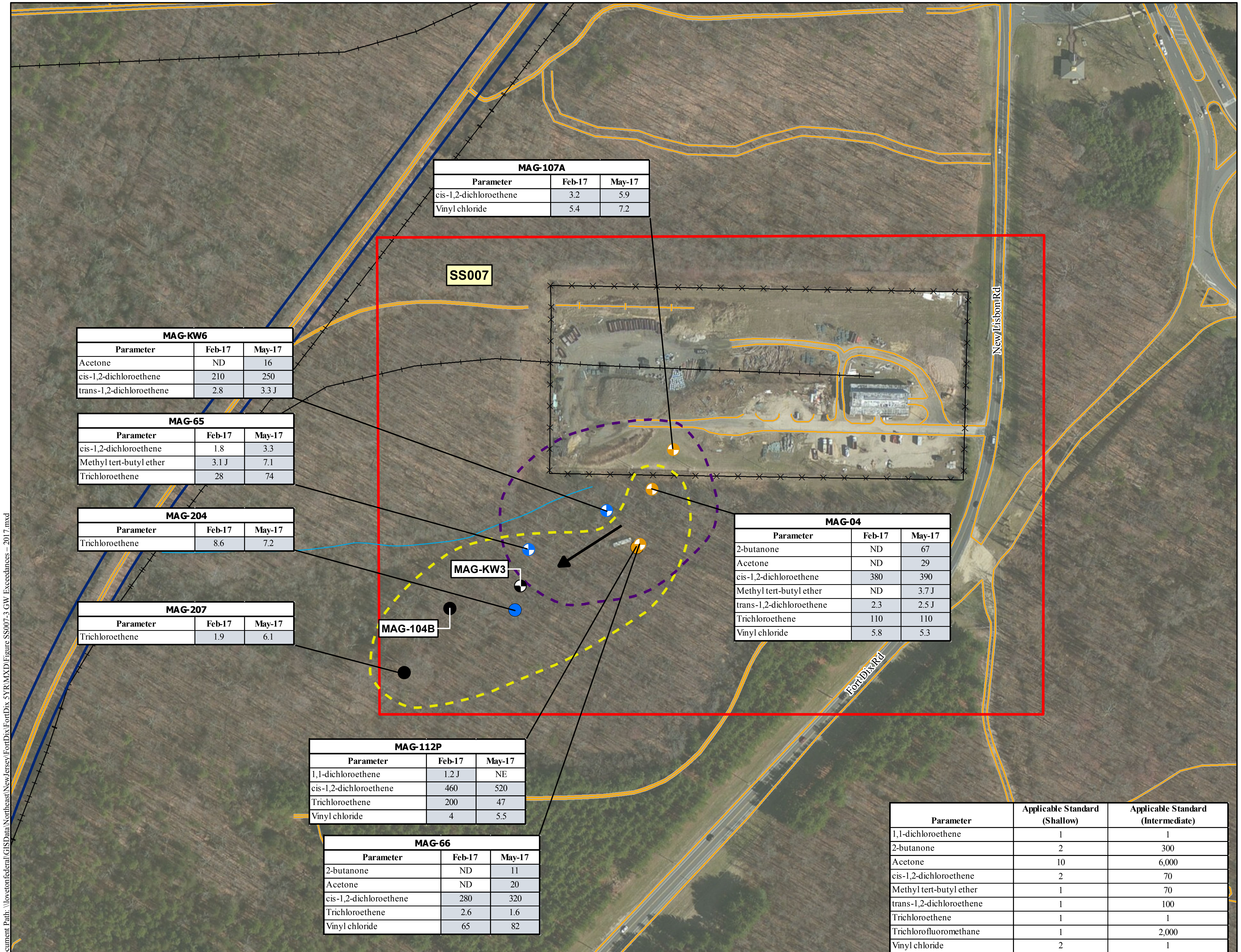


MAG-107A

Parameter	Feb-17	May-17
cis-1,2-dichloroethene	3.2	5.9
Vinyl chloride	5.4	7.2

MAG-KW6

Parameter	Feb-17	May-17
Acetone	ND	16
cis-1,2-dichloroethene	210	250
trans-1,2-dichloroethene	2.8	3.3 J

MAG-65

Parameter	Feb-17	May-17
cis-1,2-dichloroethene	1.8	3.3
Methyl tert-butyl ether	3.1 J	7.1
Trichloroethene	28	74

MAG-204

Parameter	Feb-17	May-17
Trichloroethene	8.6	7.2

MAG-207

Parameter	Feb-17	May-17
Trichloroethene	1.9	6.1

MAG-04

Parameter	Feb-17	May-17
2-butanone	ND	67
Acetone	ND	29
cis-1,2-dichloroethene	380	390
Methyl tert-butyl ether	ND	3.7 J
trans-1,2-dichloroethene	2.3	2.5 J
Trichloroethene	110	110
Vinyl chloride	5.8	5.3

MAG-112P

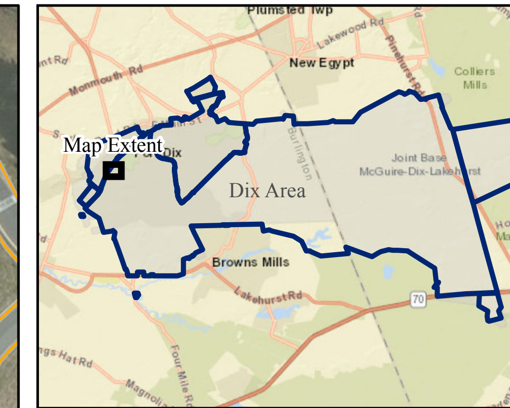
Parameter	Feb-17	May-17
1,1-dichloroethene	1.2 J	NE
cis-1,2-dichloroethene	460	520
Trichloroethene	200	47
Vinyl chloride	4	5.5

MAG-66

Parameter	Feb-17	May-17
2-butanone	ND	11
Acetone	ND	20
cis-1,2-dichloroethene	280	320
Trichloroethene	2.6	1.6
Vinyl chloride	65	82

Parameter	Applicable Standard (Shallow)	Applicable Standard (Intermediate)
1,1-dichloroethene	1	1
2-butanone	2	300
Acetone	10	6,000
cis-1,2-dichloroethene	2	70
Methyl tert-butyl ether	1	70
trans-1,2-dichloroethene	1	100
Trichloroethene	1	1
Trichlorofluoromethane	1	2,000
Vinyl chloride	2	1

VICINITY MAP



Legend

- Shallow Sentinel Well Sampled in 2017
- Shallow Plume Well Sampled in 2017
- Shallow Source Area Well Sampled in 2017
- Intermediate Sentinel Well Sampled in 2017
- Intermediate Plume Well Sampled in 2017
- Intermediate Source Area Well Sampled in 2017
- Approximate Groundwater Flow Direction
- Approximate Extent of cis-1,2-DCE Exceeding 2 µg/L in Shallow Wells Sampled
- Approximate Extent of TCE Exceeding 1 µg/L in Wells Sampled
- Fenceline
- Railroad
- Road
- Approximate Area Boundary
- Installation Boundary
- Surface Water
- SS007 Site

Notes:
All concentrations are in micrograms per liter (µg/L).
Only values exceeding the applicable standard are shown.
Exceedances are also shaded.
J = Estimated: The analyte was positively identified; the quantitation is an estimation
ND = Not Detected
NE = No Exceedance
Boundary areas based on Land Use Controls Implementation Plan, May 2013.
GIS Layers provided by JBMDL.

N

0 200 400 Feet

EA Engineering, Science, and Technology, Inc., PBC

FIGURE SS007-3
Site SS007 Groundwater Exceedances – 2017
Dix Area Five-Year Review
Joint Base McGuire-Dix-Lakehurst, New Jersey

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Table SS007-1: Chronology of Events at Site SS007

Event	Date
Preliminary Assessment/Site Investigation	1989
Remedial Investigation/Feasibility Study	1996-997
Sediment toxicity testing	1999
Feasibility Study Addendum	2001
Final Decision Document	August 2002
Multi-Site Groundwater Classification Exception Area approved	September 2003
Excavation of contaminated soil	2005-2010
Explanation of Significant Difference (including bioaugmentation) signed	13 June 2011
Baseline Monitoring Event	September 2011
Bioaugmentation System operation	October 2011 to September 2015
Additional sediment sampling	March 2013
First Five-Year Review Completed	September 2013
Monitored Natural Attenuation Evaluation (1-year)	Fall 2015-Fall 2016
Performance/Compliance Monitoring Events	February 2013 - present

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Table SS007-2: Toxicity Values for Carcinogenic Constituents at Site SS007

Chemical	Oral Slope Factor (mg/kg/day) (RI Report)	Oral Slope Factor (mg/kg/day) (2017)	Inhalation Unit Risk [(a)] (per $\mu g/m^3$) (RI Report)	Inhalation Unit Risk $(\mu g/m^3)^{-1}$ (2017)
Organics:				
Benzo(a)anthracene	7.3E-01	1E-01	Not Listed	Not Available
Benzo(a)pyrene	7.3E+00	1E+00	Not Listed	3E-04
Benzo(b)fluoranthene	7.3E-01	1E-01	Not Listed	Not Available
Benzo(k)fluoranthene	7.3E-02	1E-02	Not Listed	Not Available
Bis(2-ethylhexyl)phthalate	1.4E-02	1.4E-02	Not Listed	2E-02
Carbon tetrachloride	1.3E-03	7E-02	1.5E-05	4E-03
Chloroform	6.1E-03	3.1E-02	2.3E-05	1E-02
Chrysene	7.3E-03	1E-3	Not Listed	Not Available
Dibenzo(a,h)anthracene	7.3E+00	1E+00	Not Listed	Not Available
Indeno(1,2,3-cd)pyrene	7.3E-01	1E-01	Not Listed	Not Available
Trichloroethene	1.1E-02 (withdrawn)	4.6E-02	1.7E-06 (withdrawn)	5E-04
Vinyl chloride	1.9E+00	7.2E-01	8.4E-05	3E-03
Inorganics:				
Arsenic	1.5E+00	1.5E+00	4.3E-03	4.3E-03
Beryllium	4.3E+00	Not Available	2.4E-03	2.4E-03
Cadmium	Not Listed	Not Available	1.8E-03	1.8E-03
Chromium (as CrVI)	Not Listed	5E-01	1.2E-02	8.4E-02

Notes:
$\mu g/m^3$ = Microgram per cubic meter
mg/kg/d = Milligrams per kilogram per day
pg = Picogram
RI = Remedial Investigation

(a) The human health risk assessment in the RI used U.S. Environmental Protection Agency inhalation slope factors but converted them to inhalation risks. Conversion of air unit risk to an inhalation slope factor is: unit risk = (SF)(1/70 kg)(20 m^3/d)(10^{-3} mg/pg).

Table SS007-3: Toxicity Values for Non-Carcinogenic Constituents at Site SS007

Chemical	Oral Reference Dose (mg/kg-day) (RI Report)	Oral Reference Dose (mg/kg-day) (2017)	Inhalation Reference Concentration (mg/m^3) (RI Report)	Inhalation Reference Dose (mg/m^3) (2017)
Organics:				
Acenaphthene	6E-02	6E-02	Not Listed	Not Available
Anthracene	3E-01	3E-01	Not Listed	Not Available
Bis(2-ethylhexyl)phthalate	2E-02	2E-02	Not Applicable	Not Applicable
Carbon tetrachloride	7E-04	4E-3	Not Listed	1E-01
Chloroform	1E-02	1E-02	Not Listed	9.8E-02
1,2-Dichloroethene	9E-03	2E-03	Not Listed	Not Available
Fluoranthene	4E-02	4E-02	Not Listed	Not Available
Fluorene	4E-02	4E-02	Not Listed	Not Available
Naphthalene	4E-02	2E-02	Not Listed	3E-03
Pyrene	3E-02	3E-02	Not Listed	Not Available
Trichloroethene	6E-03 (withdrawn)	5E-04	Not Listed	2E-03
Inorganics:				
Aluminum	1E+00	1E+00	Not Listed	Not Available
Antimony	4E-04	4E-04	Not Listed	Not Available
Arsenic	3E-04	3E-04	Not Listed	1.5E-05
Beryllium	5.0E-03	2E-03	Not Listed	2E-05
Cadmium	5E-04	5E-04	Not Listed	1E-05
Chromium (as CrVI)	5E-03	3E-03	Not Listed	1E-04
Iron	3E-01	7E-01	Not Listed	Not Available
Manganese	4.7E-02	2.4E-02	1.43E-05	5E-05
Vanadium	7E-03	5E-03	Not Listed	1E-04

Notes:
mg/kg/d = milligrams per kilogram per day
RI = Remedial Investigation
mg/m^3 = milligram per cubic meter

7. SITE SS025, ARDC TEST SITE

7.1 SITE CHRONOLOGY

A timeline of major events at Site SS025, the ARDC Test Site, is presented in Table SS025-1. Tables and figures for Site SS025 are provided at the end of this Chapter.

7.2 BACKGROUND OF SITE SS025, ARDC TEST SITE

7.2.1 Physical Characteristics

Site SS025, the ARDC Test Site, is approximately 10 acres in size and is located along the northern border of Dix Area (Figure 1) in a training area designated as part of the Range and Impact Area. The site includes approximately 15 buildings and a motor fuel storage area. The site is secured by two security fences with locking gates; JB MDL controls access to the site. The land surrounding the site is forested (Figure SS0025-1).

7.2.2 Land and Resource Use

The ARDC Test Site was used for testing and analysis of weapons. Testing generally evaluated the physical response of weapons and munitions to the extreme physical conditions to which they may be exposed.

7.2.3 History of Contamination

A photo-processing lab, located at the northwest end of the site, used a micro-flash x-ray technique to analyze weapon accuracy and impact. For a 2-year period, the rinse water from this process was allowed to drain onto the ground. The rate of disposal was approximately 5-25 gallons per month.

The motor fuel storage area is located at the southeast end of the site. The fuel storage area included two aboveground storage tanks that contained gasoline or diesel fuel and 55-gallon steel drums that contained raw and/or waste oil. In 1984, a 25-gallon diesel spill was reported in this area; the top 1 ft of soil from the spill was removed and backfilled. Six drums were observed and labeled as containing lubricating oil during a 1996 investigation.

7.2.4 Initial Response

A removal action of the top 1 ft of soil was conducted in the motor fuel storage area at the ARDC Test Site in 1984, following a spill of approximately 25 gallons of diesel fuel (EA 1989). Investigations were conducted between 1986 and 1999. The results of these investigations and analyses are summarized in Section 7.2.5.

7.2.5 Basis for Taking Action

An initial sampling effort consisting of collecting seven surface soil samples was conducted in 1987 as part of the Preliminary Assessment/Site Investigation (EA 1989). Samples were collected from the photo-processing area and were analyzed for VOCs, SVOCs, and metals. No chemicals were detected at concentrations exceeding screening levels and no further action was required in this area. Samples collected in the fuel storage area were analyzed for total petroleum hydrocarbons (TPH) and were found in exceedance of screening criteria. As a result, the Phase I and Phase II RIs were developed for the fuel storage area (Dames & Moore 1991, 1993).

Sampling activities conducted as part of the Phase I RI, completed in 1988, and Phase II RI, completed in 1990, included 17 borings. Surface and subsurface soil samples and groundwater samples were collected and analyzed for TPH, VOCs, and in some cases SVOCs to determine the distribution of soil contamination. Three surface water/sediment samples were also collected and analyzed for TPH and VOCs. The results indicated the presence of PCE and TCE in the fuel storage area in addition to TPH and petroleum-related VOCs. TPH, petroleum-related VOCs, and TCE were also detected in the surface water and sediment samples collected from the drainage ditch that runs outside and parallel to the southeastern edge of the site.

Additional RI sampling conducted in 1996-1999 included additional soil, groundwater, surface water, and sediment sampling. The results were included in the Final RI and FS for the ARDC Test Site (Harding Lawson Associates 2000, Harding 2001b). The extent of the surface soil (0-2 ft bgs) contaminated with TPH and PCE was approximately 50 ft by 50 ft, with an estimated volume of 130 cubic yards. The extent of groundwater contamination was found to be approximately 55 ft by 25 ft with a depth of less than 10 ft and included a portion of the drainage ditch. Sediments were not impacted at concentrations exceeding the remediation goals.

The HHRA identified unacceptable risks from potential exposure to PCE in surface soil and PCE and TCE in groundwater. Subsurface soil, surface water, and sediment were not associated with human health concerns.

The ERA conducted for the ARDC Test Site did not identify significant hazards. Therefore, evaluation of remedial alternatives for the protection of ecological receptors was not necessary.

Based on these results, remedial alternatives for PCE in surface soil and PCE and TCE in groundwater were evaluated. Because groundwater has the potential to discharge to the drainage ditch, remedial alternatives and RAOs for PCE and TCE in surface water and sediment were also selected.

7.3 REMEDIAL ACTIONS AT SITE SS025, ARDC TEST SITE

7.3.1 Remedy Selection

The selected remedy provided in the Final DD (Harding 2003) consists of the following requirements:

- Source removal (i.e., removal of contaminated soils); mitigating exposure to ecological receptors and human visitors by the excavation of soils containing PCE and TCE above the screening levels

- Groundwater, surface water, and sediment monitoring to ensure that the remedy is protective of human health and the environment or if additional action requires evaluation

- Institutional controls (i.e., groundwater restriction) until contaminants are below applicable standards.

The RAOs, including numerical remediation goals, at the ARDC Test Site are the following:

- Protect potential commercial/industrial workers from exposure to ARDC surface soil with concentrations of PCE exceeding 0.00081 mg/kg or the PQL, whichever is lower.

- Protect potential human receptors from groundwater used for domestic purposes with PCE concentrations greater than 1.0 µg/L or the PQL, whichever is lower, and TCE concentrations greater than 1.0 µg/L, or the PQL, whichever is lower.

- Protect potential human receptors from exposure to surface water with PCE concentrations greater than 0.8 µg/L or the PQL, whichever is lower, and TCE concentrations greater than 1.0 µg/L, or the PQL, whichever is lower.

- Protect potential human receptors from exposure to sediment with PCE concentrations greater than 0.00081 mg/kg or the PQL, whichever is lower, and TCE concentrations greater than 0.0028 mg/kg or the PQL, whichever is lower.

7.3.2 Remedy Implementation

The following summarizes the remedial activities completed at the ARDC Test Site.

- Excavation and disposal of approximately 456 tons of impacted soil in 2004, with collection of post-excavation samples analyzed for VOCs, SVOCs, and TPH, followed by backfilling, compaction, and restoration of the site to its original condition

- Semiannual monitoring of groundwater and sediment from 2005 (6 months after the soil excavation was completed) until 2015, with analysis for VOCs

- Semiannual monitoring of surface water beginning 6 months after the source soil excavation was completed and continuing through 2017, with analysis for VOCs.

Soils within the impacted area were excavated to a depth of approximately 3 ft to remove the PCE- and TCE-impacted soils. Post-excavation samples were collected to ensure that all impacted soils were removed, and VOCs were either non-detect or below the residential direct contact soil cleanup levels in all post-excavation samples. The excavated areas were subsequently backfilled with clean fill and restored to their original grade. Based on the results of the post-excavation samples, the source of PCE and TCE has been removed and the excavation area is no longer a contributing source of PCE or TCE from site soils to groundwater, surface water, or sediment.

In December 2014, NJDEP approved the cessation of groundwater monitoring at Site SS025 in comments on the 2014 IMMR (Plexus Scientific 2015), based on monitoring data indicating that COCs had not been detected since March 2011. In August 2016, NJDEP approved the cessation of sediment monitoring in comments on the 2015 IMMR (Arcadis 2016a), based on monitoring data indicating that COCs had not been detected since 2013.

The ARDC Test Site was included in a multi-site CEA approved in September 2003 (Shaw 2003), and subsequently in the Dix Area Sitewide CEA (NJDEP 2014). In addition to the CEA, the LUCIP includes restrictions on the following uses for Site SS025: surface disturbance, subsurface disturbance, and residential use. Monitoring of site groundwater was performed during the FYR period to comply with the CEA. The monitoring program is described further in Section 7.5.4. In the 2016 Biennial Certification documentation for the Dix Area CEA, USAF indicated an intent to request approval to remove Site SS025 from the Dix Area CEA/WRA, based on the No Further Action determination for groundwater at this site (Arcadis 2016b).

7.3.3 Systems Operation and Maintenance

O&M of the remedy at Site SS025 consists of the collection and analysis of surface water samples, and also included groundwater and sediment sampling from 2005 until 2015. Management and reporting for this site is completed annually in accordance with the Dix Area Basewide Inspection, Maintenance, and Monitoring Plan (Plexus Scientific 2014) and biennially through CEA documentation.

7.4 PROGRESS SINCE THE LAST REVIEW AT SITE SS025, ARDC TEST SITE

The first FYR for Site SS025 was submitted on 30 September 2013 (CB&I 2013d). The 2013 FYR protectiveness statement for SS025 was as follows: "The remedy at the ARDC Test Facility is protective of human health and the environment. Continued implementation of the monitoring program will ensure the long-term protectiveness of the remedy. The COCs outlined in the Decision Document have not migrated beyond the site boundary and the remedy is considered to be functioning as required."

No issues were identified in the previous FYR that may impact the current protectiveness of the remedy in place. Issues and recommendations identified in the 2013 FYR that do not affect protectiveness, and the follow-up actions taken, are summarized below:

Remedy Component	Issue/Recommendation from the 2013 FYR (not affecting protectiveness)	Completed?	Action Taken
Groundwater Monitoring	PCE and TCE are detected sporadically in groundwater from monitoring well ARD-77, at concentrations less than 10 µg/L but above applicable standards. Recommend continued semiannual monitoring of well ARD-77.	Yes	Semiannual monitoring of groundwater from well ARD-77 was performed through April 2015.
Surface Water Monitoring	PCE, TCE, and DCE are detected in surface water from the drainage ditch at concentrations above applicable standards. Continued surface water monitoring is recommended.	Yes	Semiannual monitoring of surface water was performed throughout the FYR period.

Remedy Component	Issue/Recommendation from the 2013 FYR (not affecting protectiveness)	Completed?	Action Taken
Sediment Monitoring	PCE, TCE, and DCE are detected in sediment from the drainage ditch at concentrations above applicable standards. Continued sediment monitoring is recommended.	Yes	Semiannual monitoring of sediment was performed through November 2015.
Not applicable	Drainage in the drainage ditch was observed to be restricted due to siltation and vegetation.	Yes	Blockage was cleared from the drainage ditch in February 2013.

Additional details on progress made based on the recommendations from the last FYR are provided in the sections below.

7.4.1 Long-Term Monitoring

The following monitoring activities were completed at SS025 during the FYR period:

- Monitoring events were conducted semiannually at SS025, in spring and fall, during the review period. In 2013, 2014, and 2015, these monitoring events included groundwater, surface water, and sediment sampling. Groundwater sampling ceased after April 2015 and sediment sampling ceased after November 2015, both with NJDEP approval (see Section 7.3.2). Surface water sampling was conducted in April 2016 and April 2017, and was also attempted in Fall 2016, but no surface water was present.

- Groundwater was collected from one well, ARD-77, during each monitoring event through April 2015, and groundwater samples were analyzed for VOCs.

- Surface water and sediment samples were collected from three locations in the drainage ditch (SW/SE200, SW/SE201, and SW/SE202) through 2015. Surface water samples were collected from one location (SW202) in 2016 and 2017. Surface water and sediment samples were analyzed for VOCs.

7.4.2 Maintenance to Restore Restricted Drainage

During the site inspection conducted as part of the previous FYR, in September 2012, the drainage ditch was found to be overgrown with aquatic-type vegetation. Drainage in the ditch was observed to be poor due to siltation and partial blockage of the culverts that pass under the unimproved sand roads at the site. As a result, JB MDL subsequently cleared the blockage from the drainage ditch as part of general site maintenance in early February 2013.

7.5 FIVE-YEAR REVIEW PROCESS FOR SITE SS025, ARDC TEST SITE

7.5.1 Administrative Components

The FYR was prepared by JB MDL, in consultation with NJDEP. The team included Curtis Frye (JB MDL Remediation Program Manager), Nicole Brestle (Remediation Project Manager, Dix Area), and Haiyesh Shah (NJDEP Case Manager). This is a federal facility-lead site.

7.5.2 Community Involvement

Public notice of the beginning of the FYR process was published for 3 days in the *Asbury Park Press* (26-28 May 2017) and the *Burlington County Times* (25, 26, and 28 May 2017). The FYR was also discussed at the RAB meeting on 19 July 2017. Annual community planners meetings, including DOD representatives and contractors, are held each fall to review the JB MDL LUCIP and discuss upcoming projects at JB MDL potentially impacted by the established LUCs. Any FYR findings that impact base planning with respect to LUCs would be addressed during these meetings, as required. No public comments were received in association with the FYR. NJDEP did not have any comments regarding Site SS025 (Appendix B).

Once the FYR is completed, additional public notices will be published, the RAB mailing lists will be notified, and the results will be made available at the local site repositories, which are at the Burlington County Library (5 Pioneer Boulevard, Westhampton, New Jersey) and online at http://afcec.publicadmin-record.us.af.mil/. In addition, efforts will be made to reach out to local public officials to inform them of the results.

7.5.3 Document Review

This FYR consisted of a review of relevant documents, including the RODs/DDs, Biennial Certification Reports for the groundwater CEA, the LUCIP for JB MDL, annual IMMRs, landfill inspection reports, and remedial action reports. The documents, data, and information that were reviewed in completing this FYR are summarized in Appendix C.

7.5.4 Data Review

A long-term, groundwater, surface water, and sediment monitoring program was implemented as part of the remedy at the ARDC Test Site. Data for nine monitoring events (February 2013 through April 2017) were available from the period of review for this FYR report. Results from these monitoring events are included in tabular format in Appendix A, and concentration versus time charts are provided in Appendix D. The monitoring results and trends are briefly described below.

<u>Groundwater</u>

Groundwater samples were collected from one monitoring well, ARD-77, during five monitoring events from February 2013 through April 2015 and analyzed for VOCs.

The data from the FYR period were compared to the New Jersey PQLs, as shown in Appendix A. The DD identified cleanup standards of 1.0 µg/L for PCE and TCE in groundwater, and these standards are equal to the current PQLs.

Chlorinated VOCs (PCE and TCE) are the primary site-related contaminants. Neither of these VOCs were detected in groundwater during the review period, and no VOC concentrations exceeding PQLs were reported. Based on the lack of detections of PCE and TCE, groundwater monitoring ceased in 2015 (see Section 7.3.2).

Surface Water and Sediment

Surface water and sediment samples were collected for VOC analysis semiannually from three monitoring stations at Site SS025 (SW/SE200, SW/SE201, and SW/SE202), through 2015. In 2016 and 2017, only surface water samples were collected from location SW202 for VOC analysis.

Surface water and sediment data from the FYR period were compared to site screening criteria for each media, as shown in Appendix A. For surface water, the site screening criteria are the New Jersey PQLs. For sediment, the site screening criteria are the New Jersey Ecological Screening Levels.

Exceedances of the applicable criteria for TCE and PCE in sediment and PCE in surface water from location SW/SE201 were reported in February 2013, along with exceedances for TCE in sediment from location SE200 (Figure SS025-2 and Appendix D). Exceedances reported during subsequent events were limited to PCE concentrations inconsistently exceeding the PQL in surface water from SW202. PCE concentrations in surface water from this location showed a potentially decreasing trend, mostly driven by lower concentrations after a high in February 2013 (Appendix D). Based on the lack of detections of TCE or PCE in sediment after 2013, sediment monitoring ceased in 2015 (see Section 7.3.2).

7.5.5 Site Inspection

A site inspection at Site SS025 was conducted by EA, JB MDL, and NJDEP personnel on 25 July 2017. No issues were identified during the site inspection (Appendix E).

7.5.6 Interviews

During the FYR process, interviews were conducted with stakeholders, including representatives from the regulatory agencies overseeing the remedies at the Dix Area and community representatives aware of the remedial activities. The purpose of the interviews was to document any perceived problems or successes with the remedies that have been implemented to date. Interviews were conducted in August 2017. Detailed interview records are included in Appendix E.

None of the individuals interviewed (see Section 3.5.6 and Appendix E) indicated concerns regarding Site SS025.

7.5.7 Institutional Controls Verification

Institutional controls required for this site are listed in Section 7.3, and described further in Section 7.3.2. Required institutional controls, including the Dix Area Sitewide CEA (described in Section 2.3.2) and other LUCs, are in place and documented in the LUCIP for JB MDL. The latest Biennial Certification Monitoring Report for the Dix Area Sitewide CEA was submitted to NJDEP on 5 April 2016, and a new biennial report is in preparation for submittal as of April 2018. LUC documentation is updated annually.

7.6 TECHNICAL ASSESSMENT OF THE REMEDY AT SITE SS025, ARDC TEST SITE

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

A review of site documentation, including results from annual groundwater monitoring as well as the findings of the site inspection conducted in July 2017 in association with this FYR, indicate that the remedy at ARDC Test Site is functioning as intended by the DD. The remedy meets the RAOs for protecting human receptors from PCE-contaminated surface soil and domestic use of VOC-contaminated groundwater, and mitigates potential exposure to surface water and sediment containing PCE and TCE.

The removal of soil has achieved the RAO for surface soil. Groundwater monitoring results indicated no PCE or TCE detections during the review period, indicating no remaining risk associated with groundwater use to potential human receptors and also suggesting that discharge of groundwater containing these VOCs into the drainage ditch is insignificant. Sediment monitoring results indicate no PCE or TCE detections since 2013, indicating that the RAO for potential exposure to sediment has been achieved. PCE concentrations in surface water from location SW202 inconsistently exceed the PQL; however, exposure of human receptors to this surface water is not expected.

The remedy implemented at Site SS025 has been effective at controlling the risk to receptors. The CEA minimizes human exposure to potentially contaminated groundwater, and sediment results from the FYR period confirm that the drainage ditch is not affected by site contaminants. Low-level PCE concentrations exceeding the PQL in surface water at one location are not indicative of a lack of protectiveness, given the magnitude of the exceedances and lack of expected use of the ditch by human receptors.

7.6.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of remedy selection still valid?

7.6.2.1 Changes in Risk Assessment Methodologies

There have been no major changes in HHRA or ERA methodology since the signing of the DD that would impact the protectiveness of the SS025 – ARDC Test Facility remedy.

The RI for the ARDC Test Site (Harding Lawson Associates 2000) included human health and ecological risk assessments. The primary documents used to conduct the HHRA included the following EPA guidance documents: *RAGS, Volume I: Human Health Manual (Part A)* (EPA 1989a); *RAGS Volume I: Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors* (EPA 1991a); *RAGS Volume I: Human Health Evaluation Manual Supplemental Guidance, Part B Development of Risk-Based Preliminary Remediation Goals* (EPA 1991c); *Guidelines for Exposure Assessment* (EPA 1992a); and *Supplemental Guidance to RAGS: Calculating the Concentration Term* (EPA 1992b). Potential human health concerns were found to be associated with PCE in surface soil and TCE and PCE in groundwater. The methodologies outlined in the guidance documents used have not been updated or changed, with the following exceptions.

In September 2011, EPA released a new version of the *Exposure Factors Handbook* (EPA 2011). This handbook provides a summary of the available statistical data on various factors used in assessing human exposure (e.g., drinking water consumption). The updates to the final document do not impact the risk assessment methodologies that were implemented in the HHRA summarized in the DD. Therefore, an update to the risk assessment is not warranted.

Additionally, EPA released two risk assessment guidance documents for the assessment of dermal and inhalation exposures since the completion of the RI (Harding Lawson Associates 2000). The *RAGS, Volume I: Human Health Manual, Part E, Supplemental Guidance for Dermal Risk Assessment)* (EPA 2004) and *Part F, Supplemental Guidance for Inhalation Risk Assessment* (EPA 2009) present risk assessment methodology for the assessment of dermal and inhalation exposures. The dermal pathways for exposure to soil, surface water, and sediment, as well as the pathway for inhalation of vapors or dust, were evaluated in the RI for Site SS025. The publication of these guidance documents does not affect the protectiveness of the remedy for Site SS025.

The ERA included in the RI (Harding Lawson Associates 2000) was based on the *RAGS – Volume II Environmental Evaluation Manual* (EPA 1989c), *Framework for Ecological Risk Assessment* (EPA 1992d), EPA *Proposed Guidelines for Ecological Risk Assessment* (EPA 1996), and *Tri-Service Procedural Guidelines for Ecological Risk Assessments* (Wentsel et al., 1996). The ERA compared toxicity reference values to exposure point concentrations and to modeled doses to wildlife. The ERA concluded that there was no significant risk to ecological receptors, and the RAOs for the ARDC Test Site, as stated in the DD, do not include goals for ecological receptors (Harding 2003). In 1997, EPA published *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA 1997a), followed by the more generic *Guidelines for Ecological Risk Assessment* (EPA 1998). These later guidance documents were based on the framework cited above (EPA 1992d), and the ecological risk process is the same in all of these guidance documents. Although risk assessment methodologies presented in EPA guidance have evolved since the RI and DD were completed for Site SS025, the changes and current concentrations are such that an ERA using the updated methodology would not be expected to lead to identification of issues with the protectiveness of the remedy.

7.6.2.2 Changes in Exposure Pathways

There have been no changes in physical conditions or land use at the site that would result in the development of new exposure pathways to human or ecological receptors. Additionally, no newly identified contaminants, contaminant sources, or toxic byproducts of the remedy were identified during the FYR process.

The HHRA conducted as part of the RI considered the following human health exposure pathways for ARDC Test Site, based on use of the site as a training center and bivouac area for visiting troops, potential future industrial/commercial use, and use of the adjacent stream by hunters or residents: incidental ingestion of and dermal contact with soils, inhalation of vapors or dust in ambient air, and dermal contact with or incidental ingestion of surface water and sediment in the stream. Possible future residential use of groundwater from the Kirkwood-Cohansey aquifer was also considered. The HHRA did not evaluate potential vapor intrusion of

VOCs from groundwater to the indoor air of current buildings or future buildings at the site. Recent groundwater samples reveal TCE and PCE as non-detect. Therefore, this exposure pathway is not considered currently complete. Exposure pathways determined to be associated with potential risk, which were addressed in the DD, included human exposures to PCE in surface soil and TCE and PCE in groundwater. Soil removal actions were completed to address PCE contamination in surface soil. Therefore, potential exposure pathways via surface soil are no longer complete. Controls in place under the LUCIP and as part of the DD remedy for ARDC Test Site prevent groundwater use and residential land use, and also restrict soil disturbance.

Daily doses were developed as part of the HHRA, in accordance with the available guidance. More recently, EPA provided default exposure parameters for use in risk assessment in the *Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors* was released in 2014 (EPA 2014). A majority of the exposure parameters assumed in the HHRA included in the RI are similar to the recent default exposure parameters set forth by EPA (EPA 2014). The one change in default exposure parameters that may result in changes to overall results is the difference assumed for default body weight. The EPA revised the default adult body weight from 70 kg to 80 kg. The increase in body weight results in lower overall cancer risks and non-cancer hazards. Use of these updated default exposure parameters are not expected to change the overall results determined for the ARDC Test Site, for either the current or hypothetical exposure pathways considered. Because the current exposure pathways that were considered remain the most relevant, and no groundwater use is occurring or planned, an update to the risk assessment is not warranted.

7.6.2.3 Contaminants of Concern and Changes in Standards and To-Be-Considered Guidance

The groundwater ARARs referenced in the DD include EPA MCLs and NJDEP Class I (Pinelands) Standards (PQLs). The greater of the background concentration and the PQL was identified as the remediation goal for constituents in groundwater. Background values for PCE and TCE in groundwater at JB MDL Dix have not been established. Therefore, the remediation goals for PCE and TCE in groundwater are the PQLs for PCE and TCE (1.0 µg/L), which have not changed since the DD was finalized. In comments on the 2014 IMMR, NJDEP indicated that no further groundwater monitoring at Site SS025 is required, because COCs had not been detected since March 2011.

Surface water ARARs referenced in the DD included the PQLs, New Jersey SWQS (NJAC 7:9B), and federal AWQC. As previously noted however, the NJDEP has established a "non-degradation" policy for sites within the New Jersey Pinelands Preservation Area. The New Jersey Class I-PL groundwater standards (PQLs) are therefore also used to screen surface water data from Site SS025, as they represent the "background water quality" criterion applied to waters in the Pinelands. The lowest of the current ARARs, or the Fort Dix background value for surface water (ABB 1996) if it is greater, are used to screen monitoring data for each analyte.

The primary sediment ARAR referenced in the DD is the New Jersey Guidance for *Sediment Quality Evaluations* (NJDEP 1998). More recently, NJDEP Ecological Screening Criteria have been used along with the Fort Dix background concentrations for sediment (ABB 1996), to screen the sediment monitoring data from Site SS025. In comments on the 2015 IMMR, NJDEP indicated that no further sediment monitoring at Site SS025 is required, because COCs had not been detected since 2013.

Following removal of TPH and VOC-contaminated soil in 2004, post-excavation sample results were screened against residential direct contact soil cleanup levels of 2 mg/kg PCE and 7 mg/kg TCE. In 2017, NJDEP issued updated residential direct contact SRSs of 43 mg/kg PCE and 3 mg/kg TCE. The current (2017) ARAR for PCE is greater than the remedial goal, and the current ARAR for TCE is within an order of magnitude of the remedial goal. Additionally, the current ARARs are greater than the maximum concentrations of PCE and TCE detected in post-excavation sampling. Therefore, the original remedial goals and the soil excavation remedy remain protective.

No applicable ARARs were found to have changed since the previous review period.

7.6.2.4 Changes in Toxicity and Other Contaminant Characteristics

Toxicity values for the identified COPCs were reviewed in accordance with the EPA toxicity hierarchy (EPA 2003). The EPA IRIS is the Tier I source for toxicity information (EPA 2017a). IRIS and other tiered toxicity sources presented on the EPA Regional Screening Level table (EPA 2017b) were reviewed to determine if revisions had been made to the factors used to calculate risk in the RI.

Tables SS025-2 and SS025-3, showing non-carcinogenic and carcinogenic COPCs, was adapted from the RI (Harding Lawson Associates 2000). These tables list the COPCs and the corresponding toxicity values (carcinogenic slope factors and reference doses) from both the RI and the EPA's IRIS database in July 2017. An increase in the oral slope factor will have an effect on the calculated risk. In addition, a decrease in the oral reference dose will produce an increased HQ. Changes in toxicity information are noted below to demonstrate that the values have not changed significantly since the analyses were initially conducted in the mid-1990s. It is noted that since the completion of the RI, EPA has identified TCE and dichloromethane (methylene chloride) as mutagenic compounds, which indicates potential concerns for early life exposures to these analytes (EPA 2005). As noted previously, recent groundwater samples reveal TCE and methylene chloride as non-detect, which means the identification of chemicals as mutagenic compounds would not change the overall conclusions of the HHRA and would not require a revised risk assessment. Although the toxicity values for PCE and TCE have been updated since the establishment of the DD, these revisions do not affect the clean-up criteria for groundwater at the ARDC Test Site, because the PQLs are not risk-based values. These revisions also do not affect the remediation goals for surface soil, surface water, or sediment at the ARDC.

Based on the changes in toxicity factors for the COPCs, the remedy is still considered protective at this time. A revised risk assessment is not required since soil has been remediated, the use of groundwater at Site SS025 is restricted by LUCs including a CEA, and recent groundwater samples reveal site COCs as non-detect.

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

There is no other information to call into question the protectiveness of the remedy.

7.6.4 Technical Assessment Summary

The review of documents, ARARs, risk assumptions, and results of the site inspection indicates that the remedy at Site SS025 is functioning as intended by the DD. Low-level PCE concentrations in surface water at one location inconsistently exceed PQLs, while RAOs have been met for soil, groundwater, and sediment.

Although risk assessment methodologies presented in EPA guidance have evolved since the RI was conducted for Site SS025, the nature of the changes is such that an assessment using the updated methodology would not be expected to lead to identification of issues with the protectiveness of the remedy. No changes in exposure pathways were noted during the review period (2013–2017).

7.7 ISSUES, RECOMMENDATIONS, AND FOLLOW-UP ACTIONS AT SITE SS025, ARDC TEST SITE

No issues that affect current or future protectiveness were identified. The following is a recommendation that addresses the effectiveness of the remedy but does not affect current protectiveness and was identified during the FYR:

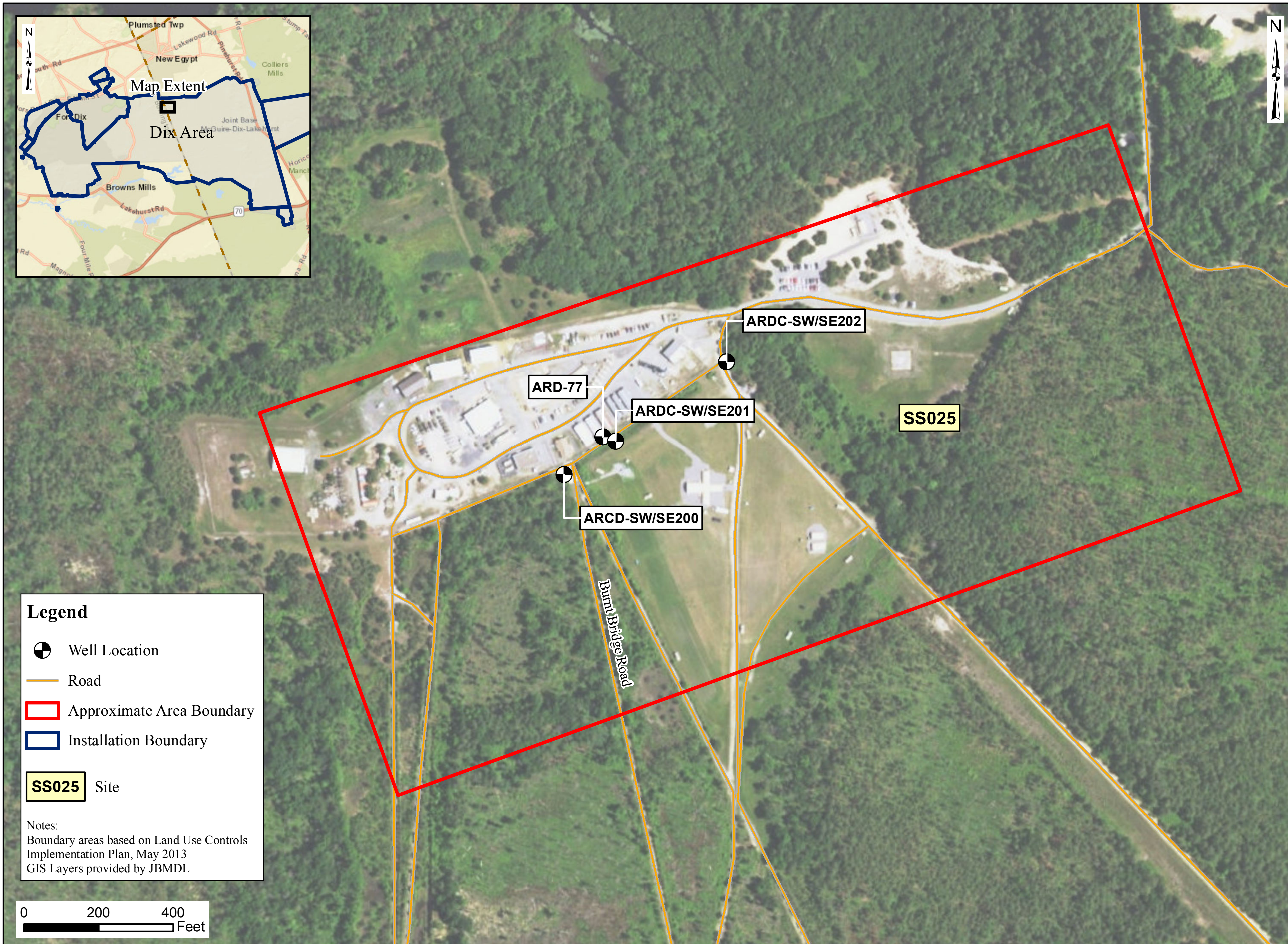
- PCE is detected sporadically in surface water from the drainage ditch at concentrations exceeding applicable standards. Continued surface water monitoring is recommended.

7.8 PROTECTIVENESS STATEMENT FOR SITE SS025, ARDC TEST SITE

Protectiveness Statement(s)	
Site: SS025	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at Site SS025 is protective of human health and the environment.	

7.9 NEXT REVIEW

The next FYR for Site SS025, the ARDC Test Site, shall be submitted by May 2023.



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DIX AREA FIVE-YEAR REVIEW
JOINT BASE MCGUIRE-DIX-LAKEHURST, NEW JERSEY

FIGURE SS025-1

SS025 SITE FEATURES

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ARDC-SW202 (surface water)	Standard	Mar-14	May-14	Dec-14	Apr-15	Nov-15	Apr-16	Apr-17
Tetrachloroethene	1 µg/L	2.7	ND	2	2	NE	1.6	NE

ARDC-SW201 (surface water)	Standard	Feb-13	Mar-14	May-14	Dec-14	Apr-15	Nov-15
Tetrachloroethene	1 µg/L	9.6	ND	ND	ND	ND	NE
ARDC-SE201 (sediment)	**Standard**	**Feb-13**	**Nov-13**	**May-14**	**Dec-14**	**Apr-15**	**Nov-15**
Tetrachloroethene	990 µg/kg	2,400 J	ND	ND	ND	ND	ND
Trichloroethene	112 µg/kg	2,700 J	ND	ND	ND	ND	ND

ARDC-SW200 (surface water)	Standard	Feb-13	Mar-14	May-14	Dec-14	Apr-15	Nov-15
Tetrachloroethene	1 µg/L	2.9	ND	ND	ND	ND	ND
ARDC-SE200 (sediment)	**Standard**	**Feb-13**	**Nov-13**	**May-14**	**Dec-14**	**Apr-15**	**Nov-15**
Trichloroethene	990 µg/kg	2,400 J	ND	ND	ND	ND	ND

VICINITY MAP

Legend

- Monitoring Well
- Road
- Approximate Area Boundary
- Installation Boundary
- SS025 Site

Notes:
Only values exceeding the applicable standard are shown.
Exceedances are also shaded.
(No exceedances of the groundwater standards were reported during the five-year review period.)
J = Estimated: The analyte was positively identified; the quantitation is an estimation
ND = Not Detected
NE = No Exceedance
Boundary areas based on Land Use Controls Implementation Plan, May 2013.
GIS Layers provided by JBMDL.

N

0 200 400 Feet

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FIGURE SS025-2
Site SS025 Surface Water and Sediment Exceedances – 2013-2017
Dix Area Five-Year Review
Joint Base McGuire-Dix-Lakehurst, New Jersey

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Table SS025-1: Chronology of Events at Site SS025

Event	Date
Preliminary Assessment/Site Investigation	1989
Remedial Investigations	1988 –2000
Feasibility Study	July 2001
Final Decision Document	May 2003
Multi-Site Groundwater Classification Exception Area approved	September 2003
Final Remedial Action Work Plan	May 2004
PCE and TCE contaminated soils excavated	August 2004
Excavated material removed from the site	November 2004
Long-Term Monitoring of groundwater, surface water, and sediment began	July 2005
First Five-Year Review Completed	September 2013
Long-Term Monitoring of Groundwater	July 2005 to April 2015
Long-Term Monitoring of Sediment	July 2005 to November 2015
Long-Term Monitoring of Surface Water	July 2005 to present

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Table SS025-2: Toxicity Values for Carcinogenic Constituents at Site SS025

Chemical	Oral Slope Factor (mg/kg-day) (RI Report)	Oral Slope Factor (mg/kg-day) (2017)	Inhalation unit risk (per µg/m^3) (RI Report)	Inhalation unit risk (per µg/m^3) (2017)
Organics:				
4,4'-DDD	2.4E-01	2.4E-01	Not Listed	Not Available
4,4'-DDE	3.4E-01	3.4E-01	Not Listed	Not Available
4,4'-DDT	3.4E-01	3.4E-01	9.7E-05	Not Available
Bis(2-ethylhexyl)phthalate	1.4E-02	1.4E-02	Not Listed	Not Available
Dichloromethane (methylene chloride)	7.5E-03	2E-03	4.7E-07	1E-08
Tetrachloroethane	5.2E-02 (withdrawn)	2.1E-03	5.9E-06 (withdrawn)	2.6E-07
Trichloroethene	1.1E-02 (withdrawn)	4.6E-02	2E-06 (withdrawn)	4.1E-06

Notes:
µg/m^3 = microgram per cubic meter
mg/kg/d = milligrams per kilogram per day
RI = Remedial Investigation

Table SS025-3: Toxicity Values for Non-Carcinogenic Constituents at Site SS025

Chemical	Oral Reference Dose (mg/kg-day) (RI Report)	Reference Dose (mg/kg-day) (2017)	Inhalation Reference Concentration (mg/m^3) (RI Report)	Inhalation Reference Dose (mg/m^3) (2017)
Organics:				
4,4’-DDD	5.0E-04	Not Available	Not Listed	Not Available
4,4’-DDE	5.0E-04	Not Available	Not Listed	Not Available
4,4’-DDT	5.0E-04	5E-04	Not Listed	Not Available
Bis(2-ethylhexyl)phthalate	2.0E-02	2E-02	Not Applicable	Not Applicable
Dichloromethane (methylene chloride)	6.0E-02	6E-03	3E+00	6E-01
2-Methylnaphthalene	2.0E-02	4E-03	Not Listed	Not Available
Tetrachloroethene	1.0E-02	6E-03	Not Listed	4E-02
Trichloroethene	6.0E-03	5E-04	Not Listed	2E-03
Inorganics:				
Copper	4.0E-02	4E-02	Not Listed	Not Available
Iron	3.0E-01	7E-01	Not Listed	Not Available
Manganese (food)	1.4E-01	1.4E-01	Not Listed	5E-05
Manganese (drinking water)	4.7E-02	2.4E-02	Not Listed	5E-05
Manganese (soil/inhalation)	4.7E-02	2.4E-02	5E-05	5E-05
Selenium	5.0E-03	5E-03	Not Listed	2E-02
Vanadium	7.0E-03	5E-03	Not Listed	1E-04

Notes:
mg/m^3 = milligram per cubic meter
mg/kg/d = milligrams per kilogram per day
RI = Remedial Investigation

8. SITE TU026, NEW EGYPT ARMORY

8.1 SITE CHRONOLOGY

A timeline of major events at Site TU026, NEA, is presented in Table TU026-1. Tables and figures for Site TU026 are provided at the end of this Chapter.

8.2 BACKGROUND OF SITE TU026, NEW EGYPT ARMORY

8.2.1 Physical Characteristics

Site TU026, NEA, is located in the northeast corner of the Range and Impact Area at the Dix Area (Figure 1), and has an area of approximately 15.8 acres. It currently consists of a fenced-in sandy area, with some asphalt paved areas. A pine-oak forest surrounds NEA to the north, east, and west, with sand pathways for occasional use by military vehicles (Figure TU026-1). Located approximately 1,000 ft northwest of NEA is a small tributary to Jumping Brook. Runoff from NEA flows through a flat area containing brush and plant debris, and then over a 30-ft wide dirt road with berms on either side. Another 30 ft of buffer area is on the other side of the road, upgradient of the Brook.

8.2.2 Land and Resource Use

NEA was formerly used by the Army and USAF for radar-related activities and for maintenance and storage of National Guard vehicles, tanks, and artillery. The site is currently being used for maintenance and storage of National Guard vehicles, tanks, and artillery. Maintenance buildings and vehicle storage areas are located within the fenced area at the northern end of the facility, and administrative buildings are located at the southern end.

8.2.3 History of Contamination

Historically, routine maintenance operations conducted by the New Jersey National Guard at the NEA may have resulted in leaks and spills of waste oils, lubricants, and hydraulic fluids containing the PCB Aroclor-1260. Two USTs previously located on a hill in the northwestern portion of the site were removed in early June 1997 and were reported to be inactive prior to removal. A third UST was removed in November 2000.

8.2.4 Initial Response

NEA has been the focus of numerous investigations to assess the nature and extent of COPCs associated with the three USTs previously located at the site, which were removed in 1997 and 2000. RIs were conducted from 1998-2003 and 2008-2010, to assess soil and groundwater contamination from the USTs. Pre-RI investigations included a 1988 Phase I Investigation of soil and groundwater, a 1995 UST investigation, and a 1997 UST closure investigation.

An interim removal action was conducted at NEA in 2004 to remove soils with PCB concentrations exceeding the previous New Jersey residential standard of 0.49 mg/kg. During the removal action, soil from the area of the former USTs and downgradient from their former location was excavated and disposed of. After sampling, the excavation was backfilled and graded, embankments were stabilized, and site restoration was performed. A Closure Report was prepared documenting the extent of the action (Kemron Environmental Services, Inc. [Kemron] 2005).

8.2.5 Basis for Taking Action

Soil and groundwater samples were collected during the RI. Analytical results were evaluated against identified screening criteria, and an HHRA and an ERA were conducted. A draft final RI Report was prepared (Kemron 2004), with results indicating substantial risk associated with the potential exposure to soil for site workers, construction workers, and future residents. The majority of the risk from exposure to soil was attributed to the COC, PCB Aroclor-1260. This RI report was never finalized.

Based upon results identified in the draft final RI Report, and with the approval of NJDEP, the interim removal action described in Section 8.2.4 was completed in 2004. Following the interim removal action, NJDEP notified JB MDL that additional investigation was required to address data gaps identified in the Closure Report for the soil removal, as well as the draft final RI Report (Kemron 2004).

An additional RI was conducted in 2008-2010 to address the data gaps identified by NJDEP. The RI was performed in the area where the previous interim removal action was conducted, as well as the area southeast of the USTs near Building 9361. The RI included investigation of soil, surface water, sediments, and groundwater to assess the nature and extent of potential impacts at the site, with the main concern being PCB impacts. A supplemental HHRA and screening-level ERA were also completed.

Soil sampling for PCBs in 2008-2010 indicated concentrations of Aroclor-1260 exceeding the New Jersey residential direct contact SRS of 0.20 mg/kg near the interim removal action area and in the area southeast of the USTs (near building 9361). The elevated concentrations were found to depths of approximately 13.5 ft (EA 2012b). The HHRA indicated cancer risks exceeding the NJDEP acceptable risk level, due to Aroclor-1260 in soil.

Analysis of surface water data found no evidence that PCBs from the site had affected water quality within the downgradient stream. Analysis of stream sediment indicated that total PCB concentrations in 4 out of 39 samples exceeded the PCB Threshold Effect Concentration. However, Probable Effect Concentrations were not exceeded, and the calculated HQ was 0.08, less than the 0.1 indicative of a medium-low priority site. Based on these findings, no further action was recommended for surface water or sediments within the tributary to Jumping Brook due to PCB impact from the NEA site.

8.3 REMEDIAL ACTIONS AT SITE TU026, NEW EGYPT ARMORY

8.3.1 Remedy Selection

The selected remedy provided in the ROD (USACE 2015b) consists of the following requirements:

- Excavation and offsite disposal of soil with PCB concentrations exceeding the NJDEP residential direct contact SRS (0.2 mg/kg)

- Confirmatory post-excavation sample collection and analysis

- Site restoration with certified clean backfill and rip/rap

- Monitoring well abandonment and closure report.

The RAO for NEA is the following:

- Prevent human exposure to PCB-impacted soil that would result in unacceptable carcinogenic risk or exceed NJDEP SRSs.

The remedial design for the soil excavation included additional pre-design data that filled data gaps identified in the ROD, and thus eliminated the need for confirmatory post-excavation sampling (PIKA-Arcadis 2015). The remedial design also indicated shallow excavation extending to approximately 3 ft under the shed. Preliminary exploratory shallow excavation work was completed along the maintenance shed to identify subsurface conditions in proximity to the shed that may affect the excavation adjacent to and extending under the shed. Footers extending to 2 ft bgs were encountered along the perimeter of the shed during this preliminary excavation work. The footers made excavating under the building, while maintaining the integrity of the shed and slab, unfeasible. To remove the soil behind the footer, excavation underneath the slab would need to proceed to a depth in excess of approximately 5 ft bgs. The deeper excavation would not be possible without removal of the shed and slab. Following discussion with USAF and NJDEP on 19 November 2016, a soil sample was collected from beneath the shed and found to exceed the New Jersey residential direct contact SRS of 0.2 mg/kg for PCBs. Therefore, it was decided that a LUC would be maintained for the soil left in place under the shed. Therefore, the following was added to the remedy, through an ESD (PIKA-Arcadis 2016a):

- A LUC to maintain the building slab to act as a cap over remaining PCB-impacted soils, preventing direct contact and/or infiltration of rainwater.

Due to this LUC, the site is also subject to FYRs.

8.3.2 Remedy Implementation

Approximately 2,712 cubic yards of non-hazardous contaminated soil was excavated and disposed of offsite at Middlesex County Landfill in November and December 2015. The excavation proceeded to various depths up to a depth of 17 ft bgs. The 5 site monitoring wells were also abandoned in accordance with New Jersey requirements in November 2015. The excavation was then backfilled with segregated clean overburden from the interim removal action and clean fill from the Lakehurst Area of JB MDL and stabilized with erosion control matting, dense graded aggregate, and rip rap (PIKA-Arcadis 2016b). The LUC to maintain the building slab was implemented in 2017.

8.3.3 Systems Operation and Maintenance

O&M of the remedy consists of annual inspections of the LUC under the LUCIP.

8.4 PROGRESS SINCE THE LAST REVIEW AT SITE TU026, NEW EGYPT ARMORY

This is the first FYR conducted for the NEA. The removal of PCB contaminated soil was completed in 2015 and the LUC is in place.

8.5 FIVE-YEAR REVIEW PROCESS FOR SITE TU026, NEW EGYPT ARMORY

8.5.1 Administrative Components

The FYR was prepared by JB MDL, in consultation with NJDEP. The team included Curtis Frye (JB MDL Remediation Program Manager), Nicole Brestle (Remediation Project Manager, Dix Area), and Haiyesh Shah (NJDEP Case Manager). This is a federal facility-lead site.

8.5.2 Community Involvement

Public notice of the beginning of the FYR process was published for 3 days in the *Asbury Park Press* (26-28 May 2017) and the *Burlington County Times* (25, 26, and 28 May 2017). The FYR was also discussed at the RAB meeting on 19 July 2017. Annual community planners meetings, including DOD representatives and contractors, are held each fall to review the JB MDL LUCIP and discuss upcoming projects at JB MDL potentially impacted by the established LUCs. Any FYR findings that impact base planning with respect to LUCs would be addressed during these meetings, as required. No public comments were received in association with the FYR. NJDEP did not have any comments regarding Site TU026 (Appendix B).

Once the FYR is completed, additional public notices will be published, the RAB mailing lists will be notified, and the results will be made available at the local site repositories, which are at the Burlington County Library (5 Pioneer Boulevard, Westhampton, New Jersey) and online at http://afcec.publicadmin-record.us.af.mil/. In addition, efforts will be made to reach out to local public officials to inform them of the results.

8.5.3 Document Review

This FYR consisted of a review of relevant documents, including the RODs/DDs, Biennial Certification Reports for the groundwater CEA, the LUCIP for JB MDL, annual IMMRs, landfill inspection report, and remedial action reports. The documents, data, and information that were reviewed in completing this FYR are summarized in Appendix C.

8.5.4 Data Review

No LTM is included in the remedy for TU026, and no additional data collection is anticipated in association with the remedy for the NEA.

8.5.5 Site Inspection

A site inspection at TU026 was conducted by EA, JB MDL, and NJDEP personnel on 25 July 2017. No issues were identified during the site inspection (Appendix E).

8.5.6 Interviews

During the FYR process, interviews were conducted with stakeholders, including representatives from the regulatory agencies overseeing the remedies at the Dix Area and community representatives aware of the remedial activities. The purpose of the interviews was to document any perceived problems or successes with the remedies that have been implemented to date. Interviews were conducted in August 2017. Detailed interview records are included in Appendix E.

None of the individuals interviewed (see Section 3.5.6 and Appendix E) indicated concerns regarding Site TU026.

8.5.7 Institutional Controls Verification

The LUC required for this site is described in Section 8.3. The LUC is in place and documented in the LUCIP for JB MDL.

8.6 TECHNICAL ASSESSMENT OF THE REMEDY AT SITE TU026, NEW EGYPT ARMORY

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

Based on a review of site documentation and observations during the site inspection conducted in July 2017, the remedy at the NEA is functioning as intended by the ROD and ESD.

Soils within the impacted area were excavated to depths up to 17 ft bgs to remove soils containing PCBs at concentrations exceeding the applicable standard of 0.2 mg/kg. The excavated areas were then backfilled with clean fill and restored to their original grade. A LUC was then instituted for maintenance of the building slab that covers remaining subsurface soil containing PCBs in excess of the applicable standard. The removal of soil, combined with the LUC for maintenance of the building slab, has achieved the RAO by preventing human exposure to PCB-impacted soil.

8.6.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of remedy selection still valid?

8.6.2.1 Changes in Risk Assessment Methodologies

There have been no major changes in HHRA or ERA methodology since the signing of the ROD that would impact the protectiveness of the TU026 – NEA remedy.

The RI for NEA (EA 2012b) included human health and ecological risk assessments. The primary documents used to conduct the HHRA included the following EPA guidance documents, as well as the NJDEP Remediation Standards (NJAC 7:26) (NJDEP 2009b): *RAGS Volume I: Human Health Manual (Part A)* (EPA 1989a), *RAGS Volume I: Human Health Evaluation Manual Supplemental Guidance, Standard Default Exposure Factors* (EPA 1991a); *RAGS Volume I: Human Health Evaluation Manual Supplemental Guidance, Part B Development of Risk-Based Preliminary Remediation Goals* (EPA 1991c); *Exposure Factors Handbook* (EPA 1997b); *RAGS Volume I: Human Health Evaluation Manual (Part D*) (EPA 2002)*; RAGS Volume I: Human Health Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)* (EPA 2004); and *Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children* (EPA 1994). Human exposure to PCB-impacted soil was determined to pose a concern.

The screening-level ERA included in the RI (EA 2012b) was based on the *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (EPA 1997a), *Guidelines for Ecological Risk Assessment* (EPA 1998), and *The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments* (EPA 2001). The ERA found no unacceptable risk to ecological receptors, and the RAO stated in the ROD does not address ecological receptors (USACE 2015b).

The risk assessment methodologies presented in EPA guidance for HHRAs and ERAs have not evolved significantly since the RI and ROD were completed for TU026.

8.6.2.2 Changes in Exposure Pathways

There have been no changes in physical conditions or land use at the site that would result in the development of new exposure pathways to human or ecological receptors. Additionally, no newly identified contaminants, contaminant sources, or toxic byproducts of the remedy were identified during the FYR process.

The HHRA conducted as part of the RI considered the following human health exposure pathways for NEA, based on use of the site for maintenance and storage of vehicles and artillery: incidental ingestion of and dermal contact with soils, inhalation of soil particles, and incidental ingestion of or dermal contact with surface water and sediment in the stream. Possible future residential use of groundwater from the Kirkwood-Cohansey aquifer was also considered. Human exposure to PCB-impacted soil was determined to pose a concern, and was the focus of the RAO defined in the ROD. PCB-impacted soil exceeding 0.2 mg/kg PCBs was removed in 2015, with the exception of soil marginally exceeding this level under the maintenance shed. With LUCs in place to maintain the slab of the maintenance shed, the exposure pathways are no longer complete.

Daily doses were developed as part of the HHRA, in accordance with the available guidance. More recently, EPA provided default exposure parameters for use in risk assessment in the *Human Health Evaluation Manual, Supplemental Guidance: Update of Standard Default Exposure Factors*, released in 2014 (EPA 2014). A majority of the exposure parameters assumed in the HHRA included in the RI are similar to the recent default exposure parameters set forth by EPA (EPA 2014). The one change in default exposure parameters that may result in changes to overall results is the difference assumed for default body weight. The EPA revised the default adult body weight from 70 kg to 80 kg. The increase in body weight results in lower overall cancer risks and non-cancer hazards. Use of these updated default exposure parameters are not expected to change the overall results determined for the NEA, for either the current or hypothetical exposure pathways considered. Because the current exposure pathways that were considered remain the most relevant, and no groundwater use is occurring or planned, an update to the RI is not warranted.

8.6.2.3 Contaminants of Concern and Changes in Standards and To-Be-Considered Guidance

The remedy selected in the ROD for NEA consisted of excavation of soils exceeding the NJDEP residential direct contact SRS of 0.2 mg/kg for PCBs, which are the only COCs identified for the site. The residential direct contact SRS for PCBs has not changed since the ROD was finalized.

8.6.2.4 Changes in Toxicity and Other Contaminant Characteristics

Toxicity values for PCBs were reviewed in accordance with the EPA toxicity hierarchy (EPA 2003). The EPA IRIS is the Tier I source for toxicity information (EPA 2017a). IRIS and other tiered toxicity sources presented on the EPA Regional Screening Level table (EPA 2017b) were reviewed to determine if revisions had been made to the factors used to calculate risk in the RI. Toxicity values for PCBs have not changed. Therefore, the remedy is still considered protective at this time. A revised risk assessment is not required since contact with soil is restricted by LUCs.

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

There is no other information to call into question the protectiveness of the remedy.

8.6.4 Technical Assessment Summary

The review of documents, risk assumptions, and results of the site inspection indicates that the remedy is functioning as intended by the ROD and ESD. The removal of soil, combined with the LUC for maintenance of the building slab, has achieved the RAO by preventing human exposure to PCB-impacted soil.

8.7 ISSUES, RECOMMENDATIONS, AND FOLLOW-UP ACTIONS AT SITE TU026, NEW EGYPT ARMORY

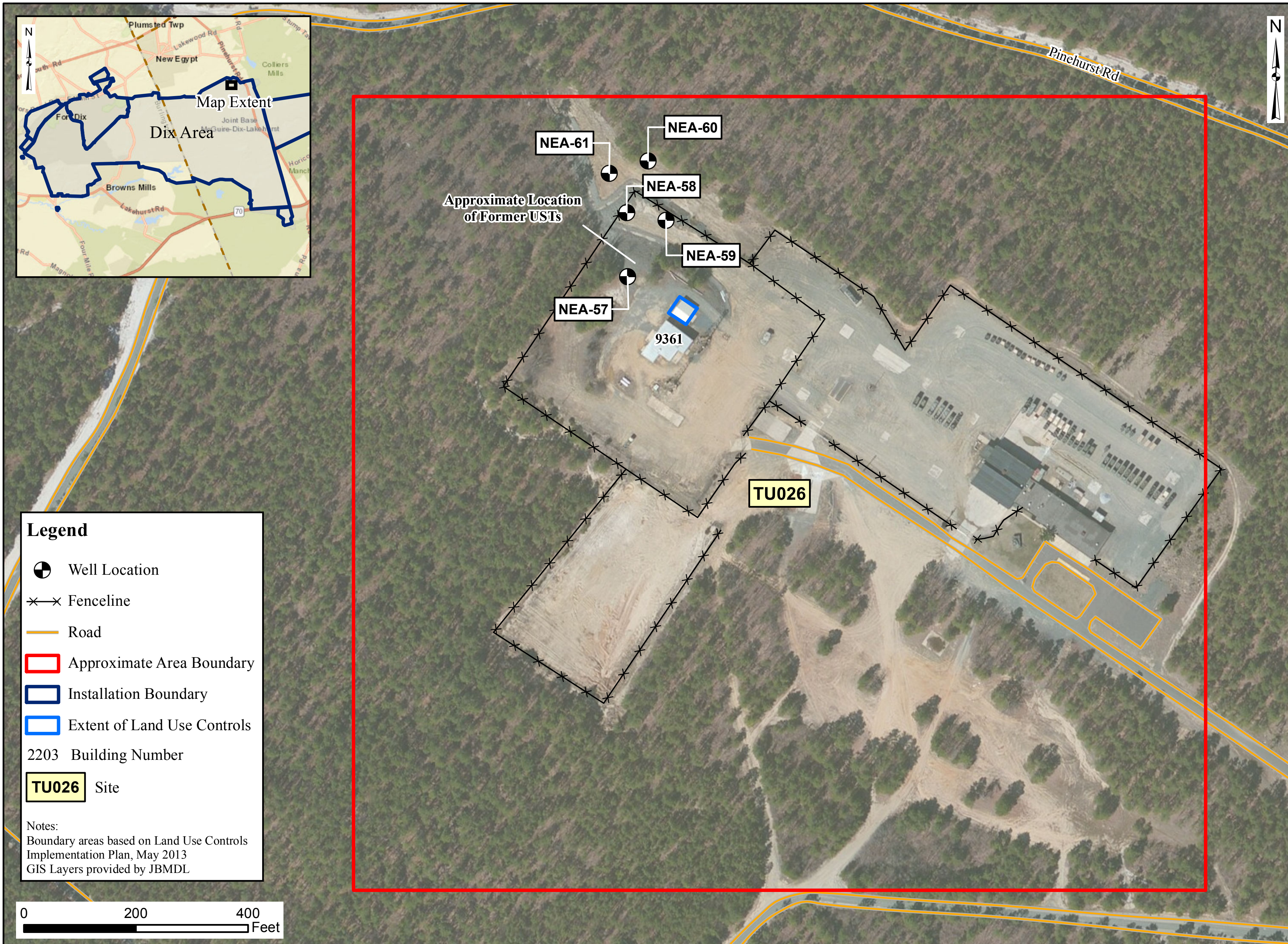
No issues that affect current or future protectiveness, and no other recommendations, were identified during the FYR.

8.8 PROTECTIVENESS STATEMENT FOR SITE TU026, NEW EGYPT ARMORY

Protectiveness Statement(s)	
Site: TU026	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at Site TU026 is protective of human health and the environment.	

8.9 NEXT REVIEW

The next FYR for Site TU026, New Egypt Armory, shall be submitted by May 2023.



