

Memo

To **Mr. Riley Neumann** Wood # **2-9133-0002**
Wisconsin Department of Natural Resources
2300 N. Dr. ML King Jr. Drive
Milwaukee, WI 53212

From **Saamih Bashir, PE, PMP** cc **Mr. James King (1CD)**
Ms. Celeste Holtz (1CD)
MSgt Brian Schrader (1CD)
Ms. Jennifer-White Singleton
(Transmittal Letter Only)

Date **11 August 2020**

Subject **DRAFT-FINAL No Further Response Action Planned Decision Document Site RW010, General Mitchell Air National Guard (ANG) Base in Milwaukee, Wisconsin**

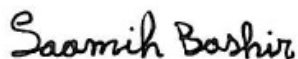
Mr. Neumann,

Attached is one electronic copy of the Draft-Final No Further Response Action Planned Decision Document Site RW010, General Mitchell Air National Guard (ANG) Base in Milwaukee, Wisconsin. This No Further Response Action Planned Decision Document has been completed as part of Contract No. W9133L-14-D-0002, Delivery Order 0002 – Great Lakes RI/FS at Multiple Air National Guard Installations (ANG2015GREATLAKES). This document is being submitted for your review and comment.

Due to the period of performance expiring on this contract, Wood and ANG request comments back on this Draft Final NFA DD by 30 August 2020.

Please contact me at (248) 313-3679 if you have any questions.

Sincerely,



Saamih Bashir, PE, PMP
Associate Engineer/Project Manager
Direct: (248) 313-3679
Mobile: (734) 644-8848





**DRAFT-FINAL
NO FURTHER RESPONSE ACTION PLANNED
DECISION DOCUMENT
SITE RW010
GENERAL MITCHELL
INTERNATIONAL AIRPORT**

**SITE RW010
128TH AIR REFUELING WING
WISCONSIN AIR NATIONAL GUARD
MILWAUKEE, WISCONSIN**

Contract #: W9133L-14-D-0002
Delivery Order 0002

August 11, 2020

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

DECLARATION	VII
1.0 INTRODUCTION.....	1-1
1.1 Site Name, Location, and Description	1-2
1.1.1 Site Description.....	1-2
1.1.2 Topography	1-2
1.1.3 Adjacent Land Uses.....	1-3
1.1.4 Nearby Populations.....	1-3
1.1.5 General Surface Water and Groundwater Resources	1-3
1.1.6 Surface and Subsurface Features.....	1-3
1.1.7 Critical Environments	1-3
1.2 Site History and Enforcement Activities.....	1-4
1.2.1 Site History	1-4
1.2.2 Site History	1-4
1.2.3 Regulatory Agency Involvement	1-4
1.3 Community Participation	1-5
1.4 Scope of Response Action.....	1-5
2.0 SUMMARY OF SITE CHARACTERISTICS	2-1
2.1 Physiography, Geologic Setting, and Climatology	2-1
2.2 Screening Level Ecological Risk Assessment.....	2-2
2.3 Soil Characteristics	2-2
2.3.1 Soil Sampling Activities.....	2-2
2.3.2 Soil Analytical Results.....	2-2
2.4 Groundwater.....	2-3
2.4.1 Hydrogeologic Setting.....	2-3
2.4.2 Groundwater Sampling Activities	2-3
2.4.3 Groundwater Analytical Results	2-4
2.5 Surface Water/Sediment.....	2-4
2.6 Soil Vapor	2-4
2.7 Receptors	2-4
3.0 REMEDIAL INVESTIGATION DATA ANALYSIS/RISK ASSESSMENT	3-1
3.1 Applicable or Relevant and Appropriate Requirements	3-1
3.2 Soil	3-1
3.3 Groundwater	3-2
3.4 Soil Vapor	3-2
3.5 Surface Water/Sediment.....	3-2
3.6 Summary	3-3
4.0 SELECTED ACTION: NO FURTHER ACTION	4-1
5.0 REFERENCES AND ADMINISTRATIVE RECORD INDEX	5-1

LIST OF FIGURES

Figure 1	Site Location Map
Figure 2	RW010 Location Map
Figure 3	RW010 – Groundwater Site Features

LIST OF TABLES

Table 1	RW010 Historical Soil Analytical Data
Table 2	RW010 Historical Groundwater Analytical Data
Table 3	2016 RW010 Soil Analytical Data
Table 4	2016 RW010 Groundwater Analytical Data

APPENDICES

Appendix A	Screening Level Ecological Risk Assessment
Appendix B	WDNR Approval Letter