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EA Engineering, Science, and Technology, Inc., PBC

DIX AREA FIVE-YEAR REVIEW
JOINT BASE MCGUIRE-DIX-LAKEHURST, NEW JERSEY

FIGURE TU026-1

TU026 SITE FEATURES

Table TU026-1: Chronology of Events at Site TU026

Event	Date
Phase I Investigation	1988
Underground storage tank investigation	1995
Removal of three underground storage tanks and closure investigation	1997 and 2000
Remedial Investigations	1998-2003 and 2008-2010
Interim soil removal action	2004
Focused Feasibility Study	September 2012
Record of Decision signed	3 June 2015
Remedial Design finalized	September 2015
Excavation of PCB-contaminated soil	November-December 2015
Explanation of Significant Differences signed	2 December 2016
Land Use Controls implemented	December 2016

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Appendix A
Analytical Data Summary Tables

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Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
October 2013

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-10 * (10/08/2013)	LTM-11 * (10/08/2013)	LTM-12 (10/08/2013)	LTM-12 (DUP) (10/08/2013)	LTM-13 * (10/08/2013)	LTM-14 * (10/08/2013)	LTM-17 * (10/08/2013)	LTM-18 * (10/08/2013)	LTM-19 (10/08/2013)	LTM-2 (10/08/2013)	LTM-20 (10/08/2013)	LTM-22 (10/08/2013)	LTM-23 (10/08/2013)	LTM-30 (10/08/2013)
Metals (SW6010C)																					
Aluminum	NS	30	200	Background ratio	NS	Background ratio	ug/l	35.9 J	121 J	126 J	115 J	51.5 J	29.9 J	1670	93.1 J	2330	41.7 J	NA	NA	290	38.4 J
Antimony	6	3	6	3	NS	3	ug/l	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	< 1.8 U	NA	NA	2.4 J	< 1.8 U
Arsenic	10	3	3	2.5	NS	3	ug/l	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	NA	NA	< 1.5 U	< 1.5 U
Barium	2000	200	6000	89.1	1000	1000	ug/l	**628 (*)**	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	< 200 U	**1280**	< 200 U	90.8 J	NA	NA	< 200 U	< 200 U
Beryllium	4	1	1	5	NS	5	ug/l	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	< 0.17 U	0.5 J	0.4 J	1	< 0.17 U	NA	NA	< 0.17 U	< 0.17 U
Cadmium	5	0.5	4	4	10	10	ug/l	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 3 U	< 0.24 U	NA	NA	< 3 U	< 0.24 U
Calcium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	23100	< 5000 U	6500	6890	< 5000 U	13700	< 5000 U	42400	< 5000 U	< 5000 U	NA	NA	30400	8950
Chromium	100	1	70	12.1	50	50	ug/l	< 10 U	< 0.92 U	< 0.92 U	< 0.92 U	< 0.92 U	< 10 U	< 10 U	< 10 U	< 10 U	**151**	NA	NA	< 0.92 U	18.1
Cobalt	NS	NS	NS	25	NS	25	ug/l	< 0.48 U	< 0.48 U	< 50 U	< 50 U	< 50 U	< 0.48 U	< 50 U	< 0.48 U	< 50 U	< 50 U	NA	NA	< 50 U	2.1 J
Copper	1300	4	1300	8.53	1000	8.53	ug/l	< 1 U	< 1 U	< 10 U	< 10 U	< 1 U	< 1 U	< 10 U	< 1 U	**10.5**	< 10 U	NA	NA	< 10 U	< 1 U
Iron	NS	20	300	Background ratio	300	Background ratio	ug/l	5020	695	3620	3510	< 100 U	13400	1810	32900	276	854	NA	NA	9160	307
Lead	15	5	5	6.45	50	50	ug/l	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	NA	NA	< 2.4 U	< 2.4 U
Magnesium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	5060	2960 J	1500 J	1520 J	1940 J	3600 J	644 J	10500	320 J	6680	NA	NA	869 J	< 5000 U
Manganese	NS	0.4	50	148	50	148	ug/l	147	**292**	24.6	25.4	< 15 U	**172**	**361**	**457**	**152**	94.6	NA	NA	**526**	141
Mercury	2	0.05	2	0.24	2	2	ug/l	< 0.089 U	**1.9 (*)**	< 0.089 U	< 0.089 U	< 0.089 U	< 0.089 U	< 0.089 U	< 0.089 U	< 0.089 U	< 0.089 U	NA	NA	< 0.089 U	< 0.089 U
Nickel	NS	4	100	10.9	NS	10.9	ug/l	< 10 U	< 1.6 U	< 10 U	< 10 U	< 10 U	**13.1**	< 10 U	< 1.6 U	< 10 U	**115**	NA	NA	**46.6**	**230**
Potassium	NS	NS	NS	7870	NS	7870	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium	50	4	40	7.45	NS	7.45	ug/l	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U	NA	NA	< 2.4 U	< 2.4 U
Silver	NS	1	40	0.25	50	1	ug/l	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	NA	NA	< 1.5 U	< 1.5 U
Sodium	NS	400	50000	10555	50000	50000	ug/l	< 10000 U	< 10000 U	< 10000 U	< 10000 U	< 10000 U	< 10000 U	< 10000 U	10500 J	< 10000 U	28200 J	NA	NA	< 10000 U	23900 J
Thallium	2	2	2	7	NS	7	ug/l	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U	< 1.3 U	1.3 J	< 1.3 U	< 1.3 U	NA	NA	< 1.3 U	< 1.3 U
Vanadium	NS	1	60	14.1	NS	14.1	ug/l	< 0.72 U	< 0.72 U	< 0.72 U	< 0.72 U	< 0.72 U	< 0.72 U	< 50 U	< 50 U	< 0.72 U	< 0.72 U	NA	NA	< 0.72 U	< 0.72 U
Zinc	NS	10	2000	54.4	5000	54.4	ug/l	5.9 J	< 4.4 U	25.7	24.3	14 J	18 J	48.2	8 J	**127**	< 4.4 U	NA	NA	**867**	9.3 J
VOCs (SW8260B)																					
1,1,1,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	26	1	ug/l	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	NA	NA	< 0.25 U	< 0.25 U	NA	NA
1,1,2,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	NA	NA	< 0.2 U	< 0.2 U	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	NS	2	ug/l	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	NA	NA	< 0.21 U	< 0.21 U	NA	NA
1,1-dichloroethane	NS	1	50	NS	NS	1	ug/l	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U	NA	NA	< 0.26 U	< 0.26 U	NA	NA
1,1-dichloroethene	7	1	1	NS	2	2	ug/l	< 0.34 U	< 0.34 U	< 0.34 U	< 0.34 U	< 0.34 U	< 0.34 U	< 0.34 U	< 0.34 U	NA	NA	< 0.34 U	< 0.34 U	NA	NA
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichloropropane	NS	0.03	0.03	NS	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	0.03	NS	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	600	NS	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 0.22 UJ	< 0.22 UJ	< 0.22 UJ	< 0.22 UJ	< 0.22 UJ	< 0.22 UJ	< 0.22 UJ	< 0.22 UJ	NA	NA	< 0.22 UJ	< 0.22 UJ	NA	NA
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloropropane	5	1	1	NS	NS	1	ug/l	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	NA	NA	< 0.28 U	< 0.28 U	NA	NA
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	75	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dioxane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	300	NS	NS	2	ug/l	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	**118**	NA	NA	< 3.2 U	< 3.2 U	NA	NA
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
October 2013

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-10 * (10/08/2013)	LTM-11 * (10/08/2013)	LTM-12 (10/08/2013)	LTM-12 (DUP) (10/08/2013)	LTM-13 * (10/08/2013)	LTM-14 * (10/08/2013)	LTM-17 * (10/08/2013)	LTM-18 * (10/08/2013)	LTM-19 (10/08/2013)	LTM-2 (10/08/2013)	LTM-20 (10/08/2013)	LTM-22 (10/08/2013)	LTM-23 (10/08/2013)	LTM-30 (10/08/2013)
4-methyl-2-pentanone	NS	NS	NS	3	NS	3	ug/l	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	NA	NA	< 1.5 U	< 1.5 U	NA	NA
Acetone	NS	10	6000	NS	NS	10	ug/l	R	R	R	R	R	R	R	**223**	NA	NA	R	R	NA	NA
Benzene	5	1	1	NS	1	1	ug/l	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U	NA	NA	**5.6**	**3.1**	NA	NA
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	1	NS	NS	1	ug/l	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	NA	NA	< 0.21 U	< 0.21 U	NA	NA
Bromoform	80	0.8	4	NS	NS	0.8	ug/l	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	NA	NA	< 0.3 U	< 0.3 U	NA	NA
Bromomethane	NS	1	10	NS	NS	1	ug/l	< 0.56 U	< 0.56 U	< 0.56 U	< 0.56 U	< 0.56 U	< 0.56 U	< 0.56 U	< 0.56 U	NA	NA	< 0.56 U	< 0.56 U	NA	NA
Carbon disulfide	NS	1	700	NS	NS	1	ug/l	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U	NA	NA	< 0.18 U	< 0.18 U	NA	NA
Carbon tetrachloride	5	1	1	NS	NS	1	ug/l	< 0.23 UJ	< 0.23 UJ	< 0.23 UJ	< 0.23 UJ	< 0.23 UJ	< 0.23 UJ	< 0.23 UJ	< 0.23 UJ	NA	NA	< 0.23 UJ	< 0.23 UJ	NA	NA
Chlorobenzene	100	1	50	NS	NS	1	ug/l	< 0.35 U	< 0.35 U	< 0.35 U	< 0.35 U	< 0.35 U	< 0.35 U	< 0.35 U	< 0.35 U	NA	NA	**3.9**	< 0.35 U	NA	NA
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U	NA	NA	< 0.39 U	< 0.39 U	NA	NA
Chloroform	80	1	70	NS	NS	1	ug/l	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	NA	NA	< 0.25 U	< 0.25 U	NA	NA
Chloromethane	NS	NS	NS	3.2	NS	3.2	ug/l	< 0.36 U	< 0.36 U	< 0.36 U	< 0.36 U	< 0.36 U	< 0.36 U	< 0.36 U	< 0.36 U	NA	NA	< 0.36 U	< 0.36 U	NA	NA
cis-1,2-dichloroethene	70	1	70	NS	NS	1	ug/l	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U	NA	NA	< 0.24 U	**18.8**	NA	NA
cis-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U	NA	NA	< 0.15 U	< 0.15 U	NA	NA
Cyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	NS	1	ug/l	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	NA	NA	< 0.19 U	< 0.19 U	NA	NA
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	NS	NS	2	ug/l	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	NA	NA	< 0.21 U	< 0.21 U	NA	NA
Hexachloro-1,3-butadiene	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	NS	0.5	7000	NS	NS	0.5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	1	3	NS	2	2	ug/l	< 0.86 U	< 0.86 U	< 0.86 U	< 0.86 U	< 0.86 U	< 0.86 U	< 0.86 U	< 0.86 U	NA	NA	< 0.86 U	< 0.86 U	NA	NA
Naphthalene	NS	2	300	NS	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	2	100	NS	NS	2	ug/l	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	NA	NA	< 0.3 U	< 0.3 U	NA	NA
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U	NA	NA	< 0.25 U	**1.2**	NA	NA
Toluene	1000	1	600	NS	NS	1	ug/l	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U	NA	NA	< 0.44 U	< 0.44 U	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	10	1	ug/l	< 0.38 U	< 0.38 U	< 0.38 U	< 0.38 U	< 0.38 U	< 0.38 U	< 0.38 U	< 0.38 U	NA	NA	< 0.38 U	0.42 J	NA	NA
trans-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U	NA	NA	< 0.21 U	< 0.21 U	NA	NA
Trichloroethene	5	1	1	NS	1	1	ug/l	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U	0.69 J	NA	NA
Trichlorofluoromethane	NS	1	2000	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2	1	1	NS	2	2	ug/l	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U	NA	NA	< 0.41 U	1.2	NA	NA
Xylenes, Total	10000	2	1000	NS	44	2	ug/l	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U	NA	NA	< 0.19 U	< 0.19 U	NA	NA

Notes:
* Indicates Sentinel Well, as classified in 2013.
(*) Result from sentinel well exceeds the PQL (or BTV for metals, if higher than the PQL), but does not exceed the Site Screening Criterion.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
ug/l = Micrograms per Liter
NA = Not Analyzed or Data Not Provided
ND = Not Detected (reporting/detection limit not provided)
NS = No Screening Criteria
R = Result rejected during validation
ROD = Record of Decision
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
October 2013

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-32 (10/08/2013)	LTM-34 * (10/08/2013)	LTM-36 * (10/08/2013)	LTM-9 * (10/08/2013)
Metals (SW6010C)											
Aluminum	NS	30	200	Background ratio	NS	Background ratio	ug/l	< 200 U	199 J	< 200 U	88.4 J
Antimony	6	3	6	3	NS	3	ug/l	< 1.8 U	2.3 J	< 1.8 U	< 1.8 U
Arsenic	10	3	3	2.5	NS	3	ug/l	**3.3**	< 3 U	< 1.5 U	< 1.5 U
Barium	2000	200	6000	89.1	1000	1000	ug/l	< 200 U	< 200 U	< 200 U	< 200 U
Beryllium	4	1	1	5	NS	5	ug/l	< 0.17 U	< 0.17 U	< 0.17 U	0.2 J
Cadmium	5	0.5	4	4	10	10	ug/l	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U
Calcium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	48500	4000 J	16300	8150
Chromium	100	1	70	12.1	50	50	ug/l	< 10 U	< 10 U	< 0.92 U	< 0.92 U
Cobalt	NS	NS	NS	25	NS	25	ug/l	< 50 U	0.5 J	< 0.48 U	< 50 U
Copper	1300	4	1300	8.53	1000	8.53	ug/l	< 1 U	< 1 U	< 1 U	< 1 U
Iron	NS	20	300	Background ratio	300	Background ratio	ug/l	48700	3270	148	61400
Lead	15	5	5	6.45	50	50	ug/l	< 2.4 U	< 2.4 U	< 2.4 U	< 2.4 U
Magnesium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	11200	< 5000 U	3740 J	1480 J
Manganese	NS	0.4	50	148	50	148	ug/l	68	< 15 U	< 15 U	76.1
Mercury	2	0.05	2	0.24	2	2	ug/l	< 0.089 U	< 0.089 U	< 0.089 U	< 0.089 U
Nickel	NS	4	100	10.9	NS	10.9	ug/l	< 10 U	< 1.6 U	< 1.6 U	< 10 U
Potassium	NS	NS	NS	7870	NS	7870	ug/l	NA	NA	NA	NA
Selenium	50	4	40	7.45	NS	7.45	ug/l	< 2.4 U	< 2.4 U	< 10 U	< 2.4 U
Silver	NS	1	40	0.25	50	1	ug/l	**1.9 J**	< 1.5 U	< 1.5 U	**2 J**
Sodium	NS	400	50000	10555	50000	50000	ug/l	< 10000 U	< 10000 U	< 10000 U	< 10000 U
Thallium	2	2	2	7	NS	7	ug/l	< 1.3 U	< 1.3 U	< 1.3 U	1.3 J
Vanadium	NS	1	60	14.1	NS	14.1	ug/l	< 0.72 U	2 J	< 0.72 U	< 50 U
Zinc	NS	10	2000	54.4	5000	54.4	ug/l	< 4.4 U	5.1 J	< 4.4 U	< 4.4 U
VOCs (SW8260B)											
1,1,1,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	26	1	ug/l	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	NS	2	ug/l	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U
1,1-dichloroethane	NS	1	50	NS	NS	1	ug/l	< 0.26 U	< 0.26 U	< 0.26 U	< 0.26 U
1,1-dichloroethene	7	1	1	NS	2	2	ug/l	< 0.34 U	< 0.34 U	< 0.34 U	< 0.34 U
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
1,2,3-trichloropropane	NS	0.03	0.03	NS	NS	0.03	ug/l	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	NS	1	ug/l	NA	NA	NA	NA
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	NS	0.02	ug/l	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	0.03	NS	NS	0.03	ug/l	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	600	NS	NS	5	ug/l	NA	NA	NA	NA
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 0.22 UJ	< 0.22 UJ	< 0.22 UJ	< 0.22 UJ
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
1,2-dichloropropane	5	1	1	NS	NS	1	ug/l	< 0.28 U	< 0.28 U	< 0.28 U	< 0.28 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	NS	5	ug/l	NA	NA	NA	NA
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	75	5	ug/l	NA	NA	NA	NA
1,4-dioxane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
2-butanone	NS	2	300	NS	NS	2	ug/l	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-32 (10/08/2013)	LTM-34 * (10/08/2013)	LTM-36 * (10/08/2013)	LTM-9 * (10/08/2013)
4-methyl-2-pentanone	NS	NS	NS	3	NS	3	ug/l	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U
Acetone	NS	10	6000	NS	NS	10	ug/l	R	R	R	R
Benzene	5	1	1	NS	1	1	ug/l	**1.8**	< 0.28 U	< 0.28 U	< 0.28 U
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
Bromodichloromethane	80	1	1	NS	NS	1	ug/l	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U
Bromoform	80	0.8	4	NS	NS	0.8	ug/l	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U
Bromomethane	NS	1	10	NS	NS	1	ug/l	< 0.56 U	< 0.56 U	< 0.56 U	< 0.56 U
Carbon disulfide	NS	1	700	NS	NS	1	ug/l	< 0.18 U	< 0.18 U	< 0.18 U	< 0.18 U
Carbon tetrachloride	5	1	1	NS	NS	1	ug/l	< 0.23 UJ	< 0.23 UJ	< 0.23 UJ	< 0.23 UJ
Chlorobenzene	100	1	50	NS	NS	1	ug/l	**15**	< 0.35 U	< 0.35 U	< 0.35 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.39 U	< 0.39 U	< 0.39 U	< 0.39 U
Chloroform	80	1	70	NS	NS	1	ug/l	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U
Chloromethane	NS	NS	NS	3.2	NS	3.2	ug/l	< 0.36 U	< 0.36 U	< 0.36 U	< 0.36 U
cis-1,2-dichloroethene	70	1	70	NS	NS	1	ug/l	< 0.24 U	< 0.24 U	< 0.24 U	< 0.24 U
cis-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 0.15 U	< 0.15 U	< 0.15 U	< 0.15 U
Cyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	NS	1	ug/l	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	NS	2	ug/l	NA	NA	NA	NA
Ethylbenzene	700	2	700	NS	NS	2	ug/l	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U
Hexachloro-1,3-butadiene	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	NS	1	ug/l	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
Methyl acetate	NS	0.5	7000	NS	NS	0.5	ug/l	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	NS	1	ug/l	NA	NA	NA	NA
Methylcyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
Methylene Chloride	5	1	3	NS	2	2	ug/l	< 0.86 U	< 0.86 U	< 0.86 U	< 0.86 U
Naphthalene	NS	2	300	NS	NS	2	ug/l	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
Styrene	100	2	100	NS	NS	2	ug/l	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 0.25 U	< 0.25 U	< 0.25 U	< 0.25 U
Toluene	1000	1	600	NS	NS	1	ug/l	< 0.44 U	< 0.44 U	< 0.44 U	< 0.44 U
trans-1,2-dichloroethene	100	1	100	NS	10	1	ug/l	< 0.38 U	< 0.38 U	< 0.38 U	< 0.38 U
trans-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 0.21 U	< 0.21 U	< 0.21 U	< 0.21 U
Trichloroethene	5	1	1	NS	1	1	ug/l	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichlorofluoromethane	NS	1	2000	NS	NS	1	ug/l	NA	NA	NA	NA
Vinyl chloride	2	1	1	NS	2	2	ug/l	< 0.41 U	< 0.41 U	< 0.41 U	< 0.41 U
Xylenes, Total	10000	2	1000	NS	44	2	ug/l	< 0.19 U	< 0.19 U	< 0.19 U	< 0.19 U

Notes:
* Indicates Sentinel Well, as classified in 2013.
(*) Result from sentinel well exceeds the PQL (or BTV for metals, if higher than the PQL), but does not exceed the Site Screening Criterion
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
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ug/l = Micrograms per Liter
NA = Not Analyzed or Data Not Provided
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ROD = Record of Decision
VOCs = Volatile Organic Compounds
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Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
July 2014

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-10 * (07/22/2014)	LTM-10-FD * (07/22/2014)	LTM-11 * (07/23/2014)	LTM-12 (07/23/2014)	LTM-13 * (07/22/2014)	LTM-14 * (07/22/2014)	LTM-17 * (07/22/2014)	LTM-18 * (07/22/2014)	LTM-19 (07/23/2014)	LTM-2 (07/23/2014)	LTM-20 (07/23/2014)	LTM-22 (07/23/2014)	LTM-23 (07/23/2014)	LTM-30 (07/23/2014)
Metals (SW6010C)																					
Aluminum	NS	30	200	Background ratio	NS	Background ratio	ug/l	34 J	38 J	407	158 J	24 J	42 J	1430	75 J	927	12 J	NA	NA	202	ND
Antimony	6	3	6	3	NS	3	ug/l	2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND
Arsenic	10	3	3	2.5	NS	3	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND
Barium	2000	200	6000	89.1	1000	1000	ug/l	**772 (*)**	763	29 J	4 J	17 J	127 J	54 J	**1610**	58 J	116 J	NA	NA	29 J	85 J
Beryllium	4	1	1	5	NS	5	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND
Cadmium	5	0.5	4	4	10	10	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	3	ND
Calcium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	26900	26700	7470	ND	ND	14100	ND	49600	ND	ND	NA	NA	37300	7290
Chromium	100	1	70	12.1	50	50	ug/l	1 J	1 J	1 J	1 J	ND	4 J	1 J	1 J	ND	32	NA	NA	1 J	14
Cobalt	NS	NS	NS	25	NS	25	ug/l	ND	ND	1 J	ND	ND	ND	6 J	ND	2 J	1 J	NA	NA	16 J	1 J
Copper	1300	4	1300	8.53	1000	8.53	ug/l	ND	ND	**15**	ND	ND	ND	2 J	ND	4 J	ND	NA	NA	ND	ND
Iron	NS	20	300	Background ratio	300	Background ratio	ug/l	19300	19300	12900	2290	ND	9340	802	38300	13 J	ND	NA	NA	18800	291
Lead	15	5	5	6.45	50	50	ug/l	ND	ND	3	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND
Magnesium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	5810	5750	1370 J	3520 J	1460 J	3580 J	545 J	12200	352 J	7830	NA	NA	1160 J	3260 J
Manganese	NS	0.4	50	148	50	148	ug/l	**204**	**205**	44	**385**	6 J	138	**259**	**532**	49	96	NA	NA	**652**	97
Mercury	2	0.05	2	0.24	2	2	ug/l	ND	ND	ND	1	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND
Nickel	NS	4	100	10.9	NS	10.9	ug/l	ND	ND	ND	ND	ND	**13**	ND	ND	ND	**55**	NA	NA	**72**	**183**
Potassium	NS	NS	NS	7870	NS	7870	ug/l	ND	ND	ND	2540 J	ND	ND	ND	**10500**	ND	**10200**	NA	NA	ND	3060 J
Selenium	50	4	40	7.45	NS	7.45	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND
Silver	NS	1	40	0.25	50	1	ug/l	ND	ND	ND	ND	ND	ND	ND	1 J	ND	ND	NA	NA	ND	ND
Sodium	NS	400	50000	10555	50000	50000	ug/l	**11700 (*)**	**11600 (*)**	8340 J	ND	1670 J	6760 J	1950 J	**12400 (*)**	5070 J	31800	NA	NA	1780 J	30300
Thallium	2	2	2	7	NS	7	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium	NS	1	60	14.1	NS	14.1	ug/l	ND	ND	1 J	1 J	ND	ND	1 J	1 J	ND	ND	NA	NA	1 J	ND
Zinc	NS	10	2000	54.4	5000	54.4	ug/l	ND	ND	23	ND	10 J	19 J	44	8 J	**78**	ND	NA	NA	**1420**	11 J
VOCs (SW8260B)																					
1,1,1,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	26	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethane	NS	1	50	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethene	7	1	1	NS	2	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichloropropane	NS	0.03	0.03	NS	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	0.03	NS	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	600	NS	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	19	NA	NA
1,2-dichloropropane	5	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	75	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dioxane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	300	NS	NS	2	ug/l	ND	ND	ND	ND	ND	ND	ND	**242**	NA	NA	ND	ND	NA	NA
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	3	NS	3	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NS	10	6000	NS	NS	10	ug/l	ND	ND	ND	ND	ND	ND	ND	**272**	NA	NA	ND	ND	NA	NA

Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
July 2014

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-10 * (07/22/2014)	LTM-10-FD * (07/22/2014)	LTM-11 * (07/23/2014)	LTM-12 (07/23/2014)	LTM-13 * (07/22/2014)	LTM-14 * (07/22/2014)	LTM-17 * (07/22/2014)	LTM-18 * (07/22/2014)	LTM-19 (07/23/2014)	LTM-2 (07/23/2014)	LTM-20 (07/23/2014)	LTM-22 (07/23/2014)	LTM-23 (07/23/2014)	LTM-30 (07/23/2014)
Benzene	5	1	1	NS	1	1	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	**4**	**2**	NA	NA
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	0.8	4	NS	NS	0.8	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NS	1	10	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	700	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	1	50	NS	NS	1	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	**3**	ND	NA	NA
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	80	1	70	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NS	NS	NS	3.2	NS	3.2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	70	1	70	NS	NS	1	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	**19**	NA	NA
cis-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	NS	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloro-1,3-butadiene	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	NS	0.5	7000	NS	NS	0.5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	1	3	NS	2	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NS	2	300	NS	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	2	100	NS	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	1	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA
Toluene	1000	1	600	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	10	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5	1	1	NS	1	1	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA
Trichlorofluoromethane	NS	1	2000	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2	1	1	NS	2	2	ug/l	ND	ND	ND	ND	ND	ND	ND	ND	NA	NA	ND	ND	NA	NA
Xylenes, Total	10000	2	1000	NS	44	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
* Indicates Sentinel Well, as classified in 2014.
(*) Result from sentinel well exceeds the PQL (or BTV for metals, if higher than the PQL), but does not exceed the Site Screening Criterion.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
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Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-32 (07/23/2014)	LTM-32-FD (07/23/2014)	LTM-34 * (07/23/2014)	LTM-36 * (07/22/2014)	LTM-9 (07/22/2014)
Metals (SW6010C)												
Aluminum	NS	30	200	Background ratio	NS	Background ratio	ug/l	ND	ND	277	39 J	50 J
Antimony	6	3	6	3	NS	3	ug/l	ND	ND	ND	ND	ND
Arsenic	10	3	3	2.5	NS	3	ug/l	2 J	3	ND	ND	ND
Barium	2000	200	6000	89.1	1000	1000	ug/l	67 J	68 J	4 J	2 J	5 J
Beryllium	4	1	1	5	NS	5	ug/l	ND	ND	ND	ND	ND
Cadmium	5	0.5	4	4	10	10	ug/l	ND	ND	ND	ND	1 J
Calcium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	48600	48800	ND	16800	9900
Chromium	100	1	70	12.1	50	50	ug/l	1 J	1 J	1 J	1 J	ND
Cobalt	NS	NS	NS	25	NS	25	ug/l	6 J	6 J	ND	ND	3 J
Copper	1300	4	1300	8.53	1000	8.53	ug/l	ND	ND	ND	ND	ND
Iron	NS	20	300	Background ratio	300	Background ratio	ug/l	53100	52200	2430	87 J	62800
Lead	15	5	5	6.45	50	50	ug/l	2 J	1 J	ND	ND	ND
Magnesium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	11300	11300	2120 J	3850 J	1600 J
Manganese	NS	0.4	50	148	50	148	ug/l	**182**	**181**	3 J	6 J	78
Mercury	2	0.05	2	0.24	2	2	ug/l	ND	ND	ND	ND	ND
Nickel	NS	4	100	10.9	NS	10.9	ug/l	4 J	4 J	ND	ND	ND
Potassium	NS	NS	NS	7870	NS	7870	ug/l	**20400**	**20300**	ND	ND	ND
Selenium	50	4	40	7.45	NS	7.45	ug/l	4 J	ND	ND	ND	ND
Silver	NS	1	40	0.25	50	1	ug/l	1 J	ND	ND	ND	ND
Sodium	NS	400	50000	10555	50000	50000	ug/l	ND	ND	2020 J	3670 J	1490 J
Thallium	2	2	2	7	NS	7	ug/l	NA	NA	NA	NA	NA
Vanadium	NS	1	60	14.1	NS	14.1	ug/l	ND	ND	2 J	ND	1 J
Zinc	NS	10	2000	54.4	5000	54.4	ug/l	ND	ND	ND	ND	9 J
VOCs (SW8260B)												
1,1,1,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	26	1	ug/l	NA	NA	NA	NA	NA
1,1,2,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	NS	2	ug/l	NA	NA	NA	NA	NA
1,1-dichloroethane	NS	1	50	NS	NS	1	ug/l	NA	NA	NA	NA	NA
1,1-dichloroethene	7	1	1	NS	2	2	ug/l	NA	NA	NA	NA	NA
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
1,2,3-trichloropropane	NS	0.03	0.03	NS	NS	0.03	ug/l	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	NS	1	ug/l	NA	NA	NA	NA	NA
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	NS	0.02	ug/l	NA	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	0.03	NS	NS	0.03	ug/l	NA	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	600	NS	NS	5	ug/l	NA	NA	NA	NA	NA
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	NA	NA	NA	NA	NA
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	ND	ND	ND	ND	ND
1,2-dichloropropane	5	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	NS	5	ug/l	NA	NA	NA	NA	NA
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	75	5	ug/l	NA	NA	NA	NA	NA
1,4-dioxane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
2-butanone	NS	2	300	NS	NS	2	ug/l	ND	ND	R	ND	R
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	3	NS	3	ug/l	NA	NA	NA	NA	NA
Acetone	NS	10	6000	NS	NS	10	ug/l	ND	ND	ND	ND	ND

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-32 (07/23/2014)	LTM-32-FD (07/23/2014)	LTM-34 * (07/23/2014)	LTM-36 * (07/22/2014)	LTM-9 (07/22/2014)
Benzene	5	1	1	NS	1	1	ug/l	1	**2**	ND	ND	ND
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Bromoform	80	0.8	4	NS	NS	0.8	ug/l	NA	NA	NA	NA	NA
Bromomethane	NS	1	10	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	700	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Carbon tetrachloride	5	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Chlorobenzene	100	1	50	NS	NS	1	ug/l	**11**	**12**	ND	ND	ND
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Chloroform	80	1	70	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Chloromethane	NS	NS	NS	3.2	NS	3.2	ug/l	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	70	1	70	NS	NS	1	ug/l	ND	ND	ND	ND	ND
cis-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Cyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	NS	2	ug/l	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	NS	NS	2	ug/l	NA	NA	NA	NA	NA
Hexachloro-1,3-butadiene	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	NS	1	ug/l	NA	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Methyl acetate	NS	0.5	7000	NS	NS	0.5	ug/l	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Methylcyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Methylene Chloride	5	1	3	NS	2	2	ug/l	NA	NA	NA	NA	NA
Naphthalene	NS	2	300	NS	NS	2	ug/l	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Styrene	100	2	100	NS	NS	2	ug/l	NA	NA	NA	NA	NA
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	1	ug/l	ND	ND	ND	ND	ND
Toluene	1000	1	600	NS	NS	1	ug/l	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	10	1	ug/l	NA	NA	NA	NA	NA
trans-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Trichloroethene	5	1	1	NS	1	1	ug/l	ND	ND	ND	ND	ND
Trichlorofluoromethane	NS	1	2000	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Vinyl chloride	2	1	1	NS	2	2	ug/l	ND	ND	ND	ND	ND
Xylenes, Total	10000	2	1000	NS	44	2	ug/l	NA	NA	NA	NA	NA

Notes:
* Indicates Sentinel Well, as classified in 2014.
(*) Result from sentinel well exceeds the PQL (or BTV for metals, if higher than the PQL), but does not exceed the Site Screening Criterion.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
ug/l = Micrograms per Liter
NA = Not Analyzed or Data Not Provided
ND = Not Detected (reporting/detection limit not provided)
NS = No Screening Criteria
R = Result rejected during validation
ROD = Record of Decision
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2015

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-10 * (04/09/2015)	LTM-10-FD * (04/09/2015)	LTM-11 * (04/09/2015)	LTM-12 (04/09/2015)	LTM-13 * (04/09/2015)	LTM-14 * (04/09/2015)	LTM-17 * (04/08/2015)	LTM-18 * (04/08/2015)	LTM-19 (04/09/2015)	LTM-2 (04/08/2015)	LTM-20 (04/09/2015)	LTM-22 (04/09/2015)	LTM-23 (04/09/2015)	LTM-30 (04/09/2015)	LTM-32 (04/09/2015)
Metals (SW6010C)																						
Aluminum	NS	30	200	Background ratio	NS	Background ratio	ug/l	< 10.2 UB	< 7.9 UB	26.7	48.4	26.9	< 6.5 UB	679	12.8 B	1380	27.8	NA	NA	130	27.3	< 4.6 UB
Antimony	6	3	6	3	NS	3	ug/l	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	0.22 B	< 2 U	< 2 U	< 2 U	NA	NA	< 2 U	< 2 U	< 2 U
Arsenic	10	3	3	2.5	NS	3	ug/l	0.24 J	< 2 UJ	< 2 U	**3.8**	< 2 U	2	< 2 U	0.67 B	< 2 U	< 2 U	NA	NA	< 2 U	< 2 U	2.1
Barium	2000	200	6000	89.1	1000	1000	ug/l	**812 (*)**	**860 (*)**	23.1	10.7	14.9	142	41.4	**1450**	85.1	94.8	NA	NA	30.7	76	59.6
Beryllium	4	1	1	5	NS	5	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	0.29 B	0.66 B	0.77 B	< 1 U	NA	NA	< 1 U	< 1 U	< 1 U
Cadmium	5	0.5	4	4	10	10	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	0.089 B	0.16 B	0.29 B	< 1 U	0.26 B	0.21 B	NA	NA	4.7	0.25 B	< 1 U
Calcium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	28300 E	29500 E	6910 E	987 E	1370 E	16000 E	1270	45300	2340 E	6410	NA	NA	87700 E	8040 E	52300 E
Chromium	100	1	70	12.1	50	50	ug/l	< 2 U	< 0.19 UB	< 2 U	1.2 B	< 0.47 UB	< 0.2 UB	0.84 B	0.88 B	< 0.67 UB	**109**	NA	NA	< 2 U	21.3	< 2 U
Cobalt	NS	NS	NS	25	NS	25	ug/l	< 0.17 UJB	< 0.3 UJB	< 0.74 UB	< 0.51 UB	< 0.84 UB	< 0.53 UB	7.1	< 0.18 UB	4.8	2.8	NA	NA	**27**	< 2.5 UB	7.5
Copper	1300	4	1300	8.53	1000	8.53	ug/l	< 0.44 UB	< 0.52 UB	2.2	< 0.53 UB	< 0.91 UB	< 0.99 UB	0.71 B	0.62 B	5.3	2.8	NA	NA	< 1.1 UB	3.2	< 0.47 UB
Iron	NS	20	300	Background ratio	300	Background ratio	ug/l	19900	21200	223	8170	< 14.8 UB	11900	< 69.2 UB	42900	< 17.6 UB	869	NA	NA	26100	1050	52600
Lead	15	5	5	6.45	50	50	ug/l	< 1 U	< 0.16 UB	< 1 U	< 0.15 UB	< 0.16 UB	< 0.11 UB	< 0.096 UB	< 1 U	< 0.38 UB	< 0.28 UB	NA	NA	< 0.31 UB	< 0.4 UB	< 0.16 UB
Magnesium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	5810	6050	1490	1390	1260	3930	612	10600	442 B	7550	NA	NA	2840	2950	11400
Manganese	NS	0.4	50	148	50	148	ug/l	**232**	**247**	25.2	46.4	8.6	**165**	**197**	**465**	61.3	84.3	NA	NA	**1310**	98.3	**154**
Mercury	2	0.05	2	0.24	2	2	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	0.84	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	NA	NA	< 0.2 U	< 0.2 U	< 0.2 U
Nickel	NS	4	100	10.9	NS	10.9	ug/l	< 1.7 UB	< 1.9 UB	< 1.2 UB	< 0.93 UB	< 2.2 UB	10.2	2.9	5.7	4.2	**144**	NA	NA	**115**	**152**	5.6
Potassium	NS	NS	NS	7870	NS	7870	ug/l	7040	7280	1750	3220	909	4420	341 B	**9490**	468 B	**10500**	NA	NA	1050	2960	**19700**
Selenium	50	4	40	7.45	NS	7.45	ug/l	0.17 J	0.27 J	0.21 B	0.33 B	0.21 B	0.26 B	< 5 U	0.43 B	0.24 B	0.27 B	NA	NA	0.55 B	0.42 B	0.32 B
Silver	NS	1	40	0.25	50	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	0.029 B	< 1 U	< 1 U	< 1 U	NA	NA	< 1 U	< 1 U	< 1 U
Sodium	NS	400	50000	10555	50000	50000	ug/l	**12000 (*)**	**12600 (*)**	7780	26000	2200	7050	1750	**11700 (*)**	5130	31700	NA	NA	2180	30600	6670
Thallium	2	2	2	7	NS	7	ug/l	< 1 U	< 1 U	0.052 B	0.54 B	< 1 U	< 1 U	0.16 B	0.085 B	0.057 B	0.16 B	NA	NA	0.062 B	0.14 B	0.069 B
Vanadium	NS	1	60	14.1	NS	14.1	ug/l	< 5 U	< 5 U	< 5 U	0.91 B	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	< 5 U
Zinc	NS	10	2000	54.4	5000	54.4	ug/l	< 10 UJB	< 11.5 UJB	< 22.4 UJB	< 12.7 UJB	< 15.1 UJB	< 23.3 UJB	49.5 J	< 16.3 UJB	**89.9 J**	< 16.9 UJB	NA	NA	**2050 J**	35.8 J	32.2 J
VOCs (SW8260B)																						
1,1,1,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	26	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,1,2-trichloroethane	5	2	3	NS	NS	2	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,1-dichloroethane	NS	1	50	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,1-dichloroethene	7	1	1	NS	2	2	ug/l	< 5 UJ	< 5 UJ	< 5 UJ	< 5 UJ	< 5 UJ	< 5 UJ	< 5 U	< 5 U	NA	NA	< 5 UJ	< 5 UJ	NA	NA	< 5 UJ
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,2,3-trichloropropane	NS	0.03	0.03	NS	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	**1.5 J**	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	NS	0.02	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	**1.1 J**	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,2-dibromoethane	0.05	0.03	0.03	NS	NS	0.03	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,2-dichlorobenzene	600	5	600	NS	NS	5	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA
1,2-dichloropropane	5	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	NS	5	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	75	5	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	**6.1**
1,4-dioxane	NS	NS	NS	NS	NS	NS	ug/l	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 UJ	< 100 U	< 100 U	NA	NA	< 100 UJ	< 100 UJ	NA	NA	< 100 UJ
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	300	NS	NS	2	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	**240 D**	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	3	NS	3	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Acetone	NS	10	6000	NS	NS	10	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	**220 D**	NA	NA	2.7 J	< 5 U	NA	NA	< 5 U
Benzene	5	1	1	NS	1	1	ug/l	< 0.4 UJ	< 0.4 UJ	< 0.4 UJ	< 0.4 UJ	< 0.4 UJ	< 0.4 UJ	< 0.4 U	< 0.4 U	NA	NA	**1.5 J**	**2.9 J**	NA	NA	< 0.4 UJ
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U

Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2015

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-10 * (04/09/2015)	LTM-10-FD * (04/09/2015)	LTM-11 * (04/09/2015)	LTM-12 (04/09/2015)	LTM-13 * (04/09/2015)	LTM-14 * (04/09/2015)	LTM-17 * (04/08/2015)	LTM-18 * (04/08/2015)	LTM-19 (04/09/2015)	LTM-2 (04/08/2015)	LTM-20 (04/09/2015)	LTM-22 (04/09/2015)	LTM-23 (04/09/2015)	LTM-30 (04/09/2015)	LTM-32 (04/09/2015)
Bromodichloromethane	80	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Bromoform	80	0.8	4	NS	NS	0.8	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Bromomethane	NS	1	10	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Carbon disulfide	NS	1	700	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Carbon tetrachloride	5	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Chlorobenzene	100	1	50	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	**2 J**	< 5 U	NA	NA	**8.8**
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Chloroform	80	1	70	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Chloromethane	NS	NS	NS	3.2	NS	3.2	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
cis-1,2-dichloroethene	70	1	70	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	**19**	NA	NA	< 5 U
cis-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Cyclohexane	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Dibromochloromethane	80	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	NS	2	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Ethylbenzene	700	2	700	NS	NS	2	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Hexachloro-1,3-butadiene	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Methyl acetate	NS	0.5	7000	NS	NS	0.5	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Methyl tert-butyl ether	NS	1	70	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Methylcyclohexane	NS	NS	NS	NS	NS	NS	ug/l	< 5 UJ	< 5 UJ	< 5 UJ	< 5 UJ	< 5 UJ	< 5 UJ	< 5 U	< 5 U	NA	NA	< 5 UJ	< 5 UJ	NA	NA	< 5 UJ
Methylene Chloride	5	1	3	NS	2	2	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Naphthalene	NS	2	300	NS	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	2	100	NS	NS	2	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Toluene	1000	1	600	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
trans-1,2-dichloroethene	100	1	100	NS	10	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
trans-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Trichloroethene	5	1	1	NS	1	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Trichlorofluoromethane	NS	1	2000	NS	NS	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U
Vinyl chloride	2	1	1	NS	2	2	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	1.1 J	NA	NA	< 5 U
Xylenes, Total	10000	2	1000	NS	44	2	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	< 5 U	< 5 U	NA	NA	< 5 U

Notes:
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EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
B = Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
Q = One or more quality criteria failed
U = Parameter was not detected
ug/l = Micrograms per Liter
NA = Not Analyzed
NS = No Screening Criteria
ROD = Record of Decision
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-34 * (04/09/2015)	LTM-36 * (04/09/2015)	LTM-42 (04/09/2015)	LTM-44 (04/09/2015)	LTM-45 (04/09/2015)	LTM-9 * (04/09/2015)
Metals (SW6010C)													
Aluminum	NS	30	200	Background ratio	NS	Background ratio	ug/l	41	< 20 U	NA	NA	NA	< 7.5 UB
Antimony	6	3	6	3	NS	3	ug/l	< 2 U	< 2 U	NA	NA	NA	< 2 U
Arsenic	10	3	3	2.5	NS	3	ug/l	< 2 U	< 2 U	NA	NA	NA	< 2 U
Barium	2000	200	6000	89.1	1000	1000	ug/l	4.6 B	2.4 B	NA	NA	NA	4.1 B
Beryllium	4	1	1	5	NS	5	ug/l	< 1 U	< 1 U	NA	NA	NA	< 1 U
Cadmium	5	0.5	4	4	10	10	ug/l	0.5 B	< 1 U	NA	NA	NA	< 1 U
Calcium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	3610 E	17600 E	NA	NA	NA	9420 E
Chromium	100	1	70	12.1	50	50	ug/l	< 0.27 UB	< 0.27 U	NA	NA	NA	< 0.27 U
Cobalt	NS	NS	NS	25	NS	25	ug/l	< 0.55 UB	< 0.11 UB	NA	NA	NA	< 0.23 UB
Copper	1300	4	1300	8.53	1000	8.53	ug/l	< 0.67 UB	< 0.43 UB	NA	NA	NA	< 0.61 UB
Iron	NS	20	300	Background ratio	300	Background ratio	ug/l	< 200 U	< 200 U	NA	NA	NA	1070
Lead	15	5	5	6.45	50	50	ug/l	4.1	< 0.098 UB	< 10 U	< 10 U	< 10 U	< 1 U
Magnesium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	2480	3830	NA	NA	NA	904
Manganese	NS	0.4	50	148	50	148	ug/l	4.1	1.7 B	NA	NA	NA	8.7
Mercury	2	0.05	2	0.24	2	2	ug/l	< 0.2 U	< 0.2 U	NA	NA	NA	< 0.2 U
Nickel	NS	4	100	10.9	NS	10.9	ug/l	< 0.93 UB	< 0.29 UB	NA	NA	NA	< 1.2 UB
Potassium	NS	NS	NS	7870	NS	7870	ug/l	799	6970	NA	NA	NA	765
Selenium	50	4	40	7.45	NS	7.45	ug/l	0.22 B	< 5 U	NA	NA	NA	< 5 U
Silver	NS	1	40	0.25	50	1	ug/l	< 1 U	< 1 U	NA	NA	NA	< 1 U
Sodium	NS	400	50000	10555	50000	50000	ug/l	1810	3670	NA	NA	NA	924
Thallium	2	2	2	7	NS	7	ug/l	0.081 B	< 1 U	NA	NA	NA	< 1 U
Vanadium	NS	1	60	14.1	NS	14.1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Zinc	NS	10	2000	54.4	5000	54.4	ug/l	< 14.9 UJB	< 6.3 UJB	NA	NA	NA	< 6.7 UJB
VOCs (SW8260B)													
1,1,1,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	26	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,1,2-trichloroethane	5	2	3	NS	NS	2	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,1-dichloroethane	NS	1	50	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,1-dichloroethene	7	1	1	NS	2	2	ug/l	< 5 UJ	< 5 U	NA	NA	NA	< 5 UJ
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,2,3-trichloropropane	NS	0.03	0.03	NS	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	NS	0.02	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,2-dibromoethane	0.05	0.03	0.03	NS	NS	0.03	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,2-dichlorobenzene	600	5	600	NS	NS	5	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
1,2-dichloropropane	5	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	NS	5	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	75	5	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
1,4-dioxane	NS	NS	NS	NS	NS	NS	ug/l	< 100 UJ	< 100 U	NA	NA	NA	< 100 UJ
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	300	NS	NS	2	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	3	NS	3	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Acetone	NS	10	6000	NS	NS	10	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Benzene	5	1	1	NS	1	1	ug/l	< 0.4 UJ	< 0.4 UJ	NA	NA	NA	< 0.4 UJ
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U

Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2015

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Bromodichloromethane	80	1	1	NS	NS	1	ug/l	< 5 U	< 5 UJ	NA	NA	NA	< 5 U
Bromoform	80	0.8	4	NS	NS	0.8	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Bromomethane	NS	1	10	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Carbon disulfide	NS	1	700	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Carbon tetrachloride	5	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Chlorobenzene	100	1	50	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Chloroform	80	1	70	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Chloromethane	NS	NS	NS	3.2	NS	3.2	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
cis-1,2-dichloroethene	70	1	70	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
cis-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Cyclohexane	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 UJ	NA	NA	NA	< 5 U
Dibromochloromethane	80	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	NS	2	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Ethylbenzene	700	2	700	NS	NS	2	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Hexachloro-1,3-butadiene	NS	1	1	NS	NS	1	ug/l	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Methyl acetate	NS	0.5	7000	NS	NS	0.5	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Methyl tert-butyl ether	NS	1	70	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Methylcyclohexane	NS	NS	NS	NS	NS	NS	ug/l	< 5 UJ	< 5 U	NA	NA	NA	< 5 UJ
Methylene Chloride	5	1	3	NS	2	2	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Naphthalene	NS	2	300	NS	NS	2	ug/l	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
Styrene	100	2	100	NS	NS	2	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Toluene	1000	1	600	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
trans-1,2-dichloroethene	100	1	100	NS	10	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
trans-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Trichloroethene	5	1	1	NS	1	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Trichlorofluoromethane	NS	1	2000	NS	NS	1	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Vinyl chloride	2	1	1	NS	2	2	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U
Xylenes, Total	10000	2	1000	NS	44	2	ug/l	< 5 U	< 5 U	NA	NA	NA	< 5 U

Notes:
* Indicates Sentinel Well, as classified in 2015.
(*) Result from sentinel well exceeds the PQL (or BTV for metals, if higher than the PQL), but does not exceed the Site Screening Criterion.
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April 2016

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Metals (SW6010C)																						
Aluminum	NS	30	200	Background ratio	NS	Background ratio	ug/l	38 J	42 J	24 J	26 J	27 J	620	87 J	5500	NA	NA	270 J	< 70 U	< 70 U	200 J	NA
Antimony	6	3	6	3	NS	3	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	0.46 J	< 1 U	< 1 U	NA	NA	< 1 U	< 1 UBJ	< 1 UJ	< 1 U	NA
Arsenic	10	3	3	2.5	NS	3	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	**3.5 J**	0.56 J	0.62 J	**5.5**	NA	NA	**6.2**	< 1 U	< 1 U	0.36 J	NA
Barium	2000	200	6000	89.1	1000	1000	ug/l	**720 Q (*)**	33 Q	3.3	18	160 Q	52 Q	**1500 Q**	460 J	NA	NA	39	76	73	29 Q	NA
Beryllium	4	1	1	5	NS	5	ug/l	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	0.34 J	0.75 J	1.4	NA	NA	< 0.3 U	0.11 J	< 0.3 UJ	< 0.3 U	NA
Cadmium	5	0.5	4	4	10	10	ug/l	< 1 U	< 1 U	0.27 J	< 1 U	< 1 U	0.38 J	< 1 U	0.78 J	NA	NA	8.5	< 1 U	< 1 U	< 1 U	NA
Calcium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	26000	20000	5700	1200	17000	1300	39000	1400	NA	NA	91000 J	8200	8000	2300	NA
Chromium	100	1	70	12.1	50	50	ug/l	< 1.8 U	< 1.8 U	< 1.8 U	0.6 J	0.56 J	< 1.8 U	0.54 J	0.67 J	NA	NA	0.55 J	3.1 J	3.2 J	0.9 J	NA
Cobalt	NS	NS	NS	25	NS	25	ug/l	0.078 J	1.6	0.14 J	0.66 J	0.82 J	8.2	0.11 J	11	NA	NA	**45**	0.71 J	0.75 J	1.4	NA
Copper	1300	4	1300	8.53	1000	8.53	ug/l	0.85 J	2	< 1.8 U	0.56 J	1.3 J	3.8	< 1.8 U	**9.3**	NA	NA	1.5 J	1.5 J	1.3 J	1.6 J	NA
Iron	NS	20	300	Background ratio	300	Background ratio	ug/l	23000	3100	190	< 85 U	15000	32 J	47000	110	NA	NA	11000 J	< 85 U	< 85 U	430	NA
Lead	15	5	5	6.45	50	50	ug/l	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	4.6	< 0.7 U	0.46 J	NA	NA	< 0.7 U	< 0.7 U	< 0.7 U	0.32 J	NA
Magnesium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	5900	1900	3600	1500	4300	680	10000	480 J	NA	NA	2600 DJ	3100	3100	2600	NA
Manganese	NS	0.4	50	148	50	148	ug/l	**230**	97	**420**	8.2	**190**	**310**	**500**	51	NA	NA	**1600 J**	62	59	26	NA
Mercury	2	0.05	2	0.24	2	2	ug/l	< 0.08 U	< 0.08 U	0.13 J	< 0.08 U	< 0.08 U	< 0.08 U	< 0.08 U	< 0.08 U	NA	NA	< 0.08 U	< 0.08 U	< 0.08 U	< 0.08 U	NA
Nickel	NS	4	100	10.9	NS	10.9	ug/l	< 1 UB	1.7 J	< 1 U	< 1 UB	8.1	2.8 J	3.8	10	NA	NA	**210 J**	**42**	**39**	< 1 UB	NA
Potassium	NS	NS	NS	7870	NS	7870	ug/l	7100	1100 J	1800 J	720 J	4400	< 940 U	**9300**	900 J	NA	NA	1400 J	3400	3300	2100 J	NA
Selenium	50	4	40	7.45	NS	7.45	ug/l	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	NA	NA	0.75 J	0.72 J	0.75 J	< 2 U	NA
Silver	NS	1	40	0.25	50	1	ug/l	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	NA	NA	< 0.1 U	< 0.1 UBJ	< 0.1 UJ	< 0.1 U	NA
Sodium	NS	400	50000	10555	50000	50000	ug/l	**14000 (*)**	6800	1500 J	1600 J	7300	2200 J	13000	3000 J	NA	NA	2000 J	43000	42000	2300 J	NA
Thallium	2	2	2	7	NS	7	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	0.056 J	< 0.2 U	0.081 J	NA	NA	< 0.2 U	< 0.2 UBJ	< 0.2 UBJ	0.063 J	NA
Vanadium	NS	1	60	14.1	NS	14.1	ug/l	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	NA	NA	< 2 U	< 2 U	< 2 U	0.86 J	NA
Zinc	NS	10	2000	54.4	5000	54.4	ug/l	17 J	24	9.2 J	21	22	52	14 J	**330**	NA	NA	**3800 J**	5.7 J	5.5 J	23	NA
VOCs (SW8260B)																						
1,1,1,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
1,1,1-trichloroethane	200	1	30	NS	26	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	NS	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
1,1-dichloroethane	NS	1	50	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
1,1-dichloroethene	7	1	1	NS	2	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	0.27 J	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
1,2,3-trichloropropane	NS	0.03	0.03	NS	NS	0.03	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
1,2,4-trichlorobenzene	70	1	9	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	NS	0.02	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	NA	< 1.6 U	< 1.6 U	NA	NA	NA	< 1.6 U	< 1.6 U
1,2-dibromoethane	0.05	0.03	0.03	NS	NS	0.03	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
1,2-dichlorobenzene	600	5	600	NS	NS	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	0.86 J
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	NA	0.16 J	5	NA	NA	NA	< 0.2 U	0.24 J
1,2-dichloropropane	5	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
1,3-dichlorobenzene	600	5	600	NS	NS	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
1,4-dichlorobenzene	75	5	75	NS	75	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	0.82 J	< 0.4 U	NA	NA	NA	< 0.4 U	**8.8**
1,4-dioxane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
2-butanone	NS	2	300	NS	NS	2	ug/l	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	**47**	NA	< 4 U	< 4 U	NA	NA	NA	< 4 U	< 4 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	NA	< 4 U	< 4 U	NA	NA	NA	< 4 U	< 4 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
4-methyl-2-pentanone	NS	NS	NS	3	NS	3	ug/l	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	NA	< 3.2 U	< 3.2 U	NA	NA	NA	< 3.2 U	< 3.2 U

Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2016

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-10 * (04/15/2016)	LTM-11 * (04/15/2016)	LTM-12 (04/15/2016)	LTM-13 (04/15/2016)	LTM-14 (04/15/2016)	LTM-17 * (04/15/2016)	LTM-18 (04/15/2016)	LTM-19 (04/15/2016)	LTM-20 (04/15/2016)	LTM-22 (04/18/2016)	LTM-23 (04/18/2016)	LTM-30 (04/18/2016)	LTM-30-FD (04/18/2016)	LTM-31 * (04/15/2016)	LTM-32 (04/15/2016)
Acetone	NS	10	6000	NS	NS	10	ug/l	< 6.4 U	< 6.4 U	< 6.4 U	< 6.4 U	< 6.4 U	< 6.4 U	**35**	NA	< 6.4 U	< 6.4 U	NA	NA	NA	< 6.4 UB	< 6.4 U
Benzene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	**2.7**	0.72 J	NA	NA	NA	< 0.4 U	**1.3**
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	NA	< 0.2 U	< 0.2 U	NA	NA	NA	< 0.2 U	< 0.2 U
Bromodichloromethane	80	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
Bromoform	80	0.8	4	NS	NS	0.8	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
Bromomethane	NS	1	10	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
Carbon disulfide	NS	1	700	NS	NS	1	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	NA	< 1.6 U	< 1.6 U	NA	NA	NA	< 1.6 U	< 1.6 U
Carbon tetrachloride	5	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
Chlorobenzene	100	1	50	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	**2.5**	< 0.4 U	NA	NA	NA	< 0.4 U	**12**
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	NA	< 1.6 U	< 1.6 U	NA	NA	NA	< 1.6 U	< 1.6 U
Chloroform	80	1	70	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
Chloromethane	NS	NS	NS	3.2	NS	3.2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
cis-1,2-dichloroethene	70	1	70	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	0.16 J	**5**	NA	NA	NA	< 0.4 U	0.24 J
cis-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
Cyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
Dichlorodifluoromethane	NS	2	1000	NS	NS	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	0.68 J
Ethylbenzene	700	2	700	NS	NS	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
Hexachloro-1,3-butadiene	NS	1	1	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
Isopropylbenzene	NS	1	700	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	0.5 J
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
Methyl acetate	NS	0.5	7000	NS	NS	0.5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
Methylcyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	1	3	NS	2	2	ug/l	< 0.8 UB	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UB	NA	< 0.8 U	< 0.8 UB	NA	NA	NA	< 0.8 U	< 0.8 UB
Naphthalene	NS	2	300	NS	NS	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	0.24 J	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	0.85 J
Styrene	100	2	100	NS	NS	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	0.41 J
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	0.47 J	NA	NA	NA	< 0.4 U	< 0.4 U
Toluene	1000	1	600	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
trans-1,2-dichloroethene	100	1	100	NS	10	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
trans-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	NA	NA	NA	< 0.4 U	< 0.4 U
Trichloroethene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	0.3 J	NA	NA	NA	< 0.4 U	< 0.4 U
Trichlorofluoromethane	NS	1	2000	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U
Vinyl chloride	2	1	1	NS	2	2	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	NA	< 0.2 U	< 0.2 U	NA	NA	NA	< 0.2 U	< 0.2 U
Xylenes, Total	10000	2	1000	NS	44	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	NA	NA	NA	< 0.8 U	< 0.8 U

Notes:
* Indicates Sentinel Well.
(*) Result from sentinel well exceeds the PQL (or BTV for metals, if higher than the PQL), but does not exceed the Site Screening Criterion.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
B = Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
Q = One or more quality criteria failed
U = Parameter was not detected
ug/l = Micrograms per Liter
NA = Not Analyzed
NS = No Screening Criteria
ROD = Record of Decision
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2016

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-34 * (04/15/2016)	LTM-36 * (04/15/2016)	LTM-40 * (04/15/2016)	LTM-40 * (11/21/2016)	LTM-42 * (04/15/2016)	LTM-44 * (04/15/2016)	LTM-45 * (04/15/2016)	LTM-45-FD * (04/15/2016)	LTM-9 * (04/15/2016)
Metals (SW6010C)																
Aluminum	NS	30	200	Background ratio	NS	Background ratio	ug/l	35 J	< 70 U	NA	540	20 J	83 J	340	NA	40 J
Antimony	6	3	6	3	NS	3	ug/l	0.59 J	< 1 U	NA	0.42 J	< 1 U	0.68 J	0.45 J	NA	0.63 J
Arsenic	10	3	3	2.5	NS	3	ug/l	< 1 U	< 1 U	NA	1.7 J	< 1 U	< 1 U	< 1 U	NA	< 1 U
Barium	2000	200	6000	89.1	1000	1000	ug/l	5.6	1.6 J	NA	41 Q	15	95	70	NA	3.5
Beryllium	4	1	1	5	NS	5	ug/l	< 0.3 U	< 0.3 U	NA	0.13 J	< 0.3 U	1.3	0.29 J	NA	< 0.3 U
Cadmium	5	0.5	4	4	10	10	ug/l	< 1 U	< 1 U	NA	< 1 U	< 1 U	< 1 U	0.72 J	NA	< 1 U
Calcium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	2800	17000	NA	110000	1400	4100	510 J	NA	6100
Chromium	100	1	70	12.1	50	50	ug/l	< 1.8 U	< 1.8 U	NA	5.5 J	1.1 J	0.81 J	< 1.8 U	NA	< 1.8 U
Cobalt	NS	NS	NS	25	NS	25	ug/l	0.47 J	< 0.2 U	NA	0.49 J	1.7	< 0.2 U	1	NA	2.8
Copper	1300	4	1300	8.53	1000	8.53	ug/l	0.92 J	0.6 J	NA	< 1.8 U	2.2	1.3 J	2.1	NA	< 1.8 U
Iron	NS	20	300	Background ratio	300	Background ratio	ug/l	< 85 U	< 85 U	4500	11000	< 85 U	120	480	470	23000
Lead	15	5	5	6.45	50	50	ug/l	< 0.7 U	< 0.7 U	NA	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	NA	< 0.7 U
Magnesium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	2100	3800	NA	26000	3200	1500	810	NA	870
Manganese	NS	0.4	50	148	50	148	ug/l	3.9	2.4 J	NA	**560 Q**	14	72	29	NA	58
Mercury	2	0.05	2	0.24	2	2	ug/l	< 0.08 U	< 0.08 U	NA	< 0.08 U	< 0.08 U	< 0.08 UJ	< 0.08 UJ	NA	< 0.08 U
Nickel	NS	4	100	10.9	NS	10.9	ug/l	< 1 UB	< 1 UB	NA	0.9 J	1.7 J	0.78 J	4.4	NA	< 1 UB
Potassium	NS	NS	NS	7870	NS	7870	ug/l	890 J	7000	NA	**8900**	530 J	3200	2000 J	NA	1100 J
Selenium	50	4	40	7.45	NS	7.45	ug/l	< 2 U	< 2 U	NA	0.72 J	< 2 U	< 2 U	< 2 U	NA	< 2 U
Silver	NS	1	40	0.25	50	1	ug/l	0.059 J	< 0.1 U	NA	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	NA	0.08 J
Sodium	NS	400	50000	10555	50000	50000	ug/l	1700 J	3800 J	NA	**920000**	2900 J	3200 J	2700 J	NA	670 J
Thallium	2	2	2	7	NS	7	ug/l	0.092 J	< 0.2 U	NA	< 0.2 U	< 0.2 U	< 0.2 U	0.46 J	NA	0.13 J
Vanadium	NS	1	60	14.1	NS	14.1	ug/l	< 2 U	< 2 U	NA	8.4	< 2 U	< 2 U	< 2 U	NA	< 2 U
Zinc	NS	10	2000	54.4	5000	54.4	ug/l	14 J	6.3 J	NA	8.4 J	21	23	19 J	NA	12 J
VOCs (SW8260B)																
1,1,1,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,1-trichloroethane	200	1	30	NS	26	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	NS	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethane	NS	1	50	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethene	7	1	1	NS	2	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,3-trichloropropane	NS	0.03	0.03	NS	NS	0.03	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trichlorobenzene	70	1	9	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	NS	0.02	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	NA	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
1,2-dibromoethane	0.05	0.03	0.03	NS	NS	0.03	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichlorobenzene	600	5	600	NS	NS	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	NA	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
1,2-dichloropropane	5	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichlorobenzene	600	5	600	NS	NS	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,4-dichlorobenzene	75	5	75	NS	75	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,4-dioxane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-butanone	NS	2	300	NS	NS	2	ug/l	< 4 U	< 4 U	< 4 U	NA	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	< 4 U	< 4 U	< 4 U	NA	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
4-methyl-2-pentanone	NS	NS	NS	3	NS	3	ug/l	< 3.2 U	< 3.2 U	< 3.2 U	NA	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U

Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2016

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-34 * (04/15/2016)	LTM-36 * (04/15/2016)	LTM-40 * (04/15/2016)	LTM-40 * (11/21/2016)	LTM-42 * (04/15/2016)	LTM-44 * (04/15/2016)	LTM-45 * (04/15/2016)	LTM-45-FD * (04/15/2016)	LTM-9 * (04/15/2016)
Acetone	NS	10	6000	NS	NS	10	ug/l	< 6.4 UB	< 6.4 U	< 6.4 UB	NA	< 6.4 U	< 6.4 UB	< 6.4 U	< 6.4 U	< 6.4 U
Benzene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	NA	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Bromodichloromethane	80	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromoform	80	0.8	4	NS	NS	0.8	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromomethane	NS	1	10	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Carbon disulfide	NS	1	700	NS	NS	1	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	NA	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Carbon tetrachloride	5	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chlorobenzene	100	1	50	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	NA	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Chloroform	80	1	70	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	0.69 J	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloromethane	NS	NS	NS	3.2	NS	3.2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
cis-1,2-dichloroethene	70	1	70	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
cis-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Cyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dichlorodifluoromethane	NS	2	1000	NS	NS	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Ethylbenzene	700	2	700	NS	NS	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Hexachloro-1,3-butadiene	NS	1	1	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Isopropylbenzene	NS	1	700	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methyl acetate	NS	0.5	7000	NS	NS	0.5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methylcyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	1	3	NS	2	2	ug/l	< 0.8 U	< 0.8 UB	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Naphthalene	NS	2	300	NS	NS	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Styrene	100	2	100	NS	NS	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Toluene	1000	1	600	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
trans-1,2-dichloroethene	100	1	100	NS	10	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
trans-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Trichloroethene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Trichlorofluoromethane	NS	1	2000	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Vinyl chloride	2	1	1	NS	2	2	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	NA	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Xylenes, Total	10000	2	1000	NS	44	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U

Notes:
* Indicates Sentinel Well.
(*) Result from sentinel well exceeds the PQL (or BTV for metals, if higher than the PQL), but does not exceed the Site Screening Criteric
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
B = Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
Q = One or more quality criteria failed
U = Parameter was not detected
ug/l = Micrograms per Liter
NA = Not Analyzed
NS = No Screening Criteria
ROD = Record of Decision
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2017

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-10 * (04/05/2017)	LTM-11 * (04/05/2017)	LTM-12 (04/05/2017)	LTM-13 (04/05/2017)	LTM-14 (04/05/2017)	LTM-17 * (04/03/2017)	LTM-18 (04/03/2017)	LTM-20 (04/03/2017)	LTM-22 (04/03/2017)	LTM-23 (04/03/2017)	LTM-30 (04/03/2017)	LTM-31 * (04/03/2017)	LTM-32 (04/03/2017)	LTM-34 * (04/05/2017)	LTM-36 * (04/05/2017)	LTM-40 * (04/05/2017)
Metals (SW6010C)																							
Aluminum	NS	30	200	Background ratio	NS	Background ratio	ug/l	< 70 U	85 J	34 J	< 70 U	< 70 U	400	< 70 U	NA	NA	350	39 J	27 J	NA	55 J	< 70 U	2200
Antimony	6	3	6	3	NS	3	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	NA	NA	< 1 U	0.96 J	< 1 U	NA	< 1 U	< 1 U	0.92 J
Arsenic	10	3	3	2.5	NS	3	ug/l	< 1 U	< 1 U	0.71 J	< 1 U	**3.6 J**	< 1 U	0.45 J	NA	NA	**4.9 J**	< 1 U	< 1 U	NA	< 1 U	< 1 U	2 J
Barium	2000	200	6000	89.1	1000	1000	ug/l	**730 (*)**	34	7.5	17	190	43	**1100**	NA	NA	54	58	37	NA	5.8	2.9 J	35 J
Beryllium	4	1	1	5	NS	5	ug/l	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	< 0.3 U	0.23 J	0.86 J	NA	NA	0.15 J	< 0.3 U	< 0.3 U	NA	0.1 J	0.25 J	0.14 J
Cadmium	5	0.5	4	4	10	10	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	NA	NA	**21**	< 1 U	< 1 U	NA	< 1 U	< 1 U	< 1 U
Calcium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	27000	21000	8800	1000	19000	2200	29000	NA	NA	92000	5400	2600	NA	3500	17000	7200
Chromium	100	1	70	12.1	50	50	ug/l	< 1.8 U	< 10 UB	< 10 UB	< 10 UB	< 10 UB	0.95 J	< 1.8 U	NA	NA	0.77 J	5.2 J	< 1.8 U	NA	< 1.8 U	< 1.8 U	5.1 J
Cobalt	NS	NS	NS	25	NS	25	ug/l	0.11 J	0.35 J	0.54 J	0.31 J	0.58 J	11	0.11 J	NA	NA	**76**	0.72 J	0.91 J	NA	0.51 J	0.082 J	0.35 J
Copper	1300	4	1300	8.53	1000	8.53	ug/l	< 1.8 U	7.8	< 1.8 U	2.2	0.61 J	3	1 J	NA	NA	6.9	5.3	1.8 J	NA	2.1	1.7 J	8.3
Iron	NS	20	300	Background ratio	300	Background ratio	ug/l	15000	520	2700	< 85 U	15000	380	8300	NA	NA	310	120	32 J	NA	< 100 UB	< 100 UB	1700
Lead	15	5	5	6.45	50	50	ug/l	< 0.7 U	< 3 UB	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	< 0.7 U	NA	NA	< 0.7 U	< 0.7 U	< 0.7 U	NA	< 0.7 U	< 0.7 U	< 3 UB
Magnesium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	5900	1800	6000	1900	5000	1200	7900	NA	NA	2000	2200	2800	NA	2200	4000	2100
Manganese	NS	0.4	50	148	50	148	ug/l	**220**	12	**520**	4.4	**220**	**850**	**380**	NA	NA	**2500**	43	15	NA	4.6	4.1	21
Mercury	2	0.05	2	0.24	2	2	ug/l	< 0.08 U	< 0.08 U	0.13 J	< 0.08 U	< 0.08 U	< 0.08 U	< 0.08 U	NA	NA	< 0.08 U	< 0.08 U	< 0.08 U	NA	< 0.08 U	< 0.08 U	< 0.08 U
Nickel	NS	4	100	10.9	NS	10.9	ug/l	1.6 J	1.1 J	0.5 J	1.9 J	10	1.8 J	4.4	NA	NA	**420**	**37**	1.3 J	NA	0.48 J	0.41 J	2.3 J
Potassium	NS	NS	NS	7870	NS	7870	ug/l	7300	< 3000 UB	2900 J	1300 J	5400	400 J	**8100**	NA	NA	1100 J	2800 J	990 J	NA	< 3000 UB	7700	5100
Selenium	50	4	40	7.45	NS	7.45	ug/l	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	NA	NA	1.9 J	< 2 U	< 2 U	NA	< 2 U	< 2 U	< 2 U
Silver	NS	1	40	0.25	50	1	ug/l	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	NA	NA	< 0.1 U	< 0.1 U	< 0.1 U	NA	< 0.1 U	0.047 J	0.047 J
Sodium	NS	400	50000	10555	50000	50000	ug/l	**14000 (*)**	7500	11000	< 5000 UB	8100	3300 J	11000	NA	NA	1900 J	39000	2200 J	NA	< 5000 UB	4100 J	**300000**
Thallium	2	2	2	7	NS	7	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	NA	NA	0.06 J	0.12 J	< 0.2 U	NA	< 0.2 U	0.085 J	0.11 J
Vanadium	NS	1	60	14.1	NS	14.1	ug/l	0.55 J	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	NA	NA	< 2 U	< 2 U	< 2 U	NA	< 2 U	< 2 U	5.6 J
Zinc	NS	10	2000	54.4	5000	54.4	ug/l	17 J	46	15 J	25	24	40	19 J	NA	NA	**9100 D**	10 J	28	NA	17 J	5.5 J	15 J
VOCs (SW8260B)																							
1,1,1,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,1-trichloroethane	200	1	30	NS	26	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	NS	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethane	NS	1	50	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethene	7	1	1	NS	2	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,3-trichloropropane	NS	0.03	0.03	NS	NS	0.03	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trichlorobenzene	70	1	9	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	NS	0.02	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	NA	NA	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
1,2-dibromoethane	0.05	0.03	0.03	NS	NS	0.03	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichlorobenzene	600	5	600	NS	NS	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	0.92 J	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	24 J	NA	NA	< 0.2 U	0.22 J	< 0.2 U	< 0.2 U	< 0.2 U
1,2-dichloropropane	5	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichlorobenzene	600	5	600	NS	NS	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,4-dichlorobenzene	75	5	75	NS	75	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	0.69 J	< 0.4 U	NA	NA	< 0.4 U	**13**	< 0.4 U	< 0.4 U	< 0.4 U
1,4-dioxane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-butanone	NS	2	300	NS	NS	2	ug/l	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	**11**	< 4 U	< 4 UJ	NA	NA	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	NA	NA	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
4-methyl-2-pentanone	NS	NS	NS	3	NS	3	ug/l	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	NA	NA	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Acetone	NS	10	6000	NS	NS	10	ug/l	< 10 UB	< 6.4 U	< 6.4 U	< 6.4 U	< 10 UB	< 6.4 U	6.6 J	< 6.4 U	3.4 J	NA	NA	< 6.4 U	< 6.4 U	< 10 UB	< 10 UB	< 6.4 U
Benzene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	**3**	**3.8**	NA	NA	< 0.4 U	**1.3**	< 0.4 U	< 0.4 U	< 0.4 U
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	NA	NA	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Bromodichloromethane	80	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromoform	80	0.8	4	NS	NS	0.8	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U

Area LF010
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2017

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-10 * (04/05/2017)	LTM-11 * (04/05/2017)	LTM-12 (04/05/2017)	LTM-13 (04/05/2017)	LTM-14 (04/05/2017)	LTM-17 * (04/03/2017)	LTM-18 (04/03/2017)	LTM-20 (04/03/2017)	LTM-22 (04/03/2017)	LTM-23 (04/03/2017)	LTM-30 (04/03/2017)	LTM-31 * (04/03/2017)	LTM-32 (04/03/2017)	LTM-34 * (04/05/2017)	LTM-36 * (04/05/2017)	LTM-40 * (04/05/2017)
Bromomethane	NS	1	10	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Carbon disulfide	NS	1	700	NS	NS	1	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	NA	NA	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Carbon tetrachloride	5	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chlorobenzene	100	1	50	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	**2.5**	< 0.4 U	NA	NA	< 0.4 U	**17**	< 0.4 U	< 0.4 U	< 0.4 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	NA	NA	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Chloroform	80	1	70	NS	NS	1	ug/l	< 0.4 U	1	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloromethane	NS	NS	NS	3.2	NS	3.2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
cis-1,2-dichloroethene	70	1	70	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	**23 J**	NA	NA	< 0.4 U	0.22 J	< 0.4 U	< 0.4 U	< 0.4 U
cis-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Cyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dichlorodifluoromethane	NS	2	1000	NS	NS	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UQ	< 0.8 UQ	< 0.8 UQ	< 0.8 UQ	NA	NA	< 0.8 UQ	< 0.8 UQ	< 0.8 U	< 0.8 U	< 0.8 U
Ethylbenzene	700	2	700	NS	NS	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UM	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Hexachloro-1,3-butadiene	NS	1	1	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Isopropylbenzene	NS	1	700	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	0.48 J	< 0.4 U	< 0.4 U	< 0.4 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UM	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methyl acetate	NS	0.5	7000	NS	NS	0.5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methylcyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	1	3	NS	2	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Naphthalene	NS	2	300	NS	NS	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	1.2	< 0.8 U	< 0.8 U	< 0.8 U
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UM	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	0.74 J	< 0.4 U	< 0.4 U	< 0.4 U
Styrene	100	2	100	NS	NS	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	0.57 J	< 0.4 U	< 0.4 U	< 0.4 U
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	0.32 J	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Toluene	1000	1	600	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
trans-1,2-dichloroethene	100	1	100	NS	10	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	0.51 J	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
trans-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Trichloroethene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	0.77 J	NA	NA	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Trichlorofluoromethane	NS	1	2000	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Vinyl chloride	2	1	1	NS	2	2	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	0.74 J	NA	NA	< 0.2 U	0.17 J	< 0.2 U	< 0.2 U	< 0.2 U
Xylenes, Total	10000	2	1000	NS	44	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	NA	NA	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U

Notes:
* Indicates Sentinel Well.
(*) Result from sentinel well exceeds the PQL (or BTV for metals, if higher than the PQL), but does not exceed the Site Screening Criterion.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
B = Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
ug/l = Micrograms per Liter
NA = Not Analyzed
NS = No Screening Criteria
ROD = Record of Decision
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-42 * (04/05/2017)	LTM-44 * (04/03/2017)	LTM-44-FD * (04/03/2017)	LTM-45 * (04/05/2017)	LTM-9 * (04/05/2017)
Metals (SW6010C)												
Aluminum	NS	30	200	Background ratio	NS	Background ratio	ug/l	29 J	87 J	86 J	380	< 70 U
Antimony	6	3	6	3	NS	3	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Arsenic	10	3	3	2.5	NS	3	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Barium	2000	200	6000	89.1	1000	1000	ug/l	18	92	93	71	4
Beryllium	4	1	1	5	NS	5	ug/l	< 0.3 U	1.2	1	< 0.3 U	< 0.3 U
Cadmium	5	0.5	4	4	10	10	ug/l	< 1 U	< 1 U	< 1 U	1	< 1 U
Calcium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	1500	3900	3800	< 1000 UB	9400
Chromium	100	1	70	12.1	50	50	ug/l	< 10 UB	< 1.8 U	1.1 J	< 1.8 U	< 1.8 U
Cobalt	NS	NS	NS	25	NS	25	ug/l	1.8	0.073 J	0.41 J	0.95 J	2
Copper	1300	4	1300	8.53	1000	8.53	ug/l	0.76 J	3.1	2.4	**31**	< 1.8 U
Iron	NS	20	300	Background ratio	300	Background ratio	ug/l	< 100 UB	700	630	370	11000
Lead	15	5	5	6.45	50	50	ug/l	< 0.7 U	< 0.7 U	0.28 J	< 3 UB	< 0.7 U
Magnesium	NS	NS	NS	Background ratio	NS	Background ratio	ug/l	4000	1400	1500	720	1500
Manganese	NS	0.4	50	148	50	148	ug/l	16	76	78	29	60
Mercury	2	0.05	2	0.24	2	2	ug/l	< 0.08 U	< 0.08 U	< 0.08 U	< 0.08 U	< 0.08 U
Nickel	NS	4	100	10.9	NS	10.9	ug/l	1.5 J	1.3 J	1.3 J	4.3	0.61 J
Potassium	NS	NS	NS	7870	NS	7870	ug/l	< 3000 UB	3100	3000	2100 J	1400 J
Selenium	50	4	40	7.45	NS	7.45	ug/l	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
Silver	NS	1	40	0.25	50	1	ug/l	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U
Sodium	NS	400	50000	10555	50000	50000	ug/l	4500 J	2700 J	2800 J	< 5000 UB	< 5000 UB
Thallium	2	2	2	7	NS	7	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	0.34 J	< 0.2 U
Vanadium	NS	1	60	14.1	NS	14.1	ug/l	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
Zinc	NS	10	2000	54.4	5000	54.4	ug/l	18 J	28	**59**	44	9.4 J
VOCs (SW8260B)												
1,1,1,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,1-trichloroethane	200	1	30	NS	26	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	NS	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethane	NS	1	50	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethene	7	1	1	NS	2	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,3-trichloropropane	NS	0.03	0.03	NS	NS	0.03	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trichlorobenzene	70	1	9	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	NS	0.02	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
1,2-dibromoethane	0.05	0.03	0.03	NS	NS	0.03	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichlorobenzene	600	5	600	NS	NS	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
1,2-dichloropropane	5	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichlorobenzene	600	5	600	NS	NS	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,4-dichlorobenzene	75	5	75	NS	75	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,4-dioxane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-butanone	NS	2	300	NS	NS	2	ug/l	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
4-methyl-2-pentanone	NS	NS	NS	3	NS	3	ug/l	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Acetone	NS	10	6000	NS	NS	10	ug/l	< 6.4 U	< 6.4 U	2.5 J	< 10 UB	< 6.4 U
Benzene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Bromodichloromethane	80	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromoform	80	0.8	4	NS	NS	0.8	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	Applicable Criteria from ROD	Site Screening Criteria	Unit	LTM-42 * (04/05/2017)	LTM-44 * (04/03/2017)	LTM-44-FD * (04/03/2017)	LTM-45 * (04/05/2017)	LTM-9 * (04/05/2017)
Bromomethane	NS	1	10	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Carbon disulfide	NS	1	700	NS	NS	1	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Carbon tetrachloride	5	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chlorobenzene	100	1	50	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Chloroform	80	1	70	NS	NS	1	ug/l	0.34 J	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloromethane	NS	NS	NS	3.2	NS	3.2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
cis-1,2-dichloroethene	70	1	70	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
cis-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Cyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dichlorodifluoromethane	NS	2	1000	NS	NS	2	ug/l	< 0.8 U	< 0.8 UQ	< 0.8 UQ	< 0.8 U	< 0.8 U
Ethylbenzene	700	2	700	NS	NS	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Hexachloro-1,3-butadiene	NS	1	1	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Isopropylbenzene	NS	1	700	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methyl acetate	NS	0.5	7000	NS	NS	0.5	ug/l	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methylcyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Methylene Chloride	5	1	3	NS	2	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Naphthalene	NS	2	300	NS	NS	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Styrene	100	2	100	NS	NS	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Toluene	1000	1	600	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
trans-1,2-dichloroethene	100	1	100	NS	10	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
trans-1,3-dichloropropene	NS	1	1	NS	NS	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Trichloroethene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Trichlorofluoromethane	NS	1	2000	NS	NS	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Vinyl chloride	2	1	1	NS	2	2	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Xylenes, Total	10000	2	1000	NS	44	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U

Notes:
* Indicates Sentinel Well.
(*) Result from sentinel well exceeds the PQL (or BTV for metals, if higher than the PQL), but does not exceed the Site Screening Criterion.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
B = Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
ug/l = Micrograms per Liter
NA = Not Analyzed
NS = No Screening Criteria
ROD = Record of Decision
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area LF010
Summary of Sediment Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
October 2013 through April 2016