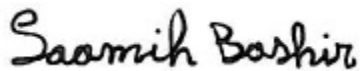
LIST OF ACRONYMS

amsl	Above Mean Sea Level
ANG	Air National Guard
AOC	Area of concern
ARARs	Applicable or relevant and appropriate requirements
AW	Air Refueling Wing
bgs	Below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COCs	Constituent of Concern
DD	Decision Document
DEHP	bis(2-ethylhexyl)phthalate
ES	Executive Summary
°F	Degrees Fahrenheit
ft	Feet
FS	Feasibility Study
gal	Gallons
GMIA	General Mitchell International Airport
NERS	Newly Evaluated Restoration Sites
NFA	No Further Action
NFRAP	No Further Response Action Planned
NOAA	National Oceanic and Atmospheric Administration
NR	Natural Resources
PA	Preliminary Assessment
PAHs	Polycyclic Aromatic Hydrocarbons
PAL	Preventative Action Limit
RCL	Residual Contaminant Level
RI	Remedial investigation
RR	Remediation and Redevelopment
SCS	Soil Conservation Service
SI	Site Investigation
RW010	Building 500 Alert Hanger Underground Storage Tanks
sq	Square
SVOCs	Semi-Volatile Organic Compounds
ug/L	Micrograms per liter
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UU/UE	Unlimited use and unrestricted exposure
VOCs	Volatile organic compounds
WDNR	Wisconsin Department of Natural Resources
WIANG	Wisconsin Air National Guard

THIS PAGE INTENTIONALLY LEFT BLANK

Certification for Contractors Statement of Technical Review

Wood Environment & Infrastructure Solutions, Inc. (Wood) has completed this Decision Document for the Air National Guard Base at General Mitchell International Airport in Milwaukee, Wisconsin. Notice is hereby given that a review has been conducted that is appropriate to the level of risk and complexity inherent in the project as defined in the Wood Quality Assurance Plan. During the independent technical review, compliance with established policy principles and procedures, using justified and valid assumptions, was verified. This included review of assumptions, methods, procedures, and materials used in analyses; the appropriateness of data used, and the level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with the law and existing policy.



08/11/2020

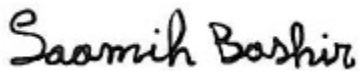
Saamih Bashir, P.E.

Date

Engineering Review

Significant concerns and explanation of the resolutions are documented within the project file.

As noted above, all concerns resulting from the technical review of the project have been considered.



08/11/2020

Saamih Bashir, P.E.

Date

Project Manager

THIS PAGE INTENTIONALLY LEFT BLANK

DECLARATION

Name of Installation

128TH Air Refueling Wing
Wisconsin Air National Guard
Milwaukee, Wisconsin

Site Name and Location

RW010: Former Aircraft Washing Area – Bureau for Remediation and Redevelopment Tracking System (BRRTS) #02-41-579110

Statement of Basis and Purpose

This Decision Document (DD) identifies a preferred alternative of Unlimited Use/Unrestricted Exposure for Installation Restoration Program (IRP) Site RW010 at the 128th Air Refueling Wing (AW) of the Wisconsin Air National Guard (WIANG), General Mitchell Air National Guard (ANG) Base in Milwaukee, Wisconsin. RW010 is located within the extent of the ANG Base. The 128th AW is currently active, and their core mission is to transfer fuel to United States Military and Allied aircraft, provide aero-medical evacuation, and to lift personnel and equipment to strategic locations in a cost-effective manner. RW010 was evaluated as part of the Newly Evaluated Restoration Sites (NERS) program. Through the NERS program, potential contamination at Department of Defense installations and formerly owned or used properties is investigated and remediated, as appropriate. The NERS program is carried out in compliance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended in 1986 by the Superfund Amendments and Reauthorization Act, and the National Oil and Hazardous Substances Pollution Contingency Plan National Contingency Plan. The ANG is the lead agency for the NERS program and works closely with the Wisconsin Department of Natural Resources (WDNR) to investigate, clean up, and ultimately close NERS sites.

Description of the Selected Remedy

Based on the current conditions at RW010, it has been determined that RW010 poses no significant risk or threat to public health or the environment. Therefore, RW010 falls under the No Further Response Action Planned (NFRAP) Category III under the CERCLA, as amended by the Superfund Amendments and Reauthorization Act of 1986, and no further investigation is required for RW010.