Parameter	NJDEP Ecological Screening Levels	Ft Dix Background Sediment	Site Screening Criteria	Unit	SD-1 (10/11/2013)	SD-1 (DUP) (10/11/2013)	SD-1 (07/23/2014)	SD-1 (DUP) (07/23/2014)	SD-1 (04/10/2015)	SD-1 (DUP) (04/10/2015)	SD-2 (10/11/2013)	SD-2 (07/23/2014)	SD-2 (04/10/2015)	SD-3 (10/11/2013)	SD-3 (07/23/2014)	SD-3 (04/10/2015)	SD-3 (04/18/2016)	SD-3 (04/03/2017)	SD-7 (10/11/2013)	SD-7 (07/23/2014)	SD-7 (04/10/2015)	SD-7 (04/18/2016)
Metals (SW6010C)																						
Aluminum	25500	2562	2562	mg/kg	241	284	394	363	103	167	158	89.5	90.9	1860	271	**9940**	**7400 J**	430 J	730	1810	1700	**3300**
Antimony	NS	NS	NS	mg/kg	< 0.24 U	< 0.23 U	0.39 J	< 0.28 U	< 1.1 U	< 0.79 U	< 0.25 U	< 0.29 U	< 0.92 U	< 0.21 U	< 0.28 U	74.6	< 0.23 UBJ	0.059 J	0.53 J	1.8	10.2	4.4
Arsenic	9.979	2.06	9.979	mg/kg	0.26 J	0.35 J	0.39 J	0.38 J	< 1.1 U	< 0.79 U	0.26 J	< 0.31 U	< 0.92 U	0.64 J	< 0.3 U	**102**	**11**	0.420 J	0.51 J	0.95 J	**12.2**	**88**
Barium	NS	43	43	mg/kg	2.3 J	2.7 J	2.7 J	2.7 J	0.43 J	1.4 J	2 J	1 J	1.3 B	10.9 J	2.4 J	**158**	**160**	8.9	4 J	10.8 J	19.2	**140**
Beryllium	NS	NS	NS	mg/kg	< 0.2 U	0.058 J	0.042 J	0.02 J	0.021 B	0.033 B	< 0.016 U	< 0.021 U	0.022 B	0.1 J	< 0.021 U	0.29 B	1.1	0.061 J	0.051 J	0.064 J	0.048 B	0.22 J
Cadmium	0.99	NS	0.99	mg/kg	< 0.073 U	< 0.069 U	< 0.053 U	< 0.051 U	< 0.27 U	< 0.2 U	< 0.074 U	< 0.053 U	< 0.23 U	0.087 J	< 0.052 U	**2.3**	**1.7**	0.055 J	0.21 J	0.54	0.26 B	0.92
Calcium	NS	356	356	mg/kg	95.7 J	108 J	< 530 U	< 510 U	47.1	46.8	40.9 J	12.2 J	19.5 B	76.9 J	< 520 U	**18400**	**2900 J**	130 J	185 J	< 460 U	**2620**	**6300**
Chromium	43.4	6.57	43.4	mg/kg	0.72 J	1	2.4	2.2	0.2 J	0.77 J	1.3	1.1	0.63 B	5.9	2.7	36.6	21	3	2.5	5.6	4.6	16
Cobalt	50	NS	50	mg/kg	< 5.1 U	0.12 J	0.085 J	0.082 J	< 2.7 U	< 2 U	< 0.069 U	0.096 J	< 2.3 U	0.37 J	0.81 J	9.9 B	17	0.78	0.27 J	0.85 J	1.2 B	4.1
Copper	31.6	6.58	31.6	mg/kg	< 2.6 U	< 2.4 U	0.49 J	< 2.6 U	0.16 J	0.28 J	< 2.6 U	2 J	0.29 B	< 2.2 U	1.1 J	**41.6**	21	0.71 J	18.4	23.4	7.2	20
Iron	NS	2649	2649	mg/kg	570	687	957	976	303 J	528 J	328	297	315	1500	1480	**132000**	**93000 J**	2600 J	1950	**3660**	**15900**	**130000 D**
Lead	35.8	14.2	35.8	mg/kg	1.7 J	2.3	3.6	4	0.67 J	2.4 J	2.5	2.4	2.5	4.8	1.6 J	**134**	34	2.1	**88.8**	**142**	22	**110**
Magnesium	NS	135	135	mg/kg	26.3 J	34.4 J	23.8 J	22.3 J	12.4 B	10.7 B	< 9.6 U	< 3.6 U	5.7 B	**269 J**	42.6 J	**966**	**770 J**	81 J	48.3 J	**173 J**	**145**	**280**
Manganese	630	8.04	630	mg/kg	5.4	5.6	4.4	4.4	0.47 J	0.84 J	6.5	5.3	1.3 B	13.7	34.4	276	560 JQ	39 J	4.4	14.1	24.2	100 Q
Mercury	0.2	NS	0.2	mg/kg	0.022 B	0.025 B	0.023 J	0.022 J	0.058 J	0.024 J	0.059	0.068	0.1	< 0.0087 U	< 0.0078 U	0.19 B	**0.22**	< 16 U	< 0.0073 U	0.01 J	0.09	0.16
Nickel	22.7	1.71	22.7	mg/kg	< 4.1 U	0.29 J	0.18 J	0.15 J	< 2.7 U	0.07 B	< 0.082 U	< 0.11 U	< 2.3 U	1 J	0.2 J	10.1 B	12	0.59	0.8 J	2.3 J	1.7 B	8.5
Potassium	NS	129	129	mg/kg	32.4 J	48.7 J	< 1100 U	< 1000 U	7.6 B	10.8 B	7.8 J	< 1100 U	5.6 B	**298 J**	< 1000 U	**711**	**840 J**	120 J	42.6 J	< 920 U	**137**	**260 J**
Selenium	NS	NS	NS	mg/kg	< 0.27 U	0.25 J	0.38 J	< 0.34 U	< 1.6 U	< 1.2 U	< 0.27 U	< 0.35 U	< 1.4 U	0.32 J	< 0.34 U	5.9 B	1.9 J	< 0.44 U	0.26 J	0.57 J	< 2.3 U	1.9
Silver	0.5	NS	0.5	mg/kg	< 0.1 U	< 0.098 U	< 0.15 U	< 0.14 U	< 1.6 U	< 1.2 U	< 0.11 U	< 0.15 U	< 1.4 U	< 0.088 U	< 0.15 U	< 9.6 U	0.1 J	< 0.060 U	0.13 J	0.19 J	< 2.3 U	0.13 J
Sodium	NS	2703	2703	mg/kg	12.5 J	10.7 J	< 1100 U	< 1000 U	< 35.3 UJB	< 39 UJ	7.7 J	< 1100 U	< 46 U	14.8 J	< 1000 U	267 B	< 920 U	< 190 UJ	23.6 J	< 920 U	< 44.1 UB	< 470 U
Thallium	NS	NS	NS	mg/kg	< 0.3 U	< 0.29 U	< 0.44 U	< 0.42 U	< 1.1 U	< 0.79 U	< 0.3 U	< 0.44 U	< 0.92 U	< 0.26 U	< 0.43 U	< 6.4 U	0.3 J	0.028 J	< 0.25 U	< 0.38 U	< 1.5 U	0.16 J
Vanadium	NS	NS	NS	mg/kg	0.72 J	0.92 J	2 J	1.9 J	0.38 J	0.82 J	1.4 J	1.2 J	1 B	5.5	1.5 J	72.7	20	1.7	4 J	6.8	11.4	32
Zinc	121	25.6	121	mg/kg	2.5	3.1	3.4	3.3	0.59 J	1.3 J	2.2	1.5 J	0.56 B	3.8	2.3	**922**	**130**	5.2 J	32.2	**125**	117	**530**
Pesticides (SW8010B)																						
4,4-DDD	8	90.1	90.1	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.1 J	1.3	< 7 U	< 45 UJ
4,4-DDE	5	NS	5	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.33 UJ	1.9	< 7 U	4.1 J
4,4-DDT	8	NS	8	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.8 J	3.6 J	< 7 U	< 45 UJ
Aldrin	2	NS	2	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.37 U	< 0.79 U	< 3.6 U	< 1.8 UJ
alpha-BHC	6	NS	6	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.24 U	< 0.79 U	< 3.6 U	< 1.8 UJ
alpha-Chlordane	NS	NS	NS	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.3 U	< 0.79 U	< 3.6 U	< 1.8 UJ
Beta-BHC	5	NS	5	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.51 U	< 0.79 U	< 3.6 U	< 4.5 UJ
Chlordane	7	NS	7	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.79 U	NA	NA
delta-BHC	NS	NS	NS	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.4 UJ	< 0.79 UJ	< 3.6 U	< 2.7 UJ
Dieldrin	2	NS	2	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.32 U	< 0.79 U	< 7 U	1.6 J
Endosulfan I	NS	NS	NS	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.31 UJ	< 0.79 U	< 3.6 U	< 1.8 UJ
Endosulfan II	NS	NS	NS	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.49 U	< 0.79 U	< 7 U	< 1.8 UJ
Endosulfan sulfate	34.6	NS	34.6	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.35 U	< 0.79 UJ	< 7 U	< 1.8 UJ
Endrin	3	NS	3	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.26 UJ	< 0.79 U	< 7 U	< 1.8 UJ
Endrin aldehyde	480	NS	480	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.43 U	< 0.79 U	< 7 U	< 1.8 UJ
Endrin ketone	NS	NS	NS	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.33 U	< 0.79 U	< 7 U	NA
Gamma-BHC (Lindane)	3	NS	3	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.4 U	< 0.79 U	< 3.6 U	< 2.7 UJ
Gamma-chlordane	NS	NS	NS	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.56 U	< 0.79 U	< 3.6 U	< 1.8 UJ
Heptachlor	0.6	NS	0.6	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.4 UJ	< 0.79 U	< 3.6 U	< 1.8 UJ
Heptachlor epoxide	5	NS	5	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.3 U	< 0.79 U	< 3.6 U	< 2.7 UJ
Methoxychlor	13.6	NS	13.6	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.8 U	< 1.6 U	< 36 U	< 27 UJ
Toxaphene	0.077	NS	0.077	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 10 U	< 20 U	< 360 U	< 89 UJ
VOCs (SW8260B)																						
1,1,1-trichloroethane	213	NS	213	ug/kg	< 0.3 UJ	< 0.29 UJ	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-tetrachloroethane	850	NS	850	ug/kg	< 0.36 U	< 0.34 U	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluo	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	NS	NS	NS	ug/kg	< 0.87 U	< 0.82 U	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethane	NS	NS	NS	ug/kg	< 0.33 U	< 0.31 U	< 0.96 U	< 1.1 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethene	19.4	NS	19.4	ug/kg	< 0.3 U	< 0.29 U	< 0.96 U	< 1.1 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 UJ	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	5062	NS	5062	ug/kg	NA	NA	NA	NA	< 3.7 UJ	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropa	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dibromoethane	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichlorobenzene	294	NS	294	ug/kg	NA	NA	NA	NA	< 3.7 UJ	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Area LF010
Summary of Sediment Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
October 2013 through April 2016

Parameter	NJDEP Ecological Screening Levels	Ft Dix Background Sediment	Site Screening Criteria	Unit	SD-1 (10/11/2013)	SD-1 (DUP) (10/11/2013)	SD-1 (07/23/2014)	SD-1 (DUP) (07/23/2014)	SD-1 (04/10/2015)	SD-1 (DUP) (04/10/2015)	SD-2 (10/11/2013)	SD-2 (07/23/2014)	SD-2 (04/10/2015)	SD-3 (10/11/2013)	SD-3 (07/23/2014)	SD-3 (04/10/2015)	SD-3 (04/18/2016)	SD-3 (04/03/2017)	SD-7 (10/11/2013)	SD-7 (07/23/2014)	SD-7 (04/10/2015)	SD-7 (04/18/2016)
1,2-dichloroethane	260	NS	260	ug/kg	< 0.34 UJ	< 0.32 UJ	< 0.96 U	< 1.1 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethene	NS	NS	NS	ug/kg	< 0.22 U	< 0.21 U	< 0.96 U	< 1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloropropane	333	NS	333	ug/kg	< 0.46 U	< 0.44 U	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	1315	NS	1315	ug/kg	NA	NA	NA	NA	< 3.7 UJ	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	318	NS	318	ug/kg	NA	NA	NA	NA	< 3.7 UJ	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dioxane	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 75 UJ	< 81 UJ	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	NS	NS	NS	ug/kg	10 R	10 R	< 9.6 U	< 11 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	ug/kg	< 1.9 U	< 1.8 U	< 4.8 U	< 5.7 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	ug/kg	< 1.4 U	< 1.3 U	< 4.8 U	< 5.7 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NS	NS	NS	ug/kg	13.2	10.7	9.6 R	11 R	3.4 J	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	142	NS	142	ug/kg	< 0.13 U	< 0.13 U	< 0.48 U	< 0.57 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	NS	NS	NS	ug/kg	< 0.3 UJ	< 0.28 UJ	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	492	NS	492	ug/kg	< 0.28 UJ	< 0.26 UJ	< 4.8 U	< 5.7 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	1.37	NS	1.37	ug/kg	< 0.51 U	< 0.48 U	< 4.8 U	< 5.7 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NS	NS	NS	ug/kg	< 0.15 U	< 0.14 U	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	1450	NS	1450	ug/kg	< 0.27 UJ	< 0.25 UJ	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	291	NS	291	ug/kg	< 0.21 U	< 0.2 U	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NS	NS	NS	ug/kg	< 1.1 U	< 0.99 U	< 4.8 U	< 5.7 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	121	NS	121	ug/kg	< 0.27 U	< 0.25 U	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NS	NS	NS	ug/kg	< 0.36 U	< 0.34 U	< 4.8 U	< 5.7 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	NS	NS	NS	ug/kg	< 0.22 U	< 0.21 U	< 0.96 U	< 1.1 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-dichloropropene	NS	NS	NS	ug/kg	< 0.24 U	< 0.23 U	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cyclohexane	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 UJ	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	NS	NS	NS	ug/kg	< 0.26 UJ	< 0.24 UJ	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	175	NS	175	ug/kg	< 0.19 U	< 0.17 U	< 0.96 U	< 1.1 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 UJ	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 UJ	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl acetate	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 UJ	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	159	NS	159	ug/kg	4.8 J	< 1.7 U	< 4.8 U	< 5.7 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	254	NS	254	ug/kg	< 0.25 U	< 0.23 U	< 1.9 U	< 2.3 U	< 3.7 UJ	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	990	NS	990	ug/kg	< 0.43 U	< 0.41 U	< 0.96 U	< 1.1 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1220	NS	1220	ug/kg	< 0.15 U	< 0.14 U	< 0.96 U	< 1.1 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	654	NS	654	ug/kg	< 0.45 U	< 0.42 U	< 0.96 U	< 1.1 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,3-dichloropropene	NS	NS	NS	ug/kg	< 0.29 UJ	< 0.27 UJ	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	112	NS	112	ug/kg	< 0.37 U	< 0.35 U	< 0.96 U	< 1.1 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NS	NS	NS	ug/kg	NA	NA	NA	NA	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	202	NS	202	ug/kg	< 0.36 U	< 0.34 U	< 1.9 U	< 2.3 U	< 3.7 U	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Xylenes, Total	433	NS	433	ug/kg	< 0.19 U	< 0.18 U	< 0.96 U	< 1.1 U	< 3.7 UJ	< 4.1 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
J = Parameter detected above the method detection limit and below the reporting limit
U = Parameter was not detected
mg/kg = Milligrams per Kilogram
ug/kg = Micrograms per Kilogram
NA = Not Analyzed
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area LF010
Summary of Surface Water Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2017

Parameter	EPA MCLs	NJ PQLs	NJ Freshwater Acute Surface Water	NJ Freshwater Chronic Surface Water	NJ Freshwater Human Health	Ft Dix Background Surface Water	Site Screening Criteria	Unit	SW-1 (10/11/2013)	SW-1 (DUP) (10/11/2013)	SW-1 (07/23/2014)	SW-1 (DUP) (07/23/2014)	SW-1 (04/10/2015)	SW-1-FD (04/10/2015)	SW-2 (10/11/2013)	SW-2 (07/23/2014)	SW-2 (04/10/2015)	SW-3 (10/11/2013)	SW-3 (07/23/2014)	SW-3 (04/10/2015)
Aluminum	NS	30	NS	NS	NS	736	736	ug/l	85.3 J	93.2 J	< 200 U	< 200 U	272	270	94.2 J	< 200 U	164	31.7 J	< 200 U	633
Antimony	6	3	NS	NS	5.6	NS	3	ug/l	< 1.8 U	< 1.8 U	< 2.6 U	< 2.6 U	0.37 J	0.2 J	< 1.8 U	< 2.6 U	0.29 B	< 1.8 U	< 2.6 U	0.27 B
Arsenic	10	3	340	150	0.017	NS	3	ug/l	< 1.5 U	< 1.5 U	< 2.6 U	< 2.6 U	0.3 B	< 2 U	< 1.5 U	< 2.6 U	< 2 U	< 1.5 U	< 2.6 U	0.74 B
Barium	2000	200	NS	NS	2000	45.7	200	ug/l	< 200 U	< 200 U	< 200 U	< 200 U	53.3	52	< 200 U	< 200 U	48.5	< 200 U	< 200 U	51.8
Beryllium	4	1	NS	NS	6	NS	1	ug/l	< 0.17 U	< 0.17 U	< 0.4 U	< 0.4 U	0.099 B	0.093 B	< 0.17 U	< 0.4 U	0.084 B	< 0.17 U	< 0.4 U	0.091 B
Cadmium	5	0.5	NS	NS	3.4	NS	0.5	ug/l	< 0.24 U	< 3 U	< 0.7 U	< 0.7 U	0.14 B	0.15 B	< 0.24 U	< 0.7 U	0.15 B	< 0.24 U	< 0.7 U	0.18 B
Calcium	NS	NS	NS	NS	NS	4730	4730	ug/l	**16400**	**14900**	**14700**	**17300**	**15200**	**15000**	**18500**	**20300**	**20400**	**13600**	**14300**	**14800**
Chromium	100	1	NS	NS	92	NS	1	ug/l	< 0.92 U	< 0.92 U	< 0.89 U	1 J	< 0.51 UB	< 0.68 UB	< 0.92 U	< 0.89 U	< 0.46 UB	< 0.92 U	< 0.89 U	< 1.4 UB
Cobalt	NS	NS	NS	NS	NS	NS	NS	ug/l	< 0.48 U	< 0.48 U	1.2 J	< 50 U	0.84 B	0.81 B	< 50 U	< 50 U	0.84 B	< 0.48 U	< 0.83 U	1.6
Copper	1300	4	NS	NS	1300	NS	4	ug/l	< 1 U	< 10 U	2.3 J	2.3 J	1.7 B	1.3 B	< 10 U	3.1 J	0.71 B	< 1 U	1.9 J	2 B
Iron	NS	20	NS	NS	NS	4280	4280	ug/l	208	233	409	489	472	493	257	368	290	1450	1410	**6310**
Lead	15	5	38	5.4	5	2.71	5	ug/l	< 2.4 U	< 2.4 U	2 J	1.8 J	0.58 B	0.58 B	< 2.4 U	2.7 J	0.76 B	< 2.4 U	< 1.3 U	3.1
Magnesium	NS	NS	NS	NS	NS	2790	2790	ug/l	**4740 J**	**4330 J**	**3830 J**	**4490 J**	**4060**	**3880**	**5090**	**5000**	**4940**	**2810 J**	**2870 J**	2780
Manganese	NS	0.4	NS	NS	NS	37.2	37.2	ug/l	15.1	< 15 U	25.5	30.8	25.5	24.8	31.2	**47.6**	28.3	19.2	28.2	**67.5**
Mercury	2	0.05	1.4	0.77	0.05	NS	0.05	ug/l	< 0.089 U	< 0.089 U	**0.2**	**0.2**	**0.14 B**	**0.13 B**	**0.19 J**	**0.31**	**0.24**	< 0.089 U	< 0.064 U	0.03 B
Nickel	NS	4	NS	NS	500	NS	4	ug/l	< 1.6 U	< 1.6 U	1.9 J	1.7 J	1.6	1.7	< 1.6 U	2.2 J	1.5	< 1.6 U	1.3 J	1.8
Potassium	NS	NS	NS	NS	NS	1390	1390	ug/l	**2080 J**	**1880 J**	< 10000 U	< 10000 U	**1670**	**1650**	**1980 J**	< 10000 U	**1950**	**7070 J**	< 10000 U	**6200**
Selenium	50	4	20	5	170	NS	4	ug/l	< 10 U	< 10 U	< 3.6 U	< 3.6 U	0.62 B	0.55 B	< 10 U	< 3.6 U	0.71 B	3.7 J	< 3.6 U	0.21 B
Silver	NS	1	NS	NS	170	NS	1	ug/l	< 1.5 U	< 1.5 U	< 1.2 U	< 1.2 U	< 1 UJB	< 0.31 UJB	< 1.5 U	< 1.2 U	< 0.55 UB	< 1.5 U	< 1.2 U	< 0.21 UB
Sodium	NS	400	NS	NS	NS	7240	7240	ug/l	**15500**	**14200**	**13300**	**15800**	**14000**	**13500**	**13500**	**14500**	**11400**	**22700**	**22400**	**20800**
Thallium	2	2	NS	NS	0.24	NS	2	ug/l	< 1.3 U	< 1.3 U	< 1.8 U	< 1.8 U	< 0.13 UJB	< 0.056 UJB	< 1.3 U	< 1.8 U	< 0.072 UB	< 1.3 U	< 1.8 U	< 0.11 UB
Vanadium	0.9	1	NS	NS	NS	NS	1	ug/l	< 0.72 U	< 0.72 U	< 0.87 U	< 0.87 U	< 5 U	< 5 U	< 0.72 U	< 0.87 U	< 5 U	< 0.72 U	< 0.87 U	**1.7 B**
Zinc	NS	10	NS	NS	7400	28.5	28.5	ug/l	12.2 J	10.9 J	< 20 U	< 20 U	19.4	19.7	17.7 J	< 20 U	13.9	< 4.4 U	< 20 U	19.9
4,4-DDD	NS	0.02	NS	NS	0.00031	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4-DDE	NS	0.01	NS	NS	0.00022	NS	0.01	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4,4-DDT	NS	0.1	1.1	0.001	0.00022	0.034	0.1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aldrin	NS	0.04	3	NS	0.000049	NS	0.04	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-BHC	NS	0.02	NS	NS	0.0026	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
alpha-Chlordane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beta-BHC	NS	0.04	NS	NS	0.0091	NS	0.04	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlordane	2	0.5	2.4	0.0043	0.0001	NS	0.5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
delta-BHC	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dieldrin	NS	0.03	0.24	0.056	0.000052	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	NS	0.02	0.22	0.056	62	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	NS	0.02	0.22	0.056	62	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulfate	NS	0.02	NS	NS	62	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin	2	0.03	0.086	0.036	0.059	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin aldehyde	NS	NS	NS	NS	0.059	NS	0.059	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Endrin ketone	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gamma-BHC (Lindane)	0.2	0.02	0.95	NS	0.98	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gamma-chlordane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor	0.4	0.05	0.52	0.0038	0.000079	NS	0.05	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	0.2	0.2	0.52	0.0038	0.000039	NS	0.2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	40	0.1	NS	0.03	40	NS	0.1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toxaphene	3	2	0.73	0.002	0.00028	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	NS	NS	120	NS	1	ug/l	< 0.25 U	< 0.25 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,1,2,2-tetrachloroethane	NS	1	NS	NS	4.7	NS	1	ug/l	< 0.2 U	< 0.2 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoro	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	NS	NS	13	NS	2	ug/l	< 0.21 U	< 0.21 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,1-dichloroethane	NS	1	NS	NS	NS	NS	1	ug/l	< 0.26 U	< 0.26 U	< 1 UJ	< 1 UJ	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,1-dichloroethene	7	1	NS	NS	4.7	NS	1	ug/l	< 0.34 U	< 0.34 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	NS	NS	21	NS	1	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	NS	NS	NS	NS	0.02	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	NS	NS	NS	NS	0.03	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	NS	NS	2000	NS	5	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,2-dichloroethane	5	2	NS	NS	0.29	NS	2	ug/l	< 0.22 U	< 0.22 U	< 1 UJ	< 1 UJ	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	NS	ug/l	< 0.24 U	< 0.24 U	< 1 U	< 1 U	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloropropane	5	1	NS	NS	0.5	NS	1	ug/l	< 0.28 U	< 0.28 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	NS	NS	2200	NS	5	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA

Area LF010
Summary of Surface Water Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2017

Parameter	EPA MCLs	NJ PQLs	NJ Freshwater Acute Surface Water	NJ Freshwater Chronic Surface Water	NJ Freshwater Human Health	Ft Dix Background Surface Water	Site Screening Criteria	Unit	SW-1 (10/11/2013)	SW-1 (DUP) (10/11/2013)	SW-1 (07/23/2014)	SW-1 (DUP) (07/23/2014)	SW-1 (04/10/2015)	SW-1-FD (04/10/2015)	SW-2 (10/11/2013)	SW-2 (07/23/2014)	SW-2 (04/10/2015)	SW-3 (10/11/2013)	SW-3 (07/23/2014)	SW-3 (04/10/2015)
1,4-dichlorobenzene	75	5	NS	NS	550	NS	5	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
1,4-dioxane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	< 100 U	< 100 U	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	NS	NS	NS	NS	2	ug/l	R	R	R	R	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	NS	NS	ug/l	< 1.7 U	< 1.7 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	NS	NS	NS	NS	ug/l	< 1.5 U	< 1.5 U	< 5 U	< 5 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Acetone	NS	10	NS	NS	NS	NS	10	ug/l	3.3 R	3.3 R	10 R	10 R	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Benzene	5	1	NS	NS	0.15	NS	1	ug/l	< 0.28 U	< 0.28 U	< 0.5 U	< 0.5 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	NS	NS	0.55	NS	1	ug/l	< 0.21 U	< 0.21 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Bromoform	80	0.8	NS	NS	4.3	NS	0.8	ug/l	< 0.3 U	< 0.3 U	< 2 U	< 2 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Bromomethane	NS	1	NS	NS	47	NS	1	ug/l	< 0.56 U	< 0.56 U	< 2 U	< 2 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	NS	NS	NS	NS	1	ug/l	< 0.18 U	< 0.18 U	< 2 U	< 2 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5	1	NS	NS	0.33	NS	1	ug/l	< 0.23 U	< 0.23 U	< 1 UJ	< 1 UJ	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	1	NS	NS	210	NS	1	ug/l	< 0.35 U	< 0.35 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Chloroethane	NS	NS	NS	NS	NS	NS	NS	ug/l	< 0.39 U	< 0.39 U	< 1 UJ	< 1 UJ	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Chloroform	80	1	NS	NS	68	NS	1	ug/l	< 0.25 U	< 0.25 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Chloromethane	NS	NS	NS	NS	NS	NS	NS	ug/l	< 0.36 U	< 0.36 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	70	1	NS	NS	NS	NS	1	ug/l	< 0.24 U	< 0.24 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
cis-1,3-dichloropropene	NS	1	NS	NS	0.34	NS	1	ug/l	< 0.15 U	< 0.15 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Cyclohexane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	NS	NS	0.4	NS	1	ug/l	< 0.19 U	< 0.19 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	NS	NS	NS	NS	2	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	NS	NS	530	NS	2	ug/l	< 0.21 U	< 0.21 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	NS	NS	NS	NS	1	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Methyl acetate	NS	0.5	NS	NS	NS	NS	0.5	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	151000	51000	70	NS	1	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Methylcyclohexane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	1	NS	NS	2.5	NS	1	ug/l	< 0.86 U	< 0.86 U	< 2 U	< 2 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Styrene	100	2	NS	NS	NS	NS	2	ug/l	< 0.3 U	< 0.3 U	< 2 U	< 2 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	NS	NS	0.34	NS	1	ug/l	< 0.25 U	< 0.25 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Toluene	1000	1	NS	NS	1300	NS	1	ug/l	< 0.44 U	< 0.44 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	NS	NS	590	NS	1	ug/l	< 0.38 U	< 0.38 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
trans-1,3-dichloropropene	NS	1	NS	NS	0.34	NS	1	ug/l	< 0.21 U	< 0.21 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Trichloroethene	5	1	NS	NS	1	NS	1	ug/l	< 0.5 U	< 0.5 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Trichlorofluoromethane	NS	1	NS	NS	NS	NS	1	ug/l	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Vinyl chloride	2	1	NS	NS	0.082	NS	1	ug/l	< 0.41 U	< 0.41 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA
Xylenes, Total	10000	2	NS	NS	NS	NS	2	ug/l	< 0.19 U	< 0.19 U	< 1 U	< 1 U	< 5 U	< 5 U	NA	NA	NA	NA	NA	NA

Notes:
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
B = Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
ug/l = Micrograms per Liter
NA = Not Analyzed or Data Not Provided
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

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2013 through 2017

Parameter	EPA MCLs	NJ PQLs	NJ Freshwater Acute Surface Water	NJ Freshwater Chronic Surface Water	NJ Freshwater Human Health	Ft Dix Background Surface Water	Site Screening Criteria	Unit	SW-3 (04/18/2016)	SW-3 (04/03/2017)	SW-7 (10/11/2013)	SW-7 (07/23/2014)	SW-7 (04/10/2015)
Aluminum	NS	30	NS	NS	NS	736	736	ug/l	24 J	31 J	295	< 200 U	85.6
Antimony	6	3	NS	NS	5.6	NS	3	ug/l	< 1 U	< 1 U	2.8 J	< 2.6 U	**5.9**
Arsenic	10	3	340	150	0.017	NS	3	ug/l	< 1 U	< 1 U	**5.3**	< 2.6 U	0.49 B
Barium	2000	200	NS	NS	2000	45.7	200	ug/l	49	43	< 200 U	< 200 U	31.5
Beryllium	4	1	NS	NS	6	NS	1	ug/l	< 0.3 U	< 0.3 U	< 0.17 U	< 0.4 U	< 1 U
Cadmium	5	0.5	NS	NS	3.4	NS	0.5	ug/l	< 1 U	< 1 U	< 3 U	< 0.7 U	< 1 U
Calcium	NS	NS	NS	NS	NS	4730	4730	ug/l	**13000**	**11000**	**25900**	**33600**	**24000**
Chromium	100	1	NS	NS	92	NS	1	ug/l	< 1.8 U	< 1.8 U	< 10 U	1 J	< 2 U
Cobalt	NS	NS	NS	NS	NS	NS	NS	ug/l	0.3 J	0.33 J	< 50 U	< 50 U	0.23 B
Copper	1300	4	NS	NS	1300	NS	4	ug/l	1 J	**4.2**	**13.9**	**4.1 J**	1.3 B
Iron	NS	20	NS	NS	NS	4280	4280	ug/l	670	850	**16200**	2710	531
Lead	15	5	38	5.4	5	2.71	5	ug/l	< 0.7 U	0.32 J	**20.4**	4.2	1.1
Magnesium	NS	NS	NS	NS	NS	2790	2790	ug/l	**2900**	2400	2390 J	**3430 J**	1880
Manganese	NS	0.4	NS	NS	NS	37.2	37.2	ug/l	28	21	**107**	**62.1**	12.1
Mercury	2	0.05	1.4	0.77	0.05	NS	0.05	ug/l	< 0.08 U	< 0.08 U	< 0.089 U	< 0.064 U	< 0.2 U
Nickel	NS	4	NS	NS	500	NS	4	ug/l	< 1 UB	1 J	**8.3 J**	1.5 J	0.89 B
Potassium	NS	NS	NS	NS	NS	1390	1390	ug/l	**6700**	**5800**	**8570 J**	< 10000 U	**7750**
Selenium	50	4	20	5	170	NS	4	ug/l	< 2 U	< 2 U	2.7 J	< 3.6 U	0.23 B
Silver	NS	1	NS	NS	170	NS	1	ug/l	< 0.1 U	< 0.1 U	< 1.5 U	< 1.2 U	< 0.031 UB
Sodium	NS	400	NS	NS	NS	7240	7240	ug/l	**24000**	**23000**	**24000**	**27800**	**24200**
Thallium	2	2	NS	NS	0.24	NS	2	ug/l	< 0.2 UB	< 0.2 U	< 1.3 U	< 1.8 U	< 1 U
Vanadium	0.9	1	NS	NS	NS	NS	1	ug/l	< 2 U	< 2 U	< 50 U	< 0.87 U	< 5 U
Zinc	NS	10	NS	NS	7400	28.5	28.5	ug/l	6.4 J	11 J	**93.6**	22.4	**31.4**
4,4-DDD	NS	0.02	NS	NS	0.00031	NS	0.02	ug/l	NA	NA	< 0.0025 UJ	< 0.01 U	< 0.1 UJ
4,4-DDE	NS	0.01	NS	NS	0.00022	NS	0.01	ug/l	NA	NA	< 0.0017 UJ	**0.026**	< 0.1 UJ
4,4-DDT	NS	0.1	1.1	0.001	0.00022	0.034	0.1	ug/l	NA	NA	< 0.0032 UJ	0.012	< 0.1 UJ
Aldrin	NS	0.04	3	NS	0.000049	NS	0.04	ug/l	NA	NA	< 0.0079 U	< 0.01 U	< 0.05 UJ
alpha-BHC	NS	0.02	NS	NS	0.0026	NS	0.02	ug/l	NA	NA	< 0.0023 UJ	< 0.01 U	< 0.05 UJ
alpha-Chlordane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	< 0.0029 U	< 0.01 U	< 0.05 UJ
Beta-BHC	NS	0.04	NS	NS	0.0091	NS	0.04	ug/l	NA	NA	< 0.0023 UJ	< 0.01 U	< 0.05 UJ
Chlordane	2	0.5	2.4	0.0043	0.0001	NS	0.5	ug/l	NA	NA	NA	< 0.01 U	NA
delta-BHC	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	< 0.0019 U	< 0.01 U	< 0.05 UJ
Dieldrin	NS	0.03	0.24	0.056	0.000052	NS	0.03	ug/l	NA	NA	< 0.0016 UJ	< 0.01 U	< 0.1 UJ
Endosulfan I	NS	0.02	0.22	0.056	62	NS	0.02	ug/l	NA	NA	< 0.0028 UJ	< 0.01 U	< 0.05 UJ
Endosulfan II	NS	0.02	0.22	0.056	62	NS	0.02	ug/l	NA	NA	< 0.002 U	< 0.01 U	< 0.1 UJ
Endosulfan sulfate	NS	0.02	NS	NS	62	NS	0.02	ug/l	NA	NA	< 0.0019 U	< 0.01 U	< 0.1 UJ
Endrin	2	0.03	0.086	0.036	0.059	NS	0.03	ug/l	NA	NA	< 0.002 UJ	< 0.01 U	< 0.1 UJ
Endrin aldehyde	NS	NS	NS	NS	0.059	NS	0.059	ug/l	NA	NA	< 0.0037 U	< 0.01 U	< 0.1 UJ
Endrin ketone	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	< 0.0047 U	< 0.01 U	< 0.1 UJ
Gamma-BHC (Lindane)	0.2	0.02	0.95	NS	0.98	NS	0.02	ug/l	NA	NA	< 0.0017 U	< 0.01 U	< 0.05 UJ
Gamma-chlordane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	< 0.0021 U	< 0.01 U	< 0.05 UJ
Heptachlor	0.4	0.05	0.52	0.0038	0.000079	NS	0.05	ug/l	NA	NA	< 0.0022 UJ	< 0.01 U	< 0.05 UJ
Heptachlor epoxide	0.2	0.2	0.52	0.0038	0.000039	NS	0.2	ug/l	NA	NA	< 0.0026 UJ	< 0.01 U	< 0.05 UJ
Methoxychlor	40	0.1	NS	0.03	40	NS	0.1	ug/l	NA	NA	< 0.0041 UJ	< 0.021 U	< 0.5 UJ
Toxaphene	3	2	0.73	0.002	0.00028	NS	2	ug/l	NA	NA	< 0.15 U	< 0.26 U	< 5 UJ
1,1,1-trichloroethane	200	1	NS	NS	120	NS	1	ug/l	NA	NA	NA	NA	NA
1,1,2,2-tetrachloroethane	NS	1	NS	NS	4.7	NS	1	ug/l	NA	NA	NA	NA	NA
1,1,2-Trichloro-1,2,2-trifluoro	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	NS	NS	13	NS	2	ug/l	NA	NA	NA	NA	NA
1,1-dichloroethane	NS	1	NS	NS	NS	NS	1	ug/l	NA	NA	NA	NA	NA
1,1-dichloroethene	7	1	NS	NS	4.7	NS	1	ug/l	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	NS	NS	21	NS	1	ug/l	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	NS	NS	NS	NS	0.02	ug/l	NA	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	NS	NS	NS	NS	0.03	ug/l	NA	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	NS	NS	2000	NS	5	ug/l	NA	NA	NA	NA	NA
1,2-dichloroethane	5	2	NS	NS	0.29	NS	2	ug/l	NA	NA	NA	NA	NA
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
1,2-dichloropropane	5	1	NS	NS	0.5	NS	1	ug/l	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	NS	NS	2200	NS	5	ug/l	NA	NA	NA	NA	NA

Area LF010
Summary of Surface Water Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2017

Parameter	EPA MCLs	NJ PQLs	NJ Freshwater Acute Surface Water	NJ Freshwater Chronic Surface Water	NJ Freshwater Human Health	Ft Dix Background Surface Water	Site Screening Criteria	Unit	SW-3 (04/18/2016)	SW-3 (04/03/2017)	SW-7 (10/11/2013)	SW-7 (07/23/2014)	SW-7 (04/10/2015)
1,4-dichlorobenzene	75	5	NS	NS	550	NS	5	ug/l	NA	NA	NA	NA	NA
1,4-dioxane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
2-butanone	NS	2	NS	NS	NS	NS	2	ug/l	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Acetone	NS	10	NS	NS	NS	NS	10	ug/l	NA	NA	NA	NA	NA
Benzene	5	1	NS	NS	0.15	NS	1	ug/l	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	NS	NS	0.55	NS	1	ug/l	NA	NA	NA	NA	NA
Bromoform	80	0.8	NS	NS	4.3	NS	0.8	ug/l	NA	NA	NA	NA	NA
Bromomethane	NS	1	NS	NS	47	NS	1	ug/l	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	NS	NS	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Carbon tetrachloride	5	1	NS	NS	0.33	NS	1	ug/l	NA	NA	NA	NA	NA
Chlorobenzene	100	1	NS	NS	210	NS	1	ug/l	NA	NA	NA	NA	NA
Chloroethane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Chloroform	80	1	NS	NS	68	NS	1	ug/l	NA	NA	NA	NA	NA
Chloromethane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	70	1	NS	NS	NS	NS	1	ug/l	NA	NA	NA	NA	NA
cis-1,3-dichloropropene	NS	1	NS	NS	0.34	NS	1	ug/l	NA	NA	NA	NA	NA
Cyclohexane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	NS	NS	0.4	NS	1	ug/l	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	NS	NS	NS	NS	2	ug/l	NA	NA	NA	NA	NA
Ethylbenzene	700	2	NS	NS	530	NS	2	ug/l	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	NS	NS	NS	NS	1	ug/l	NA	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Methyl acetate	NS	0.5	NS	NS	NS	NS	0.5	ug/l	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	151000	51000	70	NS	1	ug/l	NA	NA	NA	NA	NA
Methylcyclohexane	NS	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Methylene Chloride	5	1	NS	NS	2.5	NS	1	ug/l	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Styrene	100	2	NS	NS	NS	NS	2	ug/l	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	NS	NS	0.34	NS	1	ug/l	NA	NA	NA	NA	NA
Toluene	1000	1	NS	NS	1300	NS	1	ug/l	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	NS	NS	590	NS	1	ug/l	NA	NA	NA	NA	NA
trans-1,3-dichloropropene	NS	1	NS	NS	0.34	NS	1	ug/l	NA	NA	NA	NA	NA
Trichloroethene	5	1	NS	NS	1	NS	1	ug/l	NA	NA	NA	NA	NA
Trichlorofluoromethane	NS	1	NS	NS	NS	NS	1	ug/l	NA	NA	NA	NA	NA
Vinyl chloride	2	1	NS	NS	0.082	NS	1	ug/l	NA	NA	NA	NA	NA
Xylenes, Total	10000	2	NS	NS	NS	NS	2	ug/l	NA	NA	NA	NA	NA

Notes:
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
B = Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
ug/l = Micrograms per Liter
NA = Not Analyzed or Data Not Provided
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area LF033
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2016

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	NJ PQL from RAWP	Site Screening Criterion	Unit	PDO-100 (03/04/2013)	PDO-38 (03/04/2013)	PDO-40 (03/04/2013)	PDO-101 (03/05/2013)	PDO-102 (03/05/2013)	PDO-100 (11/19/2013)	PDO-101 (11/19/2013)	DUP-GW (11/19/2013)	PDO-102 (11/19/2013)	PDO-38 (11/20/2013)	PDO-40 (11/20/2013)
Mercury (SW7470A)																		
Mercury	2	0.05	2	0.24	0.5	0.5	ug/L	< 0.2 U	**5**	**2.7**	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	0.297	0.1537 J

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	NJ PQL from RAWP	Site Screening Criterion	Unit	PDO-100 (05/21/2014)	DUP-100 (05/21/2014)	PDO-101 (05/21/2014)	PDO-102 (05/21/2014)	PDO-38 (05/21/2014)	PDO-40 (05/21/2014)	PDO-100 (12/16/2014)	PDO-101 (12/16/2014)	PDO-102 (12/16/2014)	PDO-38 (12/16/2014)	PDO-38 (DUP) (12/16/2014)	PDO-40 (12/16/2014)
Mercury (SW7470A)																			
Mercury	2	0.05	2	0.24	0.5	0.5	ug/L	< 0.2	< 0.2 U	< 0.2 U	< 0.2 U	0.2998	0.332	< 0.0002 U	0.075 J	< 0.0002 U	0.29	0.3	0.12 J
Mercury Dissolved (0.10 UM)	2	0.05	2	0.24	0.5	0.5	ug/L	NA	NA	NA	NA	0.143 J	0.1314 J	NA	NA	NA	NA	NA	NA
Mercury Dissolved (0.45 UM)	2	0.05	2	0.24	0.5	0.5	ug/L	NA	NA	NA	NA	0.1097 J	0.247	NA	NA	NA	NA	NA	NA

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	NJ PQL from RAWP	Site Screening Criterion	Unit	PDO-100 (04/30/2015)	PDO-101 (04/30/2015)	PDO-102 (05/04/2015)	PDO-38 (05/04/2015)	PDO-40 (05/04/2015)	PDO-40 (DUP) (05/04/2015)	PDO-38 (10/27/2015)	PDO-40 (10/27/2015)
Mercury (SW7470A)															
Mercury	2	0.05	2	0.24	0.5	0.5	ug/L	< 0.1 U	< 0.1 U	< 0.1 U	0.27 J	0.25 J	0.23 J	0.16 J	0.34

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Ft Dix Background Groundwater	NJ PQL from RAWP	Site Screening Criterion	Unit	PDO-38 (04/14/2016)	PDO-40 (04/14/2016)	PDO-38 (09/27/2016)	PDO-40 (09/27/2016)
Mercury (SW7470A)											
Mercury	2	0.05	2	0.24	0.5	0.5	ug/L	0.14 J	0.2	< 0.08 UB	0.21

Notes:
Bold Values = Parameter concentration exceeds the screening criteria
J = Parameter detected above the method detection limit and below the reporting limit
U = Parameter was not detected
ug/L = Micrograms per Liter
NA = Not Analyzed
RAWP = Remedial Action Work Plan (Shaw 2004)
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area LF033
Summary of Sediment Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2016

Parameter	NJDEP Ecological Screening Levels	Ft Dix Background Sediment	Sediment Quality Criterion from RAWP	Site Screening Criterion	Unit	PDO-SE-1410 (03/05/2013)	PDO-SE-220 (03/05/2013)	PDO-SE-330 (03/05/2013)	PDO-SE-860 (03/05/2013)	PDO-SED-1410 (11/19/2013)	PDO-SED-220 (11/19/2013)	PDO-SED-330 (11/19/2013)	DUP-SED (11/19/2013)	PDO-SED-860 (11/19/2013)
Mercury (SW7471B)														
Mercury	0.2	NS	0.2	0.2	mg/kg	**0.313**	**0.269**	0.131	**0.273**	**0.65**	0.06 J	0.03 J	0.15	0.12

Parameter	NJDEP Ecological Screening Levels	Ft Dix Background Sediment	Applicable Criterion - Sediment Quality Criterion from RAWP	Site Screening Criterion	Unit	PDO-SED-1410 (05/21/2014)	PDO-SED+220 (05/21/2014)	DUP-SED+220 (05/21/2014)	PDO-SED-330 (05/21/2014)	PDO-SED-860 (05/21/2014)	PDO-SE220 (12/16/2014)	PDO-SE330 (12/16/2014)	PDO-SE860 (12/16/2014)	PDO-SE1410 (12/17/2014)	PDO-SE1410 (DUP) (12/17/2014)
Mercury (SW7471B)															
Mercury	0.2	NS	0.2	0.2	mg/kg	**2.7**	0.04 J	0.05 J	0.04 J	0.08 J	0.0478 J	0.0828 J	**3.37**	0.0768 J	0.0795 J

Parameter	NJDEP Ecological Screening Levels	Ft Dix Background Sediment	Applicable Criterion - Sediment Quality Criterion from RAWP	Site Screening Criterion	Unit	PDO-SE1410 (05/04/2015)	PDO-SE1410 (DUP) (05/04/2015)	PDO-SE220 (05/04/2015)	PDO-SE330 (05/04/2015)	PDO-SE860 (05/04/2015)	PDO-SE-1410 (10/27/2015)	PDO-SE-220 (10/27/2015)	PDO-SE-330 (10/27/2015)	PDO-SED-860 (10/27/2015)
Mercury (SW7471B)														
Mercury	0.2	NS	0.2	0.2	mg/kg	**4.96 J**	**0.629 J**	0.119 J	0.117 J	**0.591 J**	**0.47**	0.11 J	0.072	0.13

Parameter	NJDEP Ecological Screening Levels	Ft Dix Background Sediment	Applicable Criterion - Sediment Quality Criterion from RAWP	Site Screening Criterion	Unit	PDO-SE-860 (04/14/2016)	PDO-SE-1410 (05/05/2016)	PDO-SE-220 (05/05/2016)	PDO-SE-330 (05/05/2016)	PDO-SE-1410 (09/28/2016)	PDO-SE-220 (09/28/2016)	PDO-SE-330 (09/28/2016)	PDO-SE-860 (09/28/2016)
Mercury (SW7471B)													
Mercury	0.2	NS	0.2	0.2	mg/kg	0.18	**0.43**	0.061	0.042	0.15	0.086	0.079	0.077

Notes:
Bold Values = Parameter concentration exceeds the screening criteria
J = Parameter detected above the method detection limit and below the reporting limit
U = Parameter was not detected
mg/kg = Milligrams per Kilogram
NA = Not Analyzed
RAWP = Remedial Action Work Plan (Shaw 2004)
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area LF033
Summary of Surface Water Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
Lakehurst, New Jersey
2013 through 2016

Parameter	EPA MCLs	NJ PQLs	NJ Freshwater Acute Surface Water	NJ Freshwater Chronic Surface Water	NJ Freshwater Human Health	Ft Dix Background Surface Water	SWQS from RAWP	Site Screening Criterion	Unit	PDO-SW-1410 (03/05/2013)	PDO-SW-220 (03/05/2013)	PDO-SW-330 (03/05/2013)	PDO-SW-860 (03/05/2013)	PDO-SW-1410 (11/19/2013)	PDO-SW-220 (11/19/2013)	PDO-SW-330 (11/19/2013)	PDO-SW-860 (11/19/2013)	DUP-SW-860 (11/19/2013)
Mercury (SW7470A)																		
Mercury	2	0.05	1.4	0.77	0.05	NS	0.144	0.144	ug/L	**0.407**	< 0.2 U	< 0.2 U	**0.362**	**0.2959**	< 0.2 UJ	< 0.2 U	0.1422 J	0.1399 J

Parameter	EPA MCLs	NJ PQLs	NJ Freshwater Acute Surface Water	NJ Freshwater Chronic Surface Water	NJ Freshwater Human Health	Ft Dix Background Surface Water	Applicable Criterion - SWQS from RAWP	Site Screening Criterion	Unit	PDO-SW-1410 (05/21/2014)	PDO-SW+220 (05/21/2014)	DUP-SW+220 (05/21/2014)	PDO-SW-330 (05/21/2014)	PDO-SW-860 (05/21/2014)	PDO-SW220 (12/16/2014)	PDO-SW330 (12/16/2014)	PDO-SW860 (12/16/2014)	PDO-SW1410 (12/17/2014)	PDO-SW1410 (DUP) (12/17/2014)
Mercury (SW7470A)																			
Mercury	2	0.05	1.4	0.77	0.05	NS	0.144	0.144	ug/L	**0.5359**	**0.1889 J**	**0.182 J**	**0.1902 J**	**0.2564**	**0.15 J**	**0.21**	**0.36**	**61.2 J**	**14.7 J**

Parameter	EPA MCLs	NJ PQLs	NJ Freshwater Acute Surface Water	NJ Freshwater Chronic Surface Water	NJ Freshwater Human Health	Ft Dix Background Surface Water	Applicable Criterion - SWQS from RAWP	Site Screening Criterion	Unit	PDO-SW1410 (05/04/2015)	PDO-SW1410 (DUP) (05/04/2015)	PDO-SW220 (05/04/2015)	PDO-SW330 (05/04/2015)	PDO-SW860 (05/04/2015)	PDO-SW-1410 (10/27/2015)	PDO-SW-220 (10/27/2015)	PDO-SW-220-FD (10/27/2015)	PDO-SW-330 (10/27/2015)	PDO-SW-860 (10/27/2015)
Mercury (SW7470A)																			
Mercury	2	0.05	1.4	0.77	0.05	NS	0.144	0.144	ug/L	**0.37 J**	**0.22 J**	**0.17 J**	**0.28 J**	**0.3 J**	0.14 J	< 0.2 UJ	0.035 J	0.042 J	0.06 J

Parameter	EPA MCLs	NJ PQLs	NJ Freshwater Acute Surface Water	NJ Freshwater Chronic Surface Water	NJ Freshwater Human Health	Ft Dix Background Surface Water	Applicable Criterion - SWQS from RAWP	Site Screening Criterion	Unit	PDO-SW-1410 (04/14/2016)	PDO-SW-220 (04/14/2016)	PDO-SW-220-FD (04/14/2016)	PDO-SW-330 (04/14/2016)	PDO-SW-860 (04/14/2016)	PDO-SW-1410 (09/23/2016)	PDO-SW-220 (09/23/2016)	PDO-SW-220-FD (09/23/2016)	PDO-SW-330 (09/23/2016)	PDO-SW-860 (09/23/2016)
Mercury (SW7470A)																			
Mercury	2	0.05	1.4	0.77	0.05	NS	0.144	0.144	ug/L	**0.18 J**	0.073 J	0.078 J	0.1 J	0.12 J	0.083 J	0.057 J	0.047 J	0.072 J	0.082 J

Notes:
Bold Values = Parameter concentration exceeds the screening criteria
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Parameter detected above the method detection limit and below the reporting limit
U = Parameter was not detected
ug/L = Micrograms per Liter
NA = Not Analyzed
RAWP = Remedial Action Work Plan (Shaw 2004)
SWQS = New Jersey Surface Water Quality Standards
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

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Area SS005B
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2013 and November 2013

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Site Screening Criteria	Unit	DIOMW18S (02/20/2013)	DIOMW18S (11/18/2013)	GW-DUP (DIO-18S) (11/18/2013)	DIOMW24S (02/20/2013)	DIOMW29S * (02/20/2013)	DIOMW29S (11/20/2013)	DIOMW33S (02/21/2013)	DIOMW33S (11/20/2013)	DIOMW40S * (11/18/2013)
VOCs (SW8260C)														
1,1,1,2-tetrachloroethane	NS	1	1	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	1	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
1,1,2,2-tetrachloroethane	NS	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U	NA	< 0.5 U	< 0.5 U
1,1,2-Trichloro-1,2,2-triflu	NS	NS	NS	NS	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
1,1,2-trichloroethane	5	2	3	2	ug/l	NA	< 1.5 U	< 1.5 U	NA	NA	< 1.5 U	NA	< 1.5 U	< 1.5 U
1,1-dichloroethane	NS	1	50	1	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
1,1-dichloroethene	7	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U	NA	< 0.5 U	< 0.5 U
1,1-dichloropropene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
1,2,3-trichloropropane	NS	0.03	0.03	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	1	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloroprop	0.2	0.02	0.02	0.02	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
1,2-dibromoethane	0.05	0.03	0.03	0.03	ug/l	NA	< 2 U	< 2 U	NA	NA	< 2 U	NA	< 2 U	< 2 U
1,2-dichlorobenzene	600	5	600	5	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
1,2-dichloroethane	5	2	2	2	ug/l	NA	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U	NA	< 0.5 U	< 0.5 U
1,2-dichloroethene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloropropane	5	1	1	1	ug/l	NA	< 1 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	< 1 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	5	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
1,3-dichloropropane	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	5	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
1,4-dioxane	NS	NS	NS	NS	ug/l	NA	< 250 U	< 250 U	NA	NA	< 250 U	NA	< 250 U	< 250 U
2,2-dichloropropane	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	300	2	ug/l	NA	< 5 U	< 5 U	NA	NA	< 5 U	NA	< 5 U	< 5 U
2-chlorotoluene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	ug/l	NA	< 5 U	< 5 U	NA	NA	< 5 U	NA	< 5 U	< 5 U
4-chlorotoluene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	NS	ug/l	NA	< 5 U	< 5 U	NA	NA	< 5 U	NA	< 5 U	< 5 U
Acetone	NS	10	6000	10	ug/l	NA	< 5 U	< 5 U	NA	NA	< 5 U	NA	< 5 U	< 5 U
Benzene	5	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U	NA	< 0.5 U	< 0.5 U
Bromobenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
Bromodichloromethane	80	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U	NA	< 0.5 U	< 0.5 U
Bromoform	80	0.8	4	0.8	ug/l	NA	< 2 U	< 2 U	NA	NA	< 2 U	NA	< 2 U	< 2 U
Bromomethane	NS	1	10	1	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
Butyl alcohol, tert-	NS	2	100	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	700	1	ug/l	NA	< 5 U	< 5 U	NA	NA	< 5 U	NA	< 5 U	< 5 U
Carbon tetrachloride	5	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U	NA	< 0.5 U	< 0.5 U
Chlorobenzene	100	1	50	1	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
Chloroethane	NS	NS	NS	NS	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
Chloroform	80	1	70	1	ug/l	0.46 J	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
Chloromethane	NS	NS	NS	NS	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U

Area SS005B
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2013 and November 2013

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Site Screening Criteria	Unit	DIOMW18S (02/20/2013)	DIOMW18S (11/18/2013)	GW-DUP (DIO-18S) (11/18/2013)	DIOMW24S (02/20/2013)	DIOMW29S * (02/20/2013)	DIOMW29S (11/20/2013)	DIOMW33S (02/21/2013)	DIOMW33S (11/20/2013)	DIOMW40S * (11/18/2013)
cis-1,2-dichloroethene	70	1	70	1	ug/l	NA	< 2.5 U	< 2.5 U	NA	0.3 J	< 2.5 U	NA	< 2.5 U	< 2.5 U
cis-1,3-dichloropropene	NS	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U	NA	< 0.5 U	< 0.5 U
Cyclohexane	NS	NS	NS	NS	ug/l	NA	< 10 U	< 10 U	NA	NA	< 10 U	NA	< 10 U	< 10 U
Dibromochloromethane	80	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U	NA	< 0.5 U	< 0.5 U
Dibromomethane	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	2	ug/l	NA	< 5 U	< 5 U	NA	NA	< 5 U	NA	< 5 U	< 5 U
Dichloropropene	NS	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U	NA	< 0.5 U	< 0.5 U
Ethylbenzene	700	2	700	2	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
Hexachloro-1,3-butadiene	NS	1	1	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	1	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
m,p-Xylene	10000	NS	NS	NS	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
Methyl acetate	NS	0.5	7000	0.5	ug/l	NA	< 2 U	< 2 U	NA	NA	< 2 U	NA	< 2 U	< 2 U
Methyl tert-butyl ether	NS	1	70	1	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
Methylcyclohexane	NS	NS	NS	NS	ug/l	NA	< 10 U	< 10 U	NA	NA	< 10 U	NA	< 10 U	< 10 U
Methylene Chloride	5	1	3	1	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
Naphthalene	NS	2	300	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
Sec-butylbenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	2	100	2	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
Tert-butylbenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	1	ug/l	**2.4**	**3.6**	**3.4**	0.85 J	0.76	**1.6**	**2.6**	**1.9**	< 0.5 U
Toluene	1000	1	600	1	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
trans-1,2-dichloroethene	100	1	100	1	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
trans-1,3-dichloropropene	NS	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U	NA	< 0.5 U	< 0.5 U
Trichloroethene	5	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	NA	0.23 J	0.48 J	0.41 J	0.23 J	< 0.5 U
Trichlorofluoromethane	NS	1	2000	1	ug/l	**1.2**	0.86 J	0.88 J	0.25 J	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U
Vinyl chloride	2	1	1	1	ug/l	NA	< 1 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	< 1 U
Xylenes, Total	10000	2	1000	2	ug/l	NA	< 2.5 U	< 2.5 U	NA	NA	< 2.5 U	NA	< 2.5 U	< 2.5 U

Notes:
* Sentinel Well. Data from these wells are screened against the PQLs.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
ug/L = Micrograms per Liter
NA = Not Analyzed or Data Not Provided
NS = No Screening Criteria
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS005B
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
May 2014 and December 2014

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Site Screening Criteria	Unit	DIOMW18S (05/20/2014)	SA005BDIOMW18S (12/16/2014)	DIOMW29S * (05/20/2014)	DIOMW29S DUP * (05/20/2014)	SA005BDIOMW29S * (12/16/2014)	DIOMW33S (05/20/2014)	SA005BDIOMW33 S (12/16/2014)	DIOMW40S * (05/20/2014)	SA005BDIOMW40S * (12/16/2014)
VOCs (SW8260C)														
1,1,1,2-tetrachloroethane	NS	1	1	1	ug/l	NA	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,1,1-trichloroethane	200	1	30	1	ug/l	< 2.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,1,2,2-tetrachloroethane	NS	1	1	1	ug/l	< 0.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	ug/l	< 2.5 U	< 10 U	< 2.5 U	< 2.5 U	< 10 U	< 2.5 U	< 10 U	< 2.5 U	< 10 U
1,1,2-trichloroethane	5	2	3	2	ug/l	< 1.5 U	< 1 U	< 1.5 U	< 1.5 U	< 1 U	< 1.5 U	< 1 U	< 1.5 U	< 1 U
1,1-dichloroethane	NS	1	50	1	ug/l	< 2.5 U	< 1 U	< 2.5 U	< 2.5 U	< 1 U	< 2.5 U	< 1 U	< 2.5 U	< 1 U
1,1-dichloroethene	7	1	1	1	ug/l	< 0.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,1-dichloropropene	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	ug/l	< 2.5 U	< 5 U	< 2.5 U	< 2.5 U	< 5 U	< 2.5 U	< 5 U	< 2.5 U	< 5 U
1,2,3-trichloropropane	NS	0.03	0.03	0.03	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
1,2,4-trichlorobenzene	70	1	9	1	ug/l	< 2.5 U	< 5 U	< 2.5 U	< 2.5 U	< 5 U	< 2.5 U	< 5 U	< 2.5 U	< 5 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	0.02	ug/l	< 2.5 U	< 5 U	< 2.5 U	< 2.5 U	< 5 U	< 2.5 U	< 5 U	< 2.5 U	< 5 U
1,2-dibromoethane	0.05	0.03	0.03	0.03	ug/l	< 2 U	< 1 U	< 2 U	< 2 U	< 1 U	< 2 U	< 1 U	< 2 U	< 1 U
1,2-dichlorobenzene	600	5	600	5	ug/l	< 2.5 U	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
1,2-dichloroethane	5	2	2	2	ug/l	< 0.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,2-dichloroethene	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloropropane	5	1	1	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
1,3-dichlorobenzene	600	5	600	5	ug/l	< 2.5 U	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
1,3-dichloropropane	NS	NS	NS	NS	ug/l	NA	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,4-dichlorobenzene	75	5	75	5	ug/l	< 2.5 U	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
1,4-dioxane	NS	NS	NS	NS	ug/l	< 250 U	< 250 U	< 250 U	< 250 U	< 250 U	< 250 U	< 250 U	< 250 U	< 250 U
2,2-dichloropropane	NS	NS	NS	NS	ug/l	NA	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
2-butanone	NS	2	300	2	ug/l	< 5 U	< 10 U	< 5 U	< 5 U	< 10 U	< 5 U	< 10 U	< 5 U	< 10 U
2-chlorotoluene	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
2-hexanone	NS	NS	NS	NS	ug/l	< 5 U	< 10 U	< 5 U	< 5 U	< 10 U	< 5 U	< 10 U	< 5 U	< 10 U
4-chlorotoluene	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
4-Isopropyltoluene	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
4-methyl-2-pentanone	NS	NS	NS	NS	ug/l	< 5 U	< 10 U	< 5 U	< 5 U	< 10 U	< 5 U	< 10 U	< 5 U	< 10 U
Acetone	NS	10	6000	10	ug/l	< 5 U	< 20 U	< 5 U	< 5 U	< 20 U	< 5 U	< 20 U	< 5 U	< 20 U
Benzene	5	1	1	1	ug/l	< 0.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Bromobenzene	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
Bromochloromethane	NS	NS	NS	NS	ug/l	< 2.5 U	< 5 U	< 2.5 U	< 2.5 U	< 5 U	< 2.5 U	< 5 U	< 2.5 U	< 5 U
Bromodichloromethane	80	1	1	1	ug/l	< 0.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Bromoform	80	0.8	4	0.8	ug/l	< 2 U	< 4 U	NA	NA	< 4 U	NA	< 4 U	NA	< 4 U
Bromomethane	NS	1	10	1	ug/l	< 2.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Butyl alcohol, tert-	NS	2	100	2	ug/l	NA	< 20 U	NA	NA	< 20 U	NA	< 20 U	NA	< 20 U
Carbon disulfide	NS	1	700	1	ug/l	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U	< 5 U
Carbon tetrachloride	5	1	1	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U
Chlorobenzene	100	1	50	1	ug/l	< 2.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Chloroethane	NS	NS	NS	NS	ug/l	< 2.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Chloroform	80	1	70	1	ug/l	< 2.5 U	< 1 U	< 2.5 U	< 2.5 U	< 1 U	< 2.5 U	**5**	< 2.5 U	< 1 U

Area SS005B
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
May 2014 and December 2014

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Site Screening Criteria	Unit	DIOMW18S (05/20/2014)	SA005BDIOMW18S (12/16/2014)	DIOMW29S * (05/20/2014)	DIOMW29S DUP * (05/20/2014)	SA005BDIOMW29S * (12/16/2014)	DIOMW33S (05/20/2014)	SA005BDIOMW33S (12/16/2014)	DIOMW40S * (05/20/2014)	SA005BDIOMW40S * (12/16/2014)
Chloromethane	NS	NS	NS	NS	ug/l	< 2.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
cis-1,2-dichloroethene	70	1	70	1	ug/l	< 2.5 U	< 1 U	< 2.5 U	< 2.5 U	< 1 U	< 2.5 U	< 1 U	< 2.5 U	< 1 U
cis-1,3-dichloropropene	NS	1	1	1	ug/l	< 0.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Cyclohexane	NS	NS	NS	NS	ug/l	< 10 U	< 5 U	< 10 U	< 10 U	< 5 U	< 10 U	< 5 U	< 10 U	< 5 U
Dibromochloromethane	80	1	1	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U	< 0.5 U	< 1 U
Dibromomethane	NS	NS	NS	NS	ug/l	NA	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Dichlorodifluoromethane	NS	2	1000	2	ug/l	< 5 U	< 1 U	< 5 U	< 5 U	< 1 U	< 5 U	< 1 U	< 5 U	< 1 U
Dichloropropene	NS	1	1	1	ug/l	< 0.5 U	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	2	ug/l	< 2.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Hexachloro-1,3-butadiene	NS	1	1	1	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
Isopropylbenzene	NS	1	700	1	ug/l	< 2.5 U	< 5 U	< 2.5 U	< 2.5 U	< 5 U	< 2.5 U	< 5 U	< 2.5 U	< 5 U
m,p-Xylene	10000	NS	NS	NS	ug/l	< 2.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Methyl acetate	NS	0.5	7000	0.5	ug/l	< 2 U	< 5 U	< 2 U	< 2 U	< 5 U	< 2 U	< 5 U	< 2 U	< 5 U
Methyl tert-butyl ether	NS	1	70	1	ug/l	< 2.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Methylcyclohexane	NS	NS	NS	NS	ug/l	< 10 U	< 5 U	< 10 U	< 10 U	< 5 U	< 10 U	< 5 U	< 10 U	< 5 U
Methylene Chloride	5	1	3	1	ug/l	< 2.5 U	< 4 U	< 2.5 U	< 2.5 U	< 4 U	< 2.5 U	< 4 U	< 2.5 U	< 4 U
Naphthalene	NS	2	300	2	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
n-Butylbenzene	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
N-propylbenzene	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
o-Xylene	10000	NS	NS	NS	ug/l	< 2.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Sec-butylbenzene	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
Styrene	100	2	100	2	ug/l	< 2.5 U	< 5 U	< 2.5 U	< 2.5 U	< 5 U	< 2.5 U	< 5 U	< 2.5 U	< 5 U
Tert-butylbenzene	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	NA	< 5 U	NA	< 5 U	NA	< 5 U
Tetrachloroethene	5	1	1	1	ug/l	**1.3**	1	0.82	0.77	0.8 J	< 0.5 U	**3**	< 0.5 U	< 1 U
Toluene	1000	1	600	1	ug/l	< 2.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
trans-1,2-dichloroethene	100	1	100	1	ug/l	< 2.5 U	< 1 U	< 2.5 U	< 2.5 U	< 1 U	< 2.5 U	< 1 U	< 2.5 U	< 1 U
trans-1,3-dichloropropene	NS	1	1	1	ug/l	< 0.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Trichloroethene	5	1	1	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	< 0.5 U	< 1 U	0.58	< 1 U	< 0.5 U	< 1 U
Trichlorofluoromethane	NS	1	2000	1	ug/l	0.86 J	0.6 J	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Vinyl chloride	2	1	1	1	ug/l	< 1 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U
Xylenes, Total	10000	2	1000	2	ug/l	< 2.5 U	< 1 U	NA	NA	< 1 U	NA	< 1 U	NA	< 1 U

Notes:
* Sentinel Well. Data from these wells are screened against the PQLs.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
ug/L = Micrograms per Liter
NA = Not Analyzed or Data Not Provided
NS = No Screening Criteria
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS005B
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2015 and October 2015

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Site Screening Criteria	Unit	DIOMW18S (04/30/2015)	DIOMW18S (10/29/2015)	DIOMW29S * (04/30/2015)	DIOMW29S * (10/29/2015)	DIOMW29S-FD * (10/29/2015)	DIOMW33S (04/30/2015)	DIOMW33S (10/29/2015)	DIOMW40S * (04/30/2015)
VOCs (SW8260C)													
1,1,1,2-tetrachloroethane	NS	1	1	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,1,1-trichloroethane	200	1	30	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,1,2,2-tetrachloroethane	NS	1	1	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	ug/l	< 4 U	NA	< 4 U	NA	NA	< 4 U	NA	< 4 U
1,1,2-trichloroethane	5	2	3	2	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,1-dichloroethane	NS	1	50	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,1-dichloroethene	7	1	1	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,1-dichloropropene	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
1,2,3-trichloropropane	NS	0.03	0.03	0.03	ug/l	< 2 U	< 3 U	< 2 U	< 3 U	< 3 U	< 2 U	< 3 U	< 2 U
1,2,4-trichlorobenzene	70	1	9	1	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	0.02	ug/l	< 4 U	< 5 U	< 4 U	< 5 U	< 5 U	< 4 U	< 5 U	< 4 U
1,2-dibromoethane	0.05	0.03	0.03	0.03	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,2-dichlorobenzene	600	5	600	5	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
1,2-dichloroethane	5	2	2	2	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,2-dichloroethene	NS	NS	NS	NS	ug/l	NA	< 1 U	NA	< 1 U	< 1 U	NA	< 1 U	NA
1,2-dichloropropane	5	1	1	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
1,3-dichlorobenzene	600	5	600	5	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
1,3-dichloropropane	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
1,4-dichlorobenzene	75	5	75	5	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
1,4-dioxane	NS	NS	NS	NS	ug/l	< 200 U	NA	< 200 U	NA	NA	< 200 U	NA	< 200 U
2,2-dichloropropane	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
2-butanone	NS	2	300	2	ug/l	< 8 U	< 6 U	< 8 U	< 6 U	< 6 U	< 8 U	< 6 U	< 8 U
2-chlorotoluene	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
2-hexanone	NS	NS	NS	NS	ug/l	< 8 U	< 5 U	< 8 U	< 5 U	< 5 U	< 8 U	< 5 U	< 8 U
4-chlorotoluene	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
4-Isopropyltoluene	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
4-methyl-2-pentanone	NS	NS	NS	NS	ug/l	< 8 U	< 5 U	< 8 U	< 5 U	< 5 U	< 8 U	< 5 U	< 8 U
Acetone	NS	10	6000	10	ug/l	< 20 U	< 10 U	< 20 U	< 10 U	< 10 U	< 20 U	< 10 U	< 20 U
Benzene	5	1	1	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Bromobenzene	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
Bromochloromethane	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
Bromodichloromethane	80	1	1	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Bromoform	80	0.8	4	0.8	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Bromomethane	NS	1	10	1	ug/l	< 1 U	< 2 U	< 1 U	< 2 U	< 2 U	< 1 U	< 2 U	< 1 U
Butyl alcohol, tert-	NS	2	100	2	ug/l	< 20 U	NA	< 20 U	NA	NA	< 20 U	NA	< 20 U
Carbon disulfide	NS	1	700	1	ug/l	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U	< 2 U
Carbon tetrachloride	5	1	1	1	ug/l	< 1 U	< 2 U	< 1 U	< 2 U	< 2 U	< 1 U	< 2 U	< 1 U
Chlorobenzene	100	1	50	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Chloroethane	NS	NS	NS	NS	ug/l	< 1 U	< 2 U	< 1 U	< 2 U	< 2 U	< 1 U	< 2 U	< 1 U

Area SS005B
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2015 and October 2015

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Site Screening Criteria	Unit	DIOMW18S (04/30/2015)	DIOMW18S (10/29/2015)	DIOMW29S * (04/30/2015)	DIOMW29S * (10/29/2015)	DIOMW29S-FD * (10/29/2015)	DIOMW33S (04/30/2015)	DIOMW33S (10/29/2015)	DIOMW40S * (04/30/2015)
Chloroform	80	1	70	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	**2**	0.53 J	< 1 U
Chloromethane	NS	NS	NS	NS	ug/l	< 1 U	< 2 U	< 1 U	< 2 U	< 2 U	< 1 U	< 2 U	< 1 U
cis-1,2-dichloroethene	70	1	70	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
cis-1,3-dichloropropene	NS	1	1	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Cyclohexane	NS	NS	NS	NS	ug/l	< 4 U	NA	< 4 U	NA	NA	< 4 U	NA	< 4 U
Dibromochloromethane	80	1	1	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Dibromomethane	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Dichlorodifluoromethane	NS	2	1000	2	ug/l	< 1 U	< 2 U	< 1 U	< 2 U	< 2 U	< 1 U	< 2 U	< 1 U
Dichloropropene	NS	1	1	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	2	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Hexachloro-1,3-butadiene	NS	1	1	1	ug/l	< 4 U	< 1 U	< 4 U	< 1 U	< 1 U	< 4 U	< 1 U	< 4 U
Isopropylbenzene	NS	1	700	1	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
m,p-Xylene	10000	NS	NS	NS	ug/l	< 1 U	< 2 U	< 1 U	< 2 U	< 2 U	< 1 U	< 2 U	< 1 U
Methyl acetate	NS	0.5	7000	0.5	ug/l	< 2 U	NA	< 2 U	NA	NA	< 2 U	NA	< 2 U
Methyl tert-butyl ether	NS	1	70	1	ug/l	< 1 U	< 5 U	< 1 U	< 5 U	< 5 U	< 1 U	< 5 U	< 1 U
Methylcyclohexane	NS	NS	NS	NS	ug/l	< 2 U	NA	< 2 U	NA	NA	< 2 U	NA	< 2 U
Methylene Chloride	5	1	3	1	ug/l	< 4 U	< 5 U	< 4 U	< 5 U	< 5 U	< 4 U	< 5 U	< 4 U
Naphthalene	NS	2	300	2	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
n-Butylbenzene	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
N-propylbenzene	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
o-Xylene	10000	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Sec-butylbenzene	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
Styrene	100	2	100	2	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
Tert-butylbenzene	NS	NS	NS	NS	ug/l	< 2 U	< 1 U	< 2 U	< 1 U	< 1 U	< 2 U	< 1 U	< 2 U
Tetrachloroethene	5	1	1	1	ug/l	**3**	**1.3**	0.7 J	0.62 J	0.78 J	**4**	**3.7**	< 1 U
Toluene	1000	1	600	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
trans-1,2-dichloroethene	100	1	100	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
trans-1,3-dichloropropene	NS	1	1	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U
Trichloroethene	5	1	1	1	ug/l	< 1 U	< 1 U	< 1 U	< 1 U	< 1 U	0.6 J	0.44 J	< 1 U
Trichlorofluoromethane	NS	1	2000	1	ug/l	0.6 J	< 2 U	< 1 U	< 2 U	< 2 U	< 1 U	< 2 U	< 1 U
Vinyl chloride	2	1	1	1	ug/l	< 1 U	< 1.5 U	< 1 U	< 1.5 U	< 1.5 U	< 1 U	< 1.5 U	< 1 U
Xylenes, Total	10000	2	1000	2	ug/l	< 1 U	NA	< 1 U	NA	NA	< 1 U	NA	< 1 U

Notes:
* Sentinel Well. Data from these wells are screened against the PQLs.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
ug/L = Micrograms per Liter
NA = Not Analyzed
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Area SS005B
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2016 and September 2016

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Site Screening Criteria	Unit	DIOMW18S (04/13/2016)	DIOMW18S (09/20/2016)	DIOMW29S * (04/13/2016)	DIOMW29S-FD * (04/13/2016)	DIOMW29S * (09/20/2016)	DIOMW29S-FD * (09/20/2016)	DIOMW33S (04/14/2016)	DIOMW33S (09/20/2016)	DIOMW40S * (04/13/2016)	DIOMW40S * (09/20/2016)
VOCs (SW8260C)															
1,1,1,2-tetrachloroethane	NS	1	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,1-trichloroethane	200	1	30	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,1,2,2-tetrachloroethane	NS	1	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethane	NS	1	50	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethene	7	1	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloropropene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,3-trichloropropane	NS	0.03	0.03	0.03	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trichlorobenzene	70	1	9	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	0.02	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
1,2-dibromoethane	0.05	0.03	0.03	0.03	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichlorobenzene	600	5	600	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethane	5	2	2	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethene	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
1,2-dichloropropane	5	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichlorobenzene	600	5	600	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichloropropane	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,4-dichlorobenzene	75	5	75	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,4-dioxane	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-butanone	NS	2	300	2	ug/l	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
2-chlorotoluene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-hexanone	NS	NS	NS	NS	ug/l	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
4-chlorotoluene	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
4-Isopropyltoluene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
4-methyl-2-pentanone	NS	NS	NS	NS	ug/l	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Acetone	NS	10	6000	10	ug/l	10	< 6.4 UB	< 6.4 U	< 6.4 U	< 6.4 UB	< 6.4 UB	< 6.4 UB	< 6.4 UB	6.5 J	< 6.4 UB
Benzene	5	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromobenzene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromochloromethane	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Bromodichloromethane	80	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromoform	80	0.8	4	0.8	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromomethane	NS	1	10	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Butyl alcohol, tert-	NS	2	100	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	700	1	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Carbon tetrachloride	5	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chlorobenzene	100	1	50	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloroethane	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Chloroform	80	1	70	1	ug/l	< 0.4 U	< 0.4 U	0.56 J	0.63 J	**1.2**	**2.2**	**2.3**	0.89 J	< 0.4 U	< 0.4 U

Area SS005B
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
April 2016 and September 2016

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Site Screening Criteria	Unit	DIOMW18S (04/13/2016)	DIOMW18S (09/20/2016)	DIOMW29S * (04/13/2016)	DIOMW29S-FD * (04/13/2016)	DIOMW29S * (09/20/2016)	DIOMW29S-FD * (09/20/2016)	DIOMW33S (04/14/2016)	DIOMW33S (09/20/2016)	DIOMW40S * (04/13/2016)	DIOMW40S * (09/20/2016)
Chloromethane	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
cis-1,2-dichloroethene	70	1	70	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
cis-1,3-dichloropropene	NS	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Cyclohexane	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromomethane	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dichlorodifluoromethane	NS	2	1000	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Dichloropropene	NS	1	1	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Hexachloro-1,3-butadiene	NS	1	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Isopropylbenzene	NS	1	700	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
m,p-Xylene	10000	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methyl acetate	NS	0.5	7000	0.5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methylcyclohexane	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	1	3	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Naphthalene	NS	2	300	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	0.45 J	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
n-Butylbenzene	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
N-propylbenzene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
o-Xylene	10000	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Sec-butylbenzene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Styrene	100	2	100	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tert-butylbenzene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tetrachloroethene	5	1	1	1	ug/l	< 0.4 U	**3.6**	0.86 J	0.92 J	0.96 J	1	**2.6**	0.89 J	< 0.4 U	< 0.4 U
Toluene	1000	1	600	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
trans-1,2-dichloroethene	100	1	100	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
trans-1,3-dichloropropene	NS	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Trichloroethene	5	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	0.32 J	< 0.4 U	< 0.4 U	< 0.4 U
Trichlorofluoromethane	NS	1	2000	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Vinyl chloride	2	1	1	1	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Xylenes, Total	10000	2	1000	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U

Notes:
* Sentinel Well. Data from these wells are screened against the PQLs.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
B = Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
ug/L = Micrograms per Liter
NA = Not Analyzed
NS = No Screening Criteria
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS005B
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
March 2017

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Site Screening Criteria	Unit	DIO-18S (03/30/2017)	DIO-29S * (03/30/2017)	DIO-29S-FD * (03/30/2017)	DIO-33S (03/30/2017)	DIO-40S * (03/30/2017)
VOCs (SW8260C)										
1,1,1,2-tetrachloroethane	NS	1	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,1-trichloroethane	200	1	30	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,1,2,2-tetrachloroethane	NS	1	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethane	NS	1	50	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethene	7	1	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloropropene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,3-trichloropropane	NS	0.03	0.03	0.03	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trichlorobenzene	70	1	9	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	0.02	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
1,2-dibromoethane	0.05	0.03	0.03	0.03	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichlorobenzene	600	5	600	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethane	5	2	2	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethene	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
1,2-dichloropropane	5	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichlorobenzene	600	5	600	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichloropropane	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,4-dichlorobenzene	75	5	75	5	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,4-dioxane	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-butanone	NS	2	300	2	ug/l	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
2-chlorotoluene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-hexanone	NS	NS	NS	NS	ug/l	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
4-chlorotoluene	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
4-Isopropyltoluene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
4-methyl-2-pentanone	NS	NS	NS	NS	ug/l	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Acetone	NS	10	6000	10	ug/l	< 10 U	< 6.4 U	< 6.4 U	< 6.4 U	< 6.4 U
Benzene	5	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromobenzene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromochloromethane	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Bromodichloromethane	80	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromoform	80	0.8	4	0.8	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromomethane	NS	1	10	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Butyl alcohol, tert-	NS	2	100	2	ug/l	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	700	1	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Carbon tetrachloride	5	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chlorobenzene	100	1	50	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloroethane	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U

Area SS005B
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
March 2017

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Site Screening Criteria	Unit	DIO-18S (03/30/2017)	DIO-29S * (03/30/2017)	DIO-29S-FD * (03/30/2017)	DIO-33S (03/30/2017)	DIO-40S * (03/30/2017)
Chloroform	80	1	70	1	ug/l	< 0.4 U	0.85 J	0.84 J	0.26 J	< 0.4 U
Chloromethane	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
cis-1,2-dichloroethene	70	1	70	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
cis-1,3-dichloropropene	NS	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Cyclohexane	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromomethane	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dichlorodifluoromethane	NS	2	1000	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Dichloropropene	NS	1	1	1	ug/l	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Hexachloro-1,3-butadiene	NS	1	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Isopropylbenzene	NS	1	700	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
m,p-Xylene	10000	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methyl acetate	NS	0.5	7000	0.5	ug/l	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methylcyclohexane	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA
Methylene Chloride	5	1	3	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Naphthalene	NS	2	300	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
n-Butylbenzene	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
N-propylbenzene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
o-Xylene	10000	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Sec-butylbenzene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Styrene	100	2	100	2	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tert-butylbenzene	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tetrachloroethene	5	1	1	1	ug/l	0.99 J	0.54 J	0.5 J	**1.3**	< 0.4 U
Toluene	1000	1	600	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
trans-1,2-dichloroethene	100	1	100	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
trans-1,3-dichloropropene	NS	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Trichloroethene	5	1	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.4 U	0.26 J	< 0.4 U
Trichlorofluoromethane	NS	1	2000	1	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Vinyl chloride	2	1	1	1	ug/l	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Xylenes, Total	10000	2	1000	2	ug/l	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U

Notes:
* Sentinel Well. Data from these wells are screened against the PQLs.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
ug/L = Micrograms per Liter
NA = Not Analyzed
NS = No Screening Criteria
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2013 through December 2013

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	BMW-10 (02/25/2013)	BMW-10 (04/22/2013)	BMW-10 (12/10/2013)	KW-4 (02/25/2013)	KW-4 (04/22/2013)	KW-5 (02/25/2013)	KW-5 (04/22/2013)	KW-6 (02/25/2013)	KW-6 (04/22/2013)	MAG-102B (12/13/2013)	MAG-104B * (12/13/2013)	MAG-107A (02/25/2013)	MAG-107A (04/22/2013)	MAG-107A (12/11/2013)	MAG-111P (02/25/2013)
Field Measurement Parameters																					
Dissolved Oxygen	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oxidation reduction potential	NS	NS	NS	NS	NS	mV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	8.5	NS	8.5	NS	NS	pH units	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific conductivity	NS	NS	NS	NS	NS	µS/cm	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature	NS	NS	NS	NS	NS	deg C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	NS	NS	NS	NS	NS	ntu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Dioxide (S49)																					
Carbon dioxide	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate (E306)																					
Sulfate	250	5	250	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate (E300)																					
Nitrate	10	0.1	10	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity (SM2320)																					
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (SM5310C)																					
Total Organic Carbon	NS	NS	NS	NS	NS	mg/l	NA	NA	126	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	41.1	NA
Ethane, Ethene, Methane (RSK-175)																					
Ethane	NS	NS	NS	NS	NS	ug/l	NA	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.13	NA
Ethene	NS	NS	NS	NS	NS	ug/l	NA	NA	0.688 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75.9	NA
Methane	NS	NS	NS	NS	NS	ug/l	NA	NA	785	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4140	NA
Acids																					
Acetic acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Formic acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propionic acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (SW6010C)																					
Iron	NS	20	300	NS	Background ratio	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (SW8260C)																					
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethane	NS	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethene	7	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloropropene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethane	5	2	2	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethene	NS	NS	NS	2	2	ug/l	**150**	**160**	**232**	**27**	**24**	**72**	**100**	**160**	**160**	**2.75**	ND	**95**	**310 E**	**35.8**	**24**
1,2-dichloropropane	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NS	10	6000	NS	10	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2013 through December 2013

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	BMW-10 (02/25/2013)	BMW-10 (04/22/2013)	BMW-10 (12/10/2013)	KW-4 (02/25/2013)	KW-4 (04/22/2013)	KW-5 (02/25/2013)	KW-5 (04/22/2013)	KW-6 (02/25/2013)	KW-6 (04/22/2013)	MAG-102B (12/13/2013)	MAG-104B * (12/13/2013)	MAG-107A (02/25/2013)	MAG-107A (04/22/2013)	MAG-107A (12/11/2013)	MAG-111P (02/25/2013)
Bromobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	0.8	4	NS	0.8	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NS	1	10	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	80	1	70	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	70	1	70	2	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloro-1,3-butadiene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	1	ug/l	NA	NA	0.818 J	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	ND	NA
Methylene Chloride	5	1	3	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sec-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	2	100	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tert-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1000	1	600	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Carbon	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	NS	NS	NS	NS	NS	ug/l	194.78	211.84	NA	57	49	312	340	240	224	NA	NA	123.48	370.85	NA	514
trans-1,2-dichloroethene	100	1	100	NS	1	ug/l	NA	NA	**2.89**	NA	NA	NA	NA	NA	NA	0.662 J	ND	NA	NA	**4.06**	NA
trans-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5	1	1	1	1	ug/l	**44**	**51**	**31.6**	**30**	**25**	**240**	**240**	**80**	**64**	ND	ND	0.48 J	0.85 J	0.728 J	**490**
Trichlorofluoromethane	NS	1	2000	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2	1	1	2	2	ug/l	0.78 J	0.84 J	1.38 J	NA	NA	NA	NA	NA	NA	ND	ND	**28**	**60**	**10.8**	NA
Xylenes, Total	10000	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
* Sentinel Well.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
deg C = Degrees Celsius
mg/L = Milligrams per Liter
mV = Millivolts
ntu = Nephelometric turbidity units
µg/l = Micrograms per Liter
µS/cm = microSiemens per centimeter
NA = Not Analyzed or Data Not Available
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2013 through December 2013

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	MAG-111P (04/22/2013)	MAG-111P (12/10/2013)	MAG-112P (02/25/2013)	MAG-112P (04/22/2013)	MAG-112P (12/11/2013)	MAG-113P (02/25/2013)	MAG-113P (04/22/2013)	MAG-113P (12/11/2013)	MAG-204 (02/25/2013)	MAG-204 (04/22/2013)	MAG-204 (12/12/2013)	MAG-205 (12/12/2013)	MAG-206 (12/13/2013)	MAG-207 * (12/13/2013)	MAG-208 (12/13/2013)
Field Measurement Parameters																					
Dissolved Oxygen	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oxidation reduction potential	NS	NS	NS	NS	NS	mV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	8.5	NS	8.5	NS	NS	pH units	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific conductivity	NS	NS	NS	NS	NS	µS/cm	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature	NS	NS	NS	NS	NS	deg C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	NS	NS	NS	NS	NS	ntu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Dioxide (S49)																					
Carbon dioxide	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate (E306)																					
Sulfate	250	5	250	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate (E300)																					
Nitrate	10	0.1	10	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity (SM2320)																					
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (SM5310C)																					
Total Organic Carbon	NS	NS	NS	NS	NS	mg/l	NA	0.66 J	NA	NA	63.5	NA	NA	395	NA	NA	1	NA	NA	NA	NA
Ethane, Ethene, Methane (RSK-175)																					
Ethane	NS	NS	NS	NS	NS	ug/l	NA	ND	NA	NA	0.192 J	NA	NA	0.436 J	NA	NA	ND	NA	NA	NA	NA
Ethene	NS	NS	NS	NS	NS	ug/l	NA	ND	NA	NA	0.257 J	NA	NA	91.1	NA	NA	ND	NA	NA	NA	NA
Methane	NS	NS	NS	NS	NS	ug/l	NA	371	NA	NA	245	NA	NA	1770	NA	NA	18	NA	NA	NA	NA
Acids																					
Acetic acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Formic acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propionic acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (SW6010C)																					
Iron	NS	20	300	NS	Background ratio	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (SW8260C)																					
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethane	NS	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethene	7	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloropropene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethane	5	2	2	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethene	NS	NS	NS	2	2	ug/l	**36**	**170**	**59**	**88**	**243**	**250**	**180**	**461**	**49**	**56**	**33.1**	ND	ND	**2.9**	ND
1,2-dichloropropane	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NS	10	6000	NS	10	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2013 through December 2013

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	MAG-111P (04/22/2013)	MAG-111P (12/10/2013)	MAG-112P (02/25/2013)	MAG-112P (04/22/2013)	MAG-112P (12/11/2013)	MAG-113P (02/25/2013)	MAG-113P (04/22/2013)	MAG-113P (12/11/2013)	MAG-204 (02/25/2013)	MAG-204 (04/22/2013)	MAG-204 (12/12/2013)	MAG-205 (12/12/2013)	MAG-206 (12/13/2013)	MAG-207 * (12/13/2013)	MAG-208 (12/13/2013)
Bromobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	0.8	4	NS	0.8	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NS	1	10	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	80	1	70	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	70	1	70	2	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloro-1,3-butadiene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	1	ug/l	NA	ND	NA	NA	**2.26 J**	NA	NA	ND	NA	NA	ND	ND	ND	ND	ND
Methylene Chloride	5	1	3	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sec-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	2	100	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tert-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1000	1	600	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Carbon	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	NS	NS	NS	NS	NS	ug/l	416	NA	290.3	378.76	NA	316	221.3	NA	209	206	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	1	ug/l	NA	**2.31**	NA	NA	**3.99 J**	NA	NA	**5.04**	NA	NA	0.498 J	ND	ND	0.716 J	ND
trans-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5	1	1	1	1	ug/l	**380**	**232**	**230**	**290**	**759**	**50**	**32**	**81.6**	**160**	**150**	**103**	ND	ND	ND	ND
Trichlorofluoromethane	NS	1	2000	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2	1	1	2	2	ug/l	NA	ND	1.3 J	0.76 J	1.02 J	**16**	**9.3**	**31.2**	NA	NA	ND	ND	ND	ND	ND
Xylenes, Total	10000	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
* Sentinel Well.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
deg C = Degrees Celsius
mg/L = Milligrams per Liter
mV = Millivolts
ntu = Nephelometric turbidity units
µg/l = Micrograms per Liter
µS/cm = microSiemens per centimeter
NA = Not Analyzed or Data Not Available
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	MAG-4 (02/25/2013)	MAG-4 (04/22/2013)	MAG-4 (12/10/2013)	MAG-65 (12/16/2013)	MAG-66 (02/25/2013)	MAG-66 (04/22/2013)	MAG-66 (12/11/2013)	MAG-70 (02/25/2013)	MAG-70 (04/22/2013)	MAG-70 (12/11/2013)	MAG-IF4 (12/16/2013)	MAG-KW3 * (12/16/2013)	MAG-KW4 (12/10/2013)	MAG-KW5 (12/10/2013)	MAG-KW6 (12/10/2013)
Field Measurement Parameters																					
Dissolved Oxygen	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oxidation reduction potential	NS	NS	NS	NS	NS	mV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	8.5	NS	8.5	NS	NS	pH units	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific conductivity	NS	NS	NS	NS	NS	µS/cm	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature	NS	NS	NS	NS	NS	deg C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	NS	NS	NS	NS	NS	ntu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Dioxide (S49)																					
Carbon dioxide	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate (E306)																					
Sulfate	250	5	250	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate (E300)																					
Nitrate	10	0.1	10	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity (SM2320)																					
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (SM5310C)																					
Total Organic Carbon	NS	NS	NS	NS	NS	mg/l	NA	NA	0.71 J	NA	NA	NA	847	NA	NA	224	NA	NA	11.9	1.4	71.9
Ethane, Ethene, Methane (RSK-175)																					
Ethane	NS	NS	NS	NS	NS	ug/l	NA	NA	ND	NA	NA	NA	0.805 J	NA	NA	ND	NA	NA	0.28 J	ND	0.428 J
Ethene	NS	NS	NS	NS	NS	ug/l	NA	NA	ND	NA	NA	NA	1.37	NA	NA	0.593 J	NA	NA	ND	ND	0.405 J
Methane	NS	NS	NS	NS	NS	ug/l	NA	NA	208	NA	NA	NA	1340	NA	NA	245	NA	NA	3690	434	434
Acids																					
Acetic acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Formic acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propionic acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (SW6010C)																					
Iron	NS	20	300	NS	Background ratio	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (SW8260C)																					
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethane	NS	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethene	7	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloropropene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethane	5	2	2	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethene	NS	NS	NS	2	2	ug/l	**29**	**21**	**17.4**	0.836 J	**140**	**310 E**	**385**	**130**	**190**	**332**	**224**	ND	**26.4**	**83**	**160**
1,2-dichloropropane	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NS	10	6000	NS	10	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	MAG-4 (02/25/2013)	MAG-4 (04/22/2013)	MAG-4 (12/10/2013)	MAG-65 (12/16/2013)	MAG-66 (02/25/2013)	MAG-66 (04/22/2013)	MAG-66 (12/11/2013)	MAG-70 (02/25/2013)	MAG-70 (04/22/2013)	MAG-70 (12/11/2013)	MAG-IF4 (12/16/2013)	MAG-KW3 * (12/16/2013)	MAG-KW4 (12/10/2013)	MAG-KW5 (12/10/2013)	MAG-KW6 (12/10/2013)
Bromobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	0.8	4	NS	0.8	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NS	1	10	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	80	1	70	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	70	1	70	2	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloro-1,3-butadiene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	1	ug/l	NA	NA	ND	ND	NA	NA	ND	NA	NA	ND	0.773 J	ND	ND	0.943 J	ND
Methylene Chloride	5	1	3	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sec-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	2	100	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tert-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1000	1	600	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Carbon	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	NS	NS	NS	NS	NS	ug/l	409	461	NA	NA	206.6	361	NA	282.2	321.9	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	1	ug/l	NA	NA	ND	ND	NA	NA	**3.14 J**	NA	NA	ND	**1.57**	ND	**2.49**	ND	**1.83**
trans-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5	1	1	1	1	ug/l	**380**	**440**	**435**	**60.2**	**61**	**24**	**51.3**	**150**	**130**	**18.6**	**129**	ND	**28.1**	**270**	**16**
Trichlorofluoromethane	NS	1	2000	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2	1	1	2	2	ug/l	NA	NA	ND	ND	**5.6**	**27**	**6.84**	**2.2**	1.9	**5.85**	ND	ND	ND	ND	0.604 J
Xylenes, Total	10000	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
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J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
deg C = Degrees Celsius
mg/L = Milligrams per Liter
mV = Millivolts
ntu = Nephelometric turbidity units
µg/l = Micrograms per Liter
µS/cm = microSiemens per centimeter
NA = Not Analyzed or Data Not Available
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2013 through December 2013

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	MAG-MN5 (12/12/2013)	MAG-MN6 (12/12/2013)	MAG-MN7 (12/12/2013)	MN-5 (02/25/2013)	MN-5 (04/22/2013)	MN-6 (02/25/2013)	MN-6 (04/22/2013)	MN-7 (02/25/2013)	MN-7 (04/22/2013)
Field Measurement Parameters															
Dissolved Oxygen	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oxidation reduction potential	NS	NS	NS	NS	NS	mV	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	8.5	NS	8.5	NS	NS	pH units	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific conductivity	NS	NS	NS	NS	NS	µS/cm	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature	NS	NS	NS	NS	NS	deg C	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	NS	NS	NS	NS	NS	ntu	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Dioxide (S49)															
Carbon dioxide	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate (E306)															
Sulfate	250	5	250	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate (E300)															
Nitrate	10	0.1	10	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity (SM2320)															
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (SM5310C)															
Total Organic Carbon	NS	NS	NS	NS	NS	mg/l	0.51 J	0.78 J	2.5	NA	NA	NA	NA	NA	NA
Ethane, Ethene, Methane (RSK-175)															
Ethane	NS	NS	NS	NS	NS	ug/l	ND	ND	ND	NA	NA	NA	NA	NA	NA
Ethene	NS	NS	NS	NS	NS	ug/l	ND	ND	ND	NA	NA	NA	NA	NA	NA
Methane	NS	NS	NS	NS	NS	ug/l	4.56 J	0.891 J	4.94 J	NA	NA	NA	NA	NA	NA
Acids															
Acetic acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Formic acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propionic acid	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (SW6010C)															
Iron	NS	20	300	NS	Background ratio	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (SW8260C)															
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethane	NS	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethene	7	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloropropene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethane	5	2	2	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethene	NS	NS	NS	2	2	ug/l	**2.42**	ND	0.626 J	1.8	1.1	0.38 J	NA	0.53 J	0.85 J
1,2-dichloropropane	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NS	10	6000	NS	10	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA

Area SS007
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Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2013 through December 2013

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	MAG-MN5 (12/12/2013)	MAG-MN6 (12/12/2013)	MAG-MN7 (12/12/2013)	MN-5 (02/25/2013)	MN-5 (04/22/2013)	MN-6 (02/25/2013)	MN-6 (04/22/2013)	MN-7 (02/25/2013)	MN-7 (04/22/2013)
Bromobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	0.8	4	NS	0.8	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NS	1	10	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	80	1	70	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	70	1	70	2	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloro-1,3-butadiene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	1	ug/l	0.723 J	ND	ND	NA	NA	NA	NA	NA	NA
Methylene Chloride	5	1	3	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sec-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	2	100	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tert-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1000	1	600	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Carbon	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	5.9	5.5	0.98	0.34	1.42	2.05
trans-1,2-dichloroethene	100	1	100	NS	1	ug/l	ND	ND	ND	NA	NA	NA	NA	NA	NA
trans-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5	1	1	1	1	ug/l	**27.6**	ND	**1.01**	**4.1**	**4.4**	0.6 J	0.34	0.89 J	**1.2**
Trichlorofluoromethane	NS	1	2000	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2	1	1	2	2	ug/l	ND	ND	ND	NA	NA	NA	NA	NA	NA
Xylenes, Total	10000	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
March 2014 through November 2014

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	BMW-10 (03/25/2014)	BMW-10 (07/29/2014)	MAG-102B (03/31/2014)	MAG-102C (03/31/2014)	MAG-104B * (03/28/2014)	MAG-107A (03/26/2014)	MAG-107A (07/30/2014)	MAG-107A (11/12/2014)	MAG-111P (03/24/2014)	MAG-111P (07/30/2014)	MAG-112P (03/25/2014)	MAG-112P (07/29/2014)	MAG-112P (11/11/2014)	MAG-113P (03/25/2014)	MAG-113P (07/29/2014)	MAG-202 (03/28/2014)	MAG-203 (03/28/2014)	MAG-204 (03/26/2014)
Field Measurement Parameters																								
Dissolved Oxygen	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oxidation reduction potential	NS	NS	NS	NS	NS	mV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	8.5	NS	8.5	NS	NS	pH units	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific conductivity	NS	NS	NS	NS	NS	uS/cm	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature	NS	NS	NS	NS	NS	deg C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	NS	NS	NS	NS	NS	ntu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Dioxide (S49)																								
Carbon dioxide	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate (E306)																								
Sulfate	250	5	250	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate (E300)																								
Nitrate	10	0.1	10	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity (SM2320)																								
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (SM5310C)																								
Total Organic Carbon	NS	NS	NS	NS	NS	mg/l	118	143	NA	NA	NA	24.8	21.5	20.5	4.4	< 0.5 U	129	155	182	71.3	329	NA	NA	1.3
Ethane, Ethene, Methane (RSK-175)																								
Ethane	NS	NS	NS	NS	NS	ug/l	0.172 J	< 0.5 U	NA	NA	NA	6.71	32.8	NA	< 0.5 U	< 0.5 U	0.41 J	0.666 J	NA	1.44	1.12	NA	NA	< 0.5 U
Ethene	NS	NS	NS	NS	NS	ug/l	1.03	0.496 J	NA	NA	NA	200	136	NA	< 0.5 U	< 0.5 U	2.73	2.44	NA	67.5 J	52.8 J	NA	NA	< 0.5 U
Methane	NS	NS	NS	NS	NS	ug/l	1400	1310	NA	NA	NA	9580	8110	NA	469	53.6	546	1020	NA	7700	6920	NA	NA	33.2
Acids																								
Acetic acid	NS	NS	NS	NS	NS	mg/l	< 0.5 U	8.26	NA	NA	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	74.1	96.5	NA	40.8	53.2	NA	NA	< 0.5 U
Butyric Acid	NS	NS	NS	NS	NS	mg/l	< 0.5 U	< 0.5 U	NA	NA	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U
Formic acid	NS	NS	NS	NS	NS	mg/l	3.69 J	< 0.5 U	NA	NA	NA	2.07	< 0.5 U	NA	< 0.5 U	< 0.5 U	42	< 0.5 U	NA	34.8	0.706	NA	NA	< 0.5 U
Lactic Acid	NS	NS	NS	NS	NS	mg/l	< 0.5 U	0.957	NA	NA	NA	0.379 J	1.11	NA	< 0.5 U	0.661	< 0.5 U	4.65	NA	< 0.5 U	3.17	NA	NA	1.04
Propionic acid	NS	NS	NS	NS	NS	mg/l	< 0.5 U	< 0.5 U	NA	NA	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	119	207	NA	< 0.5 U	21.3	NA	NA	< 0.5 U
Iron (SW6010C)																								
Iron	NS	20	300	NS	Background ratio	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (SW8260C)																								
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethane	NS	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethene	7	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloropropene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethane	5	2	2	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethene	NS	NS	NS	2	2	ug/l	**193**	**200**	**4.73**	< 0.5 U	< 0.5 U	**95**	**40.1**	**11.9**	**138**	**169**	**332**	**479**	**514**	**501**	**443**	< 0.5 U	< 0.5 U	**55.7**
1,2-dichloropropane	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	NS	3	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NS	10	6000	NS	10	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
March 2014 through November 2014

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	BMW-10 (03/25/2014)	BMW-10 (07/29/2014)	MAG-102B (03/31/2014)	MAG-102C (03/31/2014)	MAG-104B * (03/28/2014)	MAG-107A (03/26/2014)	MAG-107A (07/30/2014)	MAG-107A (11/12/2014)	MAG-111P (03/24/2014)	MAG-111P (07/30/2014)	MAG-112P (03/25/2014)	MAG-112P (07/29/2014)	MAG-112P (11/11/2014)	MAG-113P (03/25/2014)	MAG-113P (07/29/2014)	MAG-202 (03/28/2014)	MAG-203 (03/28/2014)	MAG-204 (03/26/2014)
Bromobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	0.8	4	NS	0.8	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NS	1	10	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	80	1	70	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NS	NS	NS	NS	3.2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	70	1	70	2	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloro-1,3-butadiene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	1	ug/l	0.425 J	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**2.4 J**	**1.42 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Methylene Chloride	5	1	3	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sec-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	2	100	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tert-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1000	1	600	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Carbon	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	1	ug/l	**3.15**	**3.22**	< 0.5 U	< 0.5 U	< 0.5 U	**2.6**	**2.45**	0.803 J	**2.37 J**	< 0.5 U	**4.11 J**	**5.9**	**6.01**	**6.32**	**4.7 J**	< 0.5 U	< 0.5 U	0.885 J
trans-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5	1	1	1	1	ug/l	**13.9**	**16.6**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	0.934 J	< 0.5 U	**344**	**470**	**572**	**233**	**282**	**48.3**	**26.1**	< 0.5 U	< 0.5 U	**184**
Trichlorofluoromethane	NS	1	2000	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2	1	1	2	2	ug/l	**2.15**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**38.6**	**12.7**	**5.03**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**25.2**	**20.4**	< 0.5 U	< 0.5 U	< 0.5 U
Xylenes, Total	10000	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
* Sentinel Well.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
deg C = Degrees Celsius
mg/L = Milligrams per Liter
mV = Millivolts
ntu = Nephelometric turbidity units
μg/l = Micrograms per Liter
μS/cm = microSiemens per centimeter
NA = Not Analyzed or Data Not Available
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
March 2014 through November 2014

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	MAG-204 (07/29/2014)	MAG-204 (11/12/2014)	MAG-207 * (03/28/2014)	MAG-4 (03/24/2014)	MAG-4 (07/30/2014)	MAG-4 (11/12/2014)	MAG-65 (03/28/2014)	MAG-65 (11/12/2014)	MAG-66 (03/25/2014)	MAG-66 (07/29/2014)	MAG-66 (11/11/2014)	MAG-70 (03/26/2014)	MAG-70 (07/30/2014)	MAG-IF4 (03/31/2014)	MAG-KW3 * (03/31/2014)	MAG-KW4 (03/24/2014)	MAG-KW4 (07/30/2014)	MAG-KW5 (03/24/2014)
Field Measurement Parameters																								
Dissolved Oxygen	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oxidation reduction potential	NS	NS	NS	NS	NS	mV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	8.5	NS	8.5	NS	NS	pH units	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific conductivity	NS	NS	NS	NS	NS	uS/cm	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature	NS	NS	NS	NS	NS	deg C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	NS	NS	NS	NS	NS	ntu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Dioxide (S49)																								
Carbon dioxide	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate (E306)																								
Sulfate	250	5	250	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate (E300)																								
Nitrate	10	0.1	10	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity (SM2320)																								
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (SM5310C)																								
Total Organic Carbon	NS	NS	NS	NS	NS	mg/l	< 0.5 U	1	NA	4.3	< 0.5 U	79.3	NA	< 0.5 U	713	1710	1370	52	1.3	NA	NA	13.3	5.2	2.2
Ethane, Ethene, Methane (RSK-175)																								
Ethane	NS	NS	NS	NS	NS	ug/l	< 0.5 U	NA	NA	< 0.5 U	< 0.5 U	NA	NA	NA	0.17 J	0.57 J	NA	0.405 J	2.23	NA	NA	< 0.5 U	0.81 J	< 0.5 U
Ethene	NS	NS	NS	NS	NS	ug/l	< 0.5 U	NA	NA	< 0.5 U	< 0.5 U	NA	NA	NA	4.58	1.81	NA	47.1 J	93.9 J	NA	NA	0.416 J	< 0.5 U	< 0.5 U
Methane	NS	NS	NS	NS	NS	ug/l	32.2	NA	NA	18.8	216	NA	NA	NA	2620	3580	NA	2350	2690	NA	NA	3490	4450	326
Acids																								
Acetic acid	NS	NS	NS	NS	NS	mg/l	< 0.5 U	NA	NA	< 0.5 U	< 0.5 U	NA	NA	NA	114	106	NA	38.9	1.12	NA	NA	< 0.5 U	< 0.5 U	< 0.5 U
Butyric Acid	NS	NS	NS	NS	NS	mg/l	< 0.5 U	NA	NA	< 0.5 U	< 0.5 U	NA	NA	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	NA	< 0.5 U	< 0.5 U	< 0.5 U
Formic acid	NS	NS	NS	NS	NS	mg/l	< 0.5 U	NA	NA	< 0.5 U	< 0.5 U	NA	NA	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	NA	1.79	< 0.5 U	0.737
Lactic Acid	NS	NS	NS	NS	NS	mg/l	1.09	NA	NA	< 0.5 U	0.604	NA	NA	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	0.784	NA	NA	< 0.5 U	0.51	< 0.5 U
Propionic acid	NS	NS	NS	NS	NS	mg/l	< 0.5 U	NA	NA	< 0.5 U	< 0.5 U	NA	NA	NA	210	232	NA	34.6	< 0.5 U	NA	NA	< 0.5 U	< 0.5 U	< 0.5 U
Iron (SW6010C)																								
Iron	NS	20	300	NS	Background ratio	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (SW8260C)																								
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethane	NS	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethene	7	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloropropene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethane	5	2	2	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethene	NS	NS	NS	2	2	ug/l	**58.8**	**19.7**	**5.46**	**9.75**	**16.2**	**180**	< 0.5 U	1.55	**667**	**825**	**602**	**356**	**116**	**93.1**	< 0.5 U	**18.9**	**20.2**	**74.6**
1,2-dichloropropane	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	NS	3	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NS	10	6000	NS	10	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
March 2014 through November 2014

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	MAG-204 (07/29/2014)	MAG-204 (11/12/2014)	MAG-207 * (03/28/2014)	MAG-4 (03/24/2014)	MAG-4 (07/30/2014)	MAG-4 (11/12/2014)	MAG-65 (03/28/2014)	MAG-65 (11/12/2014)	MAG-66 (03/25/2014)	MAG-66 (07/29/2014)	MAG-66 (11/11/2014)	MAG-70 (03/26/2014)	MAG-70 (07/30/2014)	MAG-IF4 (03/31/2014)	MAG-KW3 * (03/31/2014)	MAG-KW4 (03/24/2014)	MAG-KW4 (07/30/2014)	MAG-KW5 (03/24/2014)
Bromobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	0.8	4	NS	0.8	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NS	1	10	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	80	1	70	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NS	NS	NS	NS	3.2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	70	1	70	2	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloro-1,3-butadiene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	1	ug/l	0.305 J	0.419 J	< 0.5 U	< 0.5 U	**2.57 J**	**2.07**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	0.656 J
Methylene Chloride	5	1	3	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sec-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	2	100	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tert-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1000	1	600	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Carbon	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	1	ug/l	**1.37**	0.452 J	< 0.5 U	< 0.5 U	< 0.5 U	**1.46 J**	< 0.5 U	< 0.5 U	**7.54 J**	**6.93 J**	**6.35 J**	**11.4**	**7.14**	< 0.5 U	< 0.5 U	**1.9**	**2.37**	0.743 J
trans-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5	1	1	1	1	ug/l	**89**	**55.8**	< 0.5 U	**428**	**408**	**139**	**34**	**62.2**	**12.4**	< 0.5 U	< 0.5 U	**5.57**	**21.2**	**112**	< 0.5 U	**19.5**	**20.3**	**278**
Trichlorofluoromethane	NS	1	2000	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2	1	1	2	2	ug/l	0.611 J	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**21.5**	**22.6**	< 0.5 U	**35.9**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Xylenes, Total	10000	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
* Sentinel Well.
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
deg C = Degrees Celsius
mg/L = Milligrams per Liter
mV = Millivolts
ntu = Nephelometric turbidity units
µg/l = Micrograms per Liter
µS/cm = microSiemens per centimeter
NA = Not Analyzed or Data Not Available
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	MAG-KW5 (07/29/2014)	MAG-KW6 (03/24/2014)	MAG-KW6 (07/30/2014)	MAG-KW6 (11/11/2014)	MAG-MN5 (03/25/2014)	MAG-MN5 (07/29/2014)	MAG-MN6 (03/25/2014)	MAG-MN6 (07/29/2014)	MAG-MN7 (03/26/2014)	MAG-MN7 (07/29/2014)
Field Measurement Parameters																
Dissolved Oxygen	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oxidation reduction potential	NS	NS	NS	NS	NS	mV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	8.5	NS	8.5	NS	NS	pH units	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific conductivity	NS	NS	NS	NS	NS	uS/cm	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature	NS	NS	NS	NS	NS	deg C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	NS	NS	NS	NS	NS	ntu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Dioxide (S49)																
Carbon dioxide	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate (E306)																
Sulfate	250	5	250	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nitrate (E300)																
Nitrate	10	0.1	10	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity (SM2320)																
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (SM5310C)																
Total Organic Carbon	NS	NS	NS	NS	NS	mg/l	< 0.5 U	19.4	39.9	10.7	1.1	0.38 J	1.5	1.4	2.5	1.6
Ethane, Ethene, Methane (RSK-175)																
Ethane	NS	NS	NS	NS	NS	ug/l	< 0.5 U	0.407 J	0.399 J	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethene	NS	NS	NS	NS	NS	ug/l	< 0.5 U	0.283 J	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Methane	NS	NS	NS	NS	NS	ug/l	36.4	2360	2010	NA	6.87	4.91	2.21	3.53	3.52	0.67 J
Acids																
Acetic acid	NS	NS	NS	NS	NS	mg/l	< 0.5 U	< 0.5 U	0.839	NA	< 0.5 U	< 0.5 U	0.28 J	0.691	< 0.5 U	< 0.5 U
Butyric Acid	NS	NS	NS	NS	NS	mg/l	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Formic acid	NS	NS	NS	NS	NS	mg/l	< 0.5 U	5.37 J	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	1.85	< 0.5 U
Lactic Acid	NS	NS	NS	NS	NS	mg/l	0.817	< 0.5 U	0.661	NA	0.238 J	< 0.5 U	0.323 J	0.734	0.235 J	< 0.5 U
Propionic acid	NS	NS	NS	NS	NS	mg/l	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Iron (SW6010C)																
Iron	NS	20	300	NS	Background ratio	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
VOCs (SW8260C)																
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,1-trichloroethane	200	1	30	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1,2-trichloroethane	5	2	3	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethane	NS	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloroethene	7	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-dichloropropene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trichlorobenzene	70	1	9	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethane	5	2	2	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2-dichloroethene	NS	NS	NS	2	2	ug/l	**49.7**	**172**	**185**	**197**	**10.1**	**6.52**	< 0.5 U	0.692 J	0.512 J	0.605 J
1,2-dichloropropane	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichlorobenzene	600	5	600	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,3-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,4-dichlorobenzene	75	5	75	NS	5	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-butanone	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-hexanone	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-chlorotoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-Isopropyltoluene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4-methyl-2-pentanone	NS	NS	NS	NS	3	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetone	NS	10	6000	NS	10	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Area SS007
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March 2014 through November 2014

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	MAG-KW5 (07/29/2014)	MAG-KW6 (03/24/2014)	MAG-KW6 (07/30/2014)	MAG-KW6 (11/11/2014)	MAG-MN5 (03/25/2014)	MAG-MN5 (07/29/2014)	MAG-MN6 (03/25/2014)	MAG-MN6 (07/29/2014)	MAG-MN7 (03/26/2014)	MAG-MN7 (07/29/2014)
Bromobenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromochloromethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromodichloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromoform	80	0.8	4	NS	0.8	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Bromomethane	NS	1	10	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon tetrachloride	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chlorobenzene	100	1	50	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloroform	80	1	70	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloromethane	NS	NS	NS	NS	3.2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,2-dichloroethene	70	1	70	2	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
cis-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromochloromethane	80	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibromomethane	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dichlorodifluoromethane	NS	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	700	2	700	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexachloro-1,3-butadiene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Isopropylbenzene	NS	1	700	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
m,p-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert-butyl ether	NS	1	70	NS	1	ug/l	**1.16 J**	< 0.5 U	< 0.5 U	< 0.5 U	**1.21**	0.637 J	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Methylene Chloride	5	1	3	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NS	2	300	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
n-Butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-propylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
o-Xylene	10000	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sec-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Styrene	100	2	100	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tert-butylbenzene	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	5	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Toluene	1000	1	600	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Carbon	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	1	ug/l	0.704 J	**2.06**	**2.54**	**2.97**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,3-dichloropropene	NS	1	1	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trichloroethene	5	1	1	1	1	ug/l	**279**	**16.2**	**11.4**	**6.19**	**68.1**	**100**	< 0.5 U	**1.13**	< 0.5 U	0.762 J
Trichlorofluoromethane	NS	1	2000	NS	1	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vinyl chloride	2	1	1	2	2	ug/l	< 0.5 U	0.348 J	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Xylenes, Total	10000	2	1000	NS	2	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
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EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
deg C = Degrees Celsius
mg/L = Milligrams per Liter
mV = Millivolts
ntu = Nephelometric turbidity units
µg/l = Micrograms per Liter
µS/cm = microSiemens per centimeter
NA = Not Analyzed or Data Not Available
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS007
Summary of Ground Water Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2015 through November 2015

								Shallow Wells																	
Parameter	**EPA MCLs**	**NJ PQLs**	**NJ Class II Drinking Water**	**Applicable Criteria from Decision Document**	**Site Screening Criteria (Shallow)**	**Site Screening Criteria (Intermediate)**	**Unit**	**MAG-04 (11/03/2015)**	**MAG-4 (02/18/2015)**	**MAG-4 (05/13/2015)**	**MAG-4 (08/04/2015)**	**MAG-107A (02/18/2015)**	**MAG-107A (05/14/2015)**	**MAG-107A (08/04/2015)**	**MAG-107A (11/03/2015)**	**MAG-65 (05/12/2015)**	**MAG-65 (11/03/2015)**	**MAG-66 (02/18/2015)**	**MAG-66 (05/13/2015)**	**MAG-66 (08/04/2015)**	**MAG-66 (11/03/2015)**	**MAG-KW3 * (05/12/2015)**	**MAG-KW3 * (11/03/2015)**	**MAG-KW6 (05/13/2015)**	**MAG-KW6 (11/03/2015)**
Field Measurement Parameters																									
Dissolved Oxygen	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oxidation reduction potential	NS	NS	NS	NS	NS	NS	mV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	8.5	NS	8.5	NS	NS	NS	pH units	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific conductivity	NS	NS	NS	NS	NS	NS	uS/cm	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature	NS	NS	NS	NS	NS	NS	deg C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	NS	NS	NS	NS	NS	NS	ntu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Dioxide (S49)																									
Carbon dioxide	NS	NS	NS	NS	NS	NS	mg/l	43	NA	NA	NA	NA	NA	NA	18	NA	7.6	NA	NA	NA	< 1 U	NA	4.6	NA	20
Sulfate (E306)																									
Sulfate	250	5	250	NS	NS	NS	mg/l	14	NA	NA	NA	NA	NA	NA	4.4 J	NA	34	NA	NA	NA	< 100 U	NA	20	NA	6.1 J
Nitrate (E300)																									
Nitrate	10	0.1	10	NS	NS	NS	mg/l	< 0.5 U	NA	NA	NA	NA	NA	NA	< 0.5 U	NA	< 0.5 U	NA	NA	NA	< 10 U	NA	< 0.5 U	NA	< 10 U
Alkalinity (SM2320)																									
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (SM5310C)																									
Total Organic Carbon	NS	NS	NS	NS	NS	NS	mg/l	NA	189	327	267	3.7 J	15.4	20.3	NA	ND	NA	3150	1020	2370	NA	ND	NA	29.5	NA
Ethane, Ethene, Methane (RSK-175)																									
Ethane	NS	NS	NS	NS	NS	NS	ug/l	< 8 U	NA	NA	0.404 J	NA	NA	32.7	< 40 U	NA	< 4 U	NA	NA	0.414 J	< 40 U	NA	< 4 U	NA	< 8 U
Ethene	NS	NS	NS	NS	NS	NS	ug/l	< 6 U	NA	NA	0.696 J	NA	NA	56.7	< 30 U	NA	< 3 U	NA	NA	8.84	< 30 U	NA	< 3 U	NA	< 6 U
Methane	NS	NS	NS	NS	NS	NS	ug/l	520 D	NA	NA	5550	NA	NA	12200	3400 D	NA	< 2 U	NA	NA	9950	2600 D	NA	0.74 J	NA	550 D
Acids																									
Acetic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	185	NA	NA	ND	NA	NA	NA	NA	NA	265	NA	NA	NA	NA	NA
Butyric Acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	20.3 J	NA	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA
Formic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	ND	NA	NA	ND	NA	NA	NA	NA	NA	50.6	NA	NA	NA	NA	NA
Lactic Acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	ND	NA	NA	ND	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA
Propionic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	235	NA	NA	ND	NA	NA	NA	NA	NA	252	NA	NA	NA	NA	NA
Iron (SW6010C)																									
Iron	NS	20	300	NS	Background ratio	Background ratio	ug/l	7600	NA	NA	NA	NA	NA	NA	1600	NA	< 100 U	NA	NA	NA	1800	NA	4500	NA	670
VOCs (SW8260C)																									
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	1	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
1,1,1-trichloroethane	200	1	30	NS	1	30	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	1	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
1,1,2-trichloroethane	5	2	3	NS	2	3	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
1,1-dichloroethane	NS	1	50	NS	1	50	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
1,1-dichloroethene	7	1	1	NS	1	1	ug/l	0.46 J	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	0.23 J
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	0.03	ug/l	< 3 U	NA	NA	NA	NA	NA	NA	< 3 U	NA	< 3 U	NA	NA	NA	< 6 U	NA	< 3 U	NA	< 3 U
1,2,4-trichlorobenzene	70	1	9	NS	1	9	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	0.02	ug/l	< 5 U	NA	NA	NA	NA	NA	NA	< 5 U	NA	< 5 U	NA	NA	NA	< 10 U	NA	< 5 U	NA	< 5 U
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	0.03	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
1,2-dichlorobenzene	600	5	600	NS	5	600	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
1,2-dichloroethene	NS	NS	70	2	2	70	ug/l	**140**	**232**	**309**	**371**	**4.56**	**26**	**31**	**4.2**	**2.32**	0.44 J	**1610**	**818**	**1340**	**290**	ND	< 1 U	**180**	**190**
1,2-dichloropropane	5	1	1	NS	1	1	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
1,3-dichlorobenzene	600	5	600	NS	5	600	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
1,4-dichlorobenzene	75	5	75	NS	5	75	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
2-butanone	NS	2	300	NS	2	300	ug/l	**140**	NA	NA	NA	NA	NA	NA	< 6 U	NA	< 6 U	NA	NA	NA	**6.7 J**	NA	< 6 U	NA	< 6 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	NA	NA	NA	NA	NA	NA	< 5 U	NA	< 5 U	NA	NA	NA	< 10 U	NA	< 5 U	NA	< 5 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
4-methyl-2-pentanone	NS	NS	NS	NS	NS	NS	ug/l	< 5 U	NA	NA	NA	NA	NA	NA	< 5 U	NA	< 5 U	NA	NA	NA	< 10 U	NA	< 5 U	NA	< 5 U
Acetone	NS	10	6000	NS	10	6000	ug/l	**380 D**	NA	NA	NA	NA	NA	NA	< 10 UB	NA	< 10 U	NA	NA	NA	< 20 UB	NA	< 10 U	NA	< 14 UB
Benzene	5	1	1	NS	1	1	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
Bromodichloromethane	80	1	1	NS	1	1	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
Bromoform	80	0.8	4	NS	0.8	4	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
Bromomethane	NS	1	10	NS	1	10	ug/l	< 2 U	NA	NA	NA	NA	NA	NA	< 2 U	NA	< 2 U	NA	NA	NA	< 4 U	NA	< 2 U	NA	< 2 U

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								Shallow Wells																	
Parameter	**EPA MCLs**	**NJ PQLs**	**NJ Class II Drinking Water**	**Applicable Criteria from Decision Document**	**Site Screening Criteria (Shallow)**	**Site Screening Criteria (Intermediate)**	**Unit**	**MAG-04 (11/03/2015)**	**MAG-4 (02/18/2015)**	**MAG-4 (05/13/2015)**	**MAG-4 (08/04/2015)**	**MAG-107A (02/18/2015)**	**MAG-107A (05/14/2015)**	**MAG-107A (08/04/2015)**	**MAG-107A (11/03/2015)**	**MAG-65 (05/12/2015)**	**MAG-65 (11/03/2015)**	**MAG-66 (02/18/2015)**	**MAG-66 (05/13/2015)**	**MAG-66 (08/04/2015)**	**MAG-66 (11/03/2015)**	**MAG-KW3 * (05/12/2015)**	**MAG-KW3 * (11/03/2015)**	**MAG-KW6 (05/13/2015)**	**MAG-KW6 (11/03/2015)**
Carbon disulfide	NS	1	700	NS	1	700	ug/l	< 2 U	NA	NA	NA	NA	NA	NA	< 2 U	NA	< 2 U	NA	NA	NA	< 4 U	NA	< 2 U	NA	< 2 U
Carbon tetrachloride	5	1	1	NS	1	1	ug/l	< 2 U	NA	NA	NA	NA	NA	NA	< 2 U	NA	< 2 U	NA	NA	NA	< 4 U	NA	< 2 U	NA	< 2 U
Chlorobenzene	100	1	50	NS	1	50	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 2 U	NA	NA	NA	NA	NA	NA	0.68 J	NA	< 2 U	NA	NA	NA	< 4 U	NA	< 2 U	NA	< 2 U
Chloroform	80	1	70	NS	1	70	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
Chloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 2 U	NA	NA	NA	NA	NA	NA	< 2 U	NA	< 2 U	NA	NA	NA	< 4 U	NA	< 2 U	NA	< 2 U
cis-1,2-dichloroethene	70	1	70	2	2	70	ug/l	**140 D**	NA	NA	NA	NA	NA	NA	**3.9**	NA	0.44 J	NA	NA	NA	**290 D**	NA	< 1 U	NA	**190 D**
cis-1,3-dichloropropene	NS	1	1	NS	1	1	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
Dibromochloromethane	80	1	1	NS	1	1	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
Dichlorodifluoromethane	NS	2	1000	NS	2	1000	ug/l	< 2 U	NA	NA	NA	NA	NA	NA	< 2 U	NA	< 2 U	NA	NA	NA	< 4 U	NA	< 2 U	NA	< 2 U
Ethylbenzene	700	2	700	NS	2	700	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
Hexachloro-1,3-butadiene	NS	1	1	NS	1	1	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
Isopropylbenzene	NS	1	700	NS	1	700	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 2 U	NA	NA	NA	NA	NA	NA	< 2 U	NA	< 2 U	NA	NA	NA	< 4 UJ	NA	< 2 U	NA	< 2 U
Methyl tert-butyl ether	NS	1	70	NS	1	70	ug/l	0.91 J	**2.96 J**	0.939 J	**6.47 J**	ND	ND	ND	< 5 U	ND	< 5 U	ND	ND	ND	0.7 J	ND	< 5 U	ND	< 5 U
Methylene Chloride	5	1	3	NS	1	3	ug/l	< 5 U	NA	NA	NA	NA	NA	NA	< 5 U	NA	< 5 U	NA	NA	NA	< 10 U	NA	< 5 U	NA	< 5 U
Naphthalene	NS	2	300	NS	2	300	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
Styrene	100	2	100	NS	2	100	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
Toluene	1000	1	600	NS	1	600	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 UJ	NA	< 1 U	NA	< 1 U
Total Carbon	NS	NS	NS	NS	NS	NS	mg/l	450	NA	NA	NA	NA	NA	NA	28	NA	0.89 J	NA	NA	NA	390	NA	1.9	NA	26
Total VOCs	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	1	100	ug/l	**1.4**	ND	**3.58**	ND	0.21 J	0.433 J	0.926 J	0.26 J	ND	< 1 U	**7.86 J**	**2.51 J**	**9.85 J**	**2.3 D**	ND	< 1 U	**3**	**2**
trans-1,3-dichloropropene	NS	1	1	NS	1	1	ug/l	< 1 U	NA	NA	NA	NA	NA	NA	< 1 U	NA	< 1 U	NA	NA	NA	< 2 U	NA	< 1 U	NA	< 1 U
Trichloroethene	5	1	1	1	1	1	ug/l	**110 J**	**77.5**	**223**	**86.2**	ND	ND	ND	< 1 U	**168**	**30**	ND	**71.4**	**12.2 J**	**15 D**	ND	< 1 U	**1.48**	0.26 J
Trichlorofluoromethane	NS	1	2000	NS	1	2000	ug/l	< 2 U	NA	NA	NA	NA	NA	NA	< 2 U	NA	< 2 U	NA	NA	NA	< 4 U	NA	< 2 U	NA	< 2 U
Vinyl chloride	2	1	1	2	2	1	ug/l	< 1.5 U	1.9 J	**2.2**	**2.99 J**	**2.52**	**13.6**	**20.1**	1.2 J	ND	< 1.5 U	**91.7**	**41.4**	**170**	**21 D**	ND	< 1.5 U	0.615 J	0.36 J
Xylenes, Total	10000	2	1000	NS	2	1000	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
* Sentinel Well. Data from these wells are screened against the PQLs (shallow wells) or NJ Class II Criteria (intermediate).
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February 2015 through November 2015

								Intermediate Wells										
Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria (Shallow)	Site Screening Criteria (Intermediate)	Unit	MAG-112P (02/18/2015)	MAG-112P (08/04/2015)	MAG-112P (05/12/2015)	MAG-112P (11/03/2015)	MAG-112P-FD (11/03/2015)	MAG-204 (05/12/2015)	MAG-204 (11/03/2015)	MAG-104B * (05/13/2015)	MAG-104B * (11/03/2015)	MAG-207 * (05/14/2015)	MAG-207 * (11/03/2015)
Field Measurement Parameters																		
Dissolved Oxygen	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oxidation reduction potential	NS	NS	NS	NS	NS	NS	mV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	8.5	NS	8.5	NS	NS	NS	pH units	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific conductivity	NS	NS	NS	NS	NS	NS	uS/cm	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature	NS	NS	NS	NS	NS	NS	deg C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	NS	NS	NS	NS	NS	NS	ntu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Dioxide (S49)																		
Carbon dioxide	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	< 1 U	< 1 U	NA	4.6	NA	4.7	NA	4.4
Sulfate (E306)																		
Sulfate	250	5	250	NS	NS	NS	mg/l	NA	NA	NA	6.3 J	6.5 J	NA	39 M	NA	59	NA	45
Nitrate (E300)																		
Nitrate	10	0.1	10	NS	NS	NS	mg/l	NA	NA	NA	< 10 U	< 10 U	NA	< 0.5 U	NA	< 0.5 U	NA	< 0.5 U
Alkalinity (SM2320)																		
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (SM5310C)																		
Total Organic Carbon	NS	NS	NS	NS	NS	NS	mg/l	582	128	301	NA	NA	ND	NA	0.5 J	NA	ND	NA
Ethane, Ethene, Methane (RSK-175)																		
Ethane	NS	NS	NS	NS	NS	NS	ug/l	NA	0.247 J	NA	< 4 U	< 8 U	NA	< 4 U	NA	< 4 U	NA	< 4 U
Ethene	NS	NS	NS	NS	NS	NS	ug/l	NA	12.6	NA	4.2	5 J	NA	< 3 U	NA	< 3 U	NA	< 3 U
Methane	NS	NS	NS	NS	NS	NS	ug/l	NA	2680	NA	360	420 D	NA	7.3	NA	0.45 J	NA	5
Acids																		
Acetic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	64.8	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	NS	NS	NS	NS	NS	NS	mg/l	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Formic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	48.9	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	NS	NS	NS	NS	NS	NS	mg/l	NA	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propionic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	78	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (SW6010C)																		
Iron	NS	20	300	NS	Background ratio	Background ratio	ug/l	NA	NA	NA	1200	1300	NA	5400	NA	8100	NA	7500
VOCs (SW8260C)																		
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	1	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,1,1-trichloroethane	200	1	30	NS	1	30	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	1	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,1,2-trichloroethane	5	2	3	NS	2	3	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,1-dichloroethane	NS	1	50	NS	1	50	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,1-dichloroethene	7	1	1	NS	1	1	ug/l	NA	NA	NA	0.43 J	0.56 J	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	0.03	ug/l	NA	NA	NA	< 3 U	< 6 U	NA	< 3 U	NA	< 3 U	NA	< 3 U
1,2,4-trichlorobenzene	70	1	9	NS	1	9	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	0.02	ug/l	NA	NA	NA	< 5 U	< 10 U	NA	< 5 U	NA	< 5 U	NA	< 5 U
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	0.03	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,2-dichlorobenzene	600	5	600	NS	5	600	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	NA	NA	NA	0.3 J	0.32 J	NA	< 1 U	NA	< 1 U	NA	0.39 J
1,2-dichloroethene	NS	NS	70	2	2	70	ug/l	**412**	**487**	**344**	**250**	**320**	**81.4**	3.4	ND	< 1 U	2.97	4.8
1,2-dichloropropane	5	1	1	NS	1	1	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	0.16 J
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,3-dichlorobenzene	600	5	600	NS	5	600	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
1,4-dichlorobenzene	75	5	75	NS	5	75	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
2-butanone	NS	2	300	NS	2	300	ug/l	NA	NA	NA	< 6 U	3.9 J	NA	< 6 U	NA	< 6 U	NA	< 6 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 5 U	< 10 U	NA	< 5 U	NA	< 5 U	NA	< 5 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
4-methyl-2-pentanone	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 5 U	< 10 U	NA	< 5 U	NA	< 5 U	NA	< 5 U
Acetone	NS	10	6000	NS	10	6000	ug/l	NA	NA	NA	< 10 UJB	< 20 UJB	NA	< 10 U	NA	< 10 U	NA	< 10 U
Benzene	5	1	1	NS	1	1	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	0.16 J
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Bromodichloromethane	80	1	1	NS	1	1	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Bromoform	80	0.8	4	NS	0.8	4	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Bromomethane	NS	1	10	NS	1	10	ug/l	NA	NA	NA	< 2 U	< 4 U	NA	< 2 U	NA	< 2 U	NA	< 2 U

Area SS007
Summary of Ground Water Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2015 through November 2015

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria (Shallow)	Site Screening Criteria (Intermediate)	Unit	Intermediate Wells										
								MAG-112P (02/18/2015)	MAG-112P (08/04/2015)	MAG-112P (05/12/2015)	MAG-112P (11/03/2015)	MAG-112P-FD (11/03/2015)	MAG-204 (05/12/2015)	MAG-204 (11/03/2015)	MAG-104B * (05/13/2015)	MAG-104B * (11/03/2015)	MAG-207 * (05/14/2015)	MAG-207 * (11/03/2015)
Carbon disulfide	NS	1	700	NS	1	700	ug/l	NA	NA	NA	1.5 J	1.2 J	NA	< 2 U	NA	< 2 U	NA	< 2 U
Carbon tetrachloride	5	1	1	NS	1	1	ug/l	NA	NA	NA	< 2 U	< 4 U	NA	< 2 U	NA	< 2 U	NA	< 2 U
Chlorobenzene	100	1	50	NS	1	50	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 2 U	< 4 U	NA	< 2 U	NA	< 2 U	NA	< 2 U
Chloroform	80	1	70	NS	1	70	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Chloromethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 2 U	< 4 U	NA	< 2 U	NA	< 2 U	NA	< 2 U
cis-1,2-dichloroethene	70	1	70	2	2	70	ug/l	NA	NA	NA	**250 D**	**320 D**	NA	3.4	NA	< 1 U	NA	4.5
cis-1,3-dichloropropene	NS	1	1	NS	1	1	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Dibromochloromethane	80	1	1	NS	1	1	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Dichlorodifluoromethane	NS	2	1000	NS	2	1000	ug/l	NA	NA	NA	< 2 U	< 4 U	NA	< 2 U	NA	< 2 U	NA	< 2 U
Ethylbenzene	700	2	700	NS	2	700	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Hexachloro-1,3-butadiene	NS	1	1	NS	1	1	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Isopropylbenzene	NS	1	700	NS	1	700	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 2 U	< 4 U	NA	< 2 U	NA	< 2 U	NA	< 2 U
Methyl tert-butyl ether	NS	1	70	NS	1	70	ug/l	ND	ND	1.29	0.76 J	0.71 J	0.55 J	0.37 J	ND	< 5 U	ND	0.32 J
Methylene Chloride	5	1	3	NS	1	3	ug/l	NA	NA	NA	< 5 U	< 10 U	NA	< 5 U	NA	< 5 U	NA	< 5 U
Naphthalene	NS	2	300	NS	2	300	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Styrene	100	2	100	NS	2	100	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Tetrachloroethene	5	1	1	NS	1	1	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Toluene	1000	1	600	NS	1	600	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Total Carbon	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	63	72	NA	0.95 J	NA	0.94 J	NA	0.88 J
Total VOCs	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	1	100	ug/l	3.53 J	3.91 J	3.38	1.6	1.8 JD	1.93	< 1 U	ND	< 1 U	1.2	0.26 J
trans-1,3-dichloropropene	NS	1	1	NS	1	1	ug/l	NA	NA	NA	< 1 U	< 2 U	NA	< 1 U	NA	< 1 U	NA	< 1 U
Trichloroethene	5	1	1	1	1	1	ug/l	**46.3**	**48.6**	**193**	**55**	**56 D**	**193**	**8.3**	ND	< 1 U	ND	0.27 J
Trichlorofluoromethane	NS	1	2000	NS	1	2000	ug/l	NA	NA	NA	< 2 U	< 4 U	NA	< 2 U	NA	< 2 U	NA	< 2 U
Vinyl chloride	2	1	1	2	2	1	ug/l	**3.58 J**	**26.3**	**6.12**	**7**	**10 D**	1.3	< 1.5 U	ND	< 1.5 U	ND	< 1.5 U
Xylenes, Total	10000	2	1000	NS	2	1000	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
* Sentinel Well. Data from these wells are screened against the PQLs (shallow wells) or NJ Class II Criteria (intermediate).
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
deg C = Degrees Celsius
mg/L = Milligrams per Liter
mV = Millivolts
ntu = Nephelometric turbidity units
µg/l = Micrograms per Liter
µS/cm = microSiemens per centimeter
NA = Not Analyzed or Data Not Available
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2016 Through August 2016

								Shallow Wells																				
Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria (Shallow)	Site Screening Criteria (Intermediate)	Unit	MAG-04 (02/24/2016)	MAG-04 (05/04/2016)	MAG-04 (08/11/2016)	MAG-107A (02/24/2016)	MAG-107A (05/04/2016)	MAG-107A (08/11/2016)	MAG-65 (02/24/2016)	MAG-65 (05/04/2016)	MAG-65 (08/12/2016)	MAG-65-FD (02/24/2016)	MAG-65-FD (05/04/2016)	MAG-65-FD (08/12/2016)	MAG-66 (02/24/2016)	MAG-66 (05/04/2016)	MAG-66 (08/11/2016)	MAG-KW3 * (02/24/2016)	MAG-KW3 * (05/04/2016)	MAG-KW3 * (08/12/2016)	MAG-KW6 (02/24/2016)	MAG-KW6 (05/04/2016)	MAG-KW6 (08/11/2016)
Field Measurement Parameters																												
Dissolved Oxygen	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oxidation reduction potential	NS	NS	NS	NS	NS	NS	mV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	8.5	NS	8.5	NS	NS	NS	pH units	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific conductivity	NS	NS	NS	NS	NS	NS	uS/cm	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature	NS	NS	NS	NS	NS	NS	deg C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	NS	NS	NS	NS	NS	NS	ntu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Dioxide (S49)																												
Carbon dioxide	NS	NS	NS	NS	NS	NS	mg/l	37	560	490	9.7 J	140	110	6.3 J	91	140	3.8 J	90	150	< 0.5 U	< 2 U	< 2 U	4	37	110	12	210	330
Sulfate (E306)																												
Sulfate	250	5	250	NS	NS	NS	mg/l	24	20	12	3.5 J	3.6 J	2.5 J	26	18	30	23	18	31	5.3 J	< 10 U	< 25 U	21	16	78	6 J	< 10 U	< 25 U
Nitrate (E300)																												
Nitrate	10	0.1	10	NS	NS	NS	mg/l	< 0.1 U	< 0.1 U	< 0.1 UJ	< 0.1 U	< 0.1 U	0.058 J	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 1 U	< 2 U	< 5 UJ	< 0.1 U	< 0.1 U	< 0.1 U	< 1 U	< 2 U	< 5 UJ
Alkalinity (SM2320)																												
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (SM5310C)																												
Total Organic Carbon	NS	NS	NS	NS	NS	NS	mg/l	720	720	540	20	32	26	0.97 J	< 0.5 UB	0.82 J	1	< 0.5 UB	0.95 J	210	180	140	1.4	< 0.5 UB	2.2	44	46	49
Ethane, Ethene, Methane (RSK-175)																												
Ethane	NS	NS	NS	NS	NS	NS	ug/l	< 1.5 U	< 1.5 U	< 1.5 U	6.2 J	12 M	11 J	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 6 U	< 1.5 U	< 3 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U
Ethene	NS	NS	NS	NS	NS	NS	ug/l	5100	6500	8500	11000 J	12000 D	14000	2.2 J	1.2 J	3.1 J	2.2 J	1 J	6.5 J	20000 J	15000 D	18000 D	< 0.8 U	< 0.8 U	19	5000	6300	7400
Methane	NS	NS	NS	NS	NS	NS	ug/l	< 1.4 U	< 1.4 U	< 1.4 U	17 J	26	20 D	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	28 J	26 J	37 D	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U
Acids																												
Acetic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Formic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propionic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (SW6010C)																												
Iron	NS	20	300	NS	Background ratio	Background ratio	ug/l	7900	2000	2600	24 J	3500	94000	< 85 U	40 J	240	< 85 U	39 J	230	780	1100	1300	< 85 U	< 85 U	6300	670	520	1200
VOCs (SW8260C)																												
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,1-trichloroethane	200	1	30	NS	1	30	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,2-trichloroethane	5	2	3	NS	2	3	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethane	NS	1	50	NS	1	50	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethene	7	1	1	NS	1	1	ug/l	0.43 J	0.86 J	**1.1 J**	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	0.29 J	0.22 J	< 0.8 U	< 0.8 U	< 0.8 U	0.19 J	0.38 J	0.46 J
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	0.03	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trichlorobenzene	70	1	9	NS	1	9	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	0.02	ug/l	< 1.6 U	< 1.6 U	< 3.2 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 UJ	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	0.03	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichlorobenzene	600	5	600	NS	5	600	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	200 J	290	450	5.7	1.7	1.8	0.52 J	0.97 J	1.1	0.48 J	0.99 J	1.2	400 J	510	410 J	< 0.2 U	< 0.2 U	< 0.2 U	160	210	270
1,2-dichloropropane	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichlorobenzene	600	5	600	NS	5	600	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,4-dichlorobenzene	75	5	75	NS	5	75	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-butanone	NS	2	300	NS	2	300	ug/l	**68**	**57**	< 8 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	**12 J**	**7.5**	< 4 UJ	< 4 U	< 4 U	< 4 U	< 4 U	**3 J**	< 4 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	< 4 U	< 4 U	< 8 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 UJ	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
4-methyl-2-pentanone	NS	NS	NS	NS	NS	NS	ug/l	< 3.2 U	< 3.2 U	< 6.4 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 UJ	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Acetone	NS	10	6000	NS	10	6000	ug/l	**150**	< 6.4 UB	**19 J**	< 6.4 U	< 6.4 UB	< 6.4 U	2.3 J	< 6.4 UJ	< 6.4 U	< 6.4 UJ	< 6.4 UBJ	< 6.4 U	**14 J**	< 6.4 UB	**13 J**	< 6.4 U	< 6.4 UB	< 6.4 U	**15**	< 6.4 UB	**25**
Benzene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.4 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 UJ	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Bromodichloromethane	80	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromoform	80	0.8	4	NS	0.8	4	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromomethane	NS	1	10	NS	1	10	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Carbon disulfide	NS	1	700	NS	1	700	ug/l	< 1.6 U	< 1.6 U	< 3.2 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	**1.7 J**	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Carbon tetrachloride	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chlorobenzene	100	1	50	NS	1	50	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 3.2 U	< 1.6 U	< 1.6 U	1.4 J	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 UJ	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Chloroform	80	1	70	NS	1	70	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
cis-1,2-dichloroethene	70	1	70	2	2	70	ug/l	**200 J**	**290**	**460 D**	**5.5**	1.7	1.8	0.52 J	0.97 J	1.1	0.48 J	0.99 J	1.2	**400 J**	**510**	**370 J**	< 0.4 U	< 0.4 U	< 0.4 U	**160 D**	**210**	**250 D**
cis-1,3-dichloropropene	NS	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromochloromethane	80	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2016 Through August 2016

								Shallow Wells																				
Parameter	**EPA MCLs**	**NJ PQLs**	**NJ Class II Drinking Water**	**Applicable Criteria from Decision Document**	**Site Screening Criteria (Shallow)**	**Site Screening Criteria (Intermediate)**	**Unit**	**MAG-04 (02/24/2016)**	**MAG-04 (05/04/2016)**	**MAG-04 (08/11/2016)**	**MAG-107A (02/24/2016)**	**MAG-107A (05/04/2016)**	**MAG-107A (08/11/2016)**	**MAG-65 (02/24/2016)**	**MAG-65 (05/04/2016)**	**MAG-65 (08/12/2016)**	**MAG-65-FD (02/24/2016)**	**MAG-65-FD (05/04/2016)**	**MAG-65-FD (08/12/2016)**	**MAG-66 (02/24/2016)**	**MAG-66 (05/04/2016)**	**MAG-66 (08/11/2016)**	**MAG-KW3 * (02/24/2016)**	**MAG-KW3 * (05/04/2016)**	**MAG-KW3 * (08/12/2016)**	**MAG-KW6 (02/24/2016)**	**MAG-KW6 (05/04/2016)**	**MAG-KW6 (08/11/2016)**
Dichlorodifluoromethane	NS	2	1000	NS	2	1000	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Ethylbenzene	700	2	700	NS	2	700	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Hexachloro-1,3-butadiene	NS	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Isopropylbenzene	NS	1	700	NS	1	700	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methyl tert-butyl ether	NS	1	70	NS	1	70	ug/l	**1.1 J**	0.82 J	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	0.25 J	0.59 J	0.54 J	< 0.8 UJ	0.56 J	0.5 J	0.45 J	0.4 J	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methylene Chloride	5	1	3	NS	1	3	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	0.87 J	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Naphthalene	NS	2	300	NS	2	300	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Styrene	100	2	100	NS	2	100	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Toluene	1000	1	600	NS	1	600	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	0.18 J	0.24 J	0.21 J	< 0.4 U	0.17 J	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Total Carbon	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	1	100	ug/l	**2.1**	**4.3**	**3.7 D**	0.17 J	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	0.67 J	0.69 J	0.56 J	< 0.4 U	< 0.4 U	< 0.4 U	**1.7**	**3**	**3.2**
trans-1,3-dichloropropene	NS	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Trichloroethene	5	1	1	1	1	1	ug/l	**150 J**	**81**	**130 D**	< 0.4 U	< 0.4 U	< 0.4 U	**34**	**42**	**30**	**32**	**41**	**28**	**1.5 J**	**1.8**	**2.7 J**	< 0.4 U	< 0.4 U	< 0.4 U	0.32 J	0.19 J	< 0.4 U
Trichlorofluoromethane	NS	1	2000	NS	1	2000	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Vinyl chloride	2	1	1	2	2	1	ug/l	**2.4 J**	< 0.2 U	**5.3 D**	1.2 J	2	1.3 J	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	**80 J**	**62 J**	**50 J**	< 0.2 U	< 0.2 U	< 0.2 U	0.32 J	0.24 J	0.37 J
Xylenes, Total	10000	2	1000	NS	2	1000	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U

Notes:
* Sentinel Well. Data from these wells are screened against the PQLs (shallow wells) or NJ Class II Criteria (intermediate).
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
deg C = Degrees Celsius
mg/L = Milligrams per Liter
mV = Millivolts
ntu = Nephelometric turbidity units
µg/l = Micrograms per Liter
µS/cm = microSiemens per centimeter
NA = Not Analyzed or Data Not Available
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2016 Through August 2016

								Intermediate Wells											
Parameter	**EPA MCLs**	**NJ PQLs**	**NJ Class II Drinking Water**	**Applicable Criteria from Decision Document**	**Site Screening Criteria (Shallow)**	**Site Screening Criteria (Intermediate)**	**Unit**	**MAG-112P (02/24/2016)**	**MAG-112P (05/04/2016)**	**MAG-112P (08/11/2016)**	**MAG-204 (02/24/2016)**	**MAG-204 (05/04/2016)**	**MAG-204 (08/12/2016)**	**MAG-104B * (02/24/2016)**	**MAG-104B * (05/04/2016)**	**MAG-104B * (08/12/2016)**	**MAG-207 * (02/24/2016)**	**MAG-207 * (05/04/2016)**	**MAG-207 * (08/12/2016)**
Field Measurement Parameters																			
Dissolved Oxygen	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oxidation reduction potential	NS	NS	NS	NS	NS	NS	mV	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	8.5	NS	8.5	NS	NS	NS	pH units	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific conductivity	NS	NS	NS	NS	NS	NS	uS/cm	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature	NS	NS	NS	NS	NS	NS	deg C	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity	NS	NS	NS	NS	NS	NS	ntu	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon Dioxide (S49)																			
Carbon dioxide	NS	NS	NS	NS	NS	NS	mg/l	< 0.5 U	< 2 U	< 2 U	3.6	43	71	3.4	33	67	5	62	88
Sulfate (E306)																			
Sulfate	250	5	250	NS	NS	NS	mg/l	7 J	< 10 U	< 25 U	40	26	20	65	52	47	50	47	51
Nitrate (E300)																			
Nitrate	10	0.1	10	NS	NS	NS	mg/l	< 1 U	< 2 U	< 5 UJ	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U
Alkalinity (SM2320)																			
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (SM5310C)																			
Total Organic Carbon	NS	NS	NS	NS	NS	NS	mg/l	58	40	16	0.93 J	< 0.5 UB	1.1	0.73 J	< 0.5 UB	0.67 J	0.63 J	< 0.5 UB	0.67 J
Ethane, Ethene, Methane (RSK-175)																			
Ethane	NS	NS	NS	NS	NS	NS	ug/l	< 1.5 U	< 1.5 U	< 1.5 UJ	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U	< 1.5 U
Ethene	NS	NS	NS	NS	NS	NS	ug/l	1600	2200	2100	0.61 J	0.47 J	50	3.1 J	1.2 J	0.57 J	4.1 J	6.9	68
Methane	NS	NS	NS	NS	NS	NS	ug/l	14	33	18	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	< 1.4 U	0.52 J
Acids																			
Acetic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Formic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propionic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (SW6010C)																			
Iron	NS	20	300	NS	Background ratio	Background ratio	ug/l	1000	2600	3200	41 J	88 J	6100	540	170	2200 J	540	990	8300
VOCs (SW8260C)																			
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,1-trichloroethane	200	1	30	NS	1	30	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,2-trichloroethane	5	2	3	NS	2	3	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethane	NS	1	50	NS	1	50	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethene	7	1	1	NS	1	1	ug/l	0.49 J	0.61 J	**1.5 J**	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	0.03	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trichlorobenzene	70	1	9	NS	1	9	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	0.02	ug/l	< 1.6 U	< 1.6 U	< 3.2 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	0.03	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichlorobenzene	600	5	600	NS	5	600	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	0.35 J	0.26 J
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	340 J	410	590	1.7	2.4	3.8	< 0.2 U	< 0.2 U	0.17 J	5.6 J	7.1	5.8
1,2-dichloropropane	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichlorobenzene	600	5	600	NS	5	600	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,4-dichlorobenzene	75	5	75	NS	5	75	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-butanone	NS	2	300	NS	2	300	ug/l	5.2 J	4.2 J	< 8 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	< 4 U	< 4 U	< 8 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
4-methyl-2-pentanone	NS	NS	NS	NS	NS	NS	ug/l	< 3.2 U	< 3.2 U	< 6.4 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Acetone	NS	10	6000	NS	10	6000	ug/l	8.9 J	< 6.4 UB	< 13 U	< 6.4 U	< 6.4 UB	< 6.4 U	< 6.4 U	< 6.4 UB	< 6.4 U	< 6.4 U	< 6.4 UB	< 6.4 U
Benzene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.2 U	< 0.2 U	< 0.4 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Bromodichloromethane	80	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromoform	80	0.8	4	NS	0.8	4	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromomethane	NS	1	10	NS	1	10	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Carbon disulfide	NS	1	700	NS	1	700	ug/l	< 1.6 U	< 1.6 U	< 3.2 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	0.55 J
Carbon tetrachloride	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chlorobenzene	100	1	50	NS	1	50	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 3.2 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Chloroform	80	1	70	NS	1	70	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
cis-1,2-dichloroethene	70	1	70	2	2	70	ug/l	**340 J**	**410**	**570 D**	1.7	2.4	3.8	< 0.4 U	< 0.4 U	0.17 J	5.6 J	7.1	5.8
cis-1,3-dichloropropene	NS	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromochloromethane	80	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2016 Through August 2016