Declaration Statement

This Category III NFRAP DD has been prepared in accordance with the September 2009 Air Nation Guard Investigation Guidance. This NFRAP DD presents the selected response action for RW010 developed in accordance with CERCLA, as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan. It also satisfies the requirements of the National Environmental Policy Act that apply to CERCLA response actions. According to the 2009 Air Nation Guard Investigation Guidance, a Category III NFRAP decision is appropriate when a determination for NFRAP is made after a Remedial Investigation (RI). Analytical samples in soil and groundwater indicated no COC's in exceedances of WDNR Enforcement Standards (ESs) collected during the latest round of sampling. It has been determined that the selected remedy of no further action (NFA) allowing for unlimited use and unrestricted exposure (UU/UE) is protective of human health and the environment, attains federal and state requirements that are applicable or relevant and appropriate, and is cost effective. The statutory preference for further investigation is not applicable because RW010 has been determined to present no significant threat to human health or the environment; therefore, NFA is warranted for RW010.

NGB/A4VR

Concurrence Record

For the No Further Response Action Planned Decision at:

- RW010 – Former Aircraft Washing Area: BRRTS# 02-41-579110.

128th Air Refueling Wing
Wisconsin Air National Guard
Milwaukee, Wisconsin

Denise W. Boyer, Col. ANG
ANG/A4V Environmental Division Chief

Date

Wisconsin Department of Natural Resources
Remediation and Redevelopment Program

Concur Non-Concur (Please provide reason)

Signature	Title	Date
-----------	-------	------

THIS PAGE INTENTIONALLY LEFT BLANK

1.0 INTRODUCTION

This Decision Document (DD) supports a No Further Action (NFA) decision for RW010 – (Former Aircraft Washing Area; Bureau for Remediation and Redevelopment Tracking System (BRRTS) # 02-41-579110) (RW010) at the 128th Air Refueling Wing (AW), Wisconsin Air National Guard (WIANG), Milwaukee, Wisconsin (herein referred to as “the Base”).

General Mitchell International Airport (GMIA) is located approximately 5 miles south of the downtown business district of the City of Milwaukee, in Milwaukee County, Wisconsin. GMIA occupies approximately 2,180 acres of land. The existing WIANG facility was constructed in 1962, when Base expansion was necessary to accommodate growth. The 128th AW occupies four main areas at GMIA, referred to as Guard Central, Guard West, Guard East, and Guard South (**Figure 1**). RW010 is located at the northern portion of Guard Central.

The purpose of this Category III DD is to summarize the existing data, to evaluate potential risks to human health and the environment, and to provide the rationale for the proposed NFA decision for RW010. The primary sources of information that were used to derive and support the NFA decision for RW010 include the following reports:

- *Preliminary Assessment/Site Investigation Report for Compliance Restoration Program, Wisconsin Air National Guard, General Mitchell International Airport, Milwaukee, Wisconsin* (Leidos, 2015)
- *Final Remedial Investigation Report, Great Lakes Region, 128th AW, Newly Evaluated Restoration Sites* (Amec Foster Wheeler, 2019)

It should be noted that the Final Remedial Investigation (RI) Report (Amec Foster Wheeler, 2019) was prepared for six Areas of Concern (AOCs), including RW010, OW014, TU015, CB018a, CB018b and CG019. This NFA DD is reporting on RW010 exclusively.

A description of RW010 and the surrounding area is provided in **Section 1.1**. Site history and enforcement actions (if any) are discussed in **Section 1.2**. Community participation efforts conducted by the Base are presented in **Section 1.3**. **Section 1.4** discusses the scope of the proposed response action. The physiography, geologic setting, climatology, site soil and groundwater characteristics, and any potential site receptors, are presented in **Section 2.0**. An analysis of available site-related data, as well as an evaluation of any human health risks that

may be potentially posed by RW010, are presented in **Section 3.0**. **Section 4.0** presents the selected response action for RW010 and the rationale for selection of this action. **Appendix A** provides the Screening Level Ecological Risk Assessment (SLERA). Wood recommended NFA for RW010 in the Final RI Report (Amec Foster Wheeler, 2019) based on the lack of COCs in exceedance of the Wisconsin Department of Natural Resources (WDNR) Enforcement Standards (ESs) in soil and groundwater samples, the flagged status of the groundwater Preventative Action Limit (PAL) exceedances in sampling Round #1, and the lack of detections in groundwater samples collected during Round #2 and the WDNR concurred with the recommendation in a letter dated 30 November 2018. The WDNR letter is included in **Appendix B**.

It should be noted that the SLERA (**Appendix A**) includes a discussion of each site included in the RI activities, including AOCs RW010, OW014, TU015, CB018a, CB018b and CG019. As the SLERA was completed for each AOC during the RI activities, and is presented in the Final RI Report (Amec Foster Wheeler, 2019), text was not omitted for this DD.

1.1 Site Name, Location, and Description

This section presents an overview of RW010 including the site description, information on site topography, a discussion of critical environments, adjacent land uses, and nearby populations.

1.1.1 Site Description

The Base located at GMIA houses the 128th AW. The core mission of the 128th AW is to transfer fuel to United States Military and allied aircraft, provide aero-medical evacuation, and to lift personnel and equipment to strategic locations in a cost-effective manner. The following sections provide background information for RW010 including the description of past operations, prior investigations, and remedial actions. This information was adapted from the Preliminary Assessment (PA)/Site Investigation (SI) Report for Compliance Restoration Program (Leidos, 2015) and other project documents referenced below.

RW010 is located in the northern section of Guard Central and contains aircraft hangers, maintenance equipment, vehicles, and garages (**Figure 2**). The U.S. Air Force leases the 128ARW property (Guard West, Central, South, and East) from the State of Wisconsin and in turn licenses the property to the WIANG. The lease on the main portion (Guard Central/East) and western (Guard West) portions of the installation expires on March 31, 2051. Guard South is leased from the City of Milwaukee which expires on January 31, 2036.

1.1.2 Topography

Wisconsin is located in the Lake Michigan Basin in the northern United States. The Base is located in the Great Lakes Plain physiographic region within the Eastern Ridges and Lowlands geographical province (Wisconline, 2013). The surface topography of the Base is relatively flat with an average elevation of approximately 670 feet (ft) above mean sea level (amsl).

1.1.3 Adjacent Land Uses

The GMIA is a county-owned facility that occupies approximately 2,180 acres of land. The Base occupies the south-eastern portion of the property and a parcel of land on the western portion of the GMIA. The main portion of the Base is bordered by Bailey's Pond to the north, light industrial facilities to the east, vegetated land to the south, and the GMIA runway to the west.

1.1.4 Nearby Populations

The Base is located approximately 5 miles south of the downtown business district of the City of Milwaukee, in Milwaukee County, Wisconsin. Milwaukee has a population of approximately 595,000. The airport is surrounded by mostly industrial and commercial properties with sporadic residential properties.

1.1.5 General Surface Water and Groundwater Resources

The Base is located approximately 2.5 miles west of Lake Michigan, the primary source of drinking water for the Milwaukee area. Rivers in the area include the Milwaukee River and Menomonee River, both approximately 5 miles to the south, and the Root River, approximately 8 miles to the west. The nearest creek to the Base is Oak Creek, approximately 0.5 mile to the west (OpTech, 1996).

Surface water at RW010 drains through both surface drainage ditches and enclosed storm sewers into a storm water detention pond known as "Bailey's Pond" (**Figure 2**).

1.1.6 Surface and Subsurface Features

RW010 currently houses aircraft hangers and garages for maintenance vehicles and equipment. Subsurface features include active utilities (electric, sanitary).

1.1.7 Critical Environments

NGB/A4VR

According to the U.S. Fish and Wildlife Service (USFWS), the following mammals, birds, insects, plants, and reptiles are federally endangered, threatened, proposed, and/or listed as candidate species in Milwaukee County, USFWS Environmental Conservation Online System (ECOS, 2015):

- Red knot (*Calidris canutus rufa*) – Threatened
- Northern Long-Eared Bat (*Myotis septentrionalis*) – Threatened
- Rusty Patched Bumble Bee (*Bombus affinis*) - Endangered

There is no natural habitat within the RW010 boundaries. None of these species are known to have critical habitats identified on the Base according to 128th AW, Base Environmental Manager.

1.2 Site History and Enforcement Activities

The following subsections present the site history for RW010, and briefly discusses the enforcement activities (if any), which have occurred.

1.2.1 Site History

1.2.2 Site History

The Former Aircraft Washing Area is shown on 1964 as-built record drawings at the north end of the flight apron, at/near Buildings 101 and 104. A 5,000-gallon (gal) holding tank, a 100-gal waste oil tank, and a 6,000-gal detergent storage tank were associated with the approximately 165 ft by 170 ft wash-rack facility (**Figure 3**). The encased below ground surface (bgs) reinforced concrete walls, holding and waste oil tanks were located 50 to 60 ft north of the aircraft washing area. Decommissioning or removal records for the waste oil and holding tanks have not been located. The detergent storage tank was removed from the ground in the 1990s (Leidos, 2015). Based on the 1964 as-built record drawing details and confirmed photographs from removal activities, the detergent storage tank was approximately 8 ft in diameter and 16 ft in length and was located at approximately 11 ft bgs. No known investigation prior to the 2014 SI, other than an arsenic background study, had been conducted in this area.