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria (Shallow)	Site Screening Criteria (Intermediate)	Unit	Intermediate Wells MAG-112P (02/24/2016)	MAG-112P (05/04/2016)	MAG-112P (08/11/2016)	MAG-204 (02/24/2016)	MAG-204 (05/04/2016)	MAG-204 (08/12/2016)	MAG-104B * (02/24/2016)	MAG-104B * (05/04/2016)	MAG-104B * (08/12/2016)	MAG-207 * (02/24/2016)	MAG-207 * (05/04/2016)	MAG-207 * (08/12/2016)
Dichlorodifluoromethane	NS	2	1000	NS	2	1000	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Ethylbenzene	700	2	700	NS	2	700	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Hexachloro-1,3-butadiene	NS	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Isopropylbenzene	NS	1	700	NS	1	700	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methyl tert-butyl ether	NS	1	70	NS	1	70	ug/l	0.74 J	0.56 J	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methylene Chloride	5	1	3	NS	1	3	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U
Naphthalene	NS	2	300	NS	2	300	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 UJ	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Styrene	100	2	100	NS	2	100	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 UJ	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Toluene	1000	1	600	NS	1	600	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Total Carbon	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	1	100	ug/l	1.4 J	1.9	2.5 D	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
trans-1,3-dichloropropene	NS	1	1	NS	1	1	ug/l	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Trichloroethene	5	1	1	1	1	1	ug/l	**29 J**	**52**	**270 D**	**3.5**	**4.7**	**11**	< 0.4 U	< 0.4 U	< 0.4 U	0.19 J	0.26 J	0.23 J
Trichlorofluoromethane	NS	1	2000	NS	1	2000	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Vinyl chloride	2	1	1	2	2	1	ug/l	**11 J**	**9.5**	**5.6 D**	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Xylenes, Total	10000	2	1000	NS	2	1000	ug/l	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U

Notes:
* Sentinel Well. Data from these wells are screened against the PQLs (shallow wells) or NJ Class II Criteria (intermediate).
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
deg C = Degrees Celsius
mg/L = Milligrams per Liter
mV = Millivolts
ntu = Nephelometric turbidity units
µg/l = Micrograms per Liter
µS/cm = microSiemens per centimeter
NA = Not Analyzed or Data Not Available
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2017 Through May 2017

								Shallow													
Parameter	**EPA MCLs**	**NJ PQLs**	**NJ Class II Drinking Water**	**Applicable Criteria from Decision Document**	**Site Screening Criteria (Shallow)**	**Site Screening Criteria (Intermediate)**	**Unit**	**MAG-04 (02/10/2017)**	**MAG-04 (05/23/2017)**	**MAG-107A (02/10/2017)**	**MAG-107A (05/23/2017)**	**MAG-65 (02/10/2017)**	**MAG-65 (05/23/2017)**	**MAG-65-FD (02/10/2017)**	**MAG-65-FD (05/23/2017)**	**MAG-66 (02/10/2017)**	**MAG-66 (05/23/2017)**	**MAG-KW3 * (02/10/2017)**	**MAG-KW3 * (05/23/2017)**	**MAG-KW6 (02/10/2017)**	**MAG-KW6 (05/23/2017)**
Field Measurement Parameters																					
Dissolved Oxygen	NS	NS	NS	NS	NS	NS	mg/l	0.18	0.74	0.15	0.64	3.72	1.04	NA	NA	0.16	0.31	4.85	6.5	0.56	2.55
Oxidation reduction potential	NS	NS	NS	NS	NS	NS	mV	-37.4	-32.3	-34.6	-65.1	13.4	122.4	NA	NA	-57.5	-145.9	20.1	347.7	-67.5	-40.7
pH	8.5	NS	8.5	NS	NS	NS	pH units	4.71	4.83	6.85	6.8	4.3	4.26	NA	NA	9.62	9.04	4	4.04	6.17	6.14
Specific conductivity	NS	NS	NS	NS	NS	NS	uS/cm	990	860	1010	1080	426	405	NA	NA	3190	2180	158	98	613	570
Temperature	NS	NS	NS	NS	NS	NS	deg C	11.2	11.6	11.9	11.7	12.3	12.2	NA	NA	12.4	11.6	11.6	11	10.5	11.1
Turbidity	NS	NS	NS	NS	NS	NS	ntu	5.14	0.61	15.8	4.2	5.22	2.39	NA	NA	1.99	0.22	7.46	0.68	2.71	0.16
Carbon Dioxide (S49)																					
Carbon dioxide	NS	NS	NS	NS	NS	NS	mg/l	620 D	680 D	63	110 M	76	130 M	79	120 M	< 4.5 U	< 4.5 U	71	40 M	230	300 M
Sulfate (E306)																					
Sulfate	250	5	250	NS	NS	NS	mg/l	6.1	< 0.5 UM	16	28 M	19	19	20	19	7.4 J	< 10 UM	41	22	9 J	< 10 UM
Nitrate (E300)																					
Nitrate	10	0.1	10	NS	NS	NS	mg/l	< 0.5 UB	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 0.1 U	< 2 U	< 2 U	< 0.1 U	0.057 J	< 2 U	< 2 U
Alkalinity (SM2320)																					
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	170	210	520	560	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	970	930 B	< 3.2 U	< 3.2 U	270	270
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	690	130	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	170	210	520	560	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	1700	1100 B	< 3.2 U	< 3.2 U	270	270
Total Organic Carbon (SM5310C)																					
Total Organic Carbon	NS	NS	NS	NS	NS	NS	mg/l	450	370	25	23	1.3	0.95 J	1.3	0.97 J	200	190	2.2	1.3	26	32
Ethane, Ethene, Methane (RSK-175)																					
Ethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	NS	NS	NS	NS	NS	NS	ug/l	6400 D	8300 D	5400 D	10000 D	2	4.7	0.91 J	4.5	14000 D	14000 D	< 0.73 U	0.28 JM	8700 D	13000 D
Acids																					
Acetic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Formic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Propionic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (SW6010C)																					
Iron	NS	20	300	NS	Background ratio	Background ratio	ug/l	770	800	590	4000	48 J	330	51 J	340	900	1300	3300	24 J	1200	860
VOCs (SW8260C)																					
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	1	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,1-trichloroethane	200	1	30	NS	1	30	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	1	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,2-trichloroethane	5	2	3	NS	2	3	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethane	NS	1	50	NS	1	50	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethene	7	1	1	NS	1	1	ug/l	0.86 J	1	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	0.32 J	0.34 J	< 0.8 U	< 0.8 U	0.52 J	0.63 J
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	0.03	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trichlorobenzene	70	1	9	NS	1	9	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	0.02	ug/l	< 3.2 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 3.2 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	0.03	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichlorobenzene	600	5	600	NS	5	600	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	410	390	3.2	5.9	1.7	3.3	1.8	3.1	300	320	< 0.2 U	< 0.2 U	210	250
1,2-dichloropropane	5	1	1	NS	1	1	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichlorobenzene	600	5	600	NS	5	600	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,4-dichlorobenzene	75	5	75	NS	5	75	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-butanone	NS	2	300	NS	2	300	ug/l	< 8 U	67	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 8 U	11	< 4 U	< 4 U	< 4 U	< 4 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	< 8 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 8 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2017 Through May 2017

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria (Shallow)	Site Screening Criteria (Intermediate)	Unit	Shallow													
								MAG-04 (02/10/2017)	MAG-04 (05/23/2017)	MAG-107A (02/10/2017)	MAG-107A (05/23/2017)	MAG-65 (02/10/2017)	MAG-65 (05/23/2017)	MAG-65-FD (02/10/2017)	MAG-65-FD (05/23/2017)	MAG-66 (02/10/2017)	MAG-66 (05/23/2017)	MAG-KW3 * (02/10/2017)	MAG-KW3 * (05/23/2017)	MAG-KW6 (02/10/2017)	MAG-KW6 (05/23/2017)
4-methyl-2-pentanone	NS	NS	NS	NS	NS	NS	ug/l	< 6.4 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 6.4 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Acetone	NS	10	6000	NS	10	6000	ug/l	< 30 UB	**29**	< 10 UB	4.3 J	< 6.4 U	< 6.4 U	< 6.4 U	< 6.4 U	< 20 UB	**20**	< 6.4 U	2.2 J	< 19 UB	**16**
Benzene	5	1	1	NS	1	1	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	0.16 J	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.4 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Bromodichloromethane	80	1	1	NS	1	1	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromoform	80	0.8	4	NS	0.8	4	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromomethane	NS	1	10	NS	1	10	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Carbon disulfide	NS	1	700	NS	1	700	ug/l	< 3.2 U	0.76 J	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 3.2 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Carbon tetrachloride	5	1	1	NS	1	1	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chlorobenzene	100	1	50	NS	1	50	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 3.2 U	< 1.6 U	< 1.6 U	0.5 J	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 3.2 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Chloroform	80	1	70	NS	1	70	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
cis-1,2-dichloroethene	70	1	70	2	2	70	ug/l	**380 D**	**390 D**	**3.2**	**5.9**	1.7	**3.3**	1.8	**3.1**	**280 D**	**320 D**	< 0.4 U	< 0.4 U	**210**	**250 D**
cis-1,3-dichloropropene	NS	1	1	NS	1	1	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromochloromethane	80	1	1	NS	1	1	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dichlorodifluoromethane	NS	2	1000	NS	2	1000	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Ethylbenzene	700	2	700	NS	2	700	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Hexachloro-1,3-butadiene	NS	1	1	NS	1	1	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Isopropylbenzene	NS	1	700	NS	1	700	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methyl tert-butyl ether	NS	1	70	NS	1	70	ug/l	< 1.6 U	**3.7 J**	< 0.8 U	< 0.8 U	**3.1 J**	**7.1**	**3 J**	**6.8**	< 1.6 U	0.33 J	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methylene Chloride	5	1	3	NS	1	3	ug/l	< 10 UB	< 0.8 U	< 5 UB	< 0.8 U	< 5 UB	< 0.8 U	< 5 UB	< 0.8 U	< 10 UB	< 0.8 U	< 5 UB	< 0.8 U	< 5 UB	< 0.8 U
Naphthalene	NS	2	300	NS	2	300	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Styrene	100	2	100	NS	2	100	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Toluene	1000	1	600	NS	1	600	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	0.18 J	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Total Carbon	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	1	100	ug/l	**2.3 D**	**2.5 JD**	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	0.33 J	< 4 U	< 0.4 U	< 0.4 U	**2.8**	**3.3 JD**
trans-1,3-dichloropropene	NS	1	1	NS	1	1	ug/l	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Trichloroethene	5	1	1	1	1	1	ug/l	**110 D**	**110 D**	< 0.4 U	< 0.4 U	**27**	**74 D**	**28**	**72 D**	**2.6 D**	**1.6**	< 0.4 U	< 0.4 U	0.2 J	0.35 J
Trichlorofluoromethane	NS	1	2000	NS	1	2000	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Vinyl chloride	2	1	1	2	2	1	ug/l	**5.8 D**	**5.3**	**5.4**	**7.2**	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	**65 D**	**82 D**	< 0.2 U	< 0.2 U	0.3 J	0.33 J
Xylenes, Total	10000	2	1000	NS	2	1000	ug/l	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U

Notes:
* Sentinel Well. Data from these wells are screened against the PQLs (shallow wells) or NJ Class II Criteria (intermediate).
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
deg C = Degrees Celsius
mg/L = Milligrams per Liter
mV = Millivolts
ntu = Nephelometric turbidity units
µg/l = Micrograms per Liter
µS/cm = microSiemens per centimeter
NA = Not Analyzed or Data Not Available
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2017 Through May 2017

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Applicable Criteria from Decision Document	Site Screening Criteria (Shallow)	Site Screening Criteria (Intermediate)	Unit	Intermediate							
								MAG-112P (02/10/2017)	MAG-112P (05/23/2017)	MAG-204 (02/10/2017)	MAG-204 (05/23/2017)	MAG-104B * (02/10/2017)	MAG-104B * (05/23/2017)	MAG-207 * (02/10/2017)	MAG-207 * (05/23/2017)
Field Measurement Parameters															
Dissolved Oxygen	NS	NS	NS	NS	NS	NS	mg/l	0.13	0.09	1.36	3.06	1.58	2.45	1.25	2.18
Oxidation reduction potential	NS	NS	NS	NS	NS	NS	mV	-80	-184.8	3	419.4	13.4	443	22.9	242.7
pH	8.5	NS	8.5	NS	NS	NS	pH units	8.68	9.33	4.43	3.74	3.81	3.51	3.38	4.28
Specific conductivity	NS	NS	NS	NS	NS	NS	uS/cm	820	990	300	382	900	810	309	239
Temperature	NS	NS	NS	NS	NS	NS	deg C	12	12.4	11.7	12	11.8	12.3	11.2	11.8
Turbidity	NS	NS	NS	NS	NS	NS	ntu	16.3	0.3	5.57	4.1	1.27	0.12	1.93	0.11
Carbon Dioxide (S49)															
Carbon dioxide	NS	NS	NS	NS	NS	NS	mg/l	< 4.5 U	< 4.5 U	73	57 M	37	43 M	56	63 M
Sulfate (E306)															
Sulfate	250	5	250	NS	NS	NS	mg/l	19 J	< 10 UM	27	46	37 J	41 J	32	54
Nitrate (E300)															
Nitrate	10	0.1	10	NS	NS	NS	mg/l	< 2 U	< 2 U	< 0.5 UB	< 0.1 U	< 0.5 U	< 0.1 U	< 0.5 UB	0.047 J
Alkalinity (SM2320)															
Alkalinity, bicarbonate (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	270	370	< 5 UB	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Alkalinity, carbonate (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	84	100	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Alkalinity, hydroxide (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Alkalinity, total (as CaCO3)	NS	NS	NS	NS	NS	NS	mg/l	350	470	< 5 UB	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Total Organic Carbon (SM5310C)															
Total Organic Carbon	NS	NS	NS	NS	NS	NS	mg/l	14	35	1.4	1.7	< 1.1 UB	0.88 J	< 1 UB	1
Ethane, Ethene, Methane (RSK-175)															
Ethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA
Methane	NS	NS	NS	NS	NS	NS	ug/l	1400 D	3300 D	70	34	0.26 J	0.55 JM	4.3	22
Acids															
Acetic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA
Butyric Acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA
Formic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA
Lactic Acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA
Propionic acid	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA
Iron (SW6010C)															
Iron	NS	20	300	NS	Background ratio	Background ratio	ug/l	3500	1100	7000	2900	14000 J	350	590	8000
VOCs (SW8260C)															
1,1,1,2-tetrachloroethane	NS	1	1	NS	1	1	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,1-trichloroethane	200	1	30	NS	1	30	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,1,2,2-tetrachloroethane	NS	1	1	NS	1	1	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1,2-trichloroethane	5	2	3	NS	2	3	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethane	NS	1	50	NS	1	50	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,1-dichloroethene	7	1	1	NS	1	1	ug/l	**1.2 J**	1 JD	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	0.16 J
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,3-trichloropropane	NS	0.03	0.03	NS	0.03	0.03	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trichlorobenzene	70	1	9	NS	1	9	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	NS	0.02	0.02	ug/l	< 3.2 U	< 3.2 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
1,2-dibromoethane	0.05	0.03	0.03	NS	0.03	0.03	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichlorobenzene	600	5	600	NS	5	600	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,2-dichloroethane	5	2	2	NS	2	2	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	0.29 J
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	490	520	1.7	1.3	< 0.2 U	< 0.2 U	26	31
1,2-dichloropropane	5	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichlorobenzene	600	5	600	NS	5	600	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
1,4-dichlorobenzene	75	5	75	NS	5	75	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-butanone	NS	2	300	NS	2	300	ug/l	< 8 U	< 8 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	< 8 U	< 8 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U	< 4 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U

Area SS007
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
February 2017 Through May 2017

								Intermediate							
Parameter	**EPA MCLs**	**NJ PQLs**	**NJ Class II Drinking Water**	**Applicable Criteria from Decision Document**	**Site Screening Criteria (Shallow)**	**Site Screening Criteria (Intermediate)**	**Unit**	**MAG-112P (02/10/2017)**	**MAG-112P (05/23/2017)**	**MAG-204 (02/10/2017)**	**MAG-204 (05/23/2017)**	**MAG-104B * (02/10/2017)**	**MAG-104B * (05/23/2017)**	**MAG-207 * (02/10/2017)**	**MAG-207 * (05/23/2017)**
4-methyl-2-pentanone	NS	NS	NS	NS	NS	NS	ug/l	< 6.4 U	< 6.4 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U	< 3.2 U
Acetone	NS	10	6000	NS	10	6000	ug/l	< 13 U	< 13 U	< 6.4 U	< 6.4 U	< 6.4 U	< 6.4 U	< 6.4 U	< 6.4 U
Benzene	5	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	0.18 J	0.31 J
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.4 U	< 0.4 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U
Bromodichloromethane	80	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromoform	80	0.8	4	NS	0.8	4	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Bromomethane	NS	1	10	NS	1	10	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Carbon disulfide	NS	1	700	NS	1	700	ug/l	< 3.2 U	< 3.2 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Carbon tetrachloride	5	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chlorobenzene	100	1	50	NS	1	50	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 3.2 U	< 3.2 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U	< 1.6 U
Chloroform	80	1	70	NS	1	70	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Chloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
cis-1,2-dichloroethene	70	1	70	2	2	70	ug/l	**460 D**	**520 D**	1.7	1.3	< 0.4 U	< 0.4 U	25	30
cis-1,3-dichloropropene	NS	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromochloromethane	80	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Dichlorodifluoromethane	NS	2	1000	NS	2	1000	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Ethylbenzene	700	2	700	NS	2	700	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Hexachloro-1,3-butadiene	NS	1	1	NS	1	1	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Isopropylbenzene	NS	1	700	NS	1	700	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methyl tert-butyl ether	NS	1	70	NS	1	70	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Methylene Chloride	5	1	3	NS	1	3	ug/l	< 10 UB	< 1.6 U	< 5 UB	< 0.8 U	< 5 UB	< 0.8 U	< 5 UB	< 0.8 U
Naphthalene	NS	2	300	NS	2	300	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Styrene	100	2	100	NS	2	100	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Tetrachloroethene	5	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Toluene	1000	1	600	NS	1	600	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Total Carbon	NS	NS	NS	NS	NS	NS	mg/l	NA	NA	NA	NA	NA	NA	NA	NA
Total VOCs	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-dichloroethene	100	1	100	NS	1	100	ug/l	1.7 J	< 8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	0.56 J	0.69 J
trans-1,3-dichloropropene	NS	1	1	NS	1	1	ug/l	< 0.8 U	< 0.8 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U	< 0.4 U
Trichloroethene	5	1	1	1	1	1	ug/l	**200 D**	**47 D**	**8.6**	**7.2**	< 0.4 U	< 0.4 U	**1.9**	**6.1**
Trichlorofluoromethane	NS	1	2000	NS	1	2000	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U
Vinyl chloride	2	1	1	2	2	1	ug/l	**4 D**	**5.5 D**	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	< 0.2 U	0.38 J
Xylenes, Total	10000	2	1000	NS	2	1000	ug/l	< 1.6 U	< 1.6 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U	< 0.8 U

Notes:
* Sentinel Well. Data from these wells are screened against the PQLs (shallow wells) or NJ Class II Criteria (intermediate).
EPA MCL = U.S. Environmental Protection Agency Maximum Contaminant Level
NJ PQL = New Jersey Practical Quantitation Level
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
deg C = Degrees Celsius
mg/L = Milligrams per Liter
mV = Millivolts
ntu = Nephelometric turbidity units
µg/l = Micrograms per Liter
µS/cm = microSiemens per centimeter
NA = Not Analyzed or Data Not Available
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS007
Summary of Sediment Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
March 2013

Parameter	NJDEP Ecological Screening Levels	Ft Dix Background Sediment	Applicable Criteria from Decision Document	Site Screening Criteria	Unit	SE-200	SE-202	SE-205	SE-206	SE-209
Metals (SW6010C)										
Lead	31	14.2	46.7	46.7	mg/kg	26.5	17.6	**80**	**95.3**	**97.8**
Arsenic	6	2.06	8.2	8.2	mg/kg	2.8	4.4	7.4	6.1	**21.8**
Pesticides (SW8010B)										
Dieldrin	0.002	0.0063	0.0063	0.0063	mg/kg	ND	ND	ND	ND	ND
4,4-DDD	0.008	0.09	0.09	0.09	mg/kg	0.013	ND	0.028	0.043	ND
4,4-DDE	0.005	0.0077	0.0077	0.0077	mg/kg	**0.059**	0.0072	**0.016**	**0.038**	**0.015**
4,4-DDT	0.008	0.0071	0.0071	0.0071	mg/kg	**0.019**	ND	ND	**0.0072**	ND

Notes:
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
mg/kg = Milligrams per Kilogram
NA = Not Analyzed
NS = No Screening Criteria
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

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Area SS025
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2015

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Site Screening Criteria	Unit	ARD-77 (02/22/2013)	ARDC-77 (11/20/2013)	ARDC-77 (05/22/2014)	ARD-77-1214 (12/16/2014)	ARD-77 (04/30/2015)
VOCs (SW8260B)										
1,1,1,2-tetrachloroethane	NS	1	1	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U
1,1,1-trichloroethane	200	1	30	1	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
1,1,2,2-tetrachloroethane	NS	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	ug/l	NA	< 2.5 U	NA	< 2 U	< 2 U
1,1,2-trichloroethane	5	2	3	2	ug/l	NA	< 1.5 U	< 1.5 U	< 0.5 U	< 0.5 U
1,1-dichloroethane	NS	1	50	1	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
1,1-dichloroethene	7	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-dichloropropene	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	ug/l	NA	< 2.5 U	NA	< 1 U	< 1 U
1,2,3-trichloropropane	NS	0.03	0.03	0.03	ug/l	NA	NA	NA	< 1 U	< 1 U
1,2,4-trichlorobenzene	70	1	9	1	ug/l	NA	< 2.5 U	NA	< 1 U	< 1 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U
1,2-Dibromo-3-chloropropane	0.2	0.02	0.02	0.02	ug/l	NA	< 2.5 U	NA	< 2 U	< 2 U
1,2-dibromoethane	0.05	0.03	0.03	0.03	ug/l	NA	< 2 U	NA	< 0.5 U	< 0.5 U
1,2-dichlorobenzene	600	5	600	5	ug/l	NA	< 2.5 U	< 2.5 U	< 1 U	< 1 U
1,2-dichloroethane	5	2	2	2	ug/l	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-dichloropropane	5	1	1	1	ug/l	NA	< 1 U	< 1 U	< 0.5 U	< 0.5 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U
1,3-dichlorobenzene	600	5	600	5	ug/l	NA	< 2.5 U	< 2.5 U	< 1 U	< 1 U
1,3-dichloropropane	NS	NS	NS	NS	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U
1,4-dichlorobenzene	75	5	75	5	ug/l	NA	< 2.5 U	< 2.5 U	< 1 U	< 1 U
1,4-dioxane	NS	NS	NS	NS	ug/l	NA	< 250 U	NA	< 70 U	< 70 U
2,2-dichloropropane	NS	NS	NS	NS	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U
2-butanone	NS	2	300	2	ug/l	NA	< 5 U	NA	< 3 U	< 3 U
2-chlorotoluene	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U
2-hexanone	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	< 3 U	< 3 U
4-chlorotoluene	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U
4-Isopropyltoluene	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U
4-methyl-2-pentanone	NS	NS	NS	NS	ug/l	NA	< 5 U	NA	< 3 U	< 3 U
Acetone	NS	10	6000	10	ug/l	NA	< 5 U	NA	< 6 U	< 6 U
Benzene	5	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromobenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U
Bromochloromethane	NS	NS	NS	NS	ug/l	NA	< 2.5 U	NA	< 1 U	< 1 U
Bromodichloromethane	80	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	80	0.8	4	0.8	ug/l	NA	< 2 U	< 2 U	< 0.5 U	< 0.5 U
Bromomethane	NS	1	10	1	ug/l	0.41 BJ	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
Butyl alcohol, tert-	NS	2	100	2	ug/l	NA	NA	NA	< 5 U	< 5 U
Carbon disulfide	NS	1	700	1	ug/l	NA	< 5 U	NA	< 1 U	< 1 U
Carbon tetrachloride	5	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	100	1	50	1	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
Chloroethane	NS	NS	NS	NS	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
Chloroform	80	1	70	1	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
Chloromethane	NS	NS	NS	NS	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
cis-1,2-dichloroethene	70	1	70	1	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U

Area SS025
Summary of Groundwater Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2015

Parameter	EPA MCLs	NJ PQLs	NJ Class II Drinking Water	Site Screening Criteria	Unit	ARD-77 (02/22/2013)	ARDC-77 (11/20/2013)	ARDC-77 (05/22/2014)	ARD-77-1214 (12/16/2014)	ARD-77 (04/30/2015)
cis-1,3-dichloropropene	NS	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Cyclohexane	NS	NS	NS	NS	ug/l	NA	< 10 U	NA	< 2 U	< 2 U
Dibromochloromethane	80	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	NS	NS	NS	NS	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	NS	2	1000	2	ug/l	NA	< 5 U	NA	< 0.5 U	< 0.5 U
Dichloropropene	NS	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	NA	NA
Ethylbenzene	700	2	700	2	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
Hexachloro-1,3-butadiene	NS	1	1	1	ug/l	NA	NA	NA	< 2 U	< 2 U
Isopropylbenzene	NS	1	700	1	ug/l	NA	< 2.5 U	NA	< 1 U	< 1 U
m,p-Xylene	10000	NS	NS	NS	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
Methyl acetate	NS	0.5	7000	0.5	ug/l	NA	< 2 U	NA	< 1 U	< 1 U
Methyl tert-butyl ether	NS	1	70	1	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
Methylcyclohexane	NS	NS	NS	NS	ug/l	NA	< 10 U	NA	< 1 U	< 1 U
Methylene Chloride	5	1	3	1	ug/l	NA	< 2.5 U	< 2.5 U	< 2 U	< 2 U
Naphthalene	NS	2	300	2	ug/l	NA	NA	NA	< 1 U	< 1 U
n-Butylbenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U
N-propylbenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U
o-Xylene	10000	NS	NS	NS	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
Sec-butylbenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U
Styrene	100	2	100	2	ug/l	NA	< 2.5 U	NA	< 1 U	< 1 U
Tert-butylbenzene	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U
Tetrachloroethene	5	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	1000	1	600	1	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
trans-1,2-dichloroethene	100	1	100	1	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
trans-1,3-dichloropropene	NS	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichloroethene	5	1	1	1	ug/l	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichlorofluoromethane	NS	1	2000	1	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
Vinyl chloride	2	1	1	1	ug/l	NA	< 1 U	< 1 U	< 0.5 U	< 0.5 U
Xylenes, Total	10000	2	1000	2	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U

Notes:
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
ug/l = Micrograms per Liter
NA = Not Analyzed or Data Not Provided
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS025
Summary of Sediment Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2015

Parameter	NJDEP Ecological Screening Level	Site Screening Criteria	Unit	ARDC-SE200 (02/22/2013)	ARDC-SE200 (11/20/2013)	DUP-SED (ARDC-SE200) (11/20/2013)	ARDC-SE200 (05/22/2014)	ARDC-SE200-1214 (12/16/2014)	ARDC-SE200 (04/30/2015)	ARDC-SE200 (11/02/2015)	ARDC-SE201 (02/22/2013)	ARDC-SE201 (11/20/2013)	ARDC-SE201 (05/22/2014)	ARDC-SE201-1214 (12/16/2014)	DUP-SE1-1214 (SE201) (12/16/2014)	ARDC-SE201 (04/30/2015)	ARDC-SE201 (DUP) (04/30/2015)	ARDC-SE201 (11/02/2015)
VOCs (SW8260C)																		
1,1,1,2-tetrachloroethane	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,1,1-trichloroethane	213	213	ug/kg	NA	< 0.85 U	< 2.8 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,1,2,2-tetrachloroethane	850	850	ug/kg	NA	< 0.85 U	< 2.8 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	ug/kg	NA	< 17 U	< 56 U	< 17 U	< 15 U	< 2 U	NA	NA	< 70 U	< 70 U	< 13 U	< 14 U	< 2 U	< 2 U	NA
1,1,2-trichloroethane	NS	NS	ug/kg	NA	< 1.3 U	< 4.2 U	< 1.3 U	< 7 U	< 1 U	< 5.9 U	NA	< 5.2 U	< 5.2 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,1-dichloroethane	NS	NS	ug/kg	NA	< 1.3 U	< 4.2 U	< 1.3 U	< 7 U	< 1 U	< 5.9 U	NA	< 5.2 U	< 5.2 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,1-dichloroethene	19.4	19.4	ug/kg	NA	< 0.85 U	< 2.8 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,1-dichloropropene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,2,3-trichlorobenzene	NS	NS	ug/kg	NA	< 4.2 U	< 14 U	< 4.2 U	< 7 U	< 1 U	< 5.9 U	NA	< 18 U	< 18 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,2,3-trichloropropane	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,2,4-trichlorobenzene	5062	5062	ug/kg	NA	< 4.2 U	< 14 U	< 4.2 U	< 7 U	< 1 U	< 5.9 U	NA	< 18 U	< 18 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,2,4-trimethylbenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,2-Dibromo-3-chloropropane	NS	NS	ug/kg	NA	< 4.2 U	< 14 U	< 4.2 U	< 15 U	< 2 U	< 12 U	NA	< 18 U	< 18 U	< 13 U	< 14 U	< 2 U	< 2 U	< 160 U
1,2-dibromoethane	NS	NS	ug/kg	NA	< 3.4 U	< 11 U	< 3.4 U	< 7 U	< 1 U	< 5.9 U	NA	< 14 U	< 14 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,2-dichlorobenzene	294	294	ug/kg	NA	< 4.2 U	< 14 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 18 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,2-dichloroethane	260	260	ug/kg	NA	< 0.85 U	< 2.8 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,2-dichloroethene	NS	NS	ug/kg	NA	NA	NA	NA	NA	NA	< 5.9 U	NA	NA	NA	NA	NA	NA	NA	< 80 U
1,2-dichloropropane	333	333	ug/kg	NA	< 3 U	< 9.7 U	< 3 U	< 7 U	< 1 U	< 5.9 U	NA	< 12 U	< 12 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,3,5-trimethylbenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,3-dichlorobenzene	1315	1315	ug/kg	NA	< 4.2 U	< 14 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 18 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,3-dichloropropane	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,4-dichlorobenzene	318	318	ug/kg	NA	< 4.2 U	< 14 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 18 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
1,4-dioxane	NS	NS	ug/kg	NA	< 85 U	< 280 U	< 85 U	< 520 U	< 85 U	NA	NA	< 350 U	< 350 U	< 440 U	< 480 U	< 84 U	< 84 U	NA
2,2-dichloropropane	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
2-butanone	NS	NS	ug/kg	NA	< 8.5 U	9.1 J	< 8.5 U	< 30 U	< 5 U	< 24 U	3500 J	< 35 U	< 35 U	< 25 U	< 27 U	< 5 U	< 5 U	< 320 U
2-chlorotoluene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
2-hexanone	NS	NS	ug/kg	NA	< 8.5 U	< 28 U	< 8.5 U	< 22 U	< 4 U	< 24 U	NA	< 35 U	< 35 U	< 19 U	< 21 U	< 4 U	< 4 U	< 320 U
4-chlorotoluene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
4-Isopropyltoluene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
4-methyl-2-pentanone	NS	NS	ug/kg	NA	< 8.5 U	< 28 U	< 8.5 U	< 22 U	< 4 U	< 24 U	NA	< 35 U	< 35 U	< 19 U	< 21 U	< 4 U	< 4 U	< 320 U
Acetone	NS	NS	ug/kg	7700	11 J	300	11 J	< 52 U	53	< 24 U	15000	29 J	29 J	< 44 U	< 48 U	21 J	34 J	< 320 U
Benzene	142	142	ug/kg	NA	< 0.85 U	< 2.8 U	NA	< 4 U	< 0.6 U	< 5.9 U	NA	< 3.5 U	NA	< 3 U	< 3 U	< 0.6 U	< 0.6 U	< 80 U
Bromobenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Bromochloromethane	NS	NS	ug/kg	NA	< 4.2 U	< 14 U	< 4.2 U	< 7 U	< 1 U	< 5.9 U	NA	< 18 U	< 18 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Bromodichloromethane	NS	NS	ug/kg	NA	< 0.85 U	< 2.8 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Bromoform	492	492	ug/kg	NA	< 3.4 U	< 11 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 14 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Bromomethane	1.37	1.37	ug/kg	NA	< 1.7 U	< 5.6 U	NA	< 15 U	< 2 U	< 12 U	NA	< 7 U	NA	< 13 U	< 14 U	< 2 U	< 2 U	< 160 U
Butyl alcohol, tert-	NS	NS	ug/kg	NA	NA	NA	NA	< 150 U	< 24 U	NA	NA	NA	NA	< 130 U	< 140 U	< 24 U	< 24 U	NA
Carbon disulfide	NS	NS	ug/kg	NA	< 8.5 U	< 28 U	< 8.5 U	< 7 U	21	< 5.9 U	NA	< 35 U	< 35 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Carbon tetrachloride	1450	1450	ug/kg	NA	< 0.85 U	< 2.8 U	< 0.85 U	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	< 3.5 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Chlorobenzene	291	291	ug/kg	NA	< 0.85 U	< 2.8 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Chloroethane	NS	NS	ug/kg	NA	< 1.7 U	< 5.6 U	NA	< 15 U	< 2 U	< 12 U	NA	< 7 U	NA	< 13 U	< 14 U	< 2 U	< 2 U	< 160 U
Chloroform	121	121	ug/kg	NA	< 1.3 U	< 4.2 U	< 1.3 U	< 7 U	< 1 U	< 12 U	NA	< 5.2 U	< 5.2 U	< 6 U	< 7 U	< 1 U	< 1 U	< 160 U
Chloromethane	NS	NS	ug/kg	NA	< 4.2 U	< 14 U	NA	< 15 U	< 2 U	< 12 U	NA	< 18 U	NA	< 13 U	< 14 U	< 2 U	< 2 U	< 160 U
cis-1,2-dichloroethene	NS	NS	ug/kg	NA	< 0.85 U	< 2.8 U	< 1.4 U	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	< 1.5 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
cis-1,3-dichloropropene	NS	NS	ug/kg	NA	< 0.85 U	< 2.8 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Cyclohexane	NS	NS	ug/kg	NA	< 17 U	< 56 U	< 17 U	< 7 U	< 1 U	NA	NA	< 70 U	< 70 U	< 6 U	< 7 U	< 1 U	< 1 U	NA
Dibromochloromethane	NS	NS	ug/kg	NA	< 0.85 U	< 2.8 U	< 0.85 U	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	< 3.5 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Dibromomethane	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Dichlorodifluoromethane	NS	NS	ug/kg	NA	< 8.5 U	< 28 U	< 8.5 U	< 15 U	< 2 U	< 12 U	NA	< 35 U	< 35 U	< 13 U	< 14 U	< 2 U	< 2 U	< 160 U

Area SS025
Summary of Sediment Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2015

Parameter	NJDEP Ecological Screening Level	Site Screening Criteria	Unit	ARDC-SE200 (02/22/2013)	ARDC-SE200 (11/20/2013)	DUP-SED (ARDC-SE200) (11/20/2013)	ARDC-SE200 (05/22/2014)	ARDC-SE200-1214 (12/16/2014)	ARDC-SE200 (04/30/2015)	ARDC-SE200 (11/02/2015)	ARDC-SE201 (02/22/2013)	ARDC-SE201 (11/20/2013)	ARDC-SE201 (05/22/2014)	ARDC-SE201-1214 (12/16/2014)	DUP-SE1-1214 (SE201) (12/16/2014)	ARDC-SE201 (04/30/2015)	ARDC-SE201 (DUP) (04/30/2015)	ARDC-SE201 (11/02/2015)
Dichloropropene	NS	NS	ug/kg	NA	< 0.85 U	< 2.8 U	NA	NA	NA	NA	NA	< 3.5 U	NA	NA	NA	NA	NA	NA
Ethylbenzene	175	175	ug/kg	NA	< 0.85 U	< 2.8 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Hexachloro-1,3-butadiene	26.5	26.5	ug/kg	NA	NA	NA	NA	< 15 U	< 2 U	< 5.9 U	NA	NA	NA	< 13 U	< 14 U	< 2 U	< 2 U	< 80 U
Isopropylbenzene	NS	NS	ug/kg	NA	< 0.85 U	< 2.8 U	< 0.85 U	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	< 3.5 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
m,p-Xylene	NS	NS	ug/kg	NA	< 1.7 U	< 5.6 U	NA	< 7 U	< 1 U	< 3.8 U	NA	< 7 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 51 U
Methyl acetate	NS	NS	ug/kg	NA	< 3.4 U	< 11 U	< 3.4 U	< 15 U	< 2 U	NA	NA	< 14 U	< 14 U	23 J	< 14 U	< 2 UJ	6 J	NA
Methyl tert-butyl ether	NS	NS	ug/kg	NA	< 1.7 U	< 5.6 U	NA	< 4 U	< 0.6 U	< 24 U	NA	< 7 U	NA	< 3 U	< 3 U	< 0.6 U	< 0.6 U	< 320 U
Methylcyclohexane	NS	NS	ug/kg	NA	< 3.4 U	< 11 U	< 3.4 U	< 7 U	< 1 U	NA	NA	< 14 U	< 14 U	< 6 U	< 7 U	< 1 U	< 1 U	NA
Methylene Chloride	159	159	ug/kg	**24000**	< 4.2 U	< 14 U	< 4.2 U	< 15 U	< 2 U	< 5.9 U	**13000**	< 18 U	< 18 U	< 13 U	< 14 U	< 2 U	< 2 U	< 80 U
Naphthalene	176	176	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
n-Butylbenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
N-propylbenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
o-Xylene	NS	NS	ug/kg	NA	< 1.7 U	< 5.6 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 7 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Sec-butylbenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Styrene	254	254	ug/kg	NA	< 1.7 U	< 5.6 U	< 1.7 U	< 7 U	< 1 U	< 5.9 U	NA	< 7 U	< 7 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Tert-butylbenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 5.9 U	NA	NA	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Tetrachloroethene	990	990	ug/kg	NA	< 0.85 U	< 2.8 U	< 1.4 U	< 7 U	< 1 U	< 5.9 U	**2400 J**	< 3.5 U	< 1.5 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Toluene	1220	1220	ug/kg	1700 J	0.26 J	< 4.2 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 5.2 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
trans-1,2-dichloroethene	654	654	ug/kg	NA	< 1.3 U	< 4.2 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 5.2 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
trans-1,3-dichloropropene	NS	NS	ug/kg	NA	< 0.85 U	< 2.8 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 3.5 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Trichloroethene	112	112	ug/kg	**2400 J**	< 0.85 U	< 2.8 U	< 1.4 U	< 7 U	< 1 U	< 5.9 U	**2700 J**	< 3.5 U	< 1.5 U	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Trichlorofluoromethane	NS	NS	ug/kg	NA	< 4.2 U	< 14 U	NA	< 15 U	< 2 U	< 12 U	NA	< 18 U	NA	< 13 U	< 14 U	< 2 U	< 2 U	< 160 U
Vinyl chloride	202	202	ug/kg	NA	< 1.7 U	< 5.6 U	NA	< 7 U	< 1 U	< 5.9 U	NA	< 7 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	< 80 U
Xylenes, Total	433	433	ug/kg	NA	< 1.7 U	< 5.6 U	NA	< 7 U	< 1 U	NA	NA	< 7 U	NA	< 6 U	< 7 U	< 1 U	< 1 U	NA

Notes:
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
U = Parameter was not detected
mg/kg = Milligrams per Kilogram
ug/kg = Micrograms per Kilogram
NA = Not Analyzed or Data Not Provided
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS025
Summary of Sediment Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2015

Parameter	NJDEP Ecological Screening Level	Site Screening Criteria	Unit	ARDC-SE202 (02/22/2013)	ARDC-SE202 (11/20/2013)	ARDC-SE202 (05/22/2014)	DUP-SED202 (05/22/2014)	ARDC-SE202-1214 (12/16/2014)	ARDC-SE202 (04/30/2015)	ARDC-SE202 (11/02/2015)
VOCs (SW8260C)										
1,1,1,2-tetrachloroethane	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
1,1,1-trichloroethane	213	213	ug/kg	NA	< 1 U	NA	NA	< 7 U	< 1 U	< 10 U
1,1,2,2-tetrachloroethane	850	850	ug/kg	NA	< 1 U	NA	NA	< 7 U	< 1 U	< 10 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	ug/kg	NA	< 20 U	< 20 U	< 56 U	< 14 U	< 2 U	NA
1,1,2-trichloroethane	NS	NS	ug/kg	NA	< 1.5 U	< 1.5 U	< 4.2 U	< 7 U	< 1 U	< 10 U
1,1-dichloroethane	NS	NS	ug/kg	NA	< 1.5 U	< 1.5 U	< 4.2 U	< 7 U	< 1 U	< 10 U
1,1-dichloroethene	19.4	19.4	ug/kg	NA	< 1 U	NA	NA	< 7 U	< 1 U	< 10 U
1,1-dichloropropene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
1,2,3-trichlorobenzene	NS	NS	ug/kg	NA	< 5.1 U	< 5.1 U	< 14 U	< 7 U	< 1 U	< 10 U
1,2,3-trichloropropane	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
1,2,4-trichlorobenzene	5062	5062	ug/kg	NA	< 5.1 U	< 5.1 U	< 14 U	< 7 U	< 1 U	< 10 U
1,2,4-trimethylbenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
1,2-Dibromo-3-chloropropane	NS	NS	ug/kg	NA	< 5.1 U	< 5.1 U	< 14 U	< 14 U	< 2 U	< 20 U
1,2-dibromoethane	NS	NS	ug/kg	NA	< 4.1 U	< 4.1 U	< 11 U	< 7 U	< 1 U	< 10 U
1,2-dichlorobenzene	294	294	ug/kg	NA	< 5.1 U	NA	NA	< 7 U	< 1 U	< 10 U
1,2-dichloroethane	260	260	ug/kg	NA	< 1 U	NA	NA	< 7 U	< 1 U	< 10 U
1,2-dichloroethene	NS	NS	ug/kg	NA	NA	NA	NA	NA	NA	< 10 U
1,2-dichloropropane	333	333	ug/kg	NA	< 3.6 U	< 3.6 U	< 9.7 U	< 7 U	< 1 U	< 10 U
1,3,5-trimethylbenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
1,3-dichlorobenzene	1315	1315	ug/kg	NA	< 5.1 U	NA	NA	< 7 U	< 1 U	< 10 U
1,3-dichloropropane	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
1,4-dichlorobenzene	318	318	ug/kg	NA	< 5.1 U	NA	NA	< 7 U	< 1 U	< 10 U
1,4-dioxane	NS	NS	ug/kg	NA	< 100 U	< 100 U	< 280 U	< 490 U	< 76 U	NA
2,2-dichloropropane	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
2-butanone	NS	NS	ug/kg	NA	< 10 U	< 10 U	9.1 J	< 28 U	< 4 U	< 40 U
2-chlorotoluene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
2-hexanone	NS	NS	ug/kg	NA	< 10 U	< 10 U	< 28 U	< 21 U	< 3 U	< 40 U
4-chlorotoluene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
4-Isopropyltoluene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	3.1 J
4-methyl-2-pentanone	NS	NS	ug/kg	NA	< 10 U	< 10 U	< 28 U	< 21 U	< 3 U	< 40 U
Acetone	NS	NS	ug/kg	8600	8.2 J	8.2 J	300	< 49 U	16 J	< 40 U
Benzene	142	142	ug/kg	NA	< 1 U	NA	NA	< 3 U	< 0.5 U	< 10 U
Bromobenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
Bromochloromethane	NS	NS	ug/kg	NA	< 5.1 U	< 5.1 U	< 14 U	< 7 U	< 1 U	< 10 U
Bromodichloromethane	NS	NS	ug/kg	NA	< 1 U	NA	NA	< 7 U	< 1 U	< 10 U
Bromoform	492	492	ug/kg	NA	< 4.1 U	NA	NA	< 7 U	< 1 U	< 10 U
Bromomethane	1.37	1.37	ug/kg	NA	< 2 U	NA	NA	< 14 U	< 2 U	< 20 U
Butyl alcohol, tert-	NS	NS	ug/kg	NA	NA	NA	NA	< 140 U	< 22 U	NA
Carbon disulfide	NS	NS	ug/kg	NA	< 10 U	< 10 U	< 28 U	< 7 U	< 1 U	< 10 U
Carbon tetrachloride	1450	1450	ug/kg	NA	< 1 U	< 1 U	< 2.8 U	< 7 U	< 1 U	< 10 U
Chlorobenzene	291	291	ug/kg	NA	< 1 U	NA	NA	< 7 U	< 1 U	< 10 U
Chloroethane	NS	NS	ug/kg	NA	< 2 U	NA	NA	< 14 U	< 2 U	< 20 U
Chloroform	121	121	ug/kg	NA	< 1.5 U	< 1.5 U	< 4.2 U	< 7 U	< 1 U	< 20 U
Chloromethane	NS	NS	ug/kg	NA	< 5.1 U	NA	NA	< 14 U	< 2 U	< 20 U
cis-1,2-dichloroethene	NS	NS	ug/kg	NA	< 1 U	< 1.3 U	< 1.1 U	< 7 U	< 1 U	< 10 U
cis-1,3-dichloropropene	NS	NS	ug/kg	NA	< 1 U	NA	NA	< 7 U	< 1 U	< 10 U
Cyclohexane	NS	NS	ug/kg	NA	< 20 U	< 20 U	< 56 U	< 7 U	< 1 U	NA
Dibromochloromethane	NS	NS	ug/kg	NA	< 1 U	< 1 U	< 2.8 U	< 7 U	< 1 U	< 10 U
Dibromomethane	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
Dichlorodifluoromethane	NS	NS	ug/kg	NA	< 10 U	< 10 U	< 28 U	< 14 U	< 2 U	< 20 U

Area SS025
Summary of Sediment Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2015

Parameter	NJDEP Ecological Screening Level	Site Screening Criteria	Unit	ARDC-SE202 (02/22/2013)	ARDC-SE202 (11/20/2013)	ARDC-SE202 (05/22/2014)	DUP-SED202 (05/22/2014)	ARDC-SE202-1214 (12/16/2014)	ARDC-SE202 (04/30/2015)	ARDC-SE202 (11/02/2015)
Dichloropropene	NS	NS	ug/kg	NA	< 1 U	NA	NA	NA	NA	NA
Ethylbenzene	175	175	ug/kg	NA	< 1 U	NA	NA	< 7 U	< 1 U	< 10 U
Hexachloro-1,3-butadiene	26.5	26.5	ug/kg	NA	NA	NA	NA	< 14 U	< 2 U	< 10 U
Isopropylbenzene	NS	NS	ug/kg	NA	< 1 U	< 1 U	< 2.8 U	< 7 U	< 1 U	< 10 U
m,p-Xylene	NS	NS	ug/kg	NA	< 2 U	NA	NA	< 7 U	< 1 U	< 6.4 U
Methyl acetate	NS	NS	ug/kg	NA	< 4.1 U	< 4.1 U	< 11 U	34 J	< 2 U	NA
Methyl tert-butyl ether	NS	NS	ug/kg	NA	< 2 U	NA	NA	< 3 U	< 0.5 U	< 40 U
Methylcyclohexane	NS	NS	ug/kg	NA	< 4.1 U	< 4.1 U	< 11 U	< 7 U	< 1 U	NA
Methylene Chloride	159	159	ug/kg	**3000 J**	< 5.1 U	< 5.1 U	< 14 U	< 14 U	< 2 U	< 10 U
Naphthalene	176	176	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
n-Butylbenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
N-propylbenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
o-Xylene	NS	NS	ug/kg	NA	< 2 U	NA	NA	< 7 U	< 1 U	< 10 U
Sec-butylbenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
Styrene	254	254	ug/kg	NA	< 2 U	< 2 U	< 5.6 U	< 7 U	< 1 U	< 10 U
Tert-butylbenzene	NS	NS	ug/kg	NA	NA	NA	NA	< 7 U	< 1 U	< 10 U
Tetrachloroethene	990	990	ug/kg	NA	< 1 U	< 1.3 U	< 1.1 U	< 7 U	< 1 U	3.1 J
Toluene	1220	1220	ug/kg	NA	< 1.5 U	NA	NA	< 7 U	< 1 U	< 10 U
trans-1,2-dichloroethene	654	654	ug/kg	NA	< 1.5 U	NA	NA	< 7 U	< 1 U	< 10 U
trans-1,3-dichloropropene	NS	NS	ug/kg	NA	< 1 U	NA	NA	< 7 U	< 1 U	< 10 U
Trichloroethene	112	112	ug/kg	NA	< 1 U	< 1.3 U	< 1.1 U	< 7 U	< 1 U	2.4 J
Trichlorofluoromethane	NS	NS	ug/kg	NA	< 5.1 U	NA	NA	< 14 U	< 2 U	< 20 U
Vinyl chloride	202	202	ug/kg	NA	< 2 U	NA	NA	< 7 U	< 1 U	< 10 U
Xylenes, Total	433	433	ug/kg	NA	< 2 U	NA	NA	< 7 U	< 1 U	NA

Notes:
J = Estimated: The analyte was positively identified; the quantitation is an estimatio
U = Parameter was not detected
mg/kg = Milligrams per Kilogram
ug/kg = Micrograms per Kilogram
NA = Not Analyzed or Data Not Provided
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS025
Summary of Surface Water Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2017

Parameter	EPA MCLs	NJ PQLs	NJ Freshwater Acute Surface Water	NJ Freshwater Chronic Surface Water	NJ Freshwater Human Health	Site Screening Criteria	Unit	ARDC-SW200 (02/22/2013)	ARDC-SW200 (03/24/2014)	ARDC-SW200 (05/22/2014)	ARDC-SW200-1214 (12/16/2014)	ARDC-SW200 (04/30/2015)	ARDC-SW200 (11/02/2015)	ARDC-SW201 (02/22/2013)	ARDC-SW201 (03/24/2014)	DUP-SW201 (03/24/2014)	ARDC-SW201 (05/22/2014)	ARDC-SW201-1214 (12/16/2014)	DUP-SW1-1214 (SW201) (12/16/2014)
VOCs (SW8260B)																			
1,1,1,2-tetrachloroethane	NS	1	NS	NS	NS	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 UQ	NA	NA	NA	NA	< 0.5 U	< 0.5 U
1,1,1-trichloroethane	200	1	NS	NS	120	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
1,1,2,2-tetrachloroethane	NS	1	NS	NS	4.7	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 2 U	< 2 U	NA	NA	NA	NA	NA	< 2 U	< 2 U
1,1,2-trichloroethane	5	2	NS	NS	13	2	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
1,1-dichloroethane	NS	1	NS	NS	NS	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
1,1-dichloroethene	7	1	NS	NS	4.7	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
1,2,3-trichloropropane	NS	0.03	NS	NS	NS	0.03	ug/l	NA	NA	NA	< 1 U	< 1 U	< 3 U	NA	NA	NA	NA	< 1 U	< 1 U
1,2,4-trichlorobenzene	70	1	NS	NS	21	1	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
1,2-Dibromo-3-chloropropane	0.2	0.02	NS	NS	NS	0.02	ug/l	NA	NA	NA	< 2 U	< 2 U	< 5 U	NA	NA	NA	NA	< 2 U	< 2 U
1,2-dibromoethane	0.05	0.03	NS	NS	NS	0.03	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 UQ	NA	NA	NA	NA	< 0.5 U	< 0.5 U
1,2-dichlorobenzene	600	5	NS	NS	2000	5	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
1,2-dichloroethane	5	2	NS	NS	0.29	2	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	NA	NA	< 1 U	NA	NA	NA	NA	NA	NA
1,2-dichloropropane	5	1	NS	NS	0.5	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
1,3-dichlorobenzene	600	5	NS	NS	2200	5	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 UQ	NA	NA	NA	NA	< 0.5 U	< 0.5 U
1,4-dichlorobenzene	75	5	NS	NS	550	5	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
1,4-dioxane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 70 U	< 70 U	NA	NA	NA	NA	NA	< 70 U	< 70 U
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
2-butanone	NS	2	NS	NS	NS	2	ug/l	NA	NA	NA	< 3 U	< 3 U	< 6 U	NA	NA	NA	NA	< 3 U	< 3 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 3 U	< 3 U	< 5 UQ	NA	NA	NA	NA	< 3 U	< 3 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
4-methyl-2-pentanone	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 3 U	< 3 U	< 5 U	NA	NA	NA	NA	< 3 U	< 3 U
Acetone	NS	10	NS	NS	NS	10	ug/l	2 J	NA	NA	< 6 U	< 6 U	< 10 UJB	1.4 J	NA	NA	NA	< 6 U	< 6 U
Benzene	5	1	NS	NS	0.15	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
Bromodichloromethane	80	1	NS	NS	0.55	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Bromoform	80	0.8	NS	NS	4.3	0.8	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 UQ	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Bromomethane	NS	1	NS	NS	47	1	ug/l	0.53 BJ	NA	NA	< 0.5 U	< 0.5 U	< 2 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Butyl alcohol, tert-	NS	2	NS	NS	NS	2	ug/l	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA	NA	NA	< 5 U	< 5 U
Carbon disulfide	NS	1	NS	NS	NS	1	ug/l	NA	NA	NA	< 1 U	< 1 U	< 2 U	NA	NA	NA	NA	< 1 U	< 1 U
Carbon tetrachloride	5	1	NS	NS	0.33	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Chlorobenzene	100	1	NS	NS	210	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 UQ	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Chloroform	80	1	NS	NS	68	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Chloromethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
cis-1,2-dichloroethene	70	1	NS	NS	NS	1	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 1 U	NA	< 2.5 U	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
cis-1,3-dichloropropene	NS	1	NS	NS	0.34	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Cyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 2 U	< 2 U	NA	NA	NA	NA	NA	< 2 U	< 2 U
Dibromochloromethane	80	1	NS	NS	0.4	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 UQ	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	NS	2	NS	NS	NS	2	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Ethylbenzene	700	2	NS	NS	530	2	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 UQ	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Hexachloro-1,3-butadiene	NS	1	NS	NS	0.44	1	ug/l	NA	NA	NA	< 2 U	< 2 U	< 1 U	NA	NA	NA	NA	< 2 U	< 2 U
Isopropylbenzene	NS	1	NS	NS	NS	1	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 UQ	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Methyl acetate	NS	0.5	NS	NS	NS	0.5	ug/l	NA	NA	NA	< 1 U	< 1 U	NA	NA	NA	NA	NA	< 1 U	< 1 U
Methyl tert-butyl ether	NS	1	151000	51000	70	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Methylcyclohexane	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	NA	NA	NA	NA	NA	< 1 U	< 1 U
Methylene Chloride	5	1	NS	NS	2.5	1	ug/l	NA	NA	NA	< 2 U	< 2 U	< 5 U	NA	NA	NA	NA	< 2 U	< 2 U
Naphthalene	NS	2	NS	NS	NS	2	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U

Area SS025
Summary of Surface Water Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2017

Parameter	EPA MCLs	NJ PQLs	NJ Freshwater Acute Surface Water	NJ Freshwater Chronic Surface Water	NJ Freshwater Human Health	Site Screening Criteria	Unit	ARDC-SW200 (02/22/2013)	ARDC-SW200 (03/24/2014)	ARDC-SW200 (05/22/2014)	ARDC-SW200-1214 (12/16/2014)	ARDC-SW200 (04/30/2015)	ARDC-SW200 (11/02/2015)	ARDC-SW201 (02/22/2013)	ARDC-SW201 (03/24/2014)	DUP-SW201 (03/24/2014)	ARDC-SW201 (05/22/2014)	ARDC-SW201-1214 (12/16/2014)	DUP-SW1-1214 (SW201) (12/16/2014)
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 UQ	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
Styrene	100	2	NS	NS	NS	2	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 UQ	NA	NA	NA	NA	< 1 U	< 1 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	NA	NA	NA	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U
Tetrachloroethene	5	1	NS	NS	0.34	1	ug/l	**2.9**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 1 UQ	**9.6**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	1000	1	NS	NS	1300	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
trans-1,2-dichloroethene	100	1	NS	NS	590	1	ug/l	NA	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 1 U	NA	< 2.5 U	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U
trans-1,3-dichloropropene	NS	1	NS	NS	0.34	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Trichloroethene	5	1	NS	NS	1	1	ug/l	0.36 J	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 1 U	0.98 J	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichlorofluoromethane	NS	1	NS	NS	NS	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Vinyl chloride	2	1	NS	NS	0.082	1	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	< 1.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U
Xylenes, Total	10000	2	NS	NS	NS	2	ug/l	NA	NA	NA	< 0.5 U	< 0.5 U	NA	NA	NA	NA	NA	< 0.5 U	< 0.5 U

Notes:
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
Q = One or more quality criteria failed
U = Parameter was not detected
ug/l = Micrograms per Liter
NA = Not Analyzed or Data Not Provided
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Area SS025
Summary of Surface Water Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2017

Parameter	EPA MCLs	NJ PQLs	NJ Freshwater Acute Surface Water	NJ Freshwater Chronic Surface Water	NJ Freshwater Human Health	Site Screening Criteria	Unit	ARDC-SW201 (04/30/2015)	ARDC-SW201 (11/02/2015)	ARDC-SW201-DUP (04/30/2015)	ARDC-SW202 (02/22/2013)	ARDC-SW202 (03/24/2014)	ARDC-SW202 (05/22/2014)	DUP-SW202 (05/22/2014)	ARDC-SW202-1214 (12/16/2014)	ARDC-SW202 (04/30/2015)	ARDC-SW202 (11/02/2015)	ARDC-SW202 (04/14/2016)	ARDC-SW202 (04/03/2017)
VOCs (SW8260B)																			
1,1,1,2-tetrachloroethane	NS	1	NS	NS	NS	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.8 U	< 0.8 U
1,1,1-trichloroethane	200	1	NS	NS	120	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
1,1,2,2-tetrachloroethane	NS	1	NS	NS	4.7	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.8 U	< 0.8 U
1,1,2-Trichloro-1,2,2-trifluoroethane	NS	NS	NS	NS	NS	NS	ug/l	< 2 U	NA	< 2 U	NA	NA	NA	NA	< 2 U	< 2 U	NA	NA	NA
1,1,2-trichloroethane	5	2	NS	NS	13	2	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.8 U	< 0.8 U
1,1-dichloroethane	NS	1	NS	NS	NS	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.8 U	< 0.8 U
1,1-dichloroethene	7	1	NS	NS	4.7	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.8 U	< 0.8 U
1,1-dichloropropene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
1,2,3-trichlorobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.8 U	< 0.8 U
1,2,3-trichloropropane	NS	0.03	NS	NS	NS	0.03	ug/l	< 1 U	< 3 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 3 U	< 0.8 U	< 0.8 U
1,2,4-trichlorobenzene	70	1	NS	NS	21	1	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.8 U	< 0.8 U
1,2,4-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
1,2-Dibromo-3-chloropropane	0.2	0.02	NS	NS	NS	0.02	ug/l	< 2 U	< 5 U	< 2 U	NA	NA	NA	NA	< 2 U	< 2 U	< 5 U	< 1.6 U	< 1.6 U
1,2-dibromoethane	0.05	0.03	NS	NS	NS	0.03	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
1,2-dichlorobenzene	600	5	NS	NS	2000	5	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
1,2-dichloroethane	5	2	NS	NS	0.29	2	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
1,2-dichloroethene	NS	NS	NS	NS	NS	NS	ug/l	NA	< 1 U	NA	NA	NA	NA	NA	NA	NA	0.27 J	< 0.2 U	< 0.2 U
1,2-dichloropropane	5	1	NS	NS	0.5	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
1,3,5-trimethylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
1,3-dichlorobenzene	600	5	NS	NS	2200	5	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
1,3-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.8 U	< 0.8 U
1,4-dichlorobenzene	75	5	NS	NS	550	5	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
1,4-dioxane	NS	NS	NS	NS	NS	NS	ug/l	< 70 U	NA	< 70 U	NA	NA	NA	NA	< 70 U	< 70 U	NA	NA	NA
2,2-dichloropropane	NS	NS	NS	NS	NS	NS	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
2-butanone	NS	2	NS	NS	NS	2	ug/l	< 3 U	< 6 U	< 3 U	NA	NA	NA	NA	< 3 U	< 3 U	< 6 U	< 4 U	< 4 U
2-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
2-hexanone	NS	NS	NS	NS	NS	NS	ug/l	< 3 U	< 5 U	< 3 U	NA	NA	NA	NA	< 3 U	< 3 U	< 5 U	< 4 U	< 4 U
4-chlorotoluene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.8 U	< 0.8 U
4-Isopropyltoluene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	0.43 J	< 0.4 U	< 0.4 U
4-methyl-2-pentanone	NS	NS	NS	NS	NS	NS	ug/l	< 3 U	< 5 U	< 3 U	NA	NA	NA	NA	< 3 U	< 3 U	< 5 U	< 3.2 U	< 3.2 U
Acetone	NS	10	NS	NS	NS	10	ug/l	< 6 U	< 10 U	< 6 U	1.3 J	NA	NA	NA	< 6 U	< 6 U	< 10 U	< 6.4 UB	< 6.4 U
Benzene	5	1	NS	NS	0.15	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
Bromobenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
Bromochloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.2 U	< 0.2 U
Bromodichloromethane	80	1	NS	NS	0.55	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
Bromoform	80	0.8	NS	NS	4.3	0.8	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
Bromomethane	NS	1	NS	NS	47	1	ug/l	< 0.5 U	< 2 U	< 0.5 U	**1.3 BJ**	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 U	< 0.8 U	< 0.8 U
Butyl alcohol, tert-	NS	2	NS	NS	NS	2	ug/l	< 5 U	NA	< 5 U	NA	NA	NA	NA	< 5 U	< 5 U	NA	NA	NA
Carbon disulfide	NS	1	NS	NS	NS	1	ug/l	< 1 U	< 2 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 2 U	< 1.6 U	< 1.6 U
Carbon tetrachloride	5	1	NS	NS	0.33	1	ug/l	< 0.5 U	< 2 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 U	< 0.4 U	< 0.4 U
Chlorobenzene	100	1	NS	NS	210	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
Chloroethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.5 U	< 2 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 U	< 1.6 U	< 1.6 U
Chloroform	80	1	NS	NS	68	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
Chloromethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.5 U	< 2 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 U	< 0.8 U	< 0.8 U
cis-1,2-dichloroethene	70	1	NS	NS	NS	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	< 2.5 U	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U	0.27 J	< 0.4 U	< 0.4 U
cis-1,3-dichloropropene	NS	1	NS	NS	0.34	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
Cyclohexane	NS	NS	NS	NS	NS	NS	ug/l	< 2 U	NA	< 2 U	NA	NA	NA	NA	< 2 U	< 2 U	NA	NA	NA
Dibromochloromethane	80	1	NS	NS	0.4	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
Dibromomethane	NS	NS	NS	NS	NS	NS	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
Dichlorodifluoromethane	NS	2	NS	NS	NS	2	ug/l	< 0.5 U	< 2 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 U	< 0.8 U	< 0.8 UQ
Ethylbenzene	700	2	NS	NS	530	2	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
Hexachloro-1,3-butadiene	NS	1	NS	NS	0.44	1	ug/l	< 2 U	< 1 U	< 2 U	NA	NA	NA	NA	< 2 U	< 2 U	< 1 U	< 0.8 U	< 0.8 U
Isopropylbenzene	NS	1	NS	NS	NS	1	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
m,p-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.5 U	< 2 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 U	< 0.8 U	< 0.8 U
Methyl acetate	NS	0.5	NS	NS	NS	0.5	ug/l	< 1 U	NA	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	NA	NA	NA
Methyl tert-butyl ether	NS	1	151000	51000	70	1	ug/l	< 0.5 U	< 5 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 5 U	< 0.8 U	< 0.8 U
Methylcyclohexane	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	NA	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	NA	NA	NA
Methylene Chloride	5	1	NS	NS	2.5	1	ug/l	< 2 U	< 5 U	< 2 U	NA	NA	NA	NA	< 2 U	< 2 U	< 5 U	< 0.8 U	< 0.8 U
Naphthalene	NS	2	NS	NS	NS	2	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.8 U	< 0.8 U
n-Butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.8 U	< 0.8 U

Area SS025
Summary of Surface Water Analysis
Joint Base McGuire-Dix-Lakehurst, Dix Area
2013 through 2017

Parameter	EPA MCLs	NJ PQLs	NJ Freshwater Acute Surface Water	NJ Freshwater Chronic Surface Water	NJ Freshwater Human Health	Site Screening Criteria	Unit	ARDC-SW201 (04/30/2015)	ARDC-SW201 (11/02/2015)	ARDC-SW201-DUP (04/30/2015)	ARDC-SW202 (02/22/2013)	ARDC-SW202 (03/24/2014)	ARDC-SW202 (05/22/2014)	DUP-SW202 (05/22/2014)	ARDC-SW202-1214 (12/16/2014)	ARDC-SW202 (04/30/2015)	ARDC-SW202 (11/02/2015)	ARDC-SW202 (04/14/2016)	ARDC-SW202 (04/03/2017)
N-propylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
o-Xylene	10000	NS	NS	NS	NS	NS	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
Sec-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
Styrene	100	2	NS	NS	NS	2	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
Tert-butylbenzene	NS	NS	NS	NS	NS	NS	ug/l	< 1 U	< 1 U	< 1 U	NA	NA	NA	NA	< 1 U	< 1 U	< 1 U	< 0.4 U	< 0.4 U
Tetrachloroethene	5	1	NS	NS	0.34	1	ug/l	< 0.5 U	0.32 J	< 0.5 U	NA	**2.7**	< 0.5 U	< 0.5 U	**2**	**2**	0.84 J	**1.6**	0.59 J
Toluene	1000	1	NS	NS	1300	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
trans-1,2-dichloroethene	100	1	NS	NS	590	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	< 2.5 U	< 2.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
trans-1,3-dichloropropene	NS	1	NS	NS	0.34	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1 U	< 0.4 U	< 0.4 U
Trichloroethene	5	1	NS	NS	1	1	ug/l	< 0.5 U	< 1 U	< 0.5 U	NA	0.33 J	< 0.5 U	< 0.5 U	< 0.5 U	0.8 J	0.85 J	0.7 J	0.34 J
Trichlorofluoromethane	NS	1	NS	NS	NS	1	ug/l	< 0.5 U	< 2 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 2 U	< 0.8 U	< 0.8 U
Vinyl chloride	2	1	NS	NS	0.082	1	ug/l	< 0.5 U	< 1.5 U	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	< 1.5 U	< 0.2 U	< 0.2 U
Xylenes, Total	10000	2	NS	NS	NS	2	ug/l	< 0.5 U	NA	< 0.5 U	NA	NA	NA	NA	< 0.5 U	< 0.5 U	NA	< 0.8 U	< 0.8 U

Notes:
J = Estimated: The analyte was positively identified; the quantitation is an estimation.
Q = One or more quality criteria failed
U = Parameter was not detected
ug/l = Micrograms per Liter
NA = Not Analyzed or Data Not Provided
NS = No Screening Criteria
VOCs = Volatile Organic Compounds
Cells exceeding the Site Screening Criteria are boldfaced and shaded grey

Appendix B
Regulatory Comments

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State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Bureau of Case Management
Mail Code 401-05F
P.O. Box 420
Trenton, New Jersey 08625-0420
Telephone: 609-633-0718/Email: haiyehs.shah@dep.nj.gov

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R. MCCABE
Acting Commissioner

Mr. Curtis A. Frye, P.E.
Chief, Environmental Restoration Program
87 CES / CEAN--2403 Vandenberg Avenue
McGuire AFB, NJ 08641-5104

3April2018

Re: **8Nov17 Fort Dix Base-wide Five-Year Review Report**
Joint Base McGuire-Dix-Lakehurst--**Fort Dix Sites**
New Hanover & Pemberton Townships, Burlington County
NJDEP Preferred Identification: G000000024 + 007195

The New Jersey Department of Environmental Protection (NJDEP) has reviewed the 8Nov17 (received 9Nov18) Fort Dix Base-wide Five-Year Review Report), prepared by EA Engineering. Science & Technology Incorporated. pursuant to the Department of Defense State Memorandum of Agreement (DSMOA) executed on 3Apr92, the Site Remediation Reform Act (N.J.S.A.58:10C-1 et seq.), the Administrative Requirements for the Remediation of Contaminated Sites (N.J.A.C 7:26C), the Technical Requirements for Site Remediation at N.J.A.C. 7:26E, the Resource Conservation and Recovery Act (RCRA) as amended, the Hazardous and Solid Waste Amendments (HSWA) and Government Performance Review Act (GPRA). NJDEP does not have any comments on LF010, LF017, LF033, SS005B, SS025 & TU025. NJDEP comments on LF010 & SS007are as follows:

1. LF010: Corrective action(s) and future Operation & Maintenance at Solar panels areas must be completed/implemented in accordance with information detailed in NJDEP 22Feb18 email to Ms. Nicole York-Brestle at US Air Force.

2. LF010: All groundwater analytical data must be evaluated using the following:
   - **Source Area Monitoring:** Monitoring well(s) should be located within the source area, where possible, or as close down-gradient as feasible to monitor the effectiveness of source area remediation. Well clusters should be installed down-gradient from, and as close to, the source area to monitor the vertical extent of the source area and to assure that the source remedial action is effective.
   - **Contaminant Plume and Plume Fringe Monitoring:** Plume monitoring well(s) should be located down-gradient of the source area within the contaminant plume. Plume monitoring wells should be located along the predominant contaminant flow path(s). In cases where there may be significant variations in contaminant flow, the location of the plume monitoring wells should account for any such changes. Plume fringe monitoring wells should be located to monitor the horizontal and vertical contaminant concentrations at the leading, lateral and vertical edge(s) of the contaminant front.
   - **Down-gradient Sentinel Wells:** The location of the down-gradient sentinel wells should focus on detecting migration of the contaminant plume towards the nearest un-impacted down-gradient receptor and allow sufficient time for a remedial response to be implemented on the contaminant plume to prevent impact to the potential receptor. The down-gradient sentinel well location is determined based on the distance to potential receptors and contaminant velocity. The sentinel well should be located based on the behavior of the contaminant plume (i.e., stable, shrinking, advancing, or diving) and on

groundwater monitoring data obtained from the plume monitoring wells. If no receptors are identified within the model-predicted maximum extent of the contaminant plume, sentinel wells may not be necessary provided that monitoring data confirm modeling results, the leading edge of the plume is effectively monitored, the remedial action is effective and groundwater contaminant concentrations are decreasing.

- **Lateral Sentinel Wells:** Where there is a potential for the groundwater contaminant plume to impact receptors located adjacent to the contaminant plume, sentinel wells should be located laterally adjacent to the plume. Sentinel wells should be located adjacent to and outside of the lateral extent of ground water contamination.
- **Vertical Sentinel Wells:** Sentinel wells should be located below the contaminant plume where there is the potential to impact a receptor at depth. Sentinel wells should be positioned at the water table above the contaminant plume to evaluate potential for vapor intrusion where receptors are present.
- Groundwater quality data obtained from sentinel wells must be below the applicable Groundwater Remediation Standards. As the plume shrinks, wells within the contaminant plume may become sentinel wells.

3. SS007: Current monitored natural attenuation is not sufficient for this site as recent data suggest a potential rebound in volatile organic compounds concentrations in groundwater. Please implement the steps discussed during 21Feb18 Project Managers Meeting (PMM).

Sincerely,

Haiyesh Shah

C: Mr. John Brogard-USEPA-RCRA-GPRA
Ms. Robyn Henderek, USEPA-Federal Facility Section
Ms. Branwen Ellis, NJ Pinelands Commission

New Jersey Department of Environmental Protection Review Comments
Received 3 April 2018
Joint Base McGuire-Dix-Lakehurst

Dix Area Basewide Five Year Review Report, JB MDL
Dated November 2017
Prepared by: EA Engineering, Science, and Technology, Inc., PBC

1. Respondent Concurs (C), Does not concur (D), or takes Exception (E).
2. Commentator Agrees (A) with response, or Does not agree (D) with response.

Comment #	Page / Section	Government's Review Comment	C,D, or E (1)	Contractor's Response	A or D (2)
General Comments					
1	LF010	Corrective action(s) and future Operation & Maintenance at Solar panels areas must be completed/implemented in accordance with information detailed in NJDEP 22Feb18 email to Ms. Nicole York-Brestle at US Air Force.	C	Corrective action and future operation and maintenance of solar panel areas will be implemented in accordance with the contractor's approved February 2018 work plan. Reference to this work plan has been added to the text.	

Comment #	Page / Section	Government's Review Comment	C,D, or E (1)	Contractor's Response	A or D (2)
2	LF010	All groundwater analytical data must be evaluated using the following: • **Source Area Monitoring:** Monitoring well(s) should be located within the source area, where possible, or as close down-gradient as feasible to monitor the effectiveness of source area remediation. Well clusters should be installed down-gradient from, and as close to, the source area to monitor the vertical extent of the source area and to assure that the source remedial action is effective. • **Contaminant Plume and Plume Fringe Monitoring:** Plume monitoring well(s) should be located down-gradient of the source area within the contaminant plume. Plume monitoring wells should be located along the predominant contaminant flow path(s). In cases where there may be significant variations in contaminant flow, the location of the plume monitoring wells should account for any such changes. Plume fringe monitoring wells should be located to monitor the horizontal and vertical contaminant concentrations at the leading, lateral and vertical edge(s) of the contaminant front. • **Down-gradient Sentinel Wells:** The location of the down-gradient sentinel wells should focus on detecting migration of the contaminant plume towards the nearest un-impacted down-gradient receptor and allow sufficient time for a remedial response to be implemented on the contaminant plume to prevent impact to the potential receptor. The down-gradient sentinel well location is determined based on the distance to potential receptors and contaminant velocity. The sentinel well should be located based on the behavior of the contaminant plume (i.e., stable, shrinking, advancing, or diving) and on groundwater monitoring data obtained from the plume monitoring wells. If no receptors are identified within the model-predicted maximum extent of the contaminant plume, sentinel wells may not be necessary provided that monitoring data confirm modeling results, the leading edge of the plume is effectively monitored, the remedial action is effective and groundwater contaminant concentrations are decreasing. • **Lateral Sentinel Wells:** Where there is a potential for the groundwater contaminant plume to impact receptors located adjacent to the contaminant plume, sentinel wells should be located laterally adjacent to the plume. Sentinel wells should be located adjacent to and outside of the lateral extent of ground water contamination. • **Vertical Sentinel Wells:** Sentinel wells should be located below the contaminant plume where there is the potential to impact a receptor at depth. Sentinel wells should be positioned at the water table above the contaminant plume to evaluate potential for vapor intrusion where receptors are present. • Groundwater quality data obtained from sentinel wells must be below the applicable Groundwater Remediation Standards. As the plume shrinks, wells within the contaminant plume may become sentinel wells.	C	Comment noted. Well designations are classified with NJDEP concurrence. New well designations for LF010 were approved by NJDEP in 2016 and implemented in 2017.	

Comment #	Page / Section	Government's Review Comment	C,D, or E [(1)]	Contractor's Response	A or D [(2)]
3	SS007	Current monitored natural attenuation is not sufficient for this site as recent data suggest a potential rebound in volatile organic compounds concentrations in groundwater. Please implement the steps discussed during 21Feb18 Project Managers Meeting (PMM).	C	The 6 February 2018 Dix and McGuire Compliance Sites Meeting for the Performance Based Remediation Contract included discussion of a proposed path forward including use of a directed groundwater recirculation system at SS007 to treat water ex situ and reinject the treated water. This information has been added to Section 6.3.2, and referenced in the Technical Assessment (Sections 6.6.1 and 6.6.4). The recommendation regarding assessment of the remedy for SS007 has also been revised to reflect the current status.	