1.2.3 Regulatory Agency Involvement

There is no history of U.S. Environmental Protection Agency (USEPA) or WDNR enforcement activities at RW010. There are no permits or agreements that govern response actions at RW010.

The WDNR has reviewed the Final RI Report (Amec Foster Wheeler, 2019) and has concurred with the conclusion that RW010 does not warrant further investigation. The WDNR determination is outlined in a letter dated 30 November 2018 (**Appendix B**).

1.3 Community Participation

No community relations actions have been taken specifically regarding RW010. The ANG provides a Community Involvement Plan for the Base. All documents relevant to the Base and Site RW010 specifically, are available for public review online on the U.S. Air Force Administrative Record page located at:

<https://ar.afcec-cloud.af.mil/>

1.4 Scope of Response Action

A summary of the previous investigations that were conducted at RW010, is provided below:

Leidos 2014

PA/SI activities were performed by Leidos in 2014. Soil and groundwater samples were analyzed for volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs). Based on the results from the SI, it was determined that potential residual environmental impacts related to the former aircraft washing area process or related activities conducted within the vicinity were limited to groundwater. One groundwater constituent, bis(2-ethylhexyl)phthalate (DEHP), was detected at concentrations exceeding the Natural Resources (NR) 140 ES groundwater criteria of 6 micrograms per liter ($\mu\text{g/L}$) at five out of six sampled locations and was considered to warrant further investigation. Three polycyclic aromatic hydrocarbons (PAHs) were detected in groundwater samples collected from two monitoring wells at concentrations in exceedance of the PALs; however, the detected concentrations remained below the respective ES and these three PAHs remained non-detect or below the PAL in the remaining four monitoring well groundwater samples. No constituents were detected at concentrations exceeding screening criteria in soil.

Historical soil analytical data is provided in **Table 1**. Historical groundwater analytical data is provided in **Table 2**.

RW010 Amec Foster Wheeler RI

RI activities were performed by Amec Foster Wheeler in 2016. Eight soil borings and eight permanent groundwater monitoring wells were installed at RW010. Monitoring wells were

NGB/A4VR

installed in the same locations as the soil borings. Two soil samples and two rounds of groundwater samples were collected from each boring/well and submitted for laboratory analysis of SVOCs using USEPA Method 8270C.

Analytical data for soil samples was compared to WDNR Remediation and Redevelopment (RR) Program Soils (RCL) for Direct Contact Non-Industrial, Industrial and Groundwater Protective RCLs. Results indicated SVOCs were either non-detect or were detected below RCLs.

Analytical data for groundwater samples was compared with WDNR NR 140 ES criteria. Results indicated constituents of concern (COCs) were not detected at concentrations exceeding WDNR ESs.

THIS PAGE INTENTIONALLY LEFT BLANK

2.0 SUMMARY OF SITE CHARACTERISTICS

This section provides a summary of the physiography, geologic setting and climatology of the Base. Analytical results obtained for RW010 and potential receptors (if any) are also discussed in this section.

2.1 Physiography, Geologic Setting, and Climatology

The geology of the Milwaukee area is characterized by thick Paleozoic rocks overlain by sediment deposits consisting of unsorted till, deposited as ground and end moraines, and sorted and stratified outwash and glacial lake deposits (OpTech, 1996). Unconsolidated deposits range from approximately 80 to 140 ft bgs and overlay bedrock composed of Silurian age limestone and dolomite.

Shallow stratigraphy at the Base is composed of glacial deposits generally consisting of either fill material or organic material overlain by a thinner clay unit to an average depth of 7 ft bgs. A sand unit is typically encountered that extends to depths of 25 ft bgs (OpTech, 1996).

Surface soils at the Base have been classified as Clayey land by the Soil Conservation Service (SCS). Clayey land is a miscellaneous land type consisting of fill areas and “cut” or “borrow” areas. This land type ranges from clay to silty clay loam, may contain glacial till, and is 1 to 5 ft thick (SCS, 1971).