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2
290 BROADWAY
NEW YORK, NY 10007-1866

Mr. Curtis A. Frye, P.E.
Remediation Program Manager (AFCEC/CZO)
Joint Base McGuire-Dix-Lakehurst
87 CES/CEAN
2403 Vandenberg Avenue
Joint Base McGuire-Dix-Lakehurst, N.J., 08641

January 31, 2018

Re: Draft Fifth Five Year Review Report for Site LF010, the Dix Area Sanitary Landfill, Joint Base McGuire-Dix-Lakehurst, dated November 2017

Dear Mr. Frye,

The United States Environmental Protection Agency (EPA) has received and reviewed the Draft Fifth Five Year Review (FYR) report for Site LF010, the Dix Area Sanitary Landfill, at Joint Base McGuire-Dix-Lakehurst, dated November 2017. Please see the attached documents which include written comments on Site LF010 FYR and guidance on incorporating climate change considerations into FYRs. EPA understands that New Jersey Department of Environmental Protection (NJDEP) will be providing their comments to the United States Air Force directly.

If you have any questions regarding this review, please don't hesitate to contact me at (212) 637-4078.

Sincerely,

Robyn L. Henderek
Remedial Project Manager
United States Environmental Protection Agency, Region 2

Attachment:
1. EPA Review of the Draft Fifth Five Year Review Report for Site LF010, the Dix Area Sanitary Landfill, Joint Base McGuire-Dix-Lakehurst, dated November 2017
2. Region 2 Guidance for Incorporating Climate Change Considerations in Five Year Reviews

Cc: Haiyesh Shah, NJDEP

TECHNICAL REVIEW OF THE DRAFT FIFTH FIVE YEAR REVIEW
JB MDL-DIX – DIX AREA SANITARY LANDFILL (LF010)
DATED NOVEMBER 2017

FORT DIX
JOINT BASE MCGUIRE-DIX-LAKEHURST
PEMBERTON TOWNSHIP, NEW JERSEY

The following comments are based on a review of the Draft Fifth Five Year Review (FYR) report for Site LF010, the Dix Area Sanitary Landfill, Joint Base McGuire-Dix-Lakehurst, dated November 2017, located at Joint Base McGuire-Dix-Lakehurst, New Jersey.

GENERAL COMMENTS

1. Sentinel wells should not be moved as the result of detections of COCs as this negates the purpose of the sentinel well. Instead, the USAF should evaluate whether the contamination in these wells is truly representative of impacts from the landfill and evaluate whether additional actions need to be taken to address any migration issues related to the COCs. Please amend the recommendation on page 34 to state, “When an analyte concentration exceeding applicable criteria is reported in a currently designated sentinel well, a second round of sampling should be conducted in order to assess whether the exceedance persists. If the concentration remains greater than applicable criteria, trends should be evaluated, in addition to upgradient concentrations, well depths and other relevant information, to determine if impacts are from the landfill and if trends suggest that migration is occurring.”

2. Since the ponding from the solar panels affects future protectiveness, the protectiveness determination would be “short-term” and the statement would read, “The remedy at Site LF010 is protective of human health and the environment in the short-term because all exposure pathways have been interrupted and Remedial Action Objectives and cleanup goals are expected to be met.” In order to be protective in the long-term, drainage patterns must be reassessed, methods of improving drainage must be assessed and implemented, and vegetative maintenance must be performed regularly to protect the integrity of the cap. The seeps described in this FYR should be further investigated to determine whether it indicates that the landfill cap system is not functioning as designed. If issues with cap function are identified, they must be addressed to prevent mobilization of contaminants from the landfill.

3. Since nine COCs have changed in value since the ROD was signed in 1991, the FYR references the 2016 IMMR which states that the USAF will soon issue a document, such as an ESD, to formalize the site analyte list. Please note that a proposal, in the form of a Technical Memorandum, of the proposed updated analyte list should be issued to the regulators prior to any final decision document. In addition, please note that some landfill indicator parameters should be retained in the analyte list as they give a more thorough indication of leachate geochemical impacts than analyzing COCs alone.

4. The term “deleted non-NPL site” is frequently used throughout this document. For example, on page 12 the text states, “Site LF010 was listed on the National Priorities List

(NPL) from 1987 to 2012, and is now classified as a CERCLA non-NPL site". The term "non-NPL" has a different meaning in Superfund (e.g., a NPL-caliber site that is not listed on the NPL). Please revise to state LF010's proper designation as a "deleted NPL site".

5. LF010 is located near a site, AFFF Area 14 - WWTP Land Application Area, which contains exceedances of two emerging contaminants: perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). Please include in this FYR plans to assess to the Site for the presence of two emerging contaminants PFOS and PFOA due to its proximity to AFFF Area 14.
6. The forthcoming assessment of 1,4-dioxane should be mentioned in either Question B or C as a potential issue to be addressed in the next FYR.
7. EPA Region 2 has a general framework for evaluating climate change in FYRs. See the attached document "Region 2 Guidance for Incorporating Climate Change Considerations in Five Year Reviews". Please consider incorporating this framework into this FYR.
8. Please include the PDO Landfill and LF017 locations on one figure for reference.
9. Information regarding well depths and screened/targeted intervals based on aquifer depth designations (i.e. shallow, intermediate, and deep zones) are not included in the document, but are an important part of interpreting the data. In Appendix E/Tim Llewellyn Interview Record, it is stated that, "…a new sentinel well was identified and sampling in the intermediate…" which is the only mention of such aquifer designations in the document. Are the sentinel wells screened in appropriate intervals to monitor constituents in upgradient LTM wells? This information is crucial in interpreting data collected from apparently co-located well pairs (i.e. LTM-19 and 20, 17 and 18, 13 and 14). Please revise to incorporate this information.
10. Surface water elevations should also be included in the report or on a figure.
11. Please specify if reported metals concentrations are for total or dissolved constituents.

SPECIFIC COMMENTS

1. **Executive Summary, page 7:** Throughout the document it is noted that seeps have been observed along a landfill side slope. Have surface water and/or sediment been collected from the seep areas? This may affect the current protectiveness of the remedy, depending upon whether COCs in exceedance of acceptable concentrations are identified. The seeps should be identified on a site figure, and any pathways to surface water bodies should be delineated.
2. **Executive Summary, page 7:** The text states, "Exposure pathways that could result in unacceptable risk are being controlled." Please note that if COCs are at concentrations in exceedance of screening values in the seeps, this statement may not be supported.
3. **Executive Summary, page 8:** The last sentence indicates that, "protectiveness statements for each site are presented," however, only one site is included in this Five Year review. Please correct as appropriate.

4. **Section 1.2.1 Assessment of 1,4-Dioxane, page 13:** The text states, “Sampling is planned to begin in 2017 and will target wells in the former chlorinated solvent source areas including Site LF010 and downgradient locations as needed.” To date, has sampling been conducted at LF010? If results have been received, please include them in this FYR.
5. **Section 1.3.1 Groundwater Use in the Vicinity, page 14:** Regarding the potable water supply information, please include additional detail about where the supply wells are located in relation to the landfill (or a map).
6. **Section 2.2.1 Physical Characteristics, page 15:** Based on the groundwater contour map provided in Figure LF010-2, as well as the monitoring network and contaminant distribution, it seems oversimplified to state that groundwater flow is generally to the south. The maps show three distinct flow components, but the primary direction is to the south-southwest.
7. **Section 2.2.5 Basis for Taking Action, page 17:** Although it is noted that an environmental assessment concluded that, “significant impacts to wildlife and vegetation were not expected to occur”, it is unclear if an actual risk assessment was conducted and whether assumptions and toxicity values were reviewed to determine if actions/methods are consistent with current risk assessment methodology. Revise the FYR to clarify.
8. **Section 2.3.3 System Operation and Maintenance, page 19:** Clearly indicate here what season the annual mowing event is conducted is conducted in (spring or fall).
9. **Section 2.3.3 System Operation and Maintenance, page 20:** The text states, “JB MDL’s O&M contractor retains the responsibility for the formal semiannual inspections…” Please revise to state, “JB MDL’s O&M contractor conducts the formal semiannual inspections…on behalf of JB MDL.”
10. **Section 2.3.3 System Operation and Maintenance, page 20:** Please indicate here how many acres of the landfill cap the solar array occupies.
11. **Section 2.4 Progress Since the Last Review, page 21:** Regarding the first Issue/Recommendation on the table, please refine “Follow-Up Action Taken” to clearly indicate the sampling points (SW/SD-1, SW/SD-2, SW/SD-9, LTM-27 and LTM-28) which will no longer be included as part of LF010 LTM.
12. **Section 2.4 Progress Since the Last Review, page 21:** Regarding the second Issue/Recommendation on the table, it should be stated that LTM-11 was not reclassified based on recent sampling data and is still considered a sentinel well, as discussed in Section 2.4.2 Refinement of the Long-Term Monitoring Program. The current wording implies that it has been designated as an AOC well.
13. **Section 2.4 Progress Since the Last Review, page 21:** Regarding the third Issue/Recommendation on the table, please indicate that the referenced COCs are for groundwater only.
14. **Section 2.5.4 Data Review, Groundwater, page 24:** The text states, “Benzene and chlorobenzene concentrations along the west side of the landfill (AOC wells LTM-20, LTM-22, LTM-32) were relatively stable without apparent trend.” Based on data trends, especially during the review period, chlorobenzene concentrations at LTM-32 are not stable, and have recently (and overall) been increasing. Please modify text appropriately.

15. **Section 2.5.4 Data Review, Sediment and Surface Water, pages 25-26:** As noted in EPA's 2015 Five Year review comments, please do not differentiate between nutrient and non-nutrient metals when discussing sediment and surface water data.
16. **Section 2.5.5 Site Inspection, page 26:** It was stated that during the July 2017 site visit, "Seeping, associated with orange-colored water with an apparent sheen was also observed on the eastern side slope of the landfill." During the EPA site visit in December 2017, it should be noted that seep drains were observed on both the south and east landfill slopes, and all locations had an associated orange precipitate (presumed to be iron oxides). This precipitate was accumulating in the drainage trenches at the base of the landfill slope.
17. **Section 2.6.1 Question A, page 28:** In the discussion of sediment and surface water it is noted that concentrations are within "expected ranges". Provide additional information regarding these "expected ranges". While surface water concentrations show a downward trend, sediment concentrations at SW/SD-7 appear to be increasing. For example, arsenic and zinc appear to have increased quite significantly over the past two years according to "Lead and Arsenic in Sediment at Site LF010" and "Zinc in Sediment at Site LF010" graphs in Appendix D. Please clarify and revise.
18. **Section 2.6.1 Question A, page 28:** The response to Question A should discuss the protectiveness to ecological receptors.
19. **Section 2.6.1 Question A, page 28**: In the statement, "Qualitative analysis indicates that concentrations were generally stable or decreasing during the review period, with the exception of increased metals concentrations along the west side…" Metals are not the only exception to this statement. Please clarify that select VOCs (notably benzene, chlorobenzene, and cis-1,2-DCE, and 1,4-dichlorobenzene) also displayed increasing concentrations during the review period in LTM wells on the western portion of the landfill. Please clarify this statement in the text.
20. **Section 2.6.2.1 Changes in Risk Assessment Methodology, page 28:** The last paragraph indicates that there were no exceedances of AWQC at SW-3, however no information on SW-7 is provided in this section. Provide here additional information regarding "moderately elevated levels of metals in sediments". Specifically, discuss whether concentrations are greater than chronic values but less than acute values.
21. **Section 2.6.2.4 Changes in Toxicity and Other Contaminant Characteristics, page 32:** This section is specific to human health and does not address any changes in toxicity or contaminant characteristics which may impact risk to ecological receptors. Please revise section as necessary to address ecological risk.
22. **Section 2.7 Issues, Recommendations, and Follow-Up Actions, page 33:** Please include chemical analysis of seep material and identify any pathways to surface water/sediment.
23. **Appendix A/Figure LF010-3:** LTM-19 was not sampled during the April 2017 event. Please amend the figure box chart for clarity to indicate that it was not sampled (i.e. NS).
24. **Figure LF010-4:** Please label location of SD/SW-7 on this map.

Region 2 Guidance for Incorporating Climate Change Considerations in Five Year Reviews

Background

In June 2011, EPA issued a *Policy Statement on Climate-Change Adaptation* which recognized that climate change can pose significant challenges to EPA's ability to fulfill its mission. It calls for the Agency to anticipate and plan for future changes in climate and incorporate considerations of climate change into its activities. The *Policy Statement* also requires the development of an Agency-wide adaptation strategy that would integrate climate adaptation into the Agency's programs, policies, rules and operations. In addition to the Agency strategy, the *Policy Statement* also directed every EPA Program and Regional Office to develop an Implementation Plan that provides more detail on how it will meet the priorities and carry out the work called for in the agency-wide plan.

The Region 2 Climate Change Workgroup completed its Adaptation Implementation Plan in 2014. One of the priority actions identified in the Plan is to "include consideration of potential climate change impacts in Five-Year Reviews of NPL sites (e.g. flooding impacts to capped sites, changes to aquifers and plume migration, etc.)." This guidance outlines how the Region will implement this priority action.

Process for Considering Climate Change Impacts

When preparing the FYR, RPMs and site project teams should follow the attached decision tree to determine potential site vulnerabilities from climate change. EPA Region 2 has already identified potential vulnerabilities that are likely to affect contaminated sites; these are included in the decision tree. It is expected that most impacted sites will already have provisions in the O&M Plan to respond to climate effects. In addition to the process in the decision tree, any new storm events, flooding, etc., that have affected the site (whether or not they are related to climate change) are typically discussed in Question C, and this practice can continue.

Examples of web resources that RPMs can use to confirm climate data and indicators listed in the decision tree (such as temperature, precipitation, wind speeds, etc.) are provided in OSRTI's December 2013 fact sheet titled *Climate Change Adaptation Technical Fact Sheet: Groundwater Remediation Systems*. Information about O&M is available in *Operation and Maintenance in the Superfund Program* (OSWER 9200.1-37FS, May 2001) and on-line at https://semspub.epa.gov/work/HQ/176112.pdf. O&M information is also generally available at https://www.epa.gov/superfund/superfund-post-construction-completion.

EPA Climate Change Five-Year Review Decision Tree 2014

Have you seen evidence of any of the following situations at your site?

-Contaminant release or migration from remedies due to water level rise or flooding.

-Remedy impairement due to water level rise, flooding, storms and/or winds.

-Other site changes that may be related to any of the following climate change impacts:

Sea level rise

Increasing frequency of heavy precipitation events

Increasing intensity of storms (winds/precipitation/storm surge)

Increasing risk of floods

Changes in temperature

YES

Does the O&M Plan have provisions for responding to these changes?

YES

Include this template language in the O&M section of the FYR: *Potential site impacts from climate change have been assessed, and the perfomance of the remedy may be impacted by the following climate change effects in the region and near the site (list potential effects from above). However, the O&M Plan addresses these impacts by... (describe relevant mitigation or adaptation measures from the O&M Plan).*

NO

Include this template language in the O&M section of the FYR: *Potential site impacts from climate change have been assessed, and the perfomance of the remedy may be impacted by the following expected effects of climate change in the region and near the site: (list potential effects from above). Consider updating the O&M Plan to include the following measures...(describe relevant mitigation or adaptation measures).*

NO

Include this template language in the O&M section of the FYR: *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.*

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U.S. Environmental Protection Agency Review Comments
Received 31 January 2018
Joint Base McGuire-Dix-Lakehurst

Fifth Five Year Review Report for Site LF010, the Dix Area Sanitary Landfill, JB MDL (excerpted from the Dix Basewide FYR)
Dated November 2017
Prepared by: EA Engineering, Science, and Technology, Inc., PBC

1. Respondent Concurs (C), Does not concur (D), or takes Exception (E).
2. Commentator Agrees (A) with response, or Does not agree (D) with response.

Comment #	Page / Section	Government's Review Comment	C,D, or E (1)	Contractor's Response	A or D (2)
General Comments					
1	Page 34	Sentinel wells should not be moved as the result of detections of COCs as this negates the purpose of the sentinel well. Instead, the USAF should evaluate whether the contamination in these wells is truly representative of impacts from the landfill and evaluate whether additional actions need to be taken to address any migration issues related to the COCs. Please amend the recommendation on page 34 to state, "When an analyte concentration exceeding applicable criteria is reported in a currently designated sentinel well, a second round of sampling should be conducted in order to assess whether the exceedance persists. If the concentration remains greater than applicable criteria, trends should be evaluated, in addition to upgradient concentrations, well depths and other relevant information, to determine if impacts are from the landfill and if trends suggest that migration is occurring."	D	This recommendation has been removed, and the text has been updated to indicate that sentinel well re-designation was implemented as proposed. The monitoring well network at LF010 allows for evaluation of the long-term effectiveness of the remedy ("cap and monitor"). The reclassification of sentinel wells was completed in accordance with NJDEP technical regulations and in close coordination with the NJDEP case manager. If there are exceedances of applicable standards in sentinel wells, downgradient potable use receptors are evaluated using New Jersey MCLs and Class I-PL standards to evaluate downgradient discharge to surface water receptors. This protocol is documented in annual IMMR submissions. Exceedances going forward will be confirmed, and then further evaluated as required by NJDEP guidance (see additional details on next page).	

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				NJDEP approved re-designation of sentinel wells based on the following, as described by NJDEP Case Manager Haiyesh Shah: The location of downgradient sentinel wells should focus on detecting migration of the contaminant plume towards the nearest un-impacted downgradient receptor and allow sufficient time for a remedial response to be implemented on the contaminant plume to prevent impact to the potential receptor. The downgradient sentinel well location is determined based on the distance to potential receptors and contaminant velocity. The sentinel well should be located based on the behavior of the contaminant plume (i.e., stable, shrinking, advancing, or diving) and on groundwater monitoring data obtained from the plume monitoring wells. If no receptors are identified within the model-predicted maximum extent of the contaminant plume, sentinel wells may not be necessary provided that monitoring data confirm modeling results, the leading edge of the plume is effectively monitored, the remedial action is effective and groundwater contaminant concentrations are decreasing. Where there is a potential for the groundwater contaminant plume to impact receptors located adjacent to the contaminant plume, sentinel wells should be located laterally adjacent to the plume. Sentinel wells should be located adjacent to and outside of the lateral extent of groundwater contamination.	

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2		Since the ponding from the solar panels affects future protectiveness, the protectiveness determination would be "short-term" and the statement would read, "The remedy at Site LF010 is protective of human health and the environment in the short-term because all exposure pathways have been interrupted and Remedial Action Objectives and cleanup goals are expected to be met." In order to be protective in the long-term, drainage patterns must be reassessed, methods of improving drainage must be assessed and implemented, and vegetative maintenance must be performed regularly to protect the integrity of the cap. The seeps described in this FYR should be further investigated to determine whether it indicates that the landfill cap system is not functioning as designed. If issues with cap function are identified, they must be addressed to prevent mobilization of contaminants from the landfill.	C	The protectiveness determination has been revised as suggested.	

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3		Since nine COCs have changed in value since the ROD was signed in 1991, the FYR references the 2016 IMMR which states that the USAF will soon issue a document, such as an ESD, to formalize the site analyte list. Please note that a proposal, in the form of a Technical Memorandum, of the proposed updated analyte list should be issued to the regulators prior to any final decision document. In addition, please note that some landfill indicator parameters should be retained in the analyte list as they give a more thorough indication of leachate geochemical impacts than analyzing COCs alone.	C	Comment acknowledged. Representatives from JB MDL and JB MDL's O&M contractor hold monthly meetings with the NJDEP to cover critical topics for the Fort Dix sites including LF010. A meeting held on 6 February 2018 covered the topic of the analyte list at LF010 and the pending ESD. All parties agreed that the COCs retained for future sampling and reporting at LF010 starting in 2018 will be limited to constituents that exceeded applicable standards during either of the last two annual sampling events (completed in 2016 and 2017). In accordance with the 2014 Dix Area Basewide Inspection, Maintenance, and Monitoring Work Plan, no landfill indicator parameters are collected at LF010 or planned for collection during future monitoring events. The LF010 analyte list, and supporting COC analysis, will be included with the 2017 Dix Inspection, Maintenance, and Monitoring Report, and NJDEP will review the analyte list prior to preparation and distribution of an ESD. The recommendation regarding ESDs has been revised accordingly.	
4		The term "deleted non-NPL site" is frequently used throughout this document. For example, on page 12 the text states, "Site LF010 was listed on the National Priorities List (NPL) from 1987 to 2012, and is now classified as a CERCLA non-N PL site". The term"non-NPL" has a different meaning in Superfund (e.g., a NPL-caliber site that is not listed on the NPL). Please revise to state LF010's proper designation as a "deleted NPL site".	C	The requested change has been made throughout the document.	

Comment #	Page / Section	Government's Review Comment	C,D, or E [1]	Contractor's Response	A or D [2]
5		LF010 is located near a site, AFFF Area 14 - WWTP Land Application Area, which contains exceedances of two emerging contaminants: perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). Please include in this FYR plans to assess to the Site for the presence of two emerging contaminants PFOS and PFOA due to its proximity to AFFF Area 14.	D	Future investigations for PFCs will be associated with the Land Application Area. Therefore, PFCs are not addressed further in the FYR for LF010.	
6		The forthcoming assessment of 1,4-dioxane should be mentioned in either Question B or C as a potential issue to be addressed in the next FYR.	C	A note regarding 1,4-dioxane has been added to Question C.	
7		EPA Region 2 has a general framework for evaluating climate change in FYRs. See the attached document "Region 2 Guidance for Incorporating Climate Change Considerations in Five Year Reviews". Please consider incorporating this framework into this FYR.	C	Comment acknowledged. Air Force reviewed the guidance, and it was determined that evaluation of climate change is not necessary.	
8		Please include the PDO Landfill and LF017 locations on one figure for reference.	C	These two sites have been added to Figure 1.	
9		Information regarding well depths and screened/targeted intervals based on aquifer depth designations (i.e. shallow, intermediate, and deep zones) are not included in the document, but are an important part of interpreting the data. In Appendix E/Tim Llewellyn Interview Record, it is stated that, "…a new sentinel well was identified and sampling in the intermediate…" which is the only mention of such aquifer designations in the document. Are the sentinel wells screened in appropriate intervals to monitor constituents in upgradient LTM wells? This information is crucial in interpreting data collected from apparently co-located well pairs (i.e. LTM-19 and 20, 17 and 18, 13 and 14). Please revise to incorporate this information.	C	Figure LF010-3 has been revised to designate shallow and deep monitoring wells, and a note has been added to indicate that shallow monitoring wells are screened across the water table, and deep monitoring wells are screened in the lower portion of the surficial aquifer. Note that Tim Llewellyn's reference to an intermediate well is in regards to Site SS007, the MAG-1 Area (not LF010), where an intermediate groundwater zone has been defined.	

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10		Surface water elevations should also be included in the report or on a figure.	D	Monitoring surface water elevations at LF010 is not a requirement of the 2014 Dix Area Basewide Inspection, Maintenance, and Monitoring Work Plan approved by the NJDEP, which dictates the sampling program at the Dix IMMR sites including LF010. Therefore, monitoring of surface water elevations is not performed.	
11		Please specify if reported metals concentrations are for total or dissolved constituents.	C	The text has been revised to indicate that the reported concentrations are for total metals.	
Specific Comments					
1	Executive Summary, page 7	Throughout the document it is noted that seeps have been observed along a landfill side slope. Have surface water and/or sediment been collected from the seep areas? This may affect the current protectiveness of the remedy, depending upon whether COCs in exceedance of acceptable concentrations are identified. The seeps should be identified on a site figure, and any pathways to surface water bodies should be delineated.	C	The location of the area of potential seeps (2017) has been added to Figure LF010-1b. The area of the seeps drains to the stormwater pond at the southern end of the landfill, and does not have a direct pathway to other surface water bodies. The FYR text has been updated to indicate that the potential seeps have not been observed recently, since a contractor unclogged drainage outlets around the landfill. JB MDL did not oversee collection of surface water or sediment from the seep areas prior to unclogging of the drains. Drainage outlets and the area of potential seeps will be included in future semiannual inspections, as documented in the contractor's approved February 2018 work plan. Reference to this work plan has been added to the text.	

Comment #	Page / Section	Government's Review Comment	C,D, or E (1)	Contractor's Response	A or D (2)
2	Executive Summary, page 7	The text states, "Exposure pathways that could result in unacceptable risk are being controlled." Please note that if COCs are at concentrations in exceedance of screening values in the seeps, this statement may not be supported.	C	See response to Specific Comment 1. The potential seeps have not been observed recently, but the area will be monitored in semiannual inspections.	
3	Executive Summary, page 8	The last sentence indicates that, "protectiveness statements for each site are presented," however, only one site is included in this Five Year review. Please correct as appropriate.	C	This typo has been corrected.	
4	Section 1.2.1 Assessment of 1,4-Dioxane, page 13	The text states, "Sampling is planned to begin in 2017 and will target wells in the former chlorinated solvent source areas including Site LF010 and downgradient locations as needed." To date, has sampling been conducted at LF010? If results have been received, please include them in this FYR.	C	The 1,4-dioxane sampling at LF010 has not been conducted. The sampling is now planned for 2018, and the text has been revised accordingly.	
5	Section 1.3.1 Groundwater Use in the Vicinity, page 14	Regarding the potable water supply information, please include additional detail about where the supply wells are located in relation to the landfill (or a map).	C	The text has been revised to indicate that the fifteen potable supply wells are located upgradient of LF010. Note that JB MDL does not provide precise locations of the potable supply wells for security reasons.	
6	Section 2.2.1 Physical Characteristics, page 15	Based on the groundwater contour map provided in Figure LF010-2, as well as the monitoring network and contaminant distribution, it seems oversimplified to state that groundwater flow is generally to the south. The maps show three distinct flow components, but the primary direction is to the south-southwest.	C	The text has been revised to indicate a general groundwater direction to the south-southwest.	
7	Section 2.2.5 Basis for Taking Action, page 17	Although it is noted that an environmental assessment concluded that, "significant impacts to wildlife and vegetation were not expected to occur", it is unclear if an actual risk assessment was conducted and whether assumptions and toxicity values were reviewed to determine if actions/methods are consistent with current risk assessment methodology. Revise the FYR to clarify.	C	As stated in Section 2.6.2.1, a Health and Environmental Assessment (1989) was conducted for the Sanitary Landfill. Although this assessment was not consistent with current risk methodology, recent surface water and sediment data indicate that the current remedy is protective of ecological receptors, as described in Section 2.6.2.1. A reference to this section has been added to Section 2.2.5.	

Comment #	Page / Section	Government's Review Comment	C,D, or E (1)	Contractor's Response	A or D (2)
8	Section 2.3.3 System Operation and Maintenance, page 19	Clearly indicate here what season the annual mowing event is conducted is conducted in (spring or fall).	C	Prior to the construction of the solar farm, the landfill was mowed annually in the fall. Since construction of the solar farm, the area outside of the solar farm is mowed annually in the fall, while the area within the solar farm lease is mowed more frequently. The text has been revised accordingly.	
9	Section 2.3.3 System Operation and Maintenance, page 20	The text states, "JB MDL's O&M contractor retains the responsibility for the formal semiannual inspections…" Please revise to state, "JB MDL's O&M contractor conducts the formal semiannual inspections…on behalf of JB MDL."	C	The text has been revised as requested.	
10	Section 2.3.3 System Operation and Maintenance, page 20	Please indicate here how many acres of the landfill cap the solar array occupies.	C	The solar array occupies approximately 50 acres. This information has been added to the text.	
11	Section 2.4 Progress Since the Last Review, page 21	Regarding the first Issue/Recommendation on the table, please refine "Follow-Up Action Taken" to clearly indicate the sampling points (SW/SD-1, SW/SD-2, SW/SD-9, LTM-27 and LTM-28) which will no longer be included as part of LF010 LTM.	C	The text describing the Follow-Up Action Taken has been revised as requested.	
12	Section 2.4 Progress Since the Last Review, page 21	Regarding the second Issue/Recommendation on the table, it should be stated that LTM-11 was not reclassified based on recent sampling data and is still considered a sentinel well, as discussed in Section 2.4.2 Refinement of the Long-Term Monitoring Program. The current wording implies that it has been designated as an AOC well.	C	The text describing the Follow-Up Action Taken has been revised to indicate that LTM-14 was reclassified, while LTM-11 was retained as a sentinel well.	
13	Section 2.4 Progress Since the Last Review, page 21	Regarding the third Issue/Recommendation on the table, please indicate that the referenced COCs are for groundwater only.	C	The text has been clarified as requested.	

Comment #	Page / Section	Government's Review Comment	C,D, or E (1)	Contractor's Response	A or D (2)
14	Section 2.5.4 Data Review, Groundwater, page 24	The text states, "Benzene and chlorobenzene concentrations along the west side of the landfill (AOC wells LTM-20, LTM-22, LTM-32) were relatively stable without apparent trend." Based on data trends, especially during the review period, chlorobenzene concentrations at LTM-32 are not stable, and have recently (and overall) been increasing. Please modify text appropriately.	C	The text has been revised to indicate that chlorobenzene concentrations at LTM-32 have recently been increasing.	
15	Section 2.5.4 Data Review, Sediment and Surface Water, pages 25-26	As noted in EPA's 2015 Five Year review comments, please do not differentiate between nutrient and non-nutrient metals when discussing sediment and surface water data.	C	References to nutrient metals exceeding criteria in sediment and surface water were removed from Sections 2.5.4 and 2.6.2.1.	
16	Section 2.5.5 Site Inspection, page 26	It was stated that during the July 2017 site visit, "Seeping, associated with orange-colored water with an apparent sheen was also observed on the eastern side slope of the landfill." During the EPA site visit in December 2017, it should be noted that seep drains were observed on both the south and east landfill slopes, and all locations had an associated orange precipitate (presumed to be iron oxides). This precipitate was accumulating in the drainage trenches at the base of the landfill slope.	C	Comment acknowledged. The precipitate is associated with normal drainage from the landfill.	
17	Section 2.6.1 Question A, page 28	In the discussion of sediment and surface water it is noted that concentrations are within "expected ranges". Provide additional information regarding these "expected ranges". While surface water concentrations show a downward trend, sediment concentrations at SW/SD-7 appear to be increasing. For example, arsenic and zinc appear to have increased quite significantly over the past two years according to "Lead and Arsenic in Sediment at Site LF010" and "Zinc in Sediment at Site LF010" graphs in Appendix D. Please clarify and revise.	C	The text has been revised to clarify, as requested, consistent with the text of Section 2.5.4.	
18	Section 2.6.1 Question A, page 28	The response to Question A should discuss the protectiveness to ecological receptors.	C	Discussion of protectiveness to ecological receptors has been added to Question A, consistent with Section 2.6.2.1 and text added to Section 2.5.4.	

Comment #	Page / Section	Government's Review Comment	C,D, or E [1]	Contractor's Response	A or D [2]
19	Section 2.6.1 Question A, page 28	In the statement, "Qualitative analysis indicates that concentrations were generally stable or decreasing during the review period, with the exception of increased metals concentrations along the west side…" Metals are not the only exception to this statement. Please clarify that select VOCs (notably benzene, chlorobenzene, and cis-1,2-DCE, and 1,4-dichlorobenzene) also displayed increasing concentrations during the review period in LTM wells on the western portion of the landfill. Please clarify this statement in the text.	C	Question A has been revised to indicate that chlorobenzene concentrations at LTM-32 increased in 2015-2017. See also response to Specific Comment 14. Although concentrations of benzene, cis-1,2 DCE, and 1,4-dichlorobenzene were higher in 2017 than 2016 in one well each, these do not appear to be indicative of overall trends.	
20	Section 2.6.2.1 Changes in Risk Assessment Methodology, page 28	The last paragraph indicates that there were no exceedances of AWQC at SW-3, however no information on SW-7 is provided in this section. Provide here additional information regarding "moderately elevated levels of metals in sediments". Specifically, discuss whether concentrations are greater than chronic values but less than acute values.	C	The referenced paragraph was revised to address SW-7 as well, with reference to additional text added to Section 2.5.4. Information regarding sediment exceedances of the lowest effects levels, versus severe effects levels, was also added to Section 2.5.4, with reference in Section 2.6.2.1.	
21	Section 2.6.2.4 Changes in Toxicity and Other Contaminant Characteristics, page 32	This section is specific to human health and does not address any changes in toxicity or contaminant characteristics which may impact risk to ecological receptors. Please revise section as necessary to address ecological risk.	C	A paragraph discussing ecological risk considerations has been added to this section.	
22	Section 2.7 Issues, Recommendations, and Follow-Up Actions, page 33	Please include chemical analysis of seep material and identify any pathways to surface water/sediment.	D	See response to Specific Comment 1. The area where the seep was observed will be monitored and investigated as necessary.	
23	Appendix A/ Figure LF010-3	LTM-19 was not sampled during the April 2017 event. Please amend the figure box chart for clarity to indicate that it was not sampled (i.e. NS).	C	The figure has been revised for clarity, as requested.	
24	Figure LF010-4	Please label location of SD/SW-7 on this map.	C	The formatting of the labels on this figure has been revised for consistency.	

Appendix C
Table of Documents Reviewed for Five-Year Review

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Appendix C
Documents Reviewed for Five-Year Review

Site(s)	Title	Date	Author	Version
All Except TU026	2016 Inspection, Maintenance, and Monitoring Report, Interim Remedial Action Completion Report for TU578, and Remedial Action Completion Report for Sites LF033, NW045, TU579, and TU924.	March 2017	Arcadis	Draft
All Except TU026	2015 Inspection, Maintenance, and Monitoring Report	October 2016	Arcadis	Final
All	Project Management Plan 2016 Update	May 2017	Arcadis	Revision 2
LF010, LF017	2014 Inspection, Maintenance, and Monitoring Report	March 2015	Plexus	Final
LF010, LF017	2013 Inspection, Maintenance, and Monitoring Report	November 2014	Plexus	Final
LF010, LF017, LF033, SS005B, SS025	Dix Area Basewide Inspection, Maintenance, and Monitoring Work Plan	November 2014	Plexus	Final
Basewide	Basewide Quality Assurance Project Plan - Revision 02	November 2016	Arcadis	Final
LF010, LF033, SS005B, SS007, SS025	2016 Biennial Dix Area Classification Exception Area/Well Restriction Area Certification	April 2016	Arcadis	Final?
LF010, LF033, SS025, SS005B, SS007	Fort Dix Classification Exception Area for the Cantonment Area, Training Area and Satellite Sites: ARDC and Building 7061	September 2003	Shaw	Final
LF010, LF033, SS025, SS005B, SS007	Dix Area Sitewide Classification Exception Area / Well Restriction Area (CEA/WRA) Fact Sheet Form	February 2014	Plesus	Final?
All	Land Use Controls Implementation Plan	May 2014	JB MDL	Final?
LF010	Fourth Five-Year Review Report, Dix Sanitary Landfill, Site ID: LF010	September 2015	USACE-Baltimore	Final
LF010	Third Five-Year Review Report for The Fort Dix Sanitary Landfill	September 2010	Plexus	Final
LF010	Record of Decision, Fort Dix Landfill	September 1991	U.S. Army, EPA	Final
LF010	Proposed Response Report Addendum III, Revised Health and Environmental Assessment, RI/FS for Fort Dix Sanitary Landfill	July 1989	CDM	Final
LF010 and LF017	Fall 2014 Semi-Annual Landfill Inspection Report for the Dix Area Sanitary Landfill and EPIC-8 Landfill	September 2014	Plexus	Final
LF010 and LF017	Fall 2013 Semi-Annual Landfill Inspection Report for the Dix Area Sanitary Landfill and EPIC-8 Landfill	December 2013	Plexus	Final
LF010	Spring 2014 Semi-Annual Landfill Inspection Report for the Dix Area Sanitary Landfill	July 2014	Plexus	Final
LF010	Spring 2013 Semi-Annual Landfill Inspection Report for the Dix Area Sanitary Landfill	August 2013	Plexus	Final
LF010	Spring 2017 Sanitary Landfill Inspection Checklist	April 2017	Arcadis	Draft
LF010	Long-Term Monitoring Plan Addendum for the Dix Area Sanitary Landfill Classification Exception Area	August 2013	Plexus	Final
LF010	Classification Exception Area, The Fort Dix Sanitary Landfill	March 2002	EA	Final
LF010	Project Operations and Maintenance Plan (Exhibit F4) for Fort Dix Landfill Solar PV Lease Document	Not Indicated	Not Indicated	Not Indicated
LF017	Second Five-Year Review Report for the Dix EPIC-8 Landfill	May 2013	USACE-Baltimore	Final
LF017	First Five-Year Review Report for U.S. Army Fort Dix (EPIC-8 Landfill)	December 2008	USACE-Baltimore	Final
LF017	EPIC-8 Landfill Decision Document, Institutional Controls	August 2002 / signed October 2002	EM Federal Corp.	Final
LF017, LF033, SS005B	Fort Dix Environmental Investigation Report	May 1997	ICF Kaiser	Final
LF017	Amendment to the Fort Dix Installation Master Plan, EPIC-8 Landfill, Engineering and Institutional Controls Remedial Action	2013?	JB MDL	NA
LF033	PDO Landfill Remedial Action Report and Five-Year Review Report	September 2013	CB&I	Final
LF033	Property Disposal Office Landfill Decision Document, Remedial Action	November 2003 / signed June 2004	EM Federal Corp.	Final
LF033	Remedial Action Completion Report for Site LF033 (attachment to 2016 IMMR)	March 2017	ARCADIS	Draft?
LF033	Letter Re: Comments-17Apr13 Remedial Action Report + 5-Year Review for PDO LF	September 2013	NJDEP	Final
LF033	Proposed Sediment Remedial Action Level for Mercury - Dix Site LF033 - Property Disposal Office Landfill	November 2016	Arcadis	Final
LF033	Response to NJDEP Comments on the Review of the Draft Proposed Sediment Remedial Action Level for Mercury at LF033 - Property Disposal Office Landfill Site	Not Indicated	Not Indicated	Final
LF033, SS005B, SS025	Fall 2013 Interim Data Report, Sites SS005B (4300/4400 Area), SS025 (ARDC Test Site), and LF033 (PDO Landfill)	March 2014	PIKA-ARCADIS	Final
LF033, SS005B, SS025	Spring 2014 Interim Data Report, Sites SS005B (4300/4400 Area), SS025 (ARDC Test Site), and LF033 (PDO Landfill)	September 2014	PIKA-ARCADIS	Final

Appendix C
Documents Reviewed for Five-Year Review

Site(s)	Title	Date	Author	Version
LF033, SS005B, SS025	Semi-Annual Report, Dix Area Sites SS005B (4300/4400 Area), SS025 (ARDC Test Site), LF033 (PDO Landfill), NW045 (Building 5339), and TU924 (Building 0199)	May 2015	EA	Final
LF033, SS005B, SS025	Semi-Annual Report, Dix Area Sites SS005B (4300/4400 Area), SS025 (ARDC Test Site), LF033 (PDO Landfill), NW045 (Building 5339), and TU924 (Building 0199)	April 2016	EA	Final
LF033, SS005B, SS025	Fall 2013 and Spring 2014 Annual Monitoring Report, Sites SS005B (4300/4400 Area), SS025 (ARDC Test Site), and LF033 (PDO Landfill)	September 2014	PIKA-ARCADIS	Draft (approved)
SS005B	4300/4400 Area Remedial Action Report and Five-Year Review Report	September 2013	CB&I	Final
SS005B	Addendum to Alternatives Analysis Report, 4300 Area and 4400 Area Spill Sites	November 2001	IT Corporation	Final
SS005B	4300 Area Spill Site, 4400 Area Spill Site Decision Document, Remedial Action	May 2003 / signed June 2003	EM Federal Corp.	Final
SS005B	4300/4400 Area February 2013 Long-Term Monitoring	November 2013	CB&I	Final
SS005B	Letter Re: Unrestricted Use No Further Action Equivalent for Soil, Groundwater, Surface Water and Sediment Areas of Concern: Site 2 at 4300/4400 Area and Not Other Sites/Areas	September 2013	NJDEP	Final
SS007	MAG-1 Area (Site SS007, formerly FTDX-07) Remedial Action Report and Five-Year Review Report	September 2013	CB&I	Final
SS007	Explanation of Significant Difference, MAG-1 Area	June 2011	Shaw	Final
SS007	Magazine Area 1 Decision Document	August 2002	Harding ESE, Inc.	Final
SS007	Remedial Investigation Report, Mag-1 Area	April 1997	ABB Environmental	Final
SS007	Letter Re: Remediation Assessment and Path Forward for Dix Site SS007 (MAG-1 Area)	February 2016	Arcadis	NA
SS007	MAG-1 Remedial Action Operations and Maintenance Project Management Plan, Site SS007 (formerly FTDX-07)	December 2013	CB&I	Final?
SS007	SS007 (MAG-1) MNA Assessment and Path Forward (attachment to 2016 IMMR)	December 2016	Arcadis	Draft?
SS007	Arcadis Transition Plan for Dix Site SS007 (MAG-1 Area)	October 2015	Arcadis	NA?
SS007	MAG-1 Remedial Action Operations and Maintenance Quarterly Report for July through September 2015 and Task Order Summary Report, Site SS007 (formerly FTDX-07)	September 2015	CB&I	Rev. 2
SS007	MAG-1 Remedial Action Operations and Maintenance Quarterly Report - April through June 2015, Site SS007 (formerly FTDX-07)	June 2015	CB&I	Rev. 0
SS007	MAG-1 Remedial Action Operations and Maintenance Quarterly Report - September through December 2014, Site SS007 (formerly FTDX-07)	January 2015	CB&I	Rev. 0
SS007	MAG-1 Remedial Action Operations and Maintenance Quarterly Report - June through August 2014, Site SS007 (formerly FTDX-07)	September 2014	CB&I	Rev. 0
SS007	MAG-1 Remedial Action Operations and Maintenance Quarterly Report, Site SS007 (formerly FTDX-07)	May 2014	CB&I	Rev. 0
SS007	Meeting Minutes, JB MDL-NJDEP Project Review, MAG-1 Remedial Action O&M	May 2014	NA	NA
SS007	Letter Re: Comments-17Jul13 Remedial Action Report + 5-Year Review for Mag-1 Area	September 2013	NJDEP	Final
SS025	ARDC Test Facility Remedial Action Report and Five-Year Review Report	September 2013	CB&I	Final
SS025	ARDC Test Facility Decision Document	May 2003	Harding ESE, Inc.	Final
SS025	Remedial Investigation Report, ARDC Test Facility	June 2000	Harding Lawson Asso	Final
SS025	Letter Re: Comments-17Jul13 Remedial Action Report + 5-Year Review for ARDC Site	September 2013	NJDEP	Final
TU026	Explanation of Significant Differences, Dix Site TU026, New Egypt Armory	November/ December 2016	PIKA-ARCADIS	Final
TU026	Remedial Action Report, Dix New Egypt Armory Site (TU026)	September 2016	PIKA-ARCADIS	Final
TU026	Record of Decision, Dix Site TU026, New Egypt Armory	May 2015 / signed June 2015	NA	Final
TU026	Remedial Action Completion Memo for the New Egypt Armory	December 2015	PIKA-ARCADIS	NA
TU026	Remedial Investigation Report, New Egypt Armory	July 2012	EA	Final
TU026	Focused Feasibility Study, New Egypt Armory	September 2012	EA	Final

Appendix D
Concentration versus Time Charts

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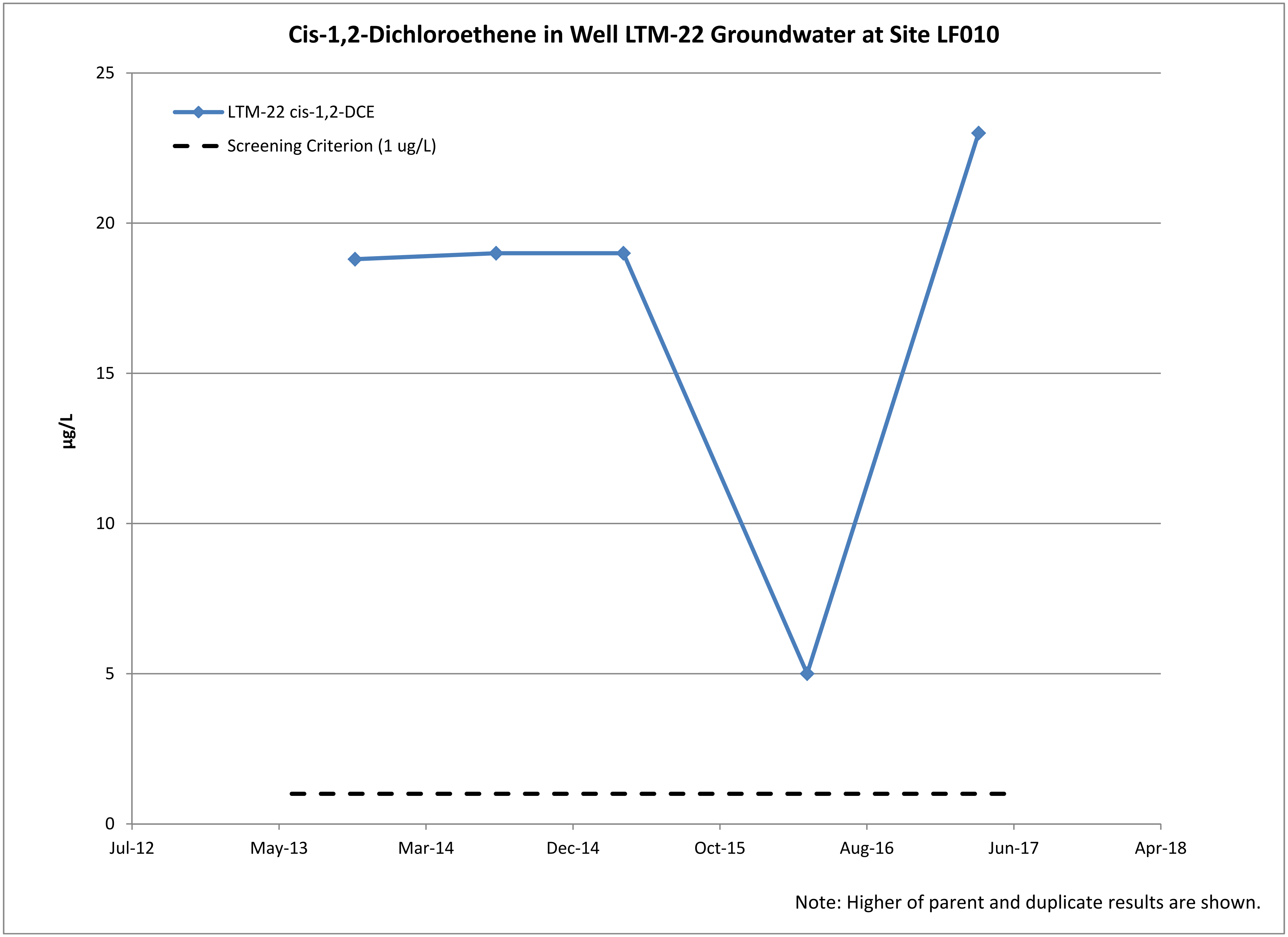
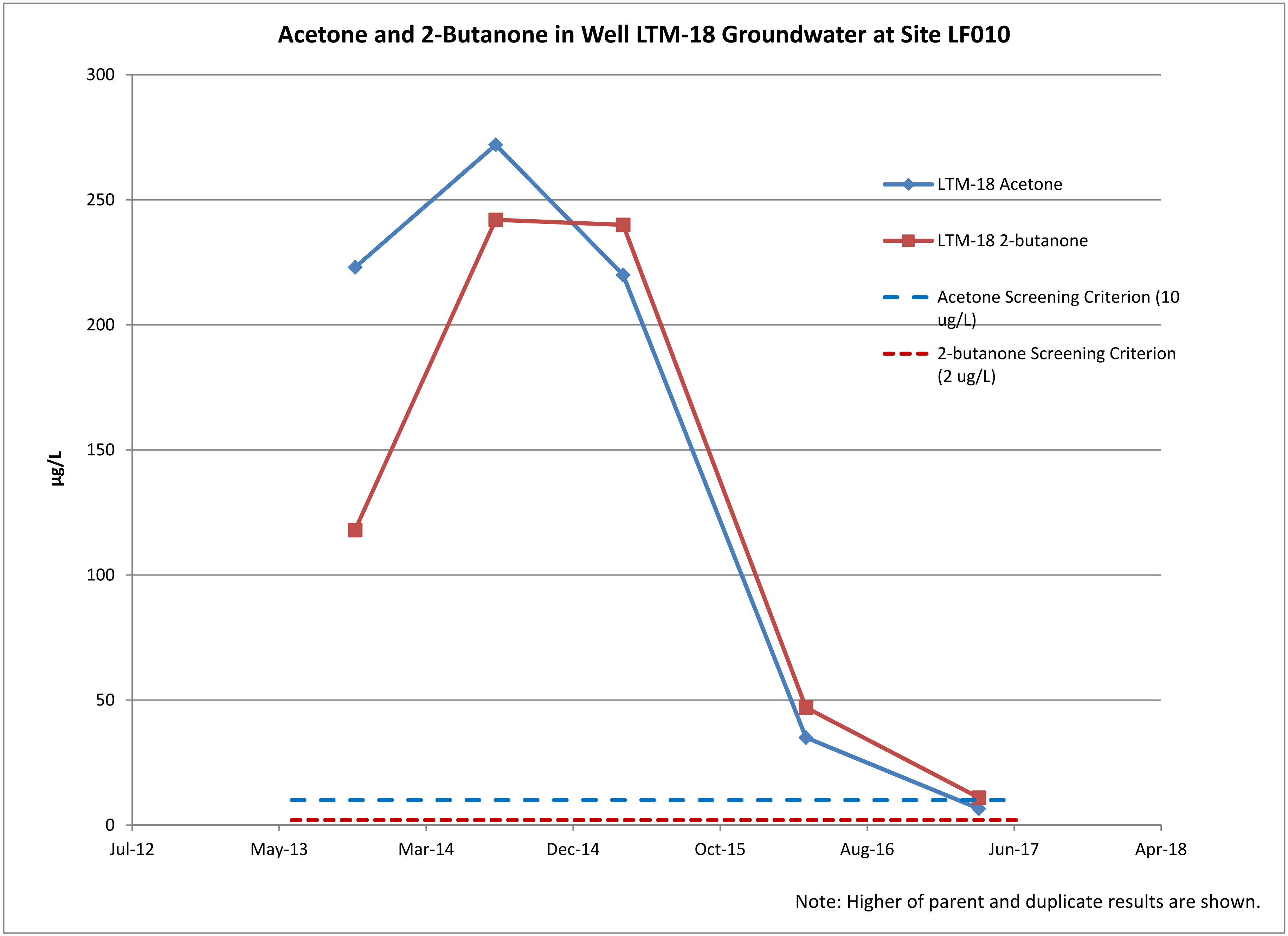
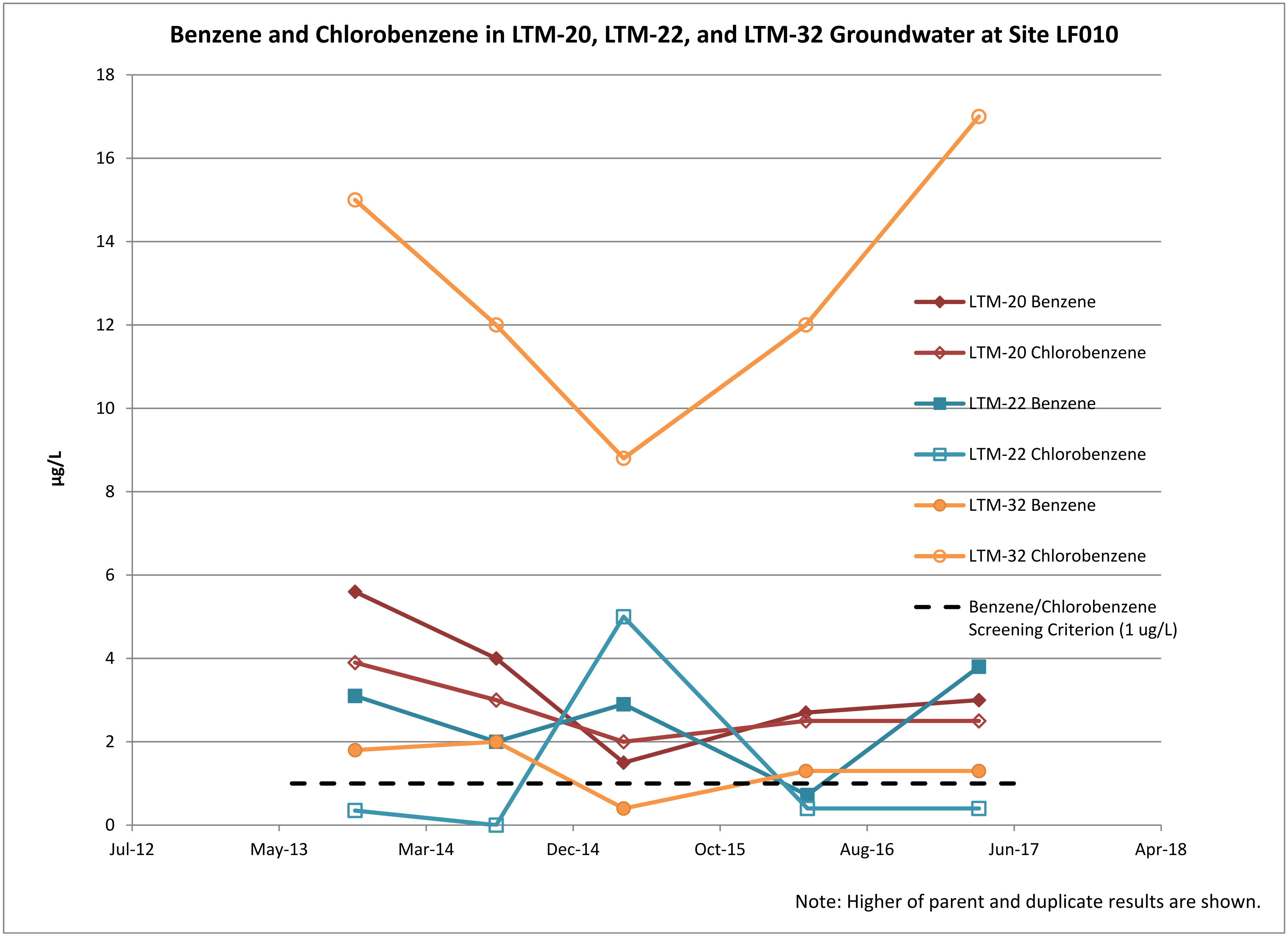
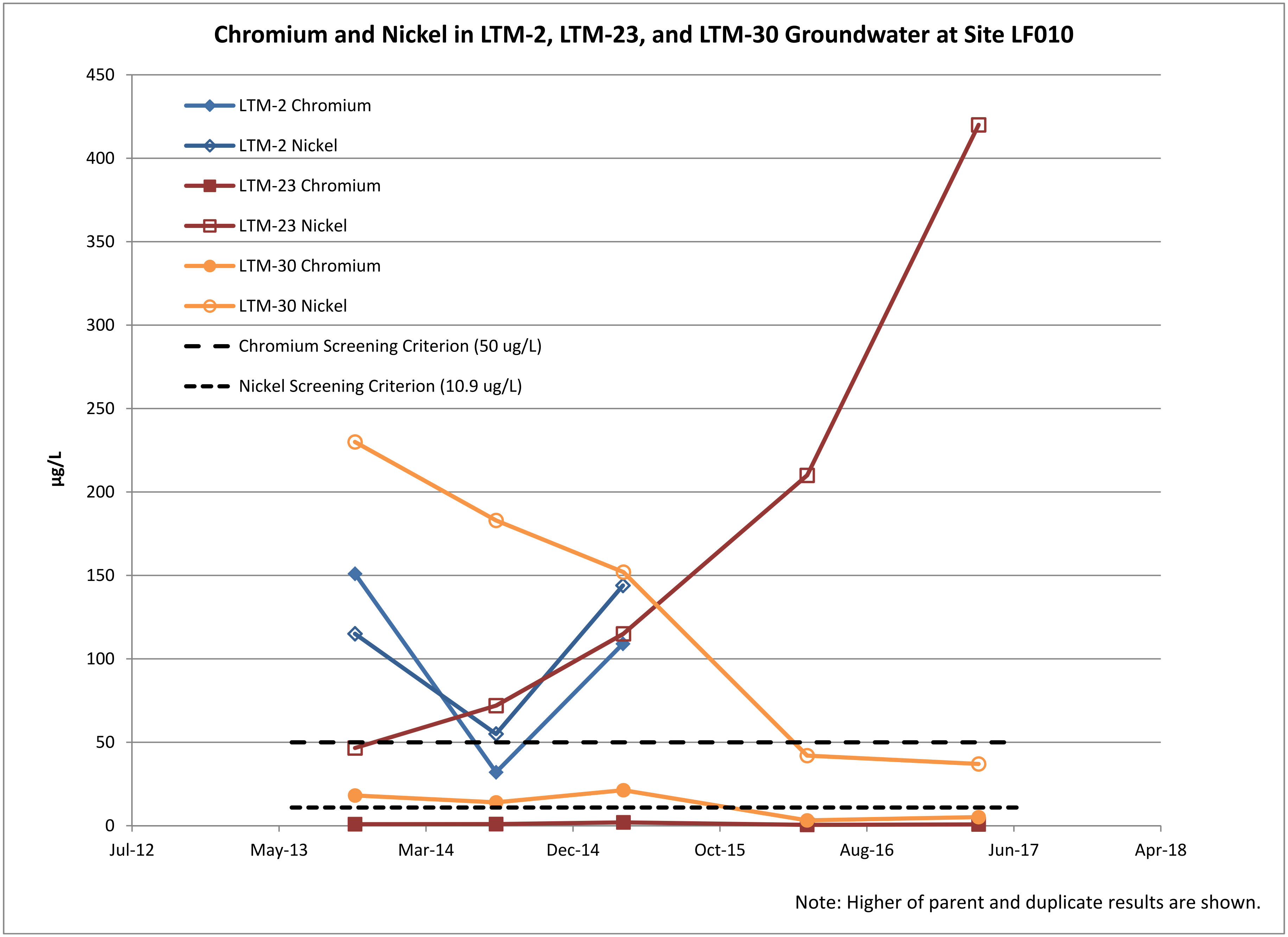

Cis-1,2-Dichloroethene in Well LTM-22 Groundwater at Site LF010
LTM-22 cis-1,2-DCE
Screening Criterion (1 ug/L)
µg/L
25
20
15
10
5
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
Note: Higher of parent and duplicate results are shown.

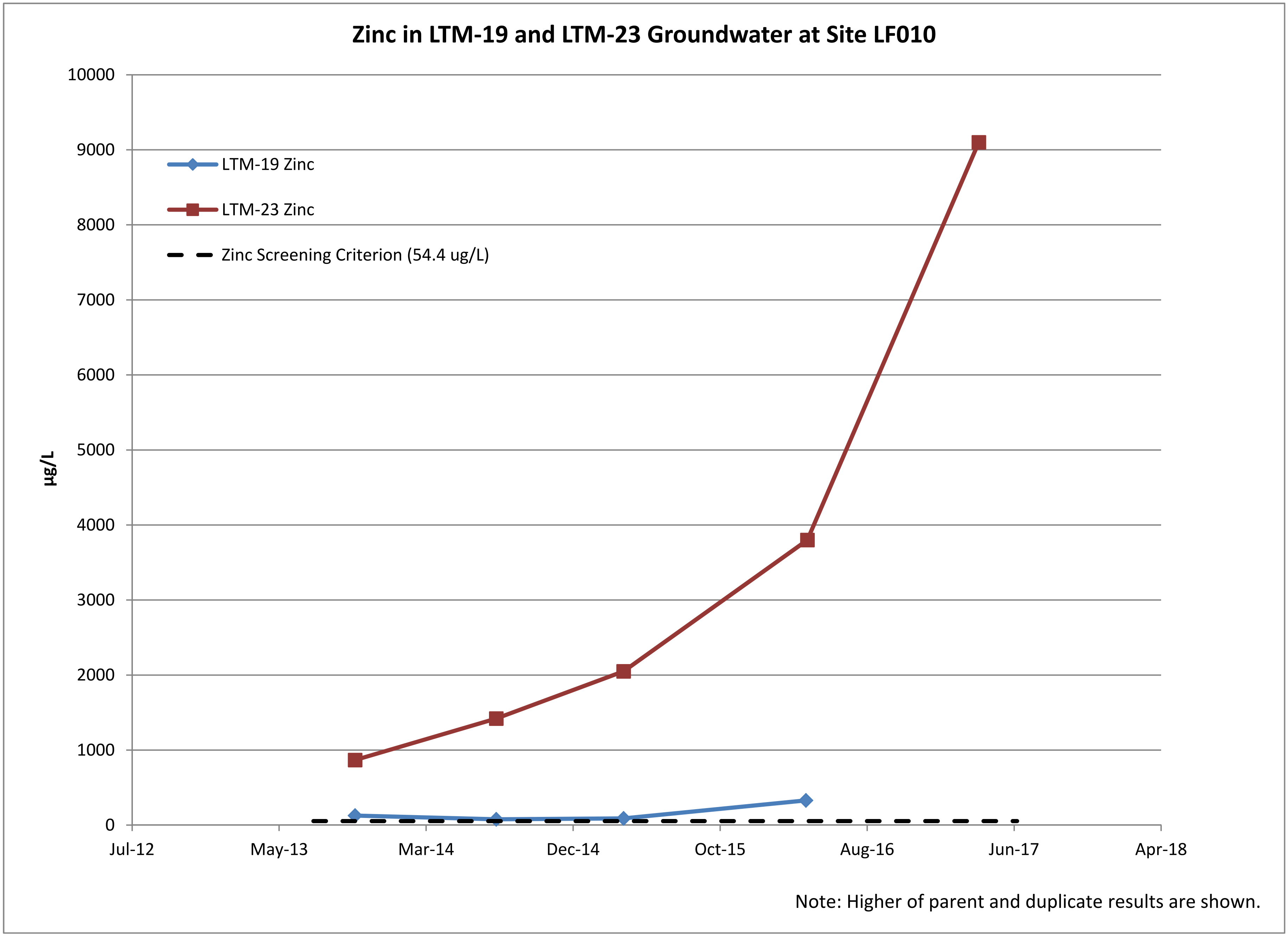


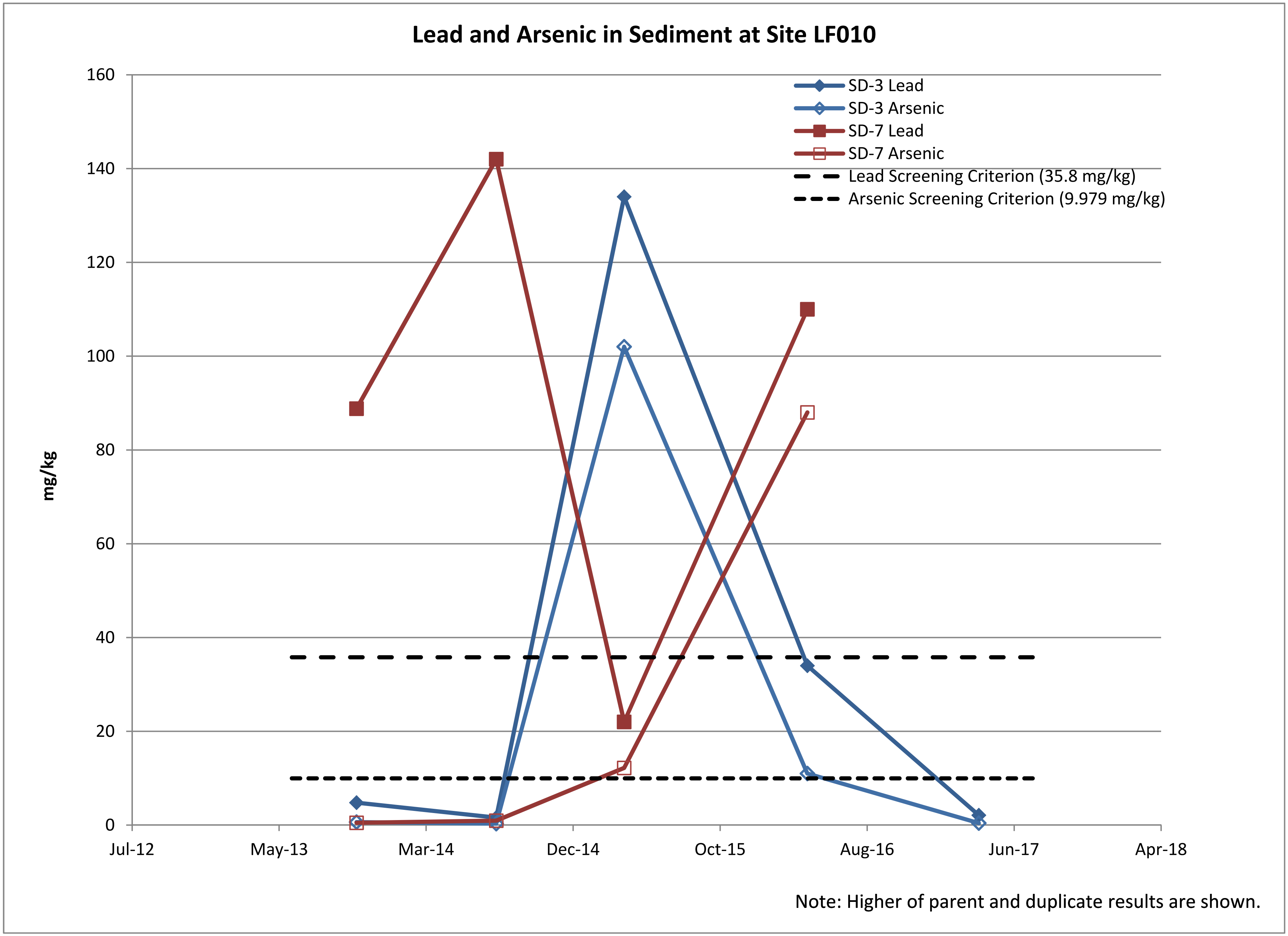
Acetone and 2-Butanone in Well LTM-18 Groundwater at Site LF010
300
250
200
150
100
50
0
µg/L
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
LTM-18 Acetone
LTM-18 2-butanone
Acetone Screening Criterion (10 ug/L)
2-butanone Screening Criterion (2 ug/L)
Note: Higher of parent and duplicate results are shown.



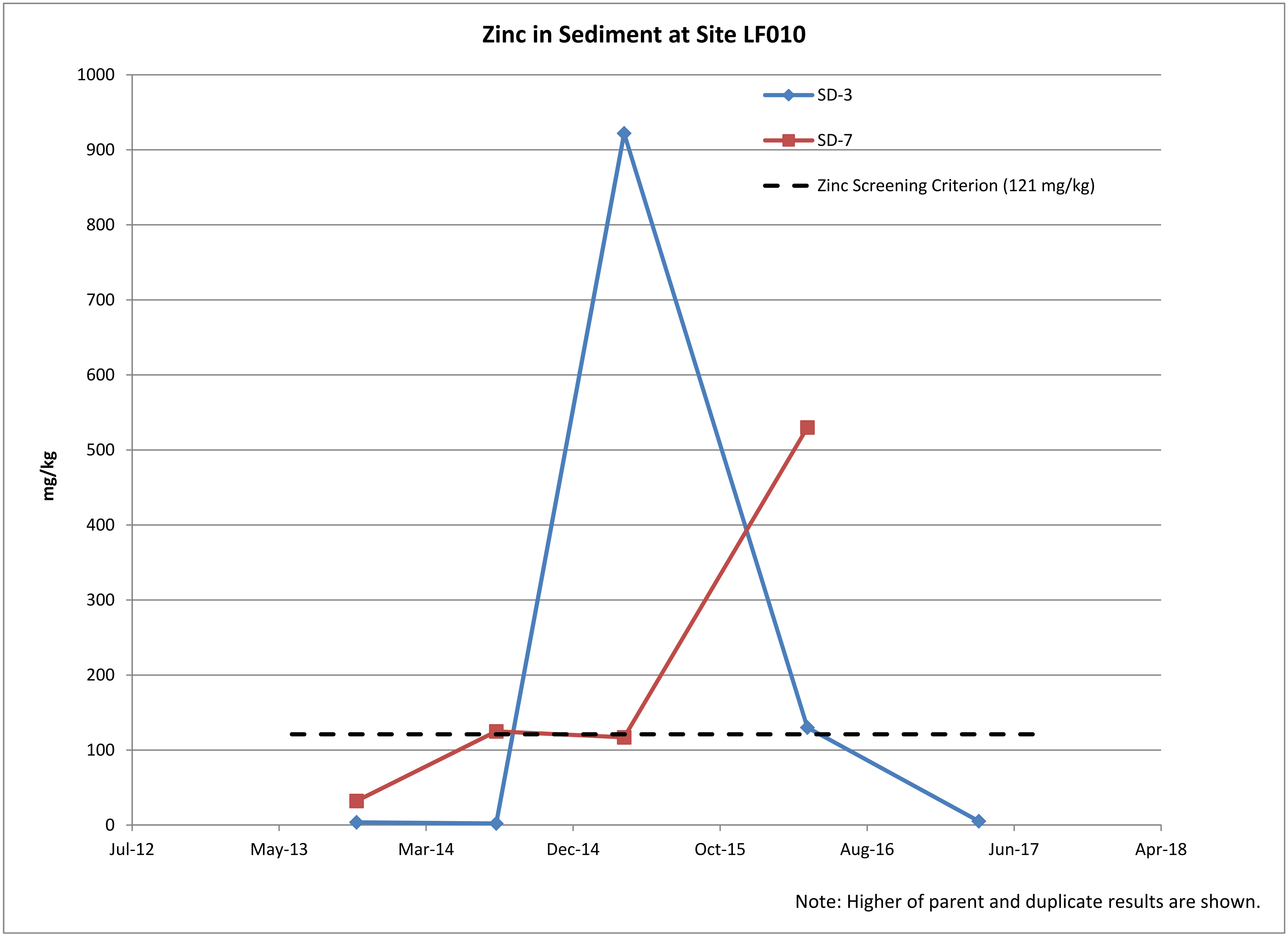
Benzene and Chlorobenzene in LTM-20, LTM-22, and LTM-32 Groundwater at Site LF010
µg/L
18
16
14
12
10
8
6
4
2
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
LTM-20 Benzene
LTM-20 Chlorobenzene
LTM-22 Benzene
LTM-22 Chlorobenzene
LTM-32 Benzene
LTM-32 Chlorobenzene
Benzene/Chlorobenzene Screening Criterion (1 ug/L)
Note: Higher of parent and duplicate results are shown.

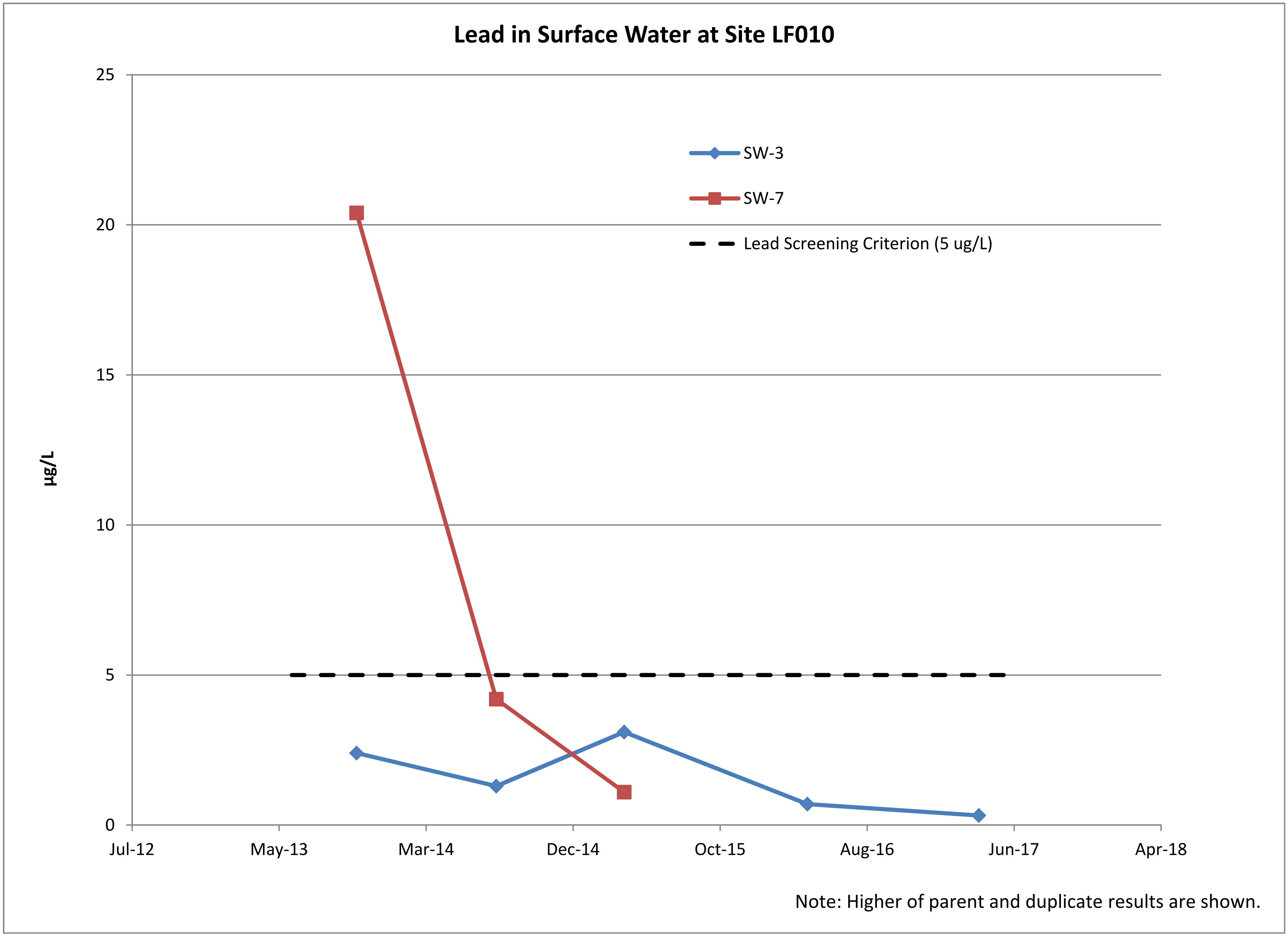

Chromium and Nickel in LTM-2, LTM-23, and LTM-30 Groundwater at Site LF010
µg/L
450
400
350
300
250
200
150
100
50
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
LTM-2 Chromium
LTM-2 Nickel
LTM-23 Chromium
LTM-23 Nickel
LTM-30 Chromium
LTM-30 Nickel
Chromium Screening Criterion (50 ug/L)
Nickel Screening Criterion (10.9 ug/L)
Note: Higher of parent and duplicate results are shown.


Zinc in LTM-19 and LTM-23 Groundwater at Site LF010
LTM-19 Zinc
LTM-23 Zinc
Zinc Screening Criterion (54.4 ug/L)
µg/L
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
Note: Higher of parent and duplicate results are shown.

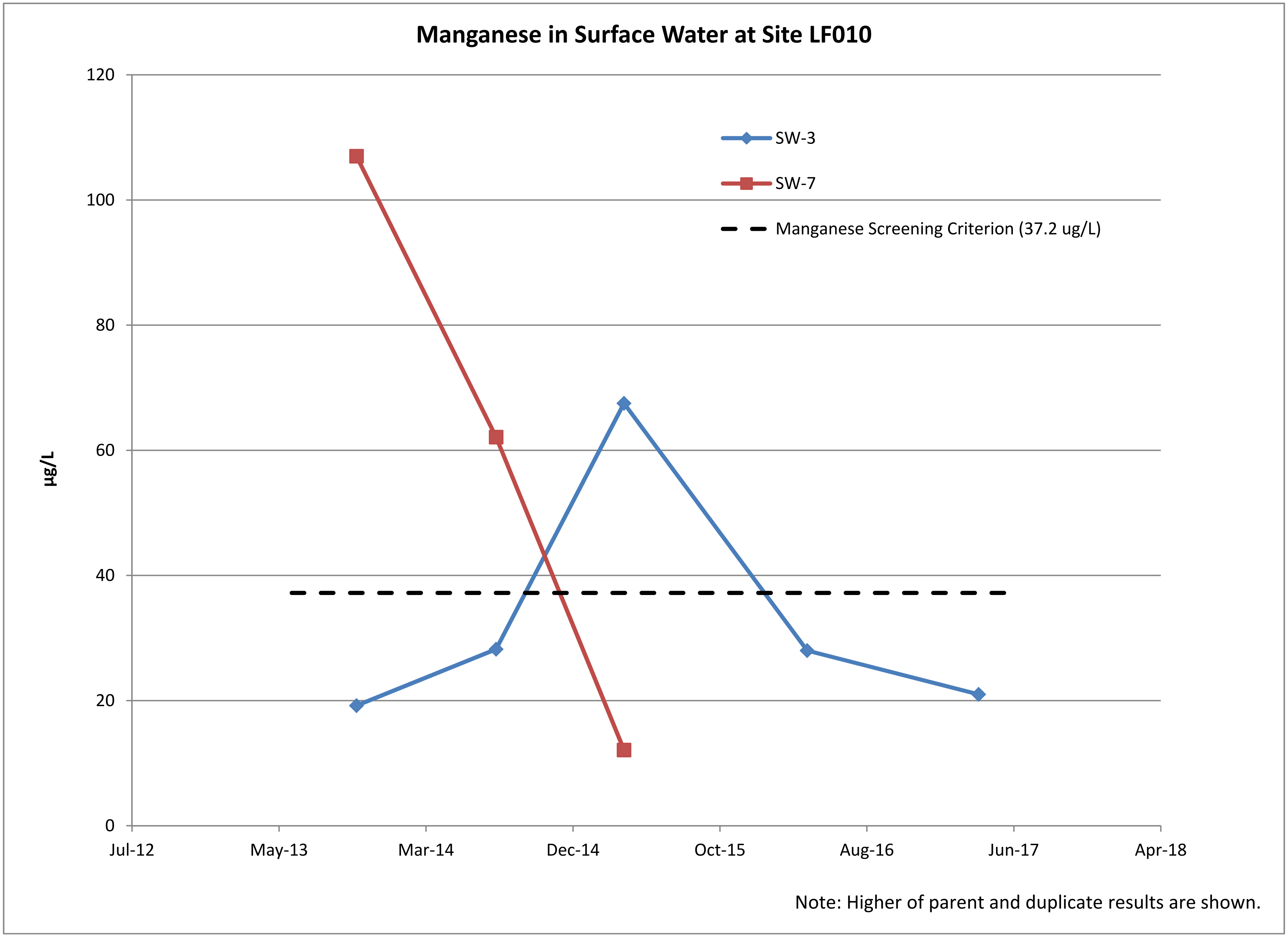


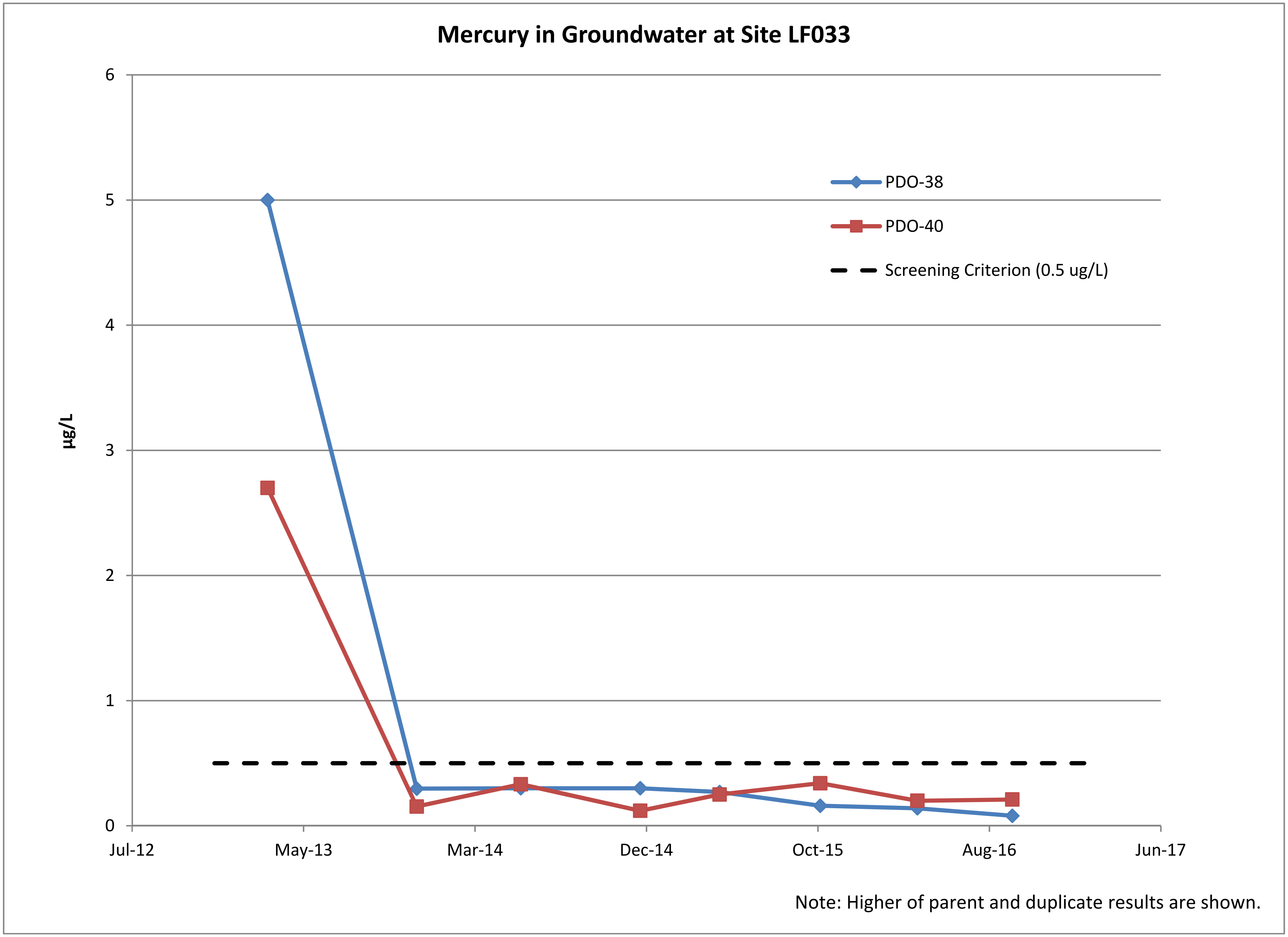
Lead and Arsenic in Sediment at Site LF010
mg/kg
160
140
120
100
80
60
40
20
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
SD-3 Lead
SD-3 Arsenic
SD-7 Lead
SD-7 Arsenic
Lead Screening Criterion (35.8 mg/kg)
Arsenic Screening Criterion (9.979 mg/kg)
Note: Higher of parent and duplicate results are shown.


Zinc in Sediment at Site LF010
SD-3
SD-7
Zinc Screening Criterion (121 mg/kg)
mg/kg
1000
900
800
700
600
500
400
300
200
100
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
Note: Higher of parent and duplicate results are shown.

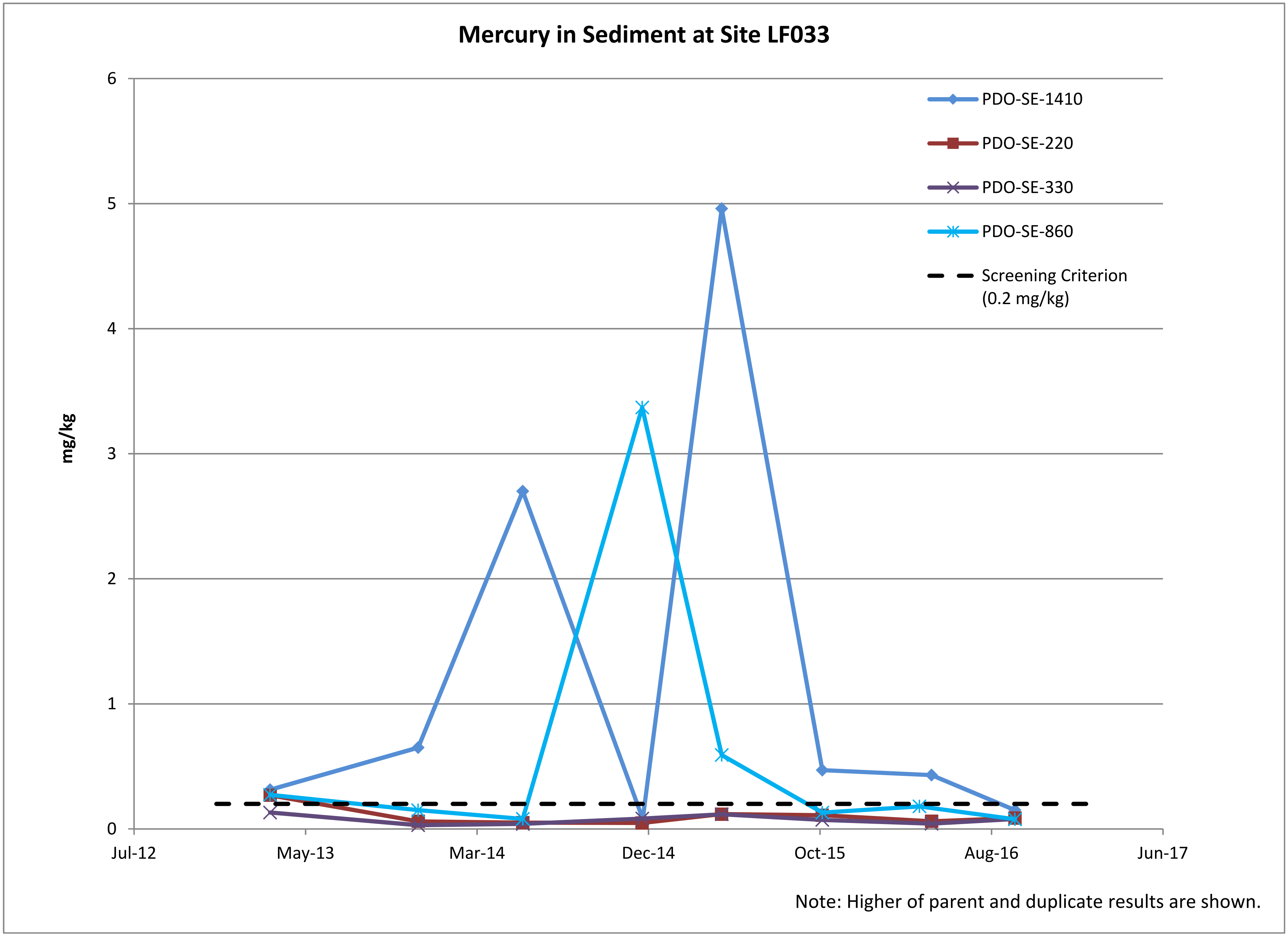


Lead in Surface Water at Site LF010
µg/L
25
20
15
10
5
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
SW-3
SW-7
Lead Screening Criterion (5 ug/L)
Note: Higher of parent and duplicate results are shown.

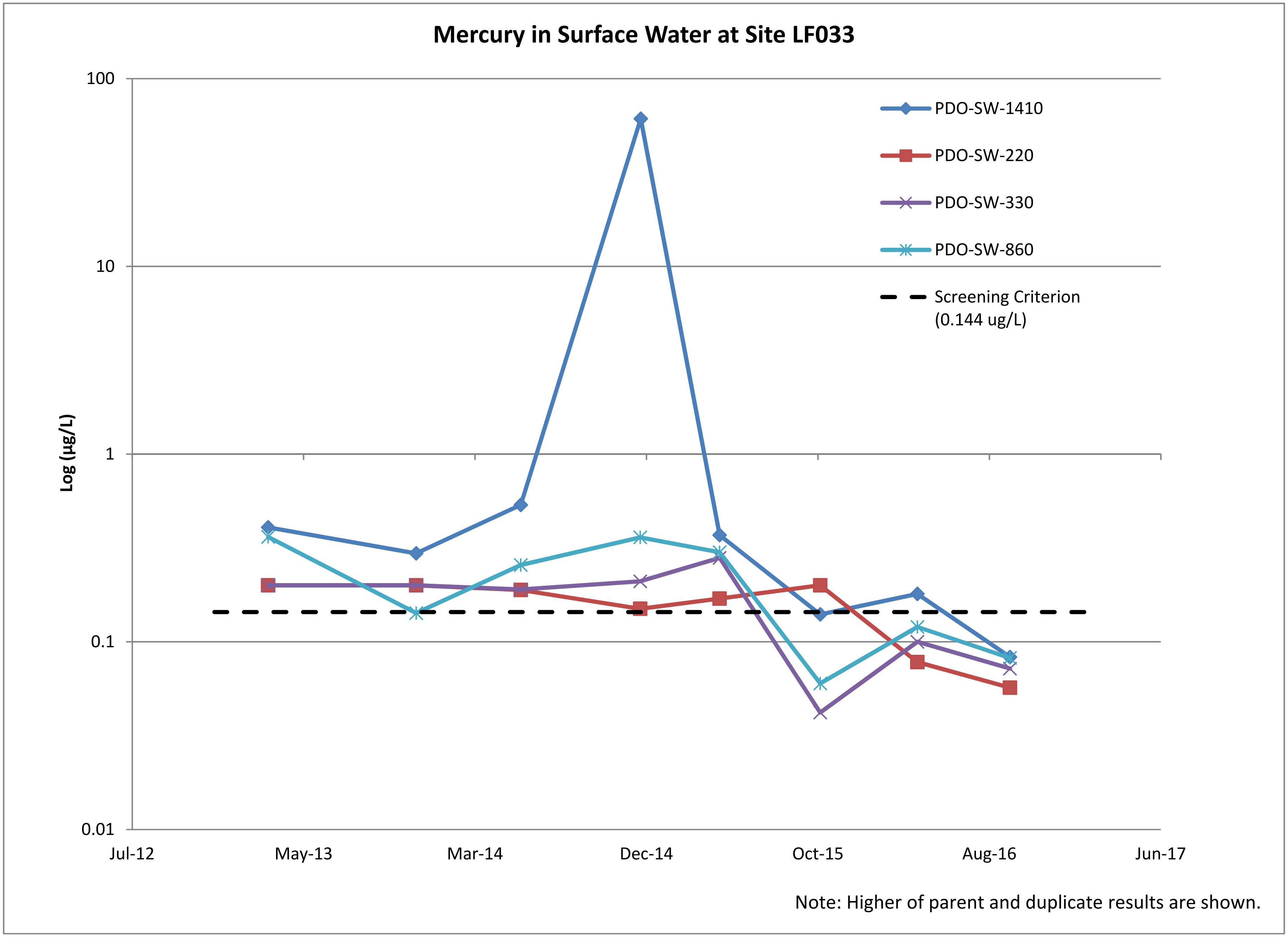

Manganese in Surface Water at Site LF010
120
100
80
60
40
20
0
µg/L
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
SW-3
SW-7
Manganese Screening Criterion (37.2 ug/L)
Note: Higher of parent and duplicate results are shown.



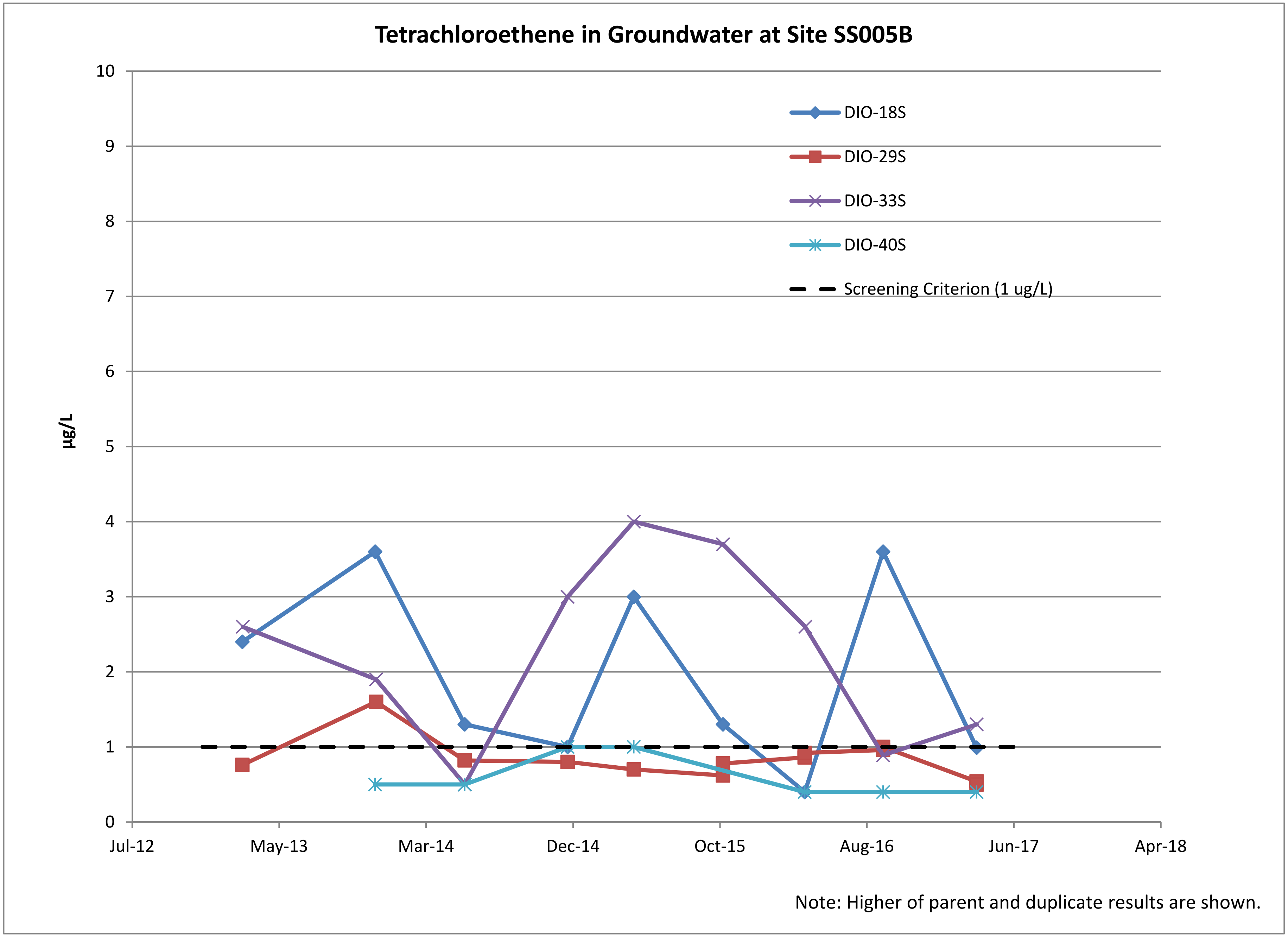
Mercury in Groundwater at Site LF033
6
5
4
3
2
1
0
µg/L
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
PDO-38
PDO-40
Screening Criterion (0.5 ug/L)
Note: Higher of parent and duplicate results are shown.

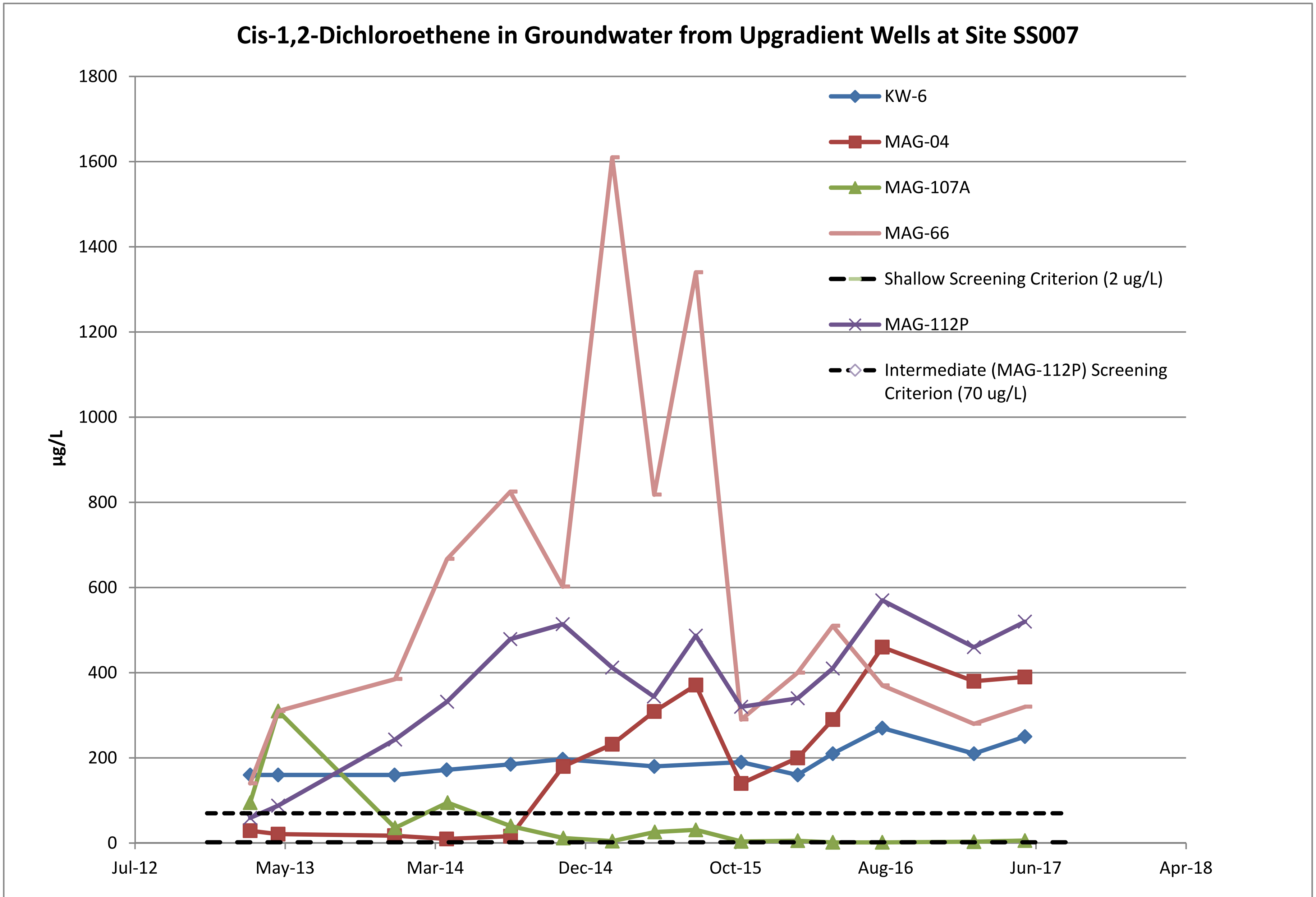


Mercury in Sediment at Site LF033
mg/kg
0
1
2
3
4
5
6
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
PDO-SE-1410
PDO-SE-220
PDO-SE-330
PDO-SE-860
Screening Criterion (0.2 mg/kg)
Note: Higher of parent and duplicate results are shown.



Mercury in Surface Water at Site LF033
100
10
1
0.1
0.01
Log (µg/L)
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
PDO-SW-1410
PDO-SW-220
PDO-SW-330
PDO-SW-860
Screening Criterion (0.144 ug/L)
Note: Higher of parent and duplicate results are shown.


Tetrachloroethene in Groundwater at Site SS005B
µg/L
10
9
8
7
6
5
4
3
2
1
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
DIO-18S
DIO-29S
DIO-33S
DIO-40S
Screening Criterion (1 ug/L)
Note: Higher of parent and duplicate results are shown.



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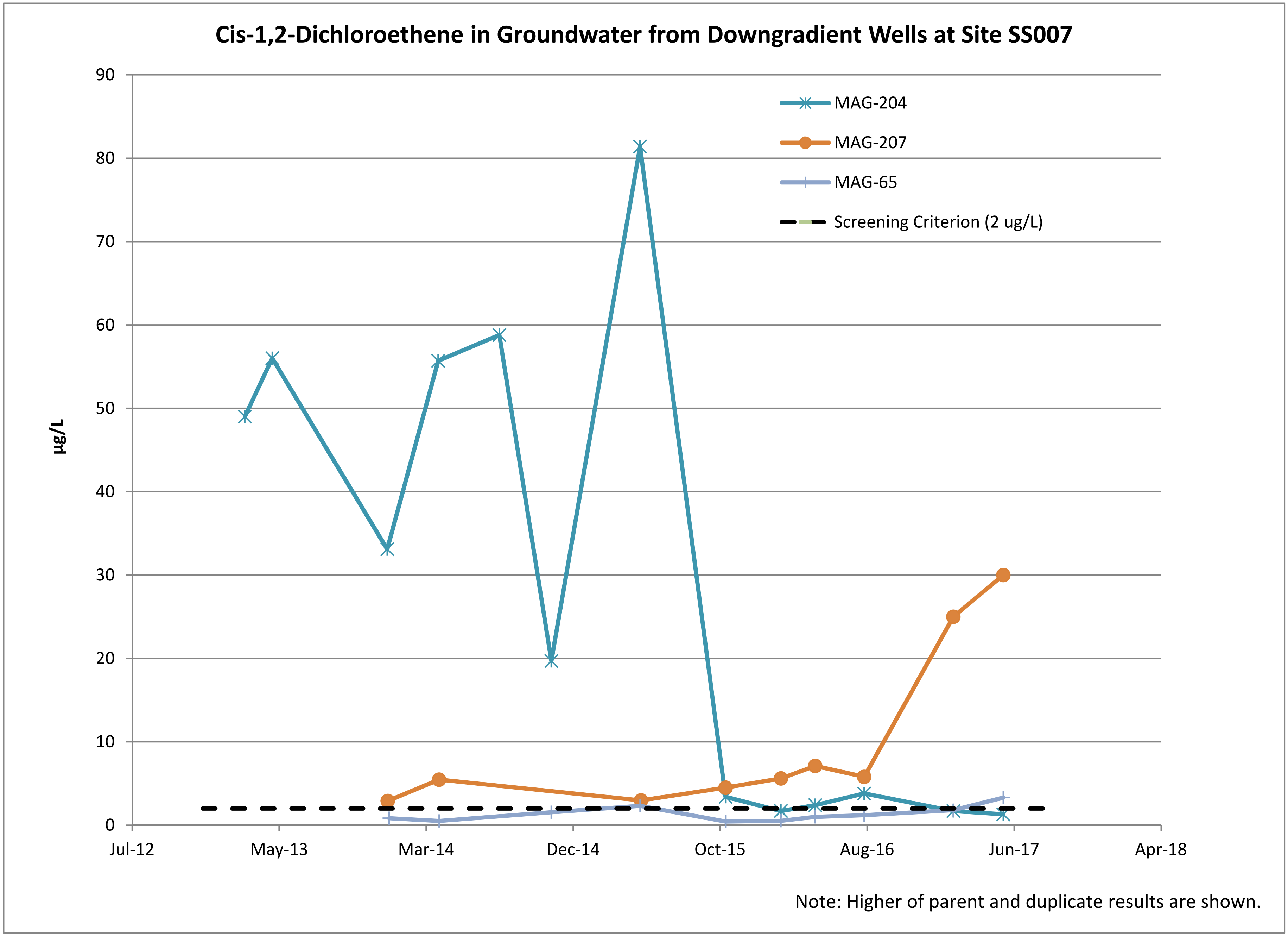
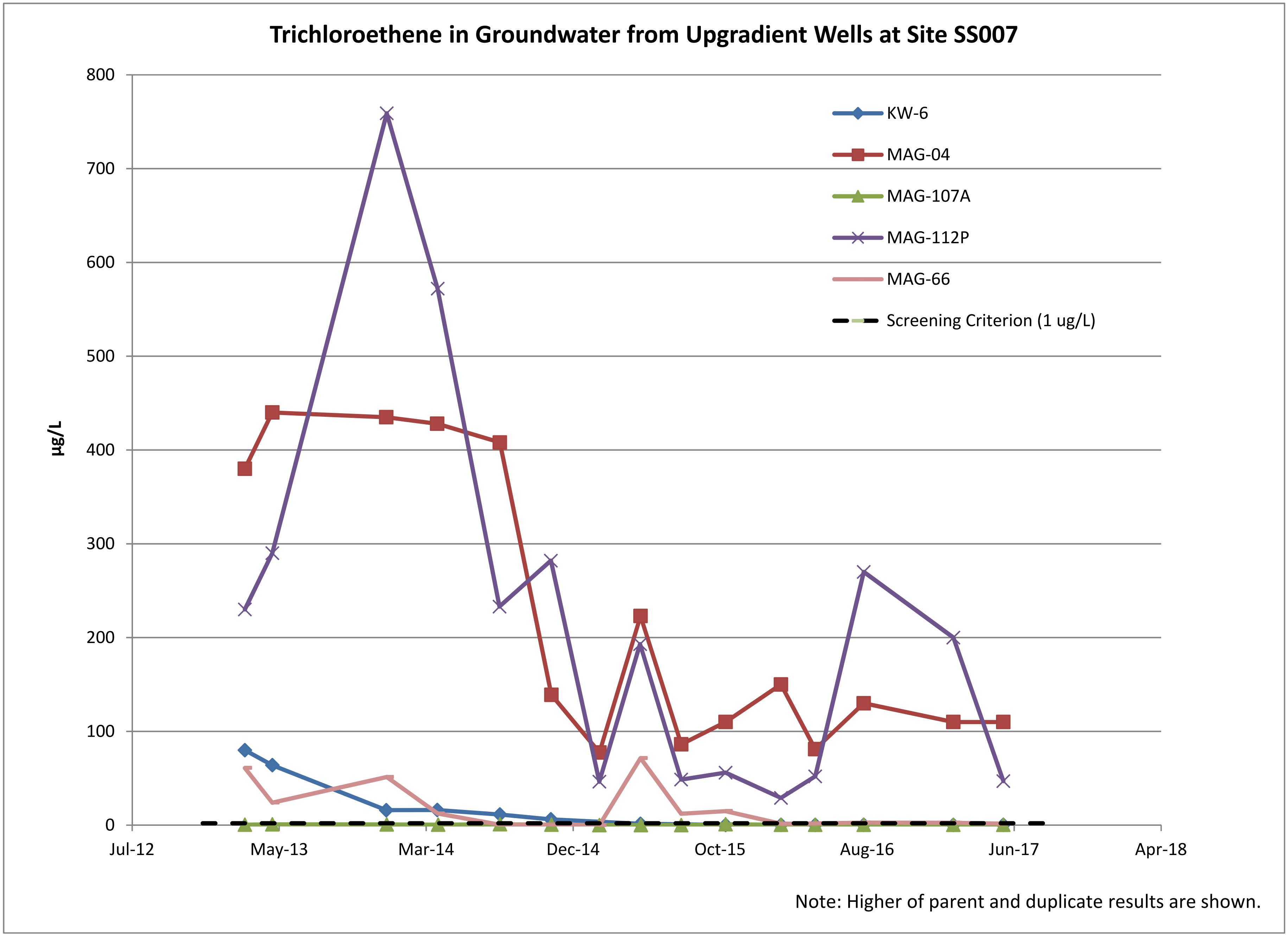
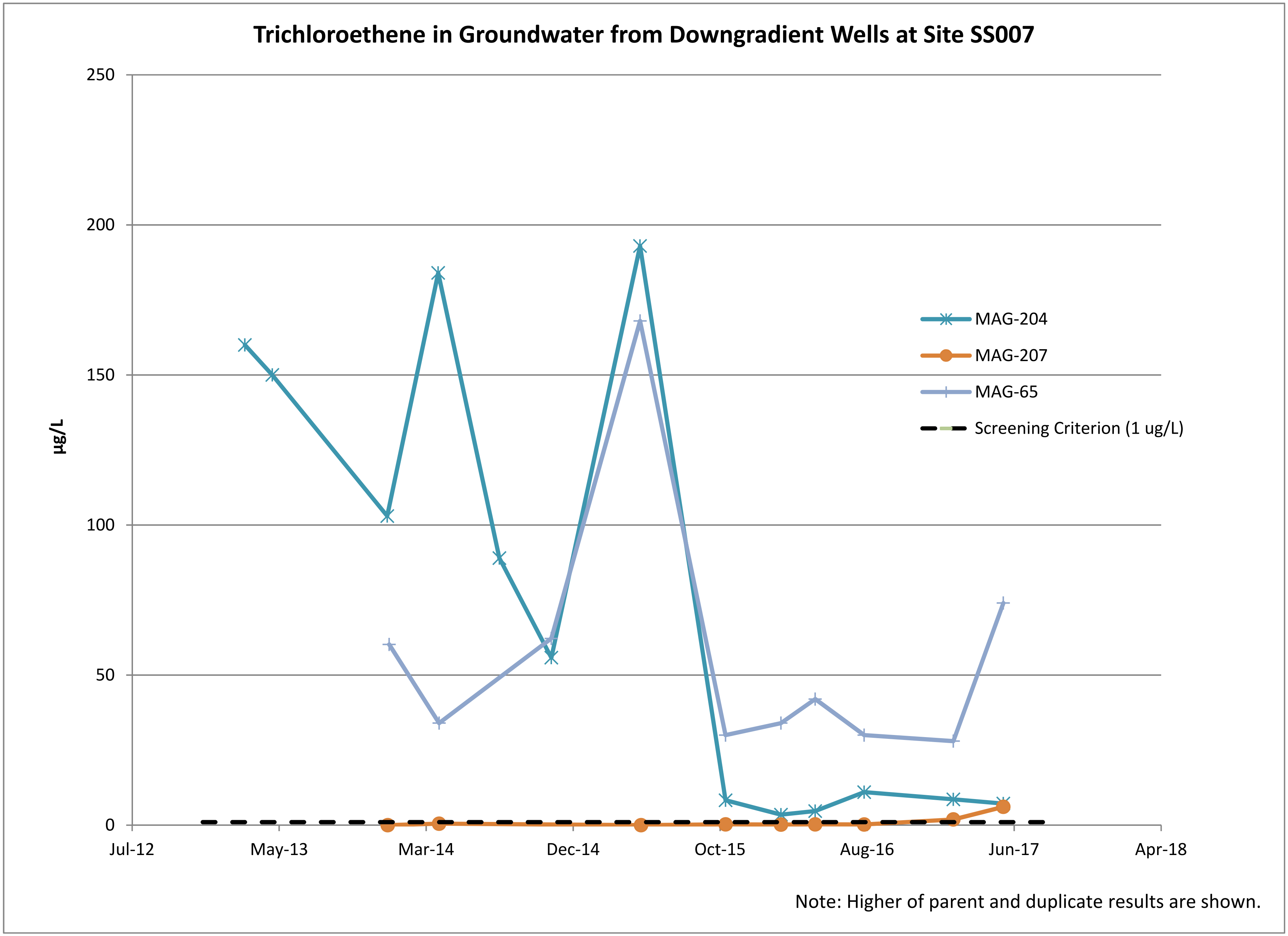
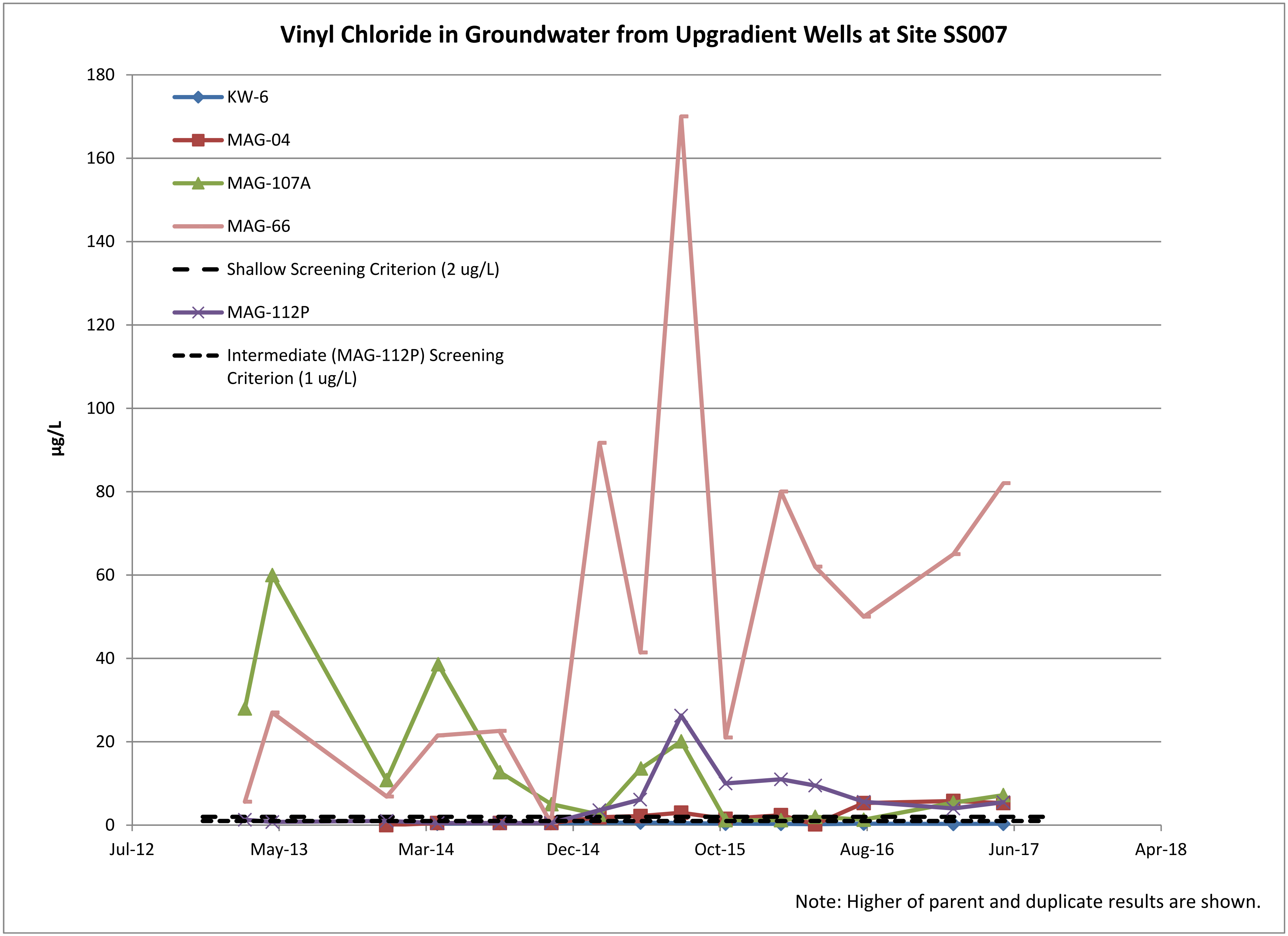

Cis-1,2-Dichloroethene in Groundwater from Downgradient Wells at Site SS007
µg/L
90
80
70
60
50
40
30
20
10
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
MAG-204
MAG-207
MAG-65
Screening Criterion (2 ug/L)
Note: Higher of parent and duplicate results are shown.

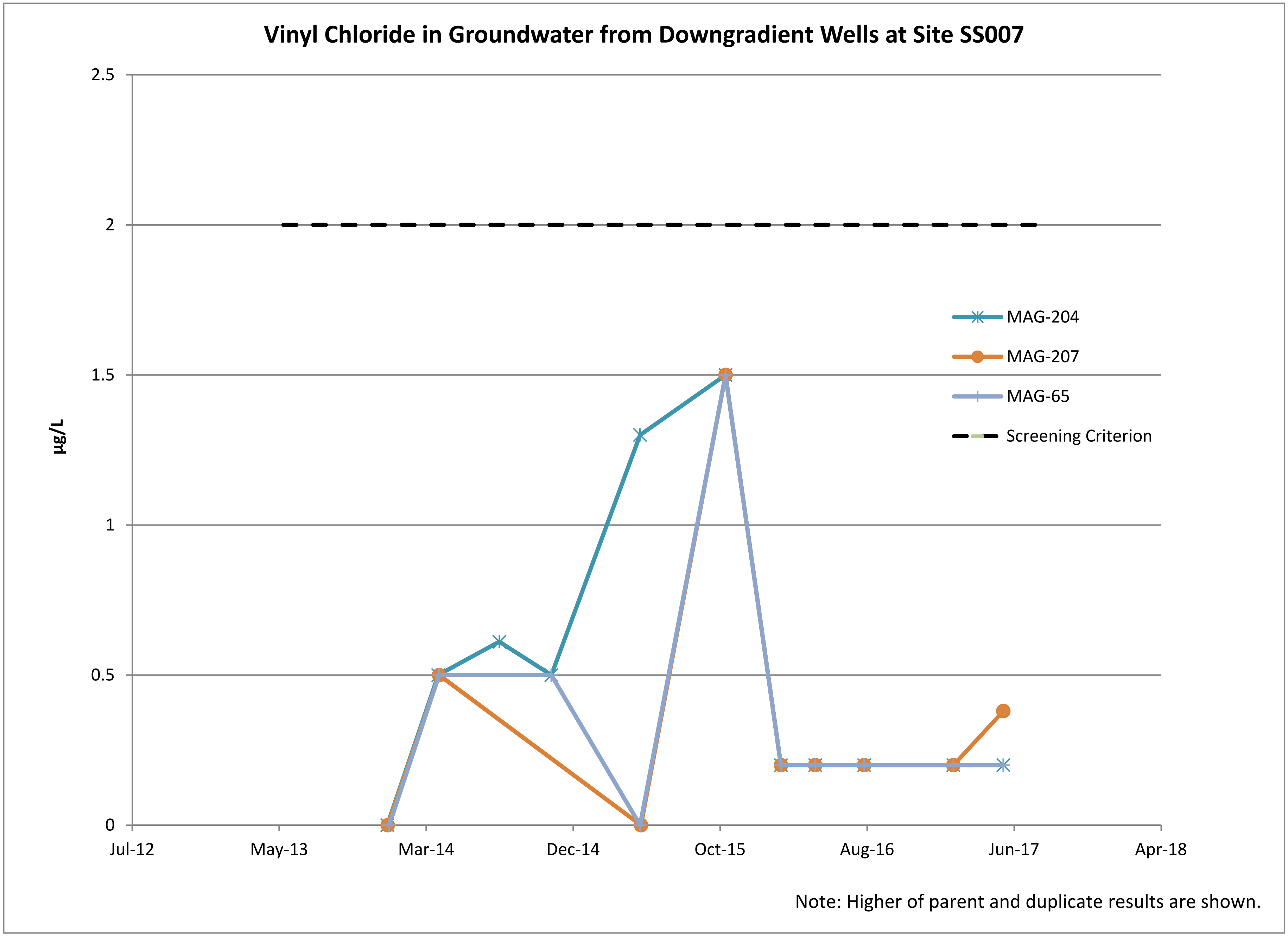


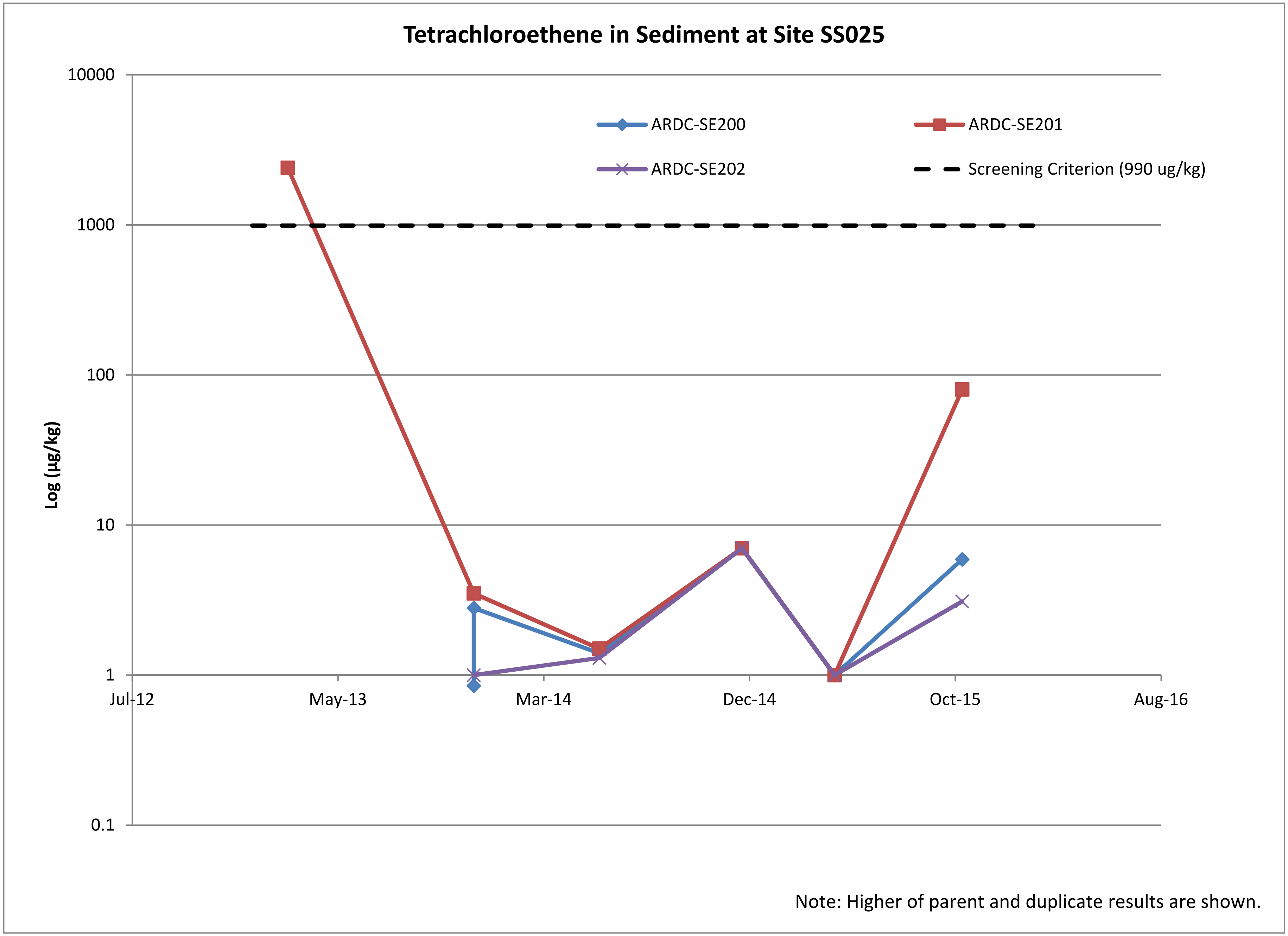
Trichloroethene in Groundwater from Upgradient Wells at Site SS007
800
700
600
500
400
300
200
100
0
µg/L
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
KW-6
MAG-04
MAG-107A
MAG-112P
MAG-66
Screening Criterion (1 ug/L)
Note: Higher of parent and duplicate results are shown.


Trichloroethene in Groundwater from Downgradient Wells at Site SS007
µg/L
250
200
150
100
50
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
MAG-204
MAG-207
MAG-65
Screening Criterion (1 ug/L)
Note: Higher of parent and duplicate results are shown.

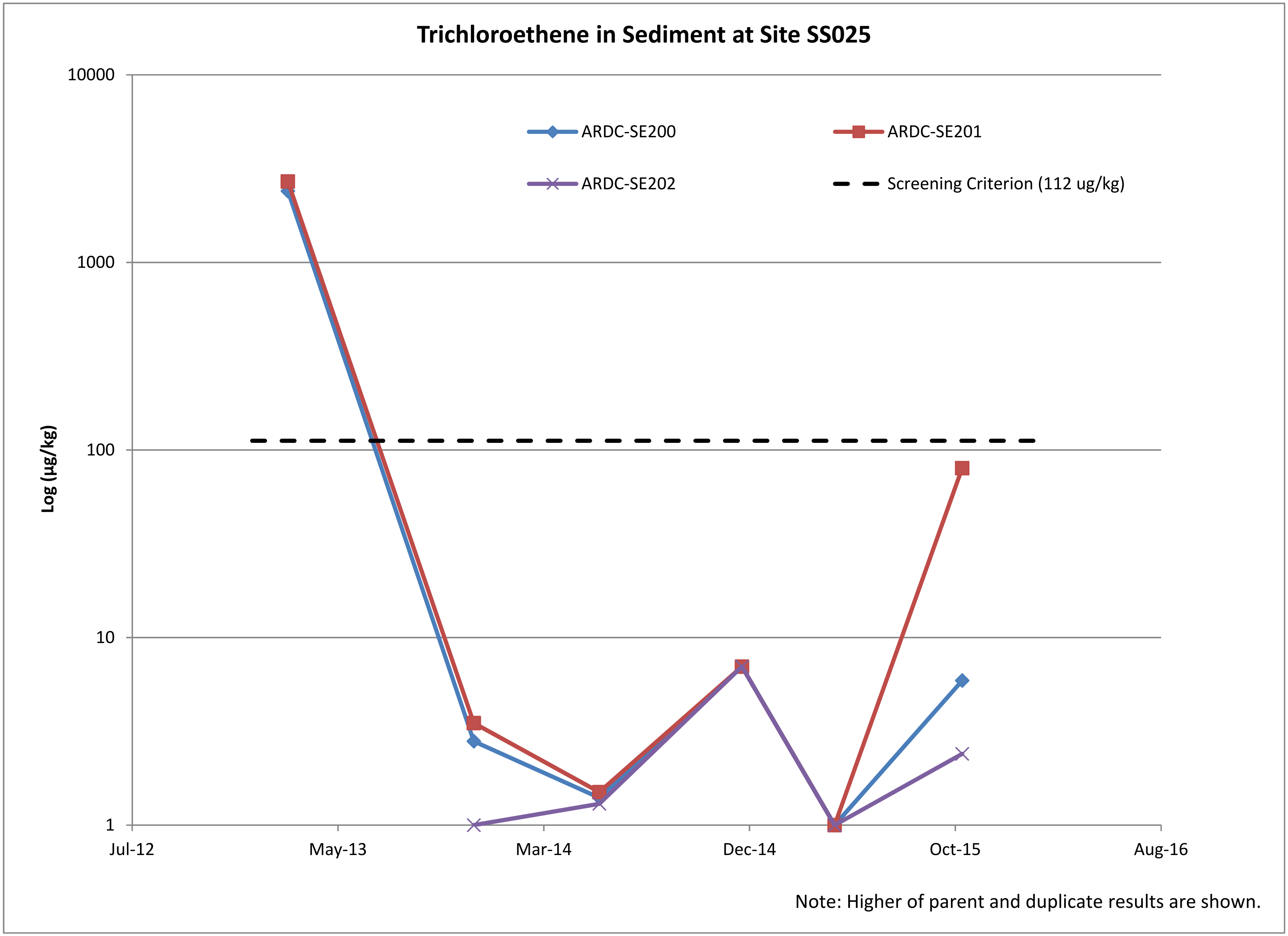


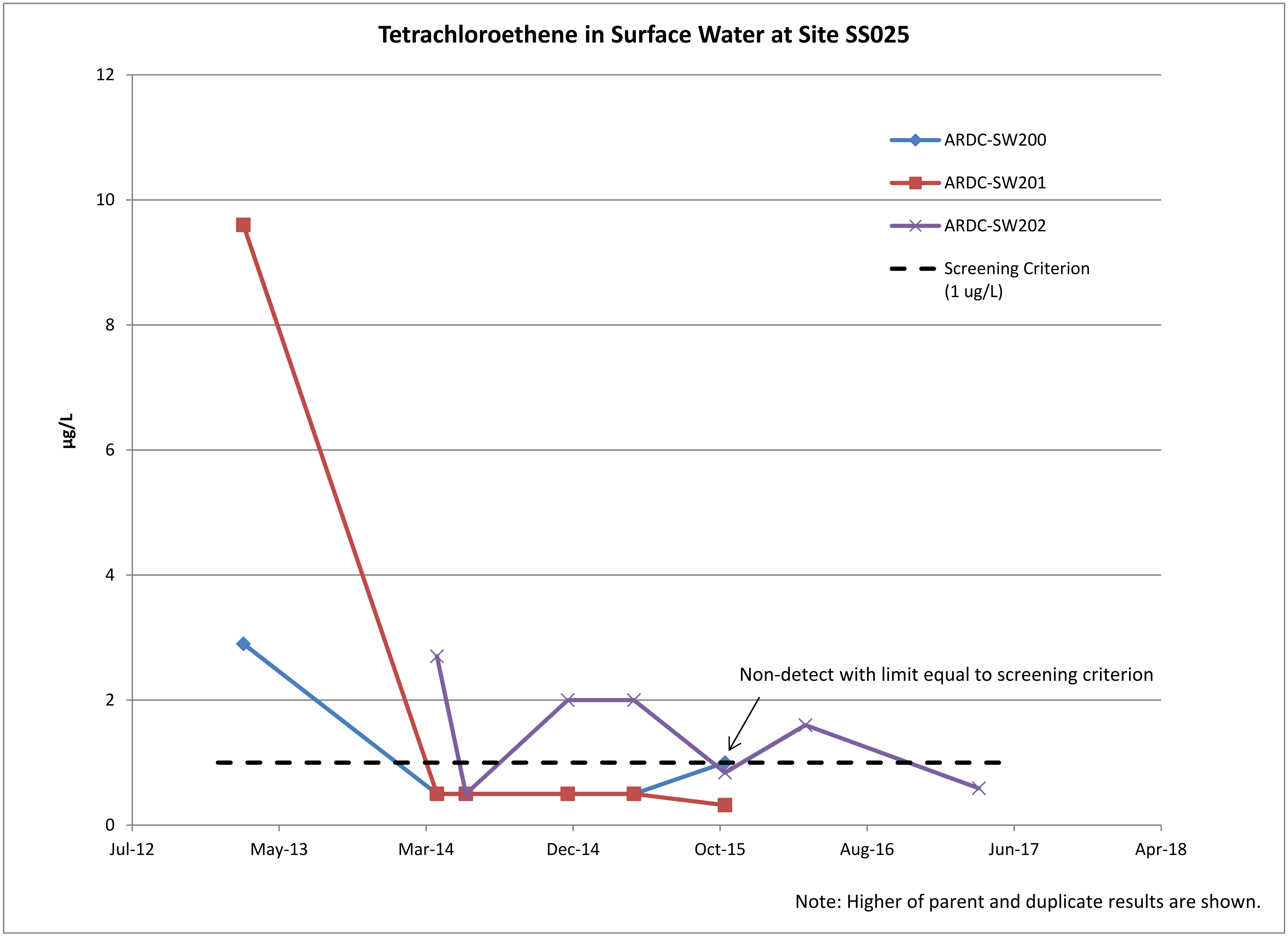
Vinyl Chloride in Groundwater from Upgradient Wells at Site SS007
µg/L
180
160
140
120
100
80
60
40
20
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
KW-6
MAG-04
MAG-107A
MAG-66
Shallow Screening Criterion (2 ug/L)
MAG-112P
Intermediate (MAG-112P) Screening Criterion (1 ug/L)
Note: Higher of parent and duplicate results are shown.


Vinyl Chloride in Groundwater from Downgradient Wells at Site SS007
2.5
2
1.5
1
0.5
0
µg/L
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
MAG-204
MAG-207
MAG-65
Screening Criterion
Note: Higher of parent and duplicate results are shown.

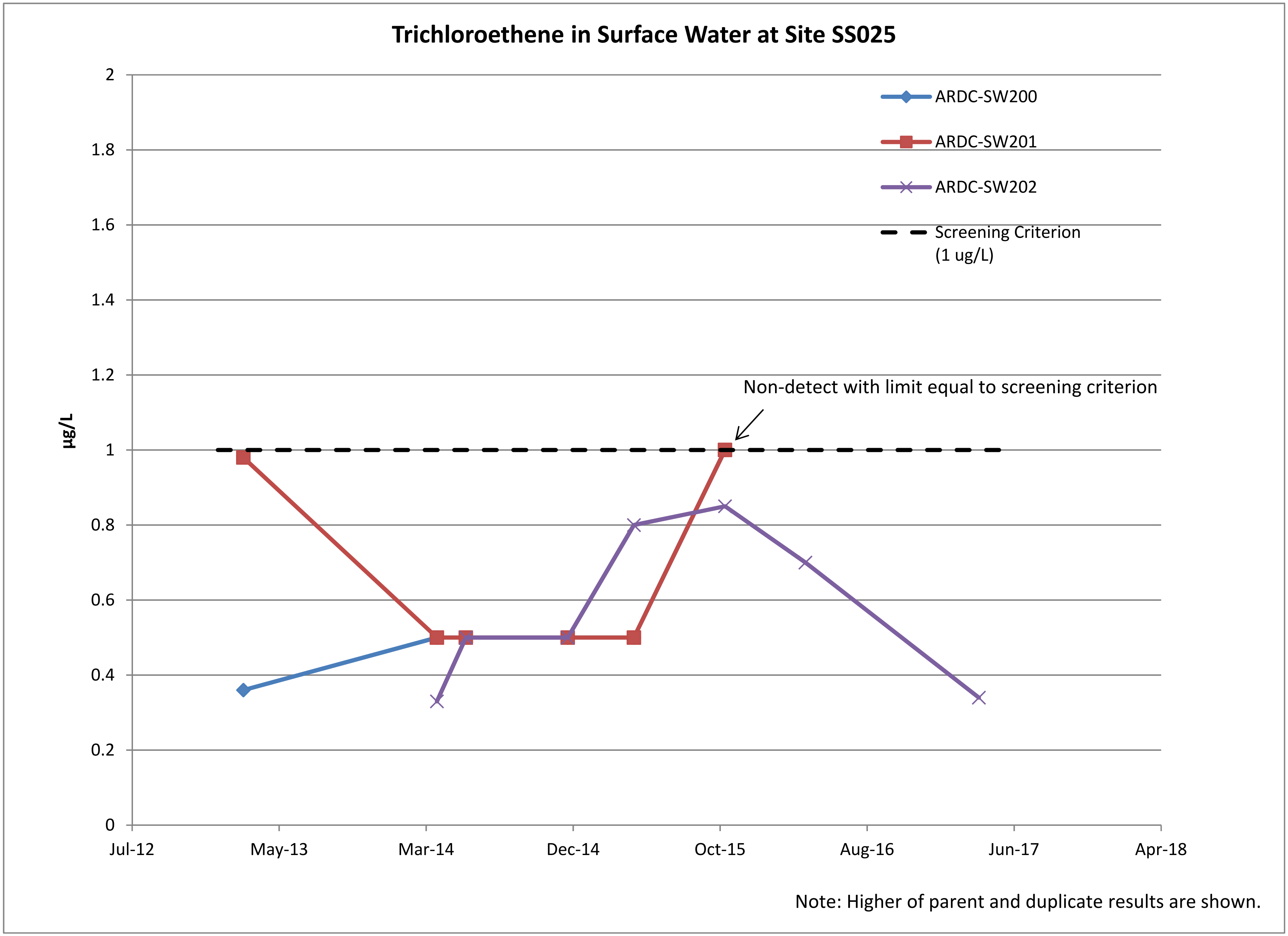


Tetrachloroethene in Sediment at Site SS025
10000
1000
100
10
1
0.1
Log (µg/kg)
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
ARDC-SE200
ARDC-SE201
ARDC-SE202
Screening Criterion (990 ug/kg)
Note: Higher of parent and duplicate results are shown.


Trichloroethene in Sediment at Site SS025
ARDC-SE200
ARDC-SE201
ARDC-SE202
Screening Criterion (112 ug/kg)
Log (µg/kg)
10000
1000
100
10
1
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Note: Higher of parent and duplicate results are shown.



Tetrachloroethene in Surface Water at Site SS025
µg/L
12
10
8
6
4
2
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
ARDC-SW200
ARDC-SW201
ARDC-SW202
Screening Criterion (1 ug/L)
Non-detect with limit equal to screening criterion
Note: Higher of parent and duplicate results are shown.



Trichloroethene in Surface Water at Site SS025
µg/L
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Jul-12
May-13
Mar-14
Dec-14
Oct-15
Aug-16
Jun-17
Apr-18
ARDC-SW200
ARDC-SW201
ARDC-SW202
Screening Criterion (1 ug/L)
Non-detect with limit equal to screening criterion
Note: Higher of parent and duplicate results are shown.

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Appendix E
Site Inspection Checklists, Interview Records, and Photograph Log

Please note that "O&M" is referred to throughout this checklist. At sites where Long-Term Response Actions are in progress, O&M activities may be referred to as "system operations" since these sites are not considered to be in the O&M phase while being remediated under the Superfund program.

Five-Year Review Site Inspection Checklist
July 2017

(Working document for site inspection. Information may be completed by hand and attached to the Five-Year Review report as supporting documentation of site status. "N/A" refers to "not applicable.")

I. SITE INFORMATION

Site name: JB MDL-Dix Area	**Date of inspection:** 25-26 July 2017
Location and Region: New Jersey, Region 2	**EPA ID:** NJ2210020275 (Site LF010), NJ4213720275
Agency, office, or company leading the five-year review: Air Force/EA Engineering, Science, and Technology, Inc., PBC	**Weather/temperature:** 65-75 degrees Fahrenheit, partly-mostly cloudy

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☒ Other Groundwater, surface water, and/or sediment monitoring at various sites; soil/sediment removal (complete) at Sites LF033, SS007, SS025, and TU026; Air Sparge/Soil Vapor Extraction (complete) at Site SS005B; Bioaugmentation at Site SS007

Attachments: ☐ Inspection team roster attached ☐ Site map attached

Note: Inspection Team included Nicole Brestle (JB MDL), Haiyesh Shah (NJDEP), and Amy Sponaugle, Samantha Saalfield, Denise Wilt, and Rachel Giampa (EA)

II. INTERVIEWS (Check all that apply)

Note: Interviews were conducted as follow-up to the site inspection.

1. **O&M site manager** ______________________________ ______________________ ____________
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. ______________
   Problems, suggestions; ☐ Report attached ____
   ____

2. **O&M staff** ______________________________ ______________________ ____________
   Name Title Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone no. ______________
   Problems, suggestions; ☐ Report attached ____
   ____

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency ______________________________
Contact ______________________________ ___________________ ________ ____________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____
____

Agency ______________________________
Contact ______________________________ ___________________ ________ ____________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____
____

Agency ______________________________
Contact ______________________________ ___________________ ________ ____________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____
____

Agency ______________________________
Contact ______________________________ ___________________ ________ ____________
Name Title Date Phone no.
Problems; suggestions; ☐ Report attached ____
____

4. **Other interviews** (optional) ☐ Report attached.

Site LF010 Sanitary Landfill

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1. **O&M Documents**				
☐ O&M manual	☐ Readily available	☐ Up to date	☐ N/A	
☐ As-built drawings	☐ Readily available	☐ Up to date	☐ N/A	
☐ Maintenance logs	☐ Readily available	☐ Up to date	☐ N/A	
Remarks No documents were available for review onsite during the inspection.				
2. **Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	☐ N/A	
☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	☐ N/A	
Remarks No documents were available for review onsite during the inspection.				
3. **O&M and OSHA Training Records**	☒ Readily available	☒ Up to date	☐ N/A	
Remarks No records were available for review onsite during the inspection.				
4. **Permits and Service Agreements**				
☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A	
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A	
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A	
☐ Other permits______________________	☐ Readily available	☐ Up to date	☒ N/A	
Remarks				
5. **Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A	
Remarks Gas monitoring ceased in 2000.				
6. **Settlement Monument Records**	☐ Readily available	☐ Up to date	☐ N/A	
Remarks No records were available for review onsite during the inspection.				
7. **Groundwater Monitoring Records**	☒ Readily available	☒ Up to date	☐ N/A	
Remarks Groundwater monitoring records through Spring 2017 were provided prior to the site inspection.				
8. **Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A	
Remarks				
9. **Discharge Compliance Records**				
☐ Air	☐ Readily available	☐ Up to date	☒ N/A	
☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A	
Remarks				
10. **Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☐ N/A	
Remarks No access logs were available for review onsite during the inspection.				

IV. O&M COSTS

1. **O&M Organization**
   - ☐ State in-house ☐ Contractor for State
   - ☐ PRP in-house ☐ Contractor for PRP
   - ☐ Federal Facility in-house ☒ Contractor for Federal Facility
   - ☐ Other____

2. **O&M Cost Records**
   - ☐ Readily available ☒ Up to date
   - ☒ Funding mechanism/agreement in place
   - Original O&M cost estimate____________________ ☐ Breakdown attached

   Total annual cost by year for review period if available
   Approximately $60,000 per year.

From (Date)	To (Date)	Total cost	
___	___	___	☐ Breakdown attached
___	___	___	☐ Breakdown attached
___	___	___	☐ Breakdown attached
___	___	___	☐ Breakdown attached
___	___	___	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: ____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A
   Remarks______No visible damage to fencing.________________________________

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☐ N/A
   Remarks__Signage on front gate and intermittently on the fencing. "High Voltage" signs on solar__ __panel station boxes.________________________________

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) self-reporting, site inspections and groundwater monitoring for Classification Exception Area (CEA) and Land Use Control Implementation Plan
Frequency Monthly inspections, formal semi-annual inspections, annual groundwater monitoring
Responsible party/agency JB MDL
Contact Nicole Brestle | IRP Project Manager | 25 July 2017 | 609-754-0068
Name | Title | Date | Phone no.

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☒ No ☐ N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks

2. **Land use changes on site** ☐ N/A
Remarks A solar panel array was installed on the landfill cap area in 2016-2017.

3. **Land use changes off site** ☒ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks Stability/degree of compaction of new road through solar array on the landfill cap is unknown; condition acceptable during inspection.

B. Other Site Conditions

Remarks ______________________________

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface –

Note: Assessment of the surface of the capped landfill was difficult due to the presence of solar panel array and related infrastructure.

1. **Settlement** (Low spots) ☐ Location shown on site map ☒ Settlement not evident
Areal extent______________ Depth______
Remarks______________________________

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident
Lengths____________ Widths___________ Depths__________
Remarks______________________________

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent______________ Depth____________
Remarks____Regraded and seeded areas along the perimeter of the capped area, associated with construction of the solar array, did not show evidence of erosion.______________________________

4. **Holes** ☐ Location shown on site map ☒ Holes not evident
Areal extent______________ Depth____________
Remarks______________________________

5. **Vegetative Cover** ☒ Grass ☒ Cover properly established ☐ No signs of stress
☒ Trees/Shrubs (indicate size and locations on a diagram)
Remarks___Lack of vegetation in areas between solar panel rows where water ponding was observed (see Item 8). Shrubs observed along letdown channels on the sides of the landfill.________________

6. **Alternative Cover (armored rock, concrete, etc.)** ☒ N/A
Remarks__Berms under solar panel supports appear to consist of a mixed gravel, including asphalt. These are located on top of the soil cover. ______________________________

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
Areal extent______________ Height____________
Remarks______________________________

8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☒ Wet areas	☒ Location shown on site map	Areal extent______________
	☒ Ponding	☒ Location shown on site map	Areal extent______________
	☒ Seeps	☒ Location shown on site map	Areal extent E side of landfill
	☐ Soft subgrade	☐ Location shown on site map	Areal extent______________
	Remarks Approximately 30 occurrences of ponded water were recorded during the site inspection (see attached sketch, referenced to the solar panel rows). Many additional areas of ponding are also believed to be present; however, not all rows of solar panels were inspected, due to access difficulties. Ponded areas often occur where "dips" are apparent in the undulating rows of solar panels, and are often marked by less or lower vegetation. An aerial photo from May 2017, following installation of the solar array, shows ponding apparently aligned with the ridges that run SW-NE across the surface of the capped portion of the landfill. Water seepage with flow, and associated with red staining and an apparent sheen, was observed along the east side of the landfill, where it had been observed during other recent site walks conducted by JB MDL and NJDEP.		
9.	**Slope Instability** ☐ Slides	☐ Location shown on site map	☒ No evidence of slope instability
	Areal extent______________ Remarks______________		

B. Benches	☒ Applicable	☐ N/A	
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.) Note: Assessment of the benches on the surface of the capped landfill was difficult due to the presence of solar panel array and related infrastructure. However, the benches and related surface drainage infrastructure do not appear functioning as designed, likely due to disruption by the supports for the solar array.		
1.	**Flows Bypass Bench** Remarks______________	☐ Location shown on site map	☒ N/A or okay
2.	**Bench Breached** Remarks______________	☐ Location shown on site map	☒ N/A or okay
3.	**Bench Overtopped** Remarks______________	☐ Location shown on site map	☒ N/A or okay

C. Letdown Channels	☒ Applicable	☐ N/A	
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement** Areal extent______________ Depth_______ Remarks______________	☐ Location shown on site map	☒ No evidence of settlement
2.	**Material Degradation** Material type______________ Areal extent______________ Remarks______________	☐ Location shown on site map	☒ No evidence of degradation
3.	**Erosion** Areal extent______________ Depth____________ Remarks______________	☐ Location shown on site map	☒ No evidence of erosion

4. **Undercutting** ☐ Location shown on site map ☒ No evidence of undercutting
Areal extent______________ Depth____________
Remarks____
____

5. **Obstructions** Type_____________________ ☒ No obstructions
☐ Location shown on site map Areal extent______________
Size____________
Remarks____
____

6. **Excessive Vegetative Growth** Type________________
☒ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent______________
Remarks___Abundant vegetation (primarily grasses) around channels, but not in the concrete-lined channels._Shrubs also observed around the channels._____________________________________

D. Cover Penetrations ☒ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☒ Passive
☐ Properly secured/locked ☒ Functioning ☐ Routinely sampled ☒ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks____A few of the gas vents appeared to be slightly less than vertical.___________________
____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks__Although no longer used, gas monitoring probes were observed surrounded by white bollards, some of which were knocked over.____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A
Remarks____
____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☒ N/A
Remarks____
____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks__One survey monument was observed near the northwest corner of the landfill. No survey records were available for review during the inspection._________________________________

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks

F. Cover Drainage Layer ☒ Applicable ☐ N/A

Note: The outlets from the drainage layer could not be located for inspection, due to excessive vegetation growth along the landfill sideslopes. However, Haiyesh Shah indicated that the outlets were observed during a site walk earlier in 2017, and water seeps were also observed near the outlets.

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A **Could not be inspected**
Remarks

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A **Could not be inspected**
Remarks

G. Detention/Sedimentation Ponds ☒ Applicable ☐ N/A

1. **Siltation** Areal extent_____ Depth_____ ☐ N/A
☒ Siltation not evident
Remarks Coniferous trees were observed growing around the edges of the sedimentation pond.

2. **Erosion** Areal extent_____ Depth_____
☒ Erosion not evident
Remarks

3. **Outlet Works** ☒ Functioning ☐ N/A
Remarks The outlet to the wetlands, on the east side of the sedimentation pond, appeared to be in good condition.

4. **Dam** ☐ Functioning ☒ N/A
Remarks The sedimentation pond is surrounded by ridges/berms, which appeared to be in good condition.

H. Retaining Walls ☐ Applicable ☒ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement____________ Vertical displacement_______________
Rotational displacement____________
Remarks____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge ☒ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☒ Siltation not evident
Areal extent______________ Depth____________
Remarks____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☒ Vegetation does not impede flow
Areal extent______________ Type____________
Remarks____

3. **Erosion** ☐ Location shown on site map ☒ Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. **Discharge Structure** ☒ Functioning ☐ N/A
Remarks____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent______________ Depth____________
Remarks____

2. **Performance Monitoring** Type of monitoring__________________________
☐ Performance not monitored
Frequency_______________________________ ☐ Evidence of breaching
Head differential__________________________
Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☒ N/A	
1.	**Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A	
1.	**Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ☐ Carbon adsorbers
☐ Filters____________________
☐ Additive (*e.g.*, chelation agent, flocculent)____________________
☐ Others____________________
☐ Good condition ☐ Needs Maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☐ Quantity of groundwater treated annually____________________
☐ Quantity of surface water treated annually____________________
Remarks____________________

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks____________________

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks____________________

4. **Discharge Structure and Appurtenances**
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks____________________

5. **Treatment Building(s)**
☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks____________________

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks____________________

D. Monitoring Data

1. Monitoring Data
☒ Is routinely submitted on time ☒ Is of acceptable quality

2. Monitoring data suggests:
☒ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☒ N/A
Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy at Site LF010 includes a landfill cap, landfill gas venting, perimeter fencing, land use controls, and long-term monitoring and O&M, with the objectives of preventing contaminant migration to drinking water or nearby surface water, protecting human health and the environment, and meeting regulatory requirements. Overall, the remedy appears to be effective and functioning as designed, with the exception of O&M issues noted below.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Additional O&M is needed to control vegetation and ponding following installation of the solar array, and to address the seepage of water observed along the east side of the landfill. If not corrected, these issues could lead to contaminant migration and/or erosion/degradation of the landfill cap, which could impact the future protectiveness of the remedy.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

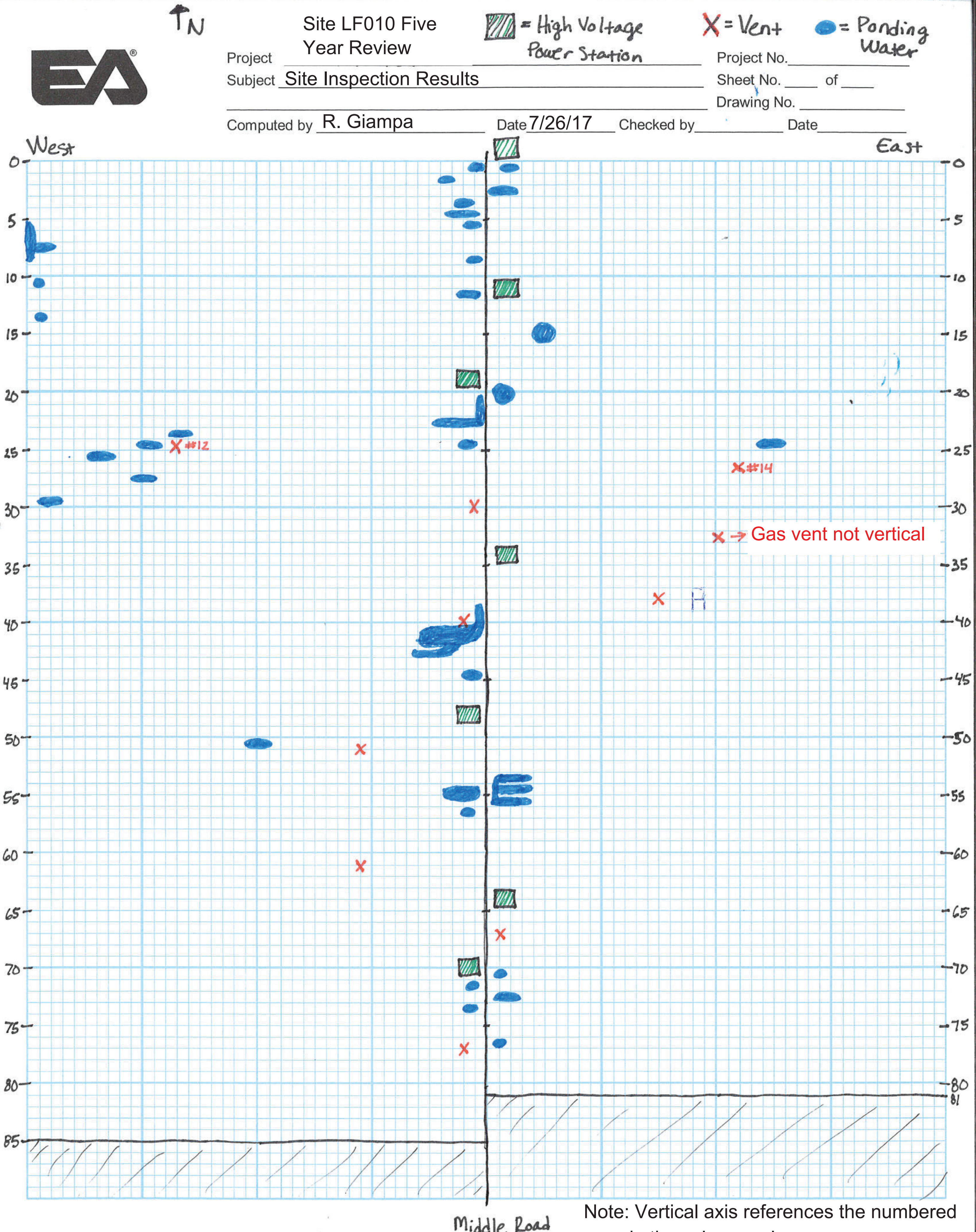
See Item B regarding overgrown vegetation, ponded water, and drainage issues. Young trees observed around the edge of sedimentation pond and drainage culverts should also be monitored to ensure that they do not impact the effectiveness or protectiveness of the remedy.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

See Item B.

Project	Site LF010 Five Year Review
Subject	Site Inspection Results
Computed by	R. Giampa
Date	7/26/17
Checked by	
Date	
Project No.	
Sheet No.	of
Drawing No.	



Note: Vertical axis references the numbered rows in the solar panel array.

Site LF017 EPIC-8 Landfill

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
☐ O&M manual ☐ Readily available ☐ Up to date ☐ N/A
☐ As-built drawings ☐ Readily available ☐ Up to date ☐ N/A
☐ Maintenance logs ☐ Readily available ☐ Up to date ☐ N/A
Remarks No documents were available for review onsite during the inspection.

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☒ N/A
☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☒ N/A
Remarks

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☒ N/A
Remarks

4. **Permits and Service Agreements**
☐ Air discharge permit ☐ Readily available ☐ Up to date ☒ N/A
☐ Effluent discharge ☐ Readily available ☐ Up to date ☒ N/A
☐ Waste disposal, POTW ☐ Readily available ☐ Up to date ☒ N/A
☐ Other permits ☐ Readily available ☐ Up to date ☒ N/A
Remarks

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A
Remarks

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A
Remarks

7. **Groundwater Monitoring Records** ☐ Readily available ☐ Up to date ☒ N/A
Remarks

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A
Remarks

9. **Discharge Compliance Records**
☐ Air ☐ Readily available ☐ Up to date ☒ N/A
☐ Water (effluent) ☐ Readily available ☐ Up to date ☒ N/A
Remarks

10. **Daily Access/Security Logs** ☒ Readily available ☐ Up to date ☒ N/A
Remarks

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☒ Contractor for Federal Facility
☐ Other____

2. **O&M Cost Records**
☒ Readily available ☒ Up to date
☒ Funding mechanism/agreement in place
Original O&M cost estimate____________________ ☐ Breakdown attached

Total annual cost by year for review period if available
Approximately $1,450 per year.

From__________ To__________ __________________ ☐ Breakdown attached
Date Date Total cost
From__________ To__________ __________________ ☐ Breakdown attached
Date Date Total cost
From__________ To__________ __________________ ☐ Breakdown attached
Date Date Total cost
From__________ To__________ __________________ ☐ Breakdown attached
Date Date Total cost
From__________ To__________ __________________ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: ____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☐ N/A
Remarks____ The gate along the Juliustown Road was securely locked. Perimeter fencing was damaged in a few places along the road, and covered in vegetation for most of its length. One animal burrow under the fence was also observed along the road.____________________

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A
Remarks____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☒ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☒ No	☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) self-reporting, formal site inspections under Land Use Control Implementation Plan

Frequency Annual

Responsible party/agency JB MDL

Contact			
Nicole Brestle	IRP Project Manager	25 July 2017	609-754-0068
Name	Title	Date	Phone no.

Reporting is up-to-date	☒ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☒ Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	☒ Yes	☐ No	☐ N/A
Violations have been reported	☐ Yes	☒ No	☐ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks

2. **Land use changes on site** ☒ N/A

Remarks

3. **Land use changes off site** ☒ N/A

Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads damaged** ☐ Location shown on site map ☐ Roads adequate ☐ N/A

Remarks

B. Other Site Conditions

Remarks ____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☒ Settlement not evident
Areal extent______________ Depth____________
Remarks____

2. **Cracks** ☐ Location shown on site map ☒ Cracking not evident
Lengths____________ Widths___________ Depths__________
Remarks____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. **Holes** ☐ Location shown on site map ☒ Holes not evident
Areal extent______________ Depth____________
Remarks___Some holes associated with fallen trees that upturned large rootballs________________

5. **Vegetative Cover** ☒ Grass ☒ Cover properly established ☐ No signs of stress
☒ Trees/Shrubs (indicate size and locations on a diagram)
Remarks__Entire area extremely heavily vegetated; it was very difficult to enter the site. Large, mature trees are very numerous at the site.__________

6. **Alternative Cover (armored rock, concrete, etc.)** ☒ N/A
Remarks____

7. **Bulges** ☐ Location shown on site map ☒ Bulges not evident
Areal extent______________ Height____________
Remarks____

8. **Wet Areas/Water Damage** ☒ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent______________
☐ Ponding ☐ Location shown on site map Areal extent______________
☐ Seeps ☐ Location shown on site map Areal extent______________
☐ Soft subgrade ☐ Location shown on site map Areal extent______________
Remarks____

9.	**Slope Instability** ☐ Slides ☐ Location shown on site map ☒ No evidence of slope instability Areal extent______________ Remarks____
B. Benches	☐ Applicable ☒ N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)
1.	**Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay Remarks____
2.	**Bench Breached** ☐ Location shown on site map ☐ N/A or okay Remarks____
3.	**Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay Remarks____
C. Letdown Channels	☐ Applicable ☒ N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)
1.	**Settlement** ☐ Location shown on site map ☐ No evidence of settlement Areal extent______________ Depth____________ Remarks____
2.	**Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation Material type_______________ Areal extent_____________ Remarks____
3.	**Erosion** ☐ Location shown on site map ☐ No evidence of erosion Areal extent______________ Depth____________ Remarks____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent______________ Depth____________
Remarks____
____

5. **Obstructions** Type_____________________ ☐ No obstructions
☐ Location shown on site map Areal extent______________
Size____________
Remarks____
____

6. **Excessive Vegetative Growth** Type____________________
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent______________
Remarks____
____

D. Cover Penetrations ☐ Applicable ☒ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks____
____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____
____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____
____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____
____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks____
____

E. Gas Collection and Treatment ☐ Applicable ☒ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks____
____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks____
____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks____
____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks____
____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks____
____

G. Detention/Sedimentation Ponds ☐ Applicable ☒ N/A

1. **Siltation** Areal extent______________ Depth____________ ☐ N/A
☐ Siltation not evident
Remarks____
____

2. **Erosion** Areal extent______________ Depth____________
☐ Erosion not evident
Remarks____
____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks____
____

4. **Dam** ☐ Functioning ☐ N/A
Remarks____
____

H. Retaining Walls	☐ Applicable ☒ N/A	
1.	**Deformations** ☐ Location shown on site map ☐ Deformation not evident Horizontal displacement____________ Vertical displacement______________ Rotational displacement____________ Remarks____	
2.	**Degradation** ☐ Location shown on site map ☐ Degradation not evident Remarks____	
I. Perimeter Ditches/Off-Site Discharge	☐ Applicable ☒ N/A	
1.	**Siltation** ☐ Location shown on site map ☐ Siltation not evident Areal extent______________ Depth____________ Remarks____	
2.	**Vegetative Growth** ☐ Location shown on site map ☐ N/A ☐ Vegetation does not impede flow Areal extent______________ Type____________ Remarks____	
3.	**Erosion** ☐ Location shown on site map ☐ Erosion not evident Areal extent______________ Depth____________ Remarks____	
4.	**Discharge Structure** ☐ Functioning ☐ N/A Remarks____	
VIII. VERTICAL BARRIER WALLS	☐ Applicable ☒ N/A	
1.	**Settlement** ☐ Location shown on site map ☐ Settlement not evident Areal extent______________ Depth____________ Remarks____	
2.	**Performance Monitoring** Type of monitoring_________________________ ☐ Performance not monitored Frequency______________________________ ☐ Evidence of breaching Head differential_________________________ Remarks____	

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A

A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing, and Electrical**
☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A
Remarks

2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☐ N/A

1. **Collection Structures, Pumps, and Electrical**
☐ Good condition ☐ Needs Maintenance
Remarks

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances**
☐ Good condition ☐ Needs Maintenance
Remarks

3. **Spare Parts and Equipment**
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks

C. Treatment System ☐ Applicable ☐ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ☐ Carbon adsorbers
☐ Filters______________________________
☐ Additive (*e.g.*, chelation agent, flocculent)____________________
☐ Others______________________________
☐ Good condition ☐ Needs Maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☐ Quantity of groundwater treated annually________________
☐ Quantity of surface water treated annually________________
Remarks______________________________

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks______________________________

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks______________________________

4. **Discharge Structure and Appurtenances**
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks______________________________

5. **Treatment Building(s)**
☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks______________________________

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks______________________________

D. Monitoring Data

1. Monitoring Data
☐ Is routinely submitted on time ☐ Is of acceptable quality

2. Monitoring data suggests:
☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks____
____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy at Site LF010 includes site access controls (fence and land use restrictions), with the objective of eliminating potential human exposure to buried wastes. The remedy has been implemented in accordance with the Decision Document and is functioning as designed. The fence is in place, with securely locked gates, and no evidence of trespassing or exposed waste was observed.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Continued O&M is needed to control vegetation along the fence, and to repair the fence in locations where it has been damaged by vegetation or other forces (e.g., vehicles along Juliustown Road.).

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

No potential future remedy problems were noted, assuming that fence-related O&M continues.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None.____

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Site LF033 PDO Landfill

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	**O&M Documents**			
	☐ O&M manual	☐ Readily available	☐ Up to date	☒ N/A
	☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A
	☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
2.	**Site-Specific Health and Safety Plan**	☒ Readily available	☐ Up to date	☐ N/A
	☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	☐ N/A
	Remarks No documents were available for review onsite during the inspection.			
3.	**O&M and OSHA Training Records**	☒ Readily available	☐ Up to date	☐ N/A
	Remarks No records were available for review onsite during the inspection.			
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
	☐ Other permits	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
7.	**Groundwater Monitoring Records**	☒ Readily available	☒ Up to date	☐ N/A
	Remarks Groundwater monitoring conducted through 2016. Monitoring records were provided prior to the site inspection.			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☒ Contractor for Federal Facility
☐ Other____

2. **O&M Cost Records**
☐ Readily available ☐ Up to date
☒ Funding mechanism/agreement in place
Original O&M cost estimate___Not available (monitoring costs)___ ☐ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
From__________	To__________	__________	☐ Breakdown attached
From__________	To__________	__________	☐ Breakdown attached
From__________	To__________	__________	☐ Breakdown attached
From__________	To__________	__________	☐ Breakdown attached
From__________	To__________	__________	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: ______None___________________________________

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A
Remarks____

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A
Remarks____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) self reporting, groundwater monitoring for the Classification Exception Area (CEA), through 2016
Frequency Semi-annual (through 2016)
Responsible party/agency JB MDL

Contact				
Contact	Nicole Brestle	IRP Project Manager	25 July 2017	609-754-0068
	Name	Title	Date	Phone no.

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☒ No ☐ N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks

2. **Land use changes on site** ☒ N/A
Remarks

3. **Land use changes off site** ☒ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks Main dirt access road now closed.

B. Other Site Conditions

Remarks ____
____
____
____
____
____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent______________ Depth____________
Remarks____
____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
Lengths____________ Widths___________ Depths__________
Remarks____
____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent______________ Depth____________
Remarks____
____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
Areal extent______________ Depth____________
Remarks____
____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks____
____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
Remarks____
____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
Areal extent______________ Height____________
Remarks____
____

8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Areal extent______________
	☐ Ponding	☐ Location shown on site map	Areal extent______________
	☐ Seeps	☐ Location shown on site map	Areal extent______________
	☐ Soft subgrade	☐ Location shown on site map	Areal extent______________
	Remarks____		
9.	**Slope Instability** ☐ Slides	☐ Location shown on site map	☐ No evidence of slope instability
	Areal extent______________		
	Remarks____		
B. Benches	☐ Applicable	☐ N/A	
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks____		
3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks____		
C. Letdown Channels	☐ Applicable	☐ N/A	
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement**	☐ Location shown on site map	☐ No evidence of settlement
	Areal extent______________	Depth____________	
	Remarks____		
2.	**Material Degradation**	☐ Location shown on site map	☐ No evidence of degradation
	Material type_______________	Areal extent_____________	
	Remarks____		
3.	**Erosion**	☐ Location shown on site map	☐ No evidence of erosion
	Areal extent______________	Depth____________	
	Remarks____		

4.	**Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting Areal extent______________ Depth____________ Remarks____	
5.	**Obstructions** Type_____________________ ☐ No obstructions ☐ Location shown on site map Areal extent______________ Size____________ Remarks____	
6.	**Excessive Vegetative Growth** Type____________________ ☐ No evidence of excessive growth ☐ Vegetation in channels does not obstruct flow ☐ Location shown on site map Areal extent______________ Remarks____	
D. Cover Penetrations ☐ Applicable ☐ N/A		
1.	**Gas Vents** ☐ Active ☐ Passive ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____	
2.	**Gas Monitoring Probes** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____	
3.	**Monitoring Wells** (within surface area of landfill) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____	
4.	**Leachate Extraction Wells** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____	
5.	**Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A Remarks____	

E. Gas Collection and Treatment	☐ Applicable	☐ N/A	
1. **Gas Treatment Facilities** ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse ☐ Good condition ☐ Needs Maintenance Remarks________			
2. **Gas Collection Wells, Manifolds and Piping** ☐ Good condition ☐ Needs Maintenance Remarks________			
3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) ☐ Good condition ☐ Needs Maintenance ☐ N/A Remarks________			
F. Cover Drainage Layer	☐ Applicable	☐ N/A	
1. **Outlet Pipes Inspected**	☐ Functioning	☐ N/A	
Remarks________			
2. **Outlet Rock Inspected**	☐ Functioning	☐ N/A	
Remarks________			
G. Detention/Sedimentation Ponds	☐ Applicable	☐ N/A	
1. **Siltation** Areal extent________ Depth________ ☐ N/A ☐ Siltation not evident Remarks________			
2. **Erosion** Areal extent________ Depth________ ☐ Erosion not evident Remarks________			
3. **Outlet Works**	☐ Functioning	☐ N/A	
Remarks________			
4. **Dam**	☐ Functioning	☐ N/A	
Remarks________			

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____________ Vertical displacement________________
Rotational displacement_____________
Remarks____
____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks____
____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
Areal extent_______________ Depth_____________
Remarks____
____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent_______________ Type_____________
Remarks____
____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_______________ Depth_____________
Remarks____
____

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks____
____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent_______________ Depth_____________
Remarks____
____

2. **Performance Monitoring** Type of monitoring___________________________
☐ Performance not monitored
Frequency________________________________ ☐ Evidence of breaching
Head differential___________________________
Remarks____
____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☒ N/A	
1.	**Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks______________________________
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks______________________________
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks______________________________
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A	
1.	**Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks______________________________
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks______________________________
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks______________________________

C. Treatment System ☐ Applicable ☒ N/A
1. **Treatment Train** (Check components that apply) ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation ☐ Air stripping ☐ Carbon adsorbers ☐ Filters______ ☐ Additive (*e.g.*, chelation agent, flocculent)______ ☐ Others______ ☐ Good condition ☐ Needs Maintenance ☐ Sampling ports properly marked and functional ☐ Sampling/maintenance log displayed and up to date ☐ Equipment properly identified ☐ Quantity of groundwater treated annually______ ☐ Quantity of surface water treated annually______ Remarks______
2. **Electrical Enclosures and Panels** (properly rated and functional) ☐ N/A ☐ Good condition ☐ Needs Maintenance Remarks______
3. **Tanks, Vaults, Storage Vessels** ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance Remarks______
4. **Discharge Structure and Appurtenances** ☐ N/A ☐ Good condition ☐ Needs Maintenance Remarks______
5. **Treatment Building(s)** ☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair ☐ Chemicals and equipment properly stored Remarks______
6. **Monitoring Wells** (pump and treatment remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance ☐ N/A Remarks______
D. Monitoring Data
3. Monitoring Data ☒ Is routinely submitted on time ☒ Is of acceptable quality
4. Monitoring data suggests: ☒ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☒ N/A

Remarks

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

Removal of contaminated sediments and wetland/stream restoration was completed in 2007.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy at Site LF033 includes sediment excavation and stream excavation (completed), land use restrictions, and semiannual monitoring of groundwater, surface water, and sediment, with the objective of protecting the Pinelands ecosystem from elevated mercury concentrations. The remedy is effective and functioning as designed. The stream appeared to be in good condition during the inspection. Monitoring was completed until 2016, after which the O&M contractor submitted a Remedial Action Completion Report, and NJDEP indicated preliminary approval of a No Further Action Request for the site. Based on groundwater concentrations consistently below the applicable standard, and compliance averaging for sediment and surface water indicating achievement of remedial goals, the remedy has met the remedial objectives.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

None.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None.

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Site SS005B 4300/4400 Area

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1. **O&M Documents**				
☐ O&M manual	☐ Readily available	☐ Up to date	☒ N/A	
☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A	
☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A	
Remarks				
2. **Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	☐ N/A	
☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	☐ N/A	
Remarks No documents were available for review onsite during the inspection.				
3. **O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☐ N/A	
Remarks No records were available for review onsite during the inspection.				
4. **Permits and Service Agreements**				
☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A	
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A	
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A	
☐ Other permits	☐ Readily available	☐ Up to date	☒ N/A	
Remarks				
5. **Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A	
Remarks				
6. **Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A	
Remarks				
7. **Groundwater Monitoring Records**	☒ Readily available	☒ Up to date	☐ N/A	
Remarks Groundwater monitoring records through Spring 2017 were provided prior to the site inspection.				
8. **Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A	
Remarks				
9. **Discharge Compliance Records**				
☐ Air	☐ Readily available	☐ Up to date	☒ N/A	
☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A	
Remarks				
10. **Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☐ N/A	
Remarks Inspection team signed in prior to accessing site. However, no access logs were available for review onsite during the inspection.				

IV. O&M COSTS

1. **O&M Organization**
   ☐ State in-house ☐ Contractor for State
   ☐ PRP in-house ☐ Contractor for PRP
   ☐ Federal Facility in-house ☒ Contractor for Federal Facility
   ☐ Other____

2. **O&M Cost Records**
   ☐ Readily available ☐ Up to date
   ☒ Funding mechanism/agreement in place
   Original O&M cost estimate_ $78,000 (including installation and operation)_ ☐ Breakdown attached

   Total annual cost by year for review period if available

From__________ (Date)	To__________ (Date)	__________ (Total cost)	☐ Breakdown attached
From__________ (Date)	To__________ (Date)	__________ (Total cost)	☐ Breakdown attached
From__________ (Date)	To__________ (Date)	__________ (Total cost)	☐ Breakdown attached
From__________ (Date)	To__________ (Date)	__________ (Total cost)	☐ Breakdown attached
From__________ (Date)	To__________ (Date)	__________ (Total cost)	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: ______None____________________________________

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A
   Remarks____

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A
   Remarks____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) self reporting, groundwater monitoring for the Classification Exception Area (CEA)
Frequency Semi-annual
Responsible party/agency JB MDL
Contact Nicole Brestle IRP Project Manager 25 July 2017 609-754-0068
Name Title Date Phone no.

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☒ No ☐ N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks

2. **Land use changes on site** ☒ N/A
Remarks

3. **Land use changes off site** ☒ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks Large portion of the area is a helipad.

B. Other Site Conditions

Remarks ____

____

____

____

____

____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
   Areal extent______________ Depth____________
   Remarks____
   ____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
   Lengths____________ Widths___________ Depths__________
   Remarks____
   ____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
   Areal extent______________ Depth____________
   Remarks____
   ____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
   Areal extent______________ Depth____________
   Remarks____
   ____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
   ☐ Trees/Shrubs (indicate size and locations on a diagram)
   Remarks____
   ____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
   Remarks____
   ____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
   Areal extent______________ Height____________
   Remarks____
   ____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent______________
☐ Ponding ☐ Location shown on site map Areal extent______________
☐ Seeps ☐ Location shown on site map Areal extent______________
☐ Soft subgrade ☐ Location shown on site map Areal extent______________
Remarks____
____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
Areal extent______________
Remarks____
____

B. Benches ☐ Applicable ☐ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks____
____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks____
____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks____
____

C. Letdown Channels ☐ Applicable ☐ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
Areal extent______________ Depth____________
Remarks____
____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____
____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Areal extent______________ Depth____________
Remarks____
____

4.	**Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting Areal extent______________ Depth____________ Remarks____ ____	
5.	**Obstructions** Type____________________ ☐ No obstructions ☐ Location shown on site map Areal extent______________ Size____________ Remarks____ ____	
6.	**Excessive Vegetative Growth** Type____________________ ☐ No evidence of excessive growth ☐ Vegetation in channels does not obstruct flow ☐ Location shown on site map Areal extent______________ Remarks____ ____	
D. Cover Penetrations ☐ Applicable ☐ N/A		
1.	**Gas Vents** ☐ Active ☐ Passive ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____ ____	
2.	**Gas Monitoring Probes** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____ ____	
3.	**Monitoring Wells** (within surface area of landfill) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____ ____	
4.	**Leachate Extraction Wells** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____ ____	
5.	**Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A Remarks____ ____	

E. Gas Collection and Treatment	☐ Applicable	☐ N/A	
1. **Gas Treatment Facilities** ☐ Flaring ☐ Thermal destruction ☐ Collection for reuse ☐ Good condition ☐ Needs Maintenance Remarks____________			
2. **Gas Collection Wells, Manifolds and Piping** ☐ Good condition ☐ Needs Maintenance Remarks____________			
3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings) ☐ Good condition ☐ Needs Maintenance ☐ N/A Remarks____________			
F. Cover Drainage Layer	☐ Applicable	☐ N/A	
1. **Outlet Pipes Inspected**	☐ Functioning	☐ N/A	
Remarks____________			
2. **Outlet Rock Inspected**	☐ Functioning	☐ N/A	
Remarks____________			
G. Detention/Sedimentation Ponds	☐ Applicable	☐ N/A	
1. **Siltation** Areal extent____________	Depth____________		☐ N/A
☐ Siltation not evident Remarks____________			
2. **Erosion** Areal extent____________	Depth____________		
☐ Erosion not evident Remarks____________			
3. **Outlet Works**	☐ Functioning	☐ N/A	
Remarks____________			
4. **Dam**	☐ Functioning	☐ N/A	
Remarks____________			

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____________ Vertical displacement________________
Rotational displacement_____________
Remarks____
____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks____
____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
Areal extent_______________ Depth_____________
Remarks____
____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent_______________ Type_____________
Remarks____
____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_______________ Depth_____________
Remarks____
____

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks____
____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent_______________ Depth_____________
Remarks____
____

2. **Performance Monitoring** Type of monitoring___________________________
☐ Performance not monitored
Frequency________________________________ ☐ Evidence of breaching
Head differential___________________________
Remarks____
____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A		
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☒ N/A		
1.	**Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks	
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks	
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks	
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A		
1.	**Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks	
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks	
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks	

C. Treatment System ☐ Applicable ☒ N/A
1. **Treatment Train** (Check components that apply) ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation ☐ Air stripping ☐ Carbon adsorbers ☐ Filters____________________ ☐ Additive (*e.g.*, chelation agent, flocculent)____________________ ☐ Others____________________ ☐ Good condition ☐ Needs Maintenance ☐ Sampling ports properly marked and functional ☐ Sampling/maintenance log displayed and up to date ☐ Equipment properly identified ☐ Quantity of groundwater treated annually____________ ☐ Quantity of surface water treated annually____________ Remarks____________________
2. **Electrical Enclosures and Panels** (properly rated and functional) ☐ N/A ☐ Good condition ☐ Needs Maintenance Remarks____________________
3. **Tanks, Vaults, Storage Vessels** ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance Remarks____________________
4. **Discharge Structure and Appurtenances** ☐ N/A ☐ Good condition ☐ Needs Maintenance Remarks____________________
5. **Treatment Building(s)** ☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair ☐ Chemicals and equipment properly stored Remarks____________________
6. **Monitoring Wells** (pump and treatment remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance ☐ N/A Remarks____________________
D. Monitoring Data
5. Monitoring Data ☒ Is routinely submitted on time ☒ Is of acceptable quality
6. Monitoring data suggests: ☒ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☒ N/A
Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

Air sparge/soil vapor extraction was completed in 2005, and the system was subsequently removed.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy at SS005B includes air sparging with soil vapor extraction (complete), monitoring of sediment and surface water (complete), land use controls, and monitoring of groundwater, with the objectives of mitigating exposure to TCE and PCE under residential exposure conditions and protecting South Run Creek as part of the Pinelands. The remedy is effective and functioning as designed. Surface water and sediment monitoring were discontinued in 2013, after 5 years of monitoring with no detections of VOCs, as documented in the 2013 FYR. Groundwater monitoring will continue until low-level groundwater PCE concentrations fall below applicable standards for 2 consecutive rounds of sampling.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

None.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None.

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Site SS007 MAG-1 Area

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ☐ O&M manual ☐ Readily available ☐ Up to date ☐ N/A
   - ☐ As-built drawings ☐ Readily available ☐ Up to date ☐ N/A
   - ☐ Maintenance logs ☐ Readily available ☐ Up to date ☐ N/A

   Remarks No documents were available for review onsite during the inspection.

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☐ N/A
   - ☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A

   Remarks No documents were available for review onsite during the inspection.

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☐ N/A

   Remarks No records were available for review onsite during the inspection.

4. **Permits and Service Agreements**
   - ☐ Air discharge permit ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Effluent discharge ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Waste disposal, POTW ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Other permits__________________ ☐ Readily available ☐ Up to date ☐ N/A

   Remarks No permits were available for review onsite during the inspection.

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

   Remarks

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A

   Remarks

7. **Groundwater Monitoring Records** ☒ Readily available ☒ Up to date ☐ N/A

   Remarks Groundwater monitoring records through Spring 2017 were provided prior to the site inspection.

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A

   Remarks

9. **Discharge Compliance Records**
   - ☐ Air ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Water (effluent) ☐ Readily available ☐ Up to date ☒ N/A

   Remarks

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☒ N/A

    Remarks

IV. O&M COSTS

1. **O&M Organization**
   - ☐ State in-house ☐ Contractor for State
   - ☐ PRP in-house ☐ Contractor for PRP
   - ☐ Federal Facility in-house ☒ Contractor for Federal Facility
   - ☐ Other

2. **O&M Cost Records**
   - ☐ Readily available ☐ Up to date
   - ☒ Funding mechanism/agreement in place
   - Original O&M cost estimate $322,459 ☐ Breakdown attached

   Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
   Describe costs and reasons: None

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A
   Remarks Although not an access control associated with the remedy, the gate to the fence surrounding Building 2203 was locked, and the fence was damaged in one location south/southwest of the building.

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A
   Remarks

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) self reporting, groundwater sampling for performance monitoring and the Classification Exception Area (CEA)
Frequency Quarterly
Responsible party/agency JB MDL

Contact			
Nicole Brestle	IRP Project Manager	25 July 2017	609-754-0068
Name	Title	Date	Phone no.

Reporting is up-to-date ☒ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☒ No ☐ N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks

2. **Land use changes on site** ☒ N/A
Remarks

3. **Land use changes off site** ☒ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks Concrete road near Building 2203, within the fenced area, was heavily vegetated with tall plants in some areas. The unpaved road leading to the bioaugmentation system was also somewhat overgrown.

B. Other Site Conditions

Remarks ____
____
____
____
____
____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent______________ Depth____________
Remarks____
____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
Lengths____________ Widths___________ Depths__________
Remarks____
____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent______________ Depth____________
Remarks____
____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
Areal extent______________ Depth____________
Remarks____
____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks____
____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
Remarks____
____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
Areal extent______________ Height____________
Remarks____
____

8. **Wet Areas/Water Damage** ☐ Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map Areal extent______________
☐ Ponding ☐ Location shown on site map Areal extent______________
☐ Seeps ☐ Location shown on site map Areal extent______________
☐ Soft subgrade ☐ Location shown on site map Areal extent______________
Remarks____
____

9. **Slope Instability** ☐ Slides ☐ Location shown on site map ☐ No evidence of slope instability
Areal extent______________
Remarks____
____

B. Benches ☐ Applicable ☐ N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. **Flows Bypass Bench** ☐ Location shown on site map ☐ N/A or okay
Remarks____
____

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay
Remarks____
____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay
Remarks____
____

C. Letdown Channels ☐ Applicable ☐ N/A
(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** ☐ Location shown on site map ☐ No evidence of settlement
Areal extent______________ Depth____________
Remarks____
____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation
Material type_______________ Areal extent_____________
Remarks____
____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion
Areal extent______________ Depth____________
Remarks____
____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent______________ Depth____________
Remarks____
____

5. **Obstructions** Type_____________________ ☐ No obstructions
☐ Location shown on site map Areal extent______________
Size____________
Remarks____
____

6. **Excessive Vegetative Growth** Type____________________
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent______________
Remarks____
____

D. Cover Penetrations ☐ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks____
____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____
____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____
____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____
____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks____
____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Areal extent______________ Depth____________ ☐ N/A
☐ Siltation not evident
Remarks____

2. **Erosion** Areal extent______________ Depth____________
☐ Erosion not evident
Remarks____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks____

4. **Dam** ☐ Functioning ☐ N/A
Remarks____

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____________ Vertical displacement_______________
Rotational displacement_____________
Remarks____
____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks____
____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
Areal extent______________ Depth____________
Remarks____
____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent______________ Type____________
Remarks____
____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent______________ Depth____________
Remarks____
____

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks____
____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent______________ Depth____________
Remarks____
____

2. **Performance Monitoring** Type of monitoring__________________________
☐ Performance not monitored
Frequency_______________________________ ☐ Evidence of breaching
Head differential__________________________
Remarks____
____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☒ N/A
1. **Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks
2. **Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3. **Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A
1. **Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks
2. **Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3. **Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks

C. Treatment System ☒ Applicable ☐ N/A

Note: Bioaugmentation treatment system operated from 2011 through 2015, when it was shutdown to allow an evaluation of Monitored Natural Attenuation at the site.

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☒ Bioremediation
☐ Air stripping ☐ Carbon adsorbers
☐ Filters____
☒ Additive (*e.g.*, chelation agent, flocculent) Lactate, buffer, nutrients (until 2015)
☐ Others____
☐ Good condition ☐ Needs Maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☐ Quantity of groundwater treated annually________________
☐ Quantity of surface water treated annually________________
Remarks____

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☒ Good condition ☒ Needs Maintenance
Remarks Appeared to be in good condition inside of the trailers via the window.

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ☒ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks Appeared to be in good condition via the window.

4. **Discharge Structure and Appurtenances**
☒ N/A ☐ Good condition ☐ Needs Maintenance
Remarks____

5. **Treatment Building(s)**
☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks____

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☒ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks All wells sampled in 2017 were located, and found to be in good condition except for some missing caps and locks (see photo log).

D. Monitoring Data

7. Monitoring Data
☒ Is routinely submitted on time ☒ Is of acceptable quality

8. Monitoring data suggests:
☒ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining
Note: Some concentrations appear to be rebounding, after shutdown of bioaugmentation system.

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition
☒ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks__ All wells sampled in 2017 were located, and found to be in good condition except for some missing caps and locks (see photo log).___

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

Soil excavation was conducted in 2005 and 2010.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

Ongoing elements of the remedy at SS007 include bioaugmentation (on hold pending monitored natural attenuation study), natural attenuation outside the bioaugmentation area, land use controls, and long-term monitoring of groundwater, with the primary objective of protecting human receptors from exposure to contaminants at levels exceeding remedial goals in soil and groundwater. The bioaugmentation remedy promoted degradation of TCE, but its effectiveness was limited. If VOC concentrations in groundwater continue to rebound under a natural attenuation scenario, then a contingency action may be needed.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Contaminants exceeding remedial goals have recently been observed in the sentinel wells, indicating that these wells are not appropriate for use as sentinel wells. New sentinel wells meeting all applicable criteria should be proposed for approval, to confirm that the remedy is protective of downgradient receptors.

C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. Apparent rebound in VOC concentrations observed during recent groundwater monitoring events; may require contingency actions such as additional bioaugmentation or groundwater recirculation with *ex situ* treatment. If treatment resumes, site maintenance including restoration of access roads, etc., will likely be required.____
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. See Items B and C.____

Site SS025 ARDC Test Facility

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. **O&M Documents**
   - ☐ O&M manual ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ As-built drawings ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Maintenance logs ☐ Readily available ☐ Up to date ☒ N/A

   Remarks

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☐ N/A
   - ☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A

   Remarks No documents were available for review onsite during the inspection.

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☐ N/A

   Remarks No records were available for review onsite during the inspection.

4. **Permits and Service Agreements**
   - ☐ Air discharge permit ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Effluent discharge ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Waste disposal, POTW ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Other permits ☐ Readily available ☐ Up to date ☒ N/A

   Remarks

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

   Remarks

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A

   Remarks

7. **Groundwater Monitoring Records** ☒ Readily available ☒ Up to date ☐ N/A

   Remarks Groundwater monitoring ceased in 2015. Monitoring records were provided prior to the site inspection.

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A

   Remarks

9. **Discharge Compliance Records**
   - ☐ Air ☐ Readily available ☐ Up to date ☒ N/A
   - ☐ Water (effluent) ☐ Readily available ☐ Up to date ☒ N/A

   Remarks

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☐ N/A

    Remarks No access logs were available for review onsite during the inspection.

IV. O&M COSTS

1. **O&M Organization**
☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☒ Contractor for Federal Facility
☐ Other____

2. **O&M Cost Records**
☐ Readily available ☐ Up to date
☒ Funding mechanism/agreement in place
Original O&M cost estimate____________________ ☐ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
From__________	To__________	__________________	☐ Breakdown attached
From__________	To__________	__________________	☐ Breakdown attached
From__________	To__________	__________________	☐ Breakdown attached
From__________	To__________	__________________	☐ Breakdown attached
From__________	To__________	__________________	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**
Describe costs and reasons: ______None____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☐ Gates secured ☒ N/A
Remarks____

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A
Remarks____

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented	☐ Yes	☒ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☒ No	☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) __self reporting__
Frequency __Biennial for Classification Exception Area__
Responsible party/agency __JB MDL__

Contact	Nicole Brestle	IRP Project Manager	25 July 2017	609-754-0068
	Name	Title	Date	Phone no.

Reporting is up-to-date	☒ Yes	☐ No	☐ N/A
Reports are verified by the lead agency	☒ Yes	☐ No	☐ N/A
Specific requirements in deed or decision documents have been met	☒ Yes	☐ No	☐ N/A
Violations have been reported	☐ Yes	☒ No	☐ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks

2. **Land use changes on site** ☒ N/A
Remarks

3. **Land use changes off site** ☒ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks

B. Other Site Conditions

Remarks
_Ditch south of site, in the area of surface water and sediment sampling, was well vegetated._____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent______________ Depth____________
Remarks____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
Lengths____________ Widths___________ Depths__________
Remarks____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
Areal extent______________ Depth____________
Remarks____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
☒ Trees/Shrubs (indicate size and locations on a diagram)
Remarks____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
Remarks____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
Areal extent______________ Height____________
Remarks____

8.	**Wet Areas/Water Damage** ☐ Wet areas ☐ Ponding ☐ Seeps ☐ Soft subgrade Remarks____ ____	☐ Wet areas/water damage not evident ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map ☐ Location shown on site map	 Areal extent______________ Areal extent______________ Areal extent______________ Areal extent______________
9.	**Slope Instability** ☐ Slides Areal extent______________ Remarks____ ____	☐ Location shown on site map	☐ No evidence of slope instability
B.	**Benches** ☐ Applicable ☐ N/A (Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench** Remarks____ ____	☐ Location shown on site map	☐ N/A or okay
2.	**Bench Breached** Remarks____ ____	☐ Location shown on site map	☐ N/A or okay
3.	**Bench Overtopped** Remarks____ ____	☐ Location shown on site map	☐ N/A or okay
C.	**Letdown Channels** ☐ Applicable ☐ N/A (Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement** Areal extent______________ Remarks____ ____	☐ Location shown on site map Depth____________	☐ No evidence of settlement
2.	**Material Degradation** Material type_______________ Remarks____ ____	☐ Location shown on site map Areal extent_____________	☐ No evidence of degradation
3.	**Erosion** Areal extent______________ Remarks____ ____	☐ Location shown on site map Depth____________	☐ No evidence of erosion

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent______________ Depth____________
Remarks____

5. **Obstructions** Type_____________________ ☐ No obstructions
☐ Location shown on site map Areal extent______________
Size____________
Remarks____

6. **Excessive Vegetative Growth** Type____________________
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent______________
Remarks____

D. Cover Penetrations ☐ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance
☐ N/A
Remarks____

2. **Gas Monitoring Probes**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____

4. **Leachate Extraction Wells**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A
Remarks____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks______________________________

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks______________________________

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks______________________________

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks______________________________

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks______________________________

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Areal extent______________ Depth____________ ☐ N/A
☐ Siltation not evident
Remarks______________________________

2. **Erosion** Areal extent______________ Depth____________
☐ Erosion not evident
Remarks______________________________

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks______________________________

4. **Dam** ☐ Functioning ☐ N/A
Remarks______________________________

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____________ Vertical displacement_______________
Rotational displacement_____________
Remarks____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
Areal extent______________ Depth____________
Remarks____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent______________ Type____________
Remarks____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent______________ Depth____________
Remarks____

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent______________ Depth____________
Remarks____

2. **Performance Monitoring** Type of monitoring__________________________
☐ Performance not monitored
Frequency_______________________________ ☐ Evidence of breaching
Head differential__________________________
Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☒ Applicable ☐ N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☒ N/A	
1.	**Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☒ N/A	
1.	**Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (Check components that apply)
☐ Metals removal ☐ Oil/water separation ☐ Bioremediation
☐ Air stripping ☐ Carbon adsorbers
☐ Filters___
☐ Additive (*e.g.*, chelation agent, flocculent)___
☐ Others___
☐ Good condition ☐ Needs Maintenance
☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
☐ Quantity of groundwater treated annually___
☐ Quantity of surface water treated annually___
Remarks___

2. **Electrical Enclosures and Panels** (properly rated and functional)
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks___

3. **Tanks, Vaults, Storage Vessels**
☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance
Remarks___

4. **Discharge Structure and Appurtenances**
☐ N/A ☐ Good condition ☐ Needs Maintenance
Remarks___

5. **Treatment Building(s)**
☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks___

6. **Monitoring Wells** (pump and treatment remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks___

D. Monitoring Data

1. Monitoring Data
☒ Is routinely submitted on time ☒ Is of acceptable quality

2. Monitoring data suggests:
☒ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☒ N/A

Remarks Groundwater monitoring associated with the natural attenuation remedy ceased in 2015.

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy at Site SS025 includes soil removal (complete), land use controls, and monitoring of groundwater and sediment (complete) and surface water, with the objectives of protecting human health and the environment by limiting exposure to concentrations of PCE and TCE exceeding applicable standards. The remedy is effective and functioning as designed. Monitoring of groundwater and sediment stopped in 2015, due to a lack of detections of contaminants of concern in these media. One surface water sampling location (SW202) will continue to be sampled until concentrations are below applicable standards.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

None.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None.

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Site TU026 New Egypt Armory

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	**O&M Documents**			
	☐ O&M manual	☐ Readily available	☐ Up to date	☒ N/A
	☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A
	☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
2.	**Site-Specific Health and Safety Plan**	☐ Readily available	☐ Up to date	☒ N/A
	☐ Contingency plan/emergency response plan	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
3.	**O&M and OSHA Training Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
4.	**Permits and Service Agreements**			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
	☐ Other permits	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
5.	**Gas Generation Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
6.	**Settlement Monument Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
7.	**Groundwater Monitoring Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
8.	**Leachate Extraction Records**	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
9.	**Discharge Compliance Records**			
	☐ Air	☐ Readily available	☐ Up to date	☒ N/A
	☐ Water (effluent)	☐ Readily available	☐ Up to date	☒ N/A
	Remarks			
10.	**Daily Access/Security Logs**	☐ Readily available	☐ Up to date	☐ N/A
	Remarks No access logs were available for review onsite during the inspection.			

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Federal Facility in-house ☐ Contractor for Federal Facility
☐ Other Not Applicable (no O&M required)

2. **O&M Cost Records**

☐ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate____________________ ☐ Breakdown attached

Total annual cost by year for review period if available

From (Date)	To (Date)	Total cost	
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached
			☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs During Review Period**

Describe costs and reasons: ____________________

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks____________________

B. Other Access Restrictions

1. **Signs and other security measures** ☐ Location shown on site map ☒ N/A

Remarks____________________

C. Institutional Controls (ICs)

1. **Implementation and enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (*e.g.*, self-reporting, drive by) self reporting, inspection for Land Use Control Implementation Plan (LUCIP), to confirm the building slab of the shed is maintained as a cap over remaining PCB-contaminated soils)
Frequency Annual
Responsible party/agency JB MDL
Contact Nicole Brestle (Name) IRP Project Manager (Title) 25 July 2017 (Date) 609-754-0068 (Phone no.)

Reporting is up-to-date ☐ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☐ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☒ No ☐ N/A
Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks

D. General

1. **Vandalism/trespassing** ☐ Location shown on site map ☒ No vandalism evident
Remarks

2. **Land use changes on site** ☒ N/A
Remarks

3. **Land use changes off site** ☒ N/A
Remarks

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A
Remarks

B. Other Site Conditions

Remarks ____
____
____
____
____
____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ Settlement not evident
Areal extent______________ Depth____________
Remarks____
____

2. **Cracks** ☐ Location shown on site map ☐ Cracking not evident
Lengths____________ Widths___________ Depths__________
Remarks____
____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent______________ Depth____________
Remarks____
____

4. **Holes** ☐ Location shown on site map ☐ Holes not evident
Areal extent______________ Depth____________
Remarks____
____

5. **Vegetative Cover** ☐ Grass ☐ Cover properly established ☐ No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks____
____

6. **Alternative Cover (armored rock, concrete, etc.)** ☐ N/A
Remarks____
____

7. **Bulges** ☐ Location shown on site map ☐ Bulges not evident
Areal extent______________ Height____________
Remarks____
____

8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Areal extent______________
	☐ Ponding	☐ Location shown on site map	Areal extent______________
	☐ Seeps	☐ Location shown on site map	Areal extent______________
	☐ Soft subgrade	☐ Location shown on site map	Areal extent______________
	Remarks______________________________		
9.	**Slope Instability** ☐ Slides	☐ Location shown on site map	☐ No evidence of slope instability
	Areal extent______________		
	Remarks______________________________		
B. Benches	☐ Applicable ☐ N/A		
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks______________________________		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks______________________________		
3.	**Bench Overtopped**	☐ Location shown on site map	☐ N/A or okay
	Remarks______________________________		
C. Letdown Channels	☐ Applicable ☐ N/A		
	(Channel lined with erosion control mats, riprap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)		
1.	**Settlement**	☐ Location shown on site map	☐ No evidence of settlement
	Areal extent______________	Depth____________	
	Remarks______________________________		
2.	**Material Degradation**	☐ Location shown on site map	☐ No evidence of degradation
	Material type_______________	Areal extent_____________	
	Remarks______________________________		
3.	**Erosion**	☐ Location shown on site map	☐ No evidence of erosion
	Areal extent______________	Depth____________	
	Remarks______________________________		

4.	**Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting Areal extent______________ Depth____________ Remarks____ ____	
5.	**Obstructions** Type_____________________ ☐ No obstructions ☐ Location shown on site map Areal extent______________ Size____________ Remarks____ ____	
6.	**Excessive Vegetative Growth** Type____________________ ☐ No evidence of excessive growth ☐ Vegetation in channels does not obstruct flow ☐ Location shown on site map Areal extent______________ Remarks____ ____	
D. Cover Penetrations ☐ Applicable ☐ N/A		
1.	**Gas Vents** ☐ Active ☐ Passive ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____ ____	
2.	**Gas Monitoring Probes** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____ ____	
3.	**Monitoring Wells** (within surface area of landfill) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____ ____	
4.	**Leachate Extraction Wells** ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ Evidence of leakage at penetration ☐ Needs Maintenance ☐ N/A Remarks____ ____	
5.	**Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A Remarks____ ____	

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs Maintenance
Remarks____
____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs Maintenance
Remarks____
____

3. **Gas Monitoring Facilities** (*e.g.*, gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs Maintenance ☐ N/A
Remarks____
____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks____
____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks____
____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Areal extent______________ Depth____________ ☐ N/A
☐ Siltation not evident
Remarks____
____

2. **Erosion** Areal extent______________ Depth____________
☐ Erosion not evident
Remarks____
____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks____
____

4. **Dam** ☐ Functioning ☐ N/A
Remarks____
____

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement_____________ Vertical displacement________________
Rotational displacement_____________
Remarks____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
Areal extent_______________ Depth_____________
Remarks____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent_______________ Type_____________
Remarks____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent_______________ Depth_____________
Remarks____

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent_______________ Depth_____________
Remarks____

2. **Performance Monitoring** Type of monitoring___________________________
☐ Performance not monitored
Frequency________________________________ ☐ Evidence of breaching
Head differential___________________________
Remarks____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines ☐ Applicable ☐ N/A	
1.	**Pumps, Wellhead Plumbing, and Electrical** ☐ Good condition ☐ All required wells properly operating ☐ Needs Maintenance ☐ N/A Remarks
2.	**Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks
B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable ☐ N/A	
1.	**Collection Structures, Pumps, and Electrical** ☐ Good condition ☐ Needs Maintenance Remarks
2.	**Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances** ☐ Good condition ☐ Needs Maintenance Remarks
3.	**Spare Parts and Equipment** ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks

C. Treatment System ☐ Applicable ☐ N/A
1. **Treatment Train** (Check components that apply) ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation ☐ Air stripping ☐ Carbon adsorbers ☐ Filters________________________ ☐ Additive (*e.g.*, chelation agent, flocculent)________________________ ☐ Others________________________ ☐ Good condition ☐ Needs Maintenance ☐ Sampling ports properly marked and functional ☐ Sampling/maintenance log displayed and up to date ☐ Equipment properly identified ☐ Quantity of groundwater treated annually________________________ ☐ Quantity of surface water treated annually________________________ Remarks________________________ ________________________
2. **Electrical Enclosures and Panels** (properly rated and functional) ☐ N/A ☐ Good condition ☐ Needs Maintenance Remarks________________________ ________________________
3. **Tanks, Vaults, Storage Vessels** ☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs Maintenance Remarks________________________ ________________________
4. **Discharge Structure and Appurtenances** ☐ N/A ☐ Good condition ☐ Needs Maintenance Remarks________________________ ________________________
5. **Treatment Building(s)** ☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair ☐ Chemicals and equipment properly stored Remarks________________________ ________________________
6. **Monitoring Wells** (pump and treatment remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs Maintenance ☐ N/A Remarks________________________ ________________________
D. Monitoring Data
1. Monitoring Data ☐ Is routinely submitted on time ☐ Is of acceptable quality
2. Monitoring data suggests: ☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs Maintenance ☐ N/A
Remarks____

X. OTHER REMEDIES

If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

Soil excavation was completed in 2015.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedy at Site TU026 consists of soil removal (complete) and a land use control for maintenance of a building slab that acts as a cap over remaining PCB-impacted subsurface soil. The land use control has reportedly been recently implemented. Based on the site inspection, the building remains in place and appears to be maintained to prevent contact with underlying PCB-impacted soils.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

None.

C. Early Indicators of Potential Remedy Problems

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future.

None.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.

None.

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Photograph Log
Joint Base McGuire-Dix-Lakehurst Dix Area, New Jersey
Site Inspections
July 25-26, 2017

Photo 1. Gate to landfill off Juliustown Road facing southwest, with signs posted.

Photo 2. View of aboveground electrical conduits along access road facing south.

Photo 3. View of aboveground electrical conduits along access road facing south and landfill in distance

Photo 4. View of the north side of the landfill facing south-southwest.

Photo 5. Regraded and seeded area on the northeast corner of the landfill facing northwest.

Photo 6. Location of seep on the northeast corner of the landfill facing north.

Photo 7. View of water discharge close to seep source, note sheen.

Photo 8. View of seep discharge at drainage channel crossing, note sheen and orange/oxidization.

Photo 9. View of typical vent, note excess vegetation.

Photo 10. View of typical fill material used as base for solar panel concrete footers, note asphalt present.

Photo 11. View of letdown channel on northeast corner, note iron staining from historical water seepage.

Photo 12. View of typical solar panel rows, tall grass indicative of no standing water.

Photo 13. View of standing water in middle of solar panel rows, Row 25 facing northwest.

Photo 14. View of machine tracks in landfill cover, Row 27

Photo 15. Example of small scale ponding and solar panel supports.

Photo 16. View of letdown channel east side of landfill facing west.

Photo 17. Wetland area, northeast corner of landfill facing east.

Photo 18. Wetland area to the east of the landfill facing east.

Photo 19. Typical fence and locked gate on east side of landfill facing east.

Photo 20. Stormwater drainage basin on south side of landfill, facing southwest, note growth of coniferous trees.

Photo 21. Fence on west side of landfill facing north.

Photo 22. Typical ponding on westside of landfill, Rows 30-31.

Photo 22. Ponding in flat area north of landfill facing northeast.

Photo 24. Ponding on northside of landfill, end of solar panel Row 1, facing southeast.

Photo 25. View of central road, centerline of solar panels and landfill, facing south.

Photo 26. View of solar panels from the center road facing northwest.

Photo 27. Electrical transformers and equipment north side of landfill, note trash.

Photo 28. Typical transformer along center road, facing west.

Photo 29. Ponded area north of Row 1W.

Photo 30. Typical large ponded area.

Photo 31. Ponding around vent area.

Photo 32. Drainage ditch

LF010—Sanitary Landfill

Photo 33. Typical view of trees and undergrowth facing southwest..

Photo 34. Typical view of trees and undergrowth facing southwest..

Photo 35. Typical view of trees and undergrowth facing southwest.

Photo 36. Tree on fence along Juliustown Road

Photo 37. Example of animal burrowing under fence along Juliustown Road.

Photo 38. Tree root ball facing southwest.

Photo 39. Fence along Juliustown Road facing north-east.

Photo 40. Vegetation on fence near former monitoring well EP-40, facing northeast.

Photo 41. Stream at PDO-100.

Photo 42. Stream at Bridge 7105 facing west at MDO-SW/SE-220 sample location area.

Photo 42. Stream at Bridge 7105 facing east.

Photo 44. Bridge 7105.

Photo 45. Monitoring well DIO-18S, in helicopter area.

Photo 46. Facing east towards DIO-33S.

Photo 47. Viewing of monitoring wells and typical system

Photo 48. Storage conex and wells facing to the north.

Photo 49. View of treatment system conex interior.

Photo 50. MAG-1 treatment system, facing northwest.

Photograph Log
Joint Base McGuire-Dix-Lakehurst Dix Area, New Jersey
Site Inspections
July 25-26, 2017

Photo 51. MN-EX-1, note cap is off.

Photo 52. MN-EX-1, note cap is off.

Photo 53. MAG-104B

Photo 54. MAG-204

SS007—Magazine-1 Area

Photo 55. MAG-207.

Photo 56. View of MAG-70 facing south.

Photo 57. View of overgrown vegetation of fencing located south of Building 2203

Photo 58. View of Building 2203 facing northeast

Photo 59. View of stream facing west from bridge, towards ARDC-SW/SE 201.

Photo 60. View of stream between ARDC-SW/SE 201 and ARDC-SW/SE 202.

Photo 61. View of stream facing east from bridge, towards ARDC-SW/SE 202.

Photo 62. ARDC-SW/SE 202 sample location.

Photo 63. Land Use Control in place—building slab in place over PCB-impacted soils facing northwest.

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INTERVIEW DOCUMENTATION FORM			
The following is a list of individual interviewed for this five-year review. See the attached contact records for a detailed summary of the interviews.			
Douglas Pocze Name	Federal Facilities Chief Title/Position	USEPA ERRD-SPB Organization	8/1/2017 Date
Haiyesh Shah Name	Case Manager Title/Position	NJDEP Organization	8/1/2017 Date
Branwen Ellis Name	Environmental Specialist Title/Position	NJ Pinelands Commission Organization	8/15/2017 Date
Matthew Csik Name	Assistant Public Health Coordinator Title/Position	Ocean County Health Department Organization	8/1/2017 Date
Robin Sutton Name	Environmental Health Coordinator Title/Position	Burlington County Health Department Organization	8/23/2017 Date
Joseph Rhyner Name	Chief, Environmental Element Title/Position	JB MDL Organization	8/1/2017 Date
Michael Tamn Name	Community Co-Chair Title/Position	Restoration Advisory Board Organization	8/22/2017 Date
Tom Besselman Name	Member Title/Position	Restoration Advisory Board Organization	8/23/2017 Date
Frank Storm Name	Member Title/Position	Restoration Advisory Board Organization	8/25/2017 Date
Tim Llewellyn Name	Senior Vice President Title/Position	Arcadis U.S. Inc. Organization	8/22/2017 Date

The following individuals were contacted for interviews and declined to comment:

- Gwen Zervas, NJDEP Section Chief (defers to Haiyesh Shah's comments)
- Richard Bizub, Pinelands Preservation Alliance representative and Director for Water Programs

Attempts to contact the following individuals for interviews were unsuccessful:

- Nancy Wittenberg, Restoration Advisory Board member and New Jersey Pinelands Commission Executive Director
- John P. Protonentis, Ocean County Health Department Environmental Health Coordinator

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INTERVIEW RECORD

Site Name: JB MDL-Dix	**EPA ID No.:** NJ2210020275	
Subject: Five-Year Review for Site LF010	**Time:** 0726	**Date:** 8/1/2017
Type: ☐ Telephone ☐ Visit ☒ Other (email) **Location of Visit:**	☒ Incoming ☐ Outgoing	

Contact Made By:

Name: Samantha Saalfield	**Title:** Geologist	**Organization:** EA Engineering, Science, and Technology, Inc., PBC

Individual Contacted:

Name: Douglas Pocze	**Title:** Federal Facilities Chief	**Organization:** USEPA ERRD-SPB
Telephone No: 212-637-4432 **Fax No:** **E-Mail Address:** Pocze.Doug@epa.gov	**Street Address:** 290 Broadway **City, State, Zip:** New York, NY 10007-1866	

Summary Of Conversation

Question: Do you have any concerns regarding the remedy in place at Site LF010?

Answer: At this time EPA has no concerns regarding the remedy at Site LF010.

Question: Do you have any concerns regarding the environmental monitoring program?

Answer: EPA receives the LTM Reports and reviews them accordingly. Where appropriate comments are provided to the Air Force who is the lead agency at JBMDL.

Question: Do you have any concerns regarding site maintenance procedures?

Answer: No concerns at this time.

Question: Do you feel that the established communication channels are adequate for providing updates on the status of Site LF010?

Answer: Communication channels are acceptable. One note, future documents should be sent to Robyn Henderek (USEPA), 290 Broadway, New York, NY, 10007) instead of Alida Karas. Ms. Henderek will be the EPA Region 2 – Point of Contact for the Ft Dix Site.

Question: Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Answer: None at this time.

INTERVIEW RECORD

Site Name: JB MDL-Dix	**EPA ID No.:** NJ2210020275, NJ4213720275	
Subject: Dix Area Basewide Five-Year Review	**Time:** 1400	**Date:** 8/1/2017
Type: ☒ Telephone ☐ Visit ☐ Other (email) **Location of Visit:**	☐ Incoming ☒ Outgoing	

Contact Made By:

Name: Samantha Saalfield	**Title:** Geologist	**Organization:** EA Engineering, Science, and Technology, Inc., PBC

Individual Contacted:

Name: Haiyesh Shah	**Title:** Case Manager	**Organization:** NJDEP
Telephone No: 609-633-0718 **Fax No:** **E-Mail Address:** Haiyesh.shah@dep.state.nj.us	**Street Address:** 401-05F, 401 East State Street, P.O. Box 420 **City, State, Zip:** Trenton, NJ 08625-0420	

Summary Of Conversation

Question: Please provide any observations you made during the site inspection that should be noted in the Five-Year Review Report.

Answer: For the former NPL Sanitary Landfill (LF010), I noted three primary issues: overgrown vegetation and grass, ponding of water between solar panel rows (possibly due to lack of proper drainage), and the seep areas (red staining) along the east side of the landfill. The seeps were also observed during a site walk in Spring 2017, and are near drainage features, which do not appear to be functioning properly.

Question: Do you have concerns regarding the remedies in place at the 7 Dix sites undergoing five-year review?

Answer: Not at this time. There is uncertainty regarding the remedy at MAG-1 (SS007), including the acceptability of the monitored natural attenuation remedy currently under consideration as well as the bioaugmentation remedy.

Question: Do you have any concerns regarding the environmental monitoring program?

Answer: At the MAG-1, I have concerns about the sentinel wells. The initially established sentinel wells cannot be used as sentinel wells, because they contain contaminants at concentrations exceeding standards. Analysis will need to be provided to prove that proposed sentinel wells meet requirements, including distance from the nearest receptor equal to at least 1.5 years of groundwater flow.

Question: Do you have any concerns regarding the path forward to site closure?

Answer: I do not have any concerns.

Question: Do you feel that the established communication channels are adequate for providing updates on these Dix sites?

Answer: Yes, I am very satisfied with the communication channels between JBMDL, NJDEP, and EPA.

Question: Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Answer: No

INTERVIEW RECORD

Site Name: JB MDL-Dix	**EPA ID No.:** NJ2210020275, NJ4213720275	
Subject: Dix Area Basewide Five-Year Review	**Time:** 1214	**Date:** 8/15/2017
Type: ☐ Telephone ☐ Visit ☒ Other (email) **Location of Visit:**	☒ Incoming ☐ Outgoing	

Contact Made By:

Name: Samantha Saalfield	**Title:** Geologist	**Organization:** EA Engineering, Science, and Technology, Inc., PBC

Individual Contacted:

Name: Branwen Ellis	**Title:** Environmental Specialist	**Organization:** New Jersey Pinelands Commission
Telephone No: 609-894-7300 **Fax No:** **E-Mail Address:** branwen.ellis@njpines.state.nj.us	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

Question: What is your overall impression of the remedies in place at these 7 Dix sites?

Answer: My overall impression of the remedies in place at the 7 Dix sites is that they are protective of human health and are intended to achieve the remedial goals.

Question: Do you have any concerns regarding the remedies in place?

Answer: I do not currently have any concerns regarding the remedies in place.

Question: Do you have any concerns regarding the environmental monitoring program?

Answer: I do not have any current concerns regarding the environmental monitoring program.

Question: Do you have any concerns regarding the path forward to site closure?

Answer: I do not have any concerns regarding the path forward to site closure.

Question: Do you feel that the established communication channels are adequate for providing updates on these Dix sites?

Answer: I do feel that the established communication channels are adequate for providing updates on the Dix sites.

Question: Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Answer: I have no further comments, suggestions or recommendations at this time.

INTERVIEW RECORD

Site Name: JB MDL-Dix	**EPA ID No.:** NJ2210020275, NJ4213720275
Subject: Dix Area Basewide Five-Year Review	**Time:** 1500 / **Date:** 8/1/2017
Type: ☒ Telephone ☐ Visit ☐ Other (email) **Location of Visit:**	☐ Incoming ☒ Outgoing

Contact Made By:

Name: Samantha Saalfield	**Title:** Geologist	**Organization:** EA Engineering, Science, and Technology, Inc., PBC

Individual Contacted:

Name: Matthew Csik	**Title:** Assistant Public Health Coordinator	**Organization:** Ocean County Health Department
Telephone No: (732) 341-9700, ext. 7471 **Fax No:** **E-Mail Address:** mcsik@ochd.org	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

Question: What is your overall impression of the remedies in place at these 7 Dix Area sites?

Answer: The remedies seem appropriate to the contamination discovered, and thorough investigations have been conducted to determine the extent of the contamination. Since the Joint Base has moved to the newer contract, submissions to regulators have become more frequent, and sites seem to be moving toward closure.

Question: Do you have any concerns regarding the remedies in place?

Answer: No, I don't have any problems or concerns with the remedies in place.

Question: Are you aware of any community concerns regarding the remedies?

Answer: No, I do not hear many comments from the community regarding these Dix Area sites.

Question: Do you feel that the established communication channels are adequate for providing updates on these Dix Area sites?

Answer: Communication channels seem fine. The RAB seems like a good forum, and I think the RAB website is a great way to transmit data and keep people updated. The onus is on the citizens is to reach out if they have concerns.

Question: Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Answer: No.

INTERVIEW RECORD

Site Name: JB MDL-Dix	**EPA ID No.:** NJ2210020275, NJ4213720275	
Subject: Dix Area Basewide Five-Year Review	**Time:** 0910	**Date:** 8/23/2017
Type: ☐ Telephone ☐ Visit ☒ Other (email) **Location of Visit:**	☒ Incoming ☐ Outgoing	

Contact Made By:

Name: Samantha Saalfield	**Title:** Geologist	**Organization:** EA Engineering, Science, and Technology, Inc., PBC

Individual Contacted:

Name: Robin Sutton	**Title:** Environmental Health Coordinator	**Organization:** Burlington County Health Department
Telephone No: 609-265-5523 **Fax No:** **E-Mail Address:** rsutton@co.burlington.nj.us	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

Question: What is your overall impression of the environmental cleanup activities occurring at the Dix Area?

Answer: From what I have read and discussed and witnessed, I feel the base is taking a proactive approach and doing a great job keeping interested parties updated and informed. I feel the base is taking the right steps towards remediation.

Question: Are you aware of any community concerns regarding the cleanup activities?

Answer: Other than a few questions, I have not heard of any concerns.

Question: Do you have any comments, suggestions, or recommendations regarding the site's management or operation with respect to environmental cleanup?

Answer: Not at this time. Has a plan been instituted for cleanup? I thought testing was still being done.

INTERVIEW RECORD

Site Name: JB MDL-Dix	**EPA ID No.:** NJ2210020275, NJ4213720275	
Subject: Dix Area Basewide Five-Year Review	**Time:** 1422	**Date:** 8/1/2017
Type: ☐ Telephone ☐ Visit ☒ Other (email) **Location of Visit:**	☒ Incoming ☐ Outgoing	

Contact Made By:

Name: Samantha Saalfield	**Title:** Geologist	**Organization:** EA Engineering, Science, and Technology, Inc., PBC

Individual Contacted:

Name: Joseph Rhyner	**Title:** Chief, Environmental Element	**Organization:** JB MDL
Telephone No: 609-562-2189 **Fax No:** **E-Mail Address:** joseph.rhyner@us.af.mil	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

Question: What is your overall impression of the remedies in place at these 7 Dix sites?

Answer: I believe the remedies are working as designed.

Question: Do you have any concerns regarding the remedies in place?

Answer: No, I do not.

Question: Do you have any concerns regarding the environmental monitoring program?

Answer: I do not.

Question: Do you have any concerns regarding the path forward to site closure?

Answer: I do not.

Question: Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Answer: I do not.

INTERVIEW RECORD

Site Name: JB MDL-Dix		**EPA ID No.:** NJ2210020275, NJ4213720275	
Subject: Dix Area Basewide Five-Year Review		**Time:** 1500	**Date:** 8/22/2017 and 8/25/2017
Type: ☒ Telephone ☐ Visit ☐ Other (email) **Location of Visit:**		☒ Incoming ☐ Outgoing	

Contact Made By:

Name: Samantha Saalfield	**Title:** Geologist	**Organization:** EA Engineering, Science, and Technology, Inc., PBC

Individual Contacted:

Name: Michael Tamn	**Title:** Community Co-Chair	**Organization:** Restoration Advisory Board
Telephone No: 609-388-5111 **Fax No:** **E-Mail Address:** leetamn@comcast.net	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

Question: What is your overall impression of the remedies in place at these 7 Dix sites?

Answer: The operation now is a big improvement over 5, 10, 20 years ago. I feel they are accomplishing a lot more now the way that they are operating. The way they are giving out contracts, performance based, seems to be working out.

Question: Are you aware of any community concerns regarding the remedies?

Answer: Community concerns often relate to groundwater plumes expanding away from the sites.

Question: Do you feel well informed about the remedial activities and progress?

Answer: The JB MDL representatives seem to be pretty good, and try to answer questions. Curt Frye is helpful, and will return my calls or call to give me a heads up on what is going on. This is also a big improvement.
Sometimes it is difficult to follow all the different site names and numbers. More frequent tours of the sites would help orient the group, including the Pinelands and EPA representatives. Some of the presentations at the RAB meetings are very good, but some of the presenters are not very good at communicating. Presentations with more maps, videos, etc., would be more informative, if the technology at the facility hosting the RAB meeting allows.

Question: Do you have any other suggestions regarding environmental cleanup activities at the Dix Area?

Answer: At the MAG-1 Area, I think natural attenuation may be better than the bioaugmentation. It sounds like the natural attenuation may be working. The bioaugmentation may do more damage in the long run than the contamination that they're trying to cure, by changing the pH and injecting chemicals into the ground, changing the soil and groundwater in unknown ways. You cannot put chemicals and bacteria into the ground without changing conditions. The bioaugmentation has been tried for a few years, and doesn't seem to be working very well, while the contamination seems to be moving farther downgradient. I am also concerned about the BOMARC TCE plume, another site where groundwater contamination is moving downgradient (*note: not included in the five-year review*).

I am interested in the results from the wells south/southwest of the Sanitary Landfill, next to the

Pemberton Township property, and whether anything is detected in groundwater, and also about the results of testing in Indian Run and other surface water near the landfill. Also I am wondering if PFAS were tested in groundwater near the landfills. It seems likely that containers of PFAS could have been disposed in any landfill, so the landfills could be contaminated. The wells are there, so there is no reason they could not collect some random samples of them for analysis of PFAS.

I also wonder if the contract for the solar panels on the landfill includes removal and disposal of the panels at the end of their useful life, because the removal and safe disposal (avoiding contamination) will be expensive.

INTERVIEW RECORD

Site Name: JB MDL-Dix	**EPA ID No.:** NJ2210020275, NJ4213720275
Subject: Dix Area Basewide Five-Year Review	**Time:** 2021 **Date:** 8/23/2017
Type: ☐ Telephone ☐ Visit ☒ Other (email) **Location of Visit:**	☒ Incoming ☐ Outgoing

Contact Made By:

Name: Samantha Saalfield	**Title:** Geologist	**Organization:** EA Engineering, Science, and Technology, Inc., PBC

Individual Contacted:

Name: Tom Besselman	**Title:** Member	**Organization:** Restoration Advisory Board
Telephone No: **Fax No:** **E-Mail Address:** oji1160@verizon.net	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

Question: What is your overall impression of the remedies in place at these 7 Dix sites?

Answer: I am satisfied with what is being done.

Question: Are you aware of any community concerns regarding the remedies?

Answer: No

Question: Do you feel well informed about the remedial activities and progress?

Answer: I'm not exactly an expert at environmental remediation but as the head of my local environmental commission I attend the meetings to find out what is being done so I can answer any questions that should come from my local community. The group at the RAB are very accommodating and willing to explain how things are being done. They are also good at simplifying the explanations to suit people with less knowledge of some processes.

Question: Do you have any other suggestions regarding environmental cleanup activities at the Dix Area?

Answer: No

Question: Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Answer: No

INTERVIEW RECORD

Site Name: JB MDL-Dix	**EPA ID No.:** NJ2210020275, NJ4213720275	
Subject: Dix Area Basewide Five-Year Review	**Time:** 1040	**Date:** 8/25/2017
Type: ☒ Telephone ☐ Visit ☐ Other (email) **Location of Visit:**	☐ Incoming ☒ Outgoing	

Contact Made By:

Name: Samantha Saalfield	**Title:** Geologist	**Organization:** EA Engineering, Science, and Technology, Inc., PBC

Individual Contacted:

Name: Frank Storm	**Title:** Member	**Organization:** Restoration Advisory Board
Telephone No: 609-387-3470 **Fax No:** **E-Mail Address:** stormf49@gmail.com	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

Question: What is your overall impression of the remedies in place at these 7 Dix sites?

Answer: See responses below.

Question: Are you aware of any community concerns regarding the remedies?

Answer: The community comes out for specific issues, but not on a regular basis. You hear community concerns more when the plumes may extend outside the Base boundary. The RAB represents a wide spectrum, which is good from a public standpoint, I think it gives them more confidence. The group from Toms River was concerned about chemicals in the aquifers a while back.

Question: Do you feel well informed about the remedial activities and progress?

Answer: Yes. They are pretty transparent, post all the minutes and reports at libraries and other locations, which is a good thing. They also post nice block ads in the newspapers, which I like. I am one of the original RAB members, over 25 years. The RAB meetings are more frequent now (quarterly), and they have started to address more and more topics now that the RAB covers the whole Joint Base, which can lead to confusion. We used to take more site visits which were more informative for the RAB members to see the site and equipment they're dealing with. I had college chemistry, but sometimes it's like they're speaking a foreign language. We count on members of EPA and DEP for the more technical questions.

They have not been mentioning funds in recent RAB meetings. Funding is a concern mainly when it impacts scheduling. They used to talk about funding, and delay projects because funding wasn't available. We would prioritize the worst ones, or whichever fit the budget.

Question: Do you have any other suggestions regarding environmental cleanup activities at the Dix Area?

Answer: No

Question: Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

Answer: They used to give the RAB updates on what other bases are doing, which they do not seem to do anymore. It might be informative to hear about new innovative methods being used at other sites and avoid reinventing things. Perhaps they could make the minutes from RAB meetings at other similar bases available.

We have seen cases where one of the contractors at the Base will try a technology and find that it did not work, so they try multiple technologies at the same site. This is a concern of the RAB and the residents. You don't want to make things worse, spreading things into a larger area by using the wrong technology.

When I worked on other municipal boards, we found that recognizing members was a good way to keep people on the board, such as giving them a letter of thanks or a certificate. It is also good to provide recognition when someone does leave. They have not done this, perhaps because the commanders do not stay very long, especially with the Joint Base, so perhaps they do not recognize how long some of us have been around. The refreshments they have been providing for meeting attendees do help lighten the mood, make it not all business, so people are at ease and ask more questions and are more likely to come back.

INTERVIEW RECORD

Site Name: JB MDL-Dix	**EPA ID No.:** NJ2210020275, NJ4213720275	
Subject: Dix Area Basewide Five-Year Review	**Time:** 1430	**Date:** 8/22/2017
Type: ☐ Telephone ☐ Visit ☒ Other (email) **Location of Visit:**	☒ Incoming ☐ Outgoing	

Contact Made By:

Name: Samantha Saalfield	**Title:** Geologist	**Organization:** EA Engineering, Science, and Technology, Inc., PBC

Individual Contacted:

Name: Tim Llewellyn	**Title:** Project Manager, Senior Vice President	**Organization:** Arcadis U.S. Inc.
Telephone No: 410-923-7818 **Fax No:** **E-Mail Address:** tim.llewellyn@arcadis.com	**Street Address:** **City, State, Zip:**	

Summary Of Conversation

Question: Do you have any concerns regarding maintenance of Site LF010? Do you have any concerns related to the solar array that was recently installed on the capped area at this site?

Answer: Prior to the initiation of the construction phase for the solar array project, the maintenance activities at Dix Site LF010 have been straight forward. Maintenance includes annual mowing of the capped areas and associated access roads and vegetation clearing along the perimeter fence to ensure the fence integrity is maintained, and semi-annual inspections completed in the fall/spring to inspect the perimeter fence/signs, soil cover, gas vents, drainage ditches/features etc per the site-specific Land Use Control (LUC) Inspection field checklist. Also, tree clearing is performed as needed to remove downed trees along the access road or that threaten the perimeter fence. There have been a handful of compliance issues documented during the construction phase of the solar array including standing water in capped areas resulting from grade changes and rutting from vehicles/construction activities. Arcadis and the Air Force have voiced these compliance issues on numerous occasions and corrective actions have been initiated by the solar array contractor.

Question: Do you have any concerns regarding the path forward for Site LF017? Are there any planned or proposed changes to the O&M for this site?

Answer: We do not have any concerns regarding the path forward at Dix Site LF017. There are no planned or proposed changes to the monitoring program in place at Dix Site LF017, and annual LUC inspections will continue which are documented annually in the Dix Inspection, Maintenance, and Monitoring Reports (IMMRs).

Question: Have there been any developments regarding the planned path forward at Site SS007 since the December 2016 MNA Assessment and Path Forward letter?

Answer: The planned path forward at Dix Site SS007 is continuation of the MNA sampling program currently in place. Upon completion of 8 quarterly MNA sampling rounds (Q4 2017) per the December 2016 MNA Assessment and Path Forward letter, Mann Kendall statistical analysis will be performed to track contaminant trends and modify the MNA program as necessary.

Question: Are any changes to the monitoring well network at Site SS007 currently planned?

Answer: Yes, Arcadis recently identified/sampled a new sentinel well (in the intermediate aquifer) approximately 1,000 ft downgradient of the MAG-207 which previously served as the sentinel monitoring well in the intermediate aquifer. One of the site constituents of concern (COCs) was detected at the sentinel well above applicable standards so a new sentinel well has been added to the monitoring program.

Question: Do you currently anticipate that Explanations of Significant Differences (or ROD Amendments) may be required for any of the 7 sites?

Answer: At Dix Site LF010, in an effort to focus future sampling and reporting efforts to the approved Decision Document (DD), following completion of the annual sampling event in April 2017 from the well network with AOC and sentinel well designations in place, constituents analyzed and reported during future sampling events will be limited to the COCs listed in the approved DD and constituents that have exceeded the higher of the BTVs and Class 1 PL standards during the last two rounds of sampling (2016/2017). Constituents not listed as DD specific COCs that exceed current standards will require an Explanation of Significant Differences (ESD) to formally add those constituents to the monitoring program moving forward at the site. There are no other anticipated ESDs or ROD Amendments to mention at this time for the other 6 Dix Sites.

Question: Do you have any concerns regarding the path forward for Sites SS005B or SS025? Are there any planned or proposed changes to the monitoring programs for these sites?

Answer: No, there are no concerns with respect to the path forward at these two sites. Both sites will continue to be monitored in 2017 on a semi-annual basis as documented in the 2016 IMMR and IMM Work Plan (Plexus 2014).

Question: Do you have any concerns regarding the applicable criteria/standards currently in use to screen data from the 7 sites?

Answer: No, there are no concerns to raise at this point with respect to applicable standards applied at the 7 Sites.

Question: Is there any other information regarding upcoming activities at these 7 sites that you think should be included in the five-year review?

Answer: It's worth noting that Dix Site LF033 is currently on the Site Closure (SC) path. This was an OES Site however, a RACR has been prepared and is currently under AF review to formally document NFAE for all site media and the site will proceed down the SC path.