The climate in the Base area is strongly influenced by Lake Michigan. Winds off the lake affect temperatures and precipitation considerably in the spring and early summer. During the winter months, the prevailing winds are westerly. The greatest rainfall occurs in May and maximum average snowfall occurs in January. The 2012 average daily temperature in the spring and fall ranged from 46.2 degrees Fahrenheit (°F) to 75.4 °F (National Oceanic and Atmospheric Administration [NOAA], 2013).

2.2 Screening Level Ecological Risk Assessment

RW010 is an approximately 48,000 square (sq) ft area located in the northern section of Guard Central. Most of the site consists of buildings, pavement, or other impervious surfaces. Approximately 22,500 sq ft of the investigation area extends onto a grassy area to the north.

The risk to ecological receptors at RW010 is negligible because maximum detected concentrations of soil contaminants in the zone of biological activity (0-2-foot interval) are below conservative ecological benchmarks. No further ecological investigation is necessary.

The ecological conceptual site model describes:

- The source areas - historical releases;
- Transport mechanisms - processes that partition chemicals among various environmental media;
- Exposure to media - those environmental media from which organisms may be exposed to site-related chemicals; and
- Receptors – potential ecological receptor organisms.

The ecological conceptual site model for RW010 is presented in **Appendix A**.

2.3 Soil Characteristics

Observations made during the 2016 RI activities indicated soil at RW010 largely consisted of clay to depths of at least 13 ft bgs.

2.3.1 Soil Sampling Activities

The 2016 RI activities at RW010 included the completion of eight soil borings. Borings were installed to a maximum depth of 12 ft bgs. Two soil samples were collected from each boring at intervals above the groundwater table (i.e. unsaturated) and submitted for laboratory analysis (sixteen soil samples total). Samples were analyzed for SVOCs.

2.3.2 Soil Analytical Results

Analytical results from soil samples collected were compared with WDNR RR RCLs for Direct Contact Industrial Scenario and Groundwater Protective RCLs. Sixteen soils samples were submitted for analysis for SVOCs. Analytical results indicated concentrations of COCs in each of the sixteen soil samples were either non-detect or below applicable criteria.

Soil analytical results are summarized in **Table 3**.

2.4 Groundwater

This section briefly describes the hydrogeologic characteristics and groundwater impacts (if any) detected at RW010 during the various investigations.

2.4.1 Hydrogeologic Setting

There are two water bearing zones at the Base. The upper water bearing zone is typically encountered at approximately 6 to 8 ft bgs. In general, shallow groundwater flows toward the northwest toward topographically low, marshy areas that intercept the shallow groundwater. Bedrock wells drilled in the vicinity of the Base have encountered water-bearing strata at approximately 110 ft bgs (OpTech, 1996). For the lower water bearing zone, groundwater is typically encountered between approximately 25 to 40 ft bgs and generally flows to the north-northwest. Based on hydraulic testing and water levels in paired monitoring and piezometer wells collected on 5 August 2013, it appears a vertical gradient across the installation is in the downward direction. This suggests that localized infiltration and recharge to the water table is occurring across the Base (HDR, 2014).

Regionally, the general direction of groundwater flow is toward Lake Michigan to the east. Groundwater moves within the water table system above bedrock and in a confined system beneath it. In the vicinity of the Base, the prevalence of localized thick layers of clay restricts the hydraulic connection between the shallow and deeper bedrock aquifer.

During 2014 SI activities, groundwater was first encountered within the unconsolidated deposits at depths ranging from 2.8 to 11.0 ft bgs at Guard Central. Across Guard Central, depths to the first encounter of groundwater generally increased from west to east and north to south.

During the 2016 RI activities, groundwater at RW010 was encountered between 4.5 – 9 ft bgs. Groundwater flow was observed to be flowing toward the central portion of the Site (**Figure 3**).

2.4.2 Groundwater Sampling Activities

The 2016 RI activities at RW010 included the completion of eight permanent monitoring wells. Two rounds (Round #1 and Round #2) of samples were collected from the eight monitoring wells (16 groundwater samples total). Groundwater samples were analyzed for SVOCs.

2.4.3 Groundwater Analytical Results

During the Round #1 sampling event, DEHP was observed at concentrations in exceedance of the WDNR NR 140 PAL at monitoring wells RW010-MW-201, RW010-MW-202, RW010-MW-203, RW010-204, RW010-MW-205, and RW010-MW-207. Additionally, chrysene was observed at concentrations exceeding the PAL at only monitoring well RW010-MW-202. However, these detections were flagged by both the laboratory and the Wood data validator as “estimated” and “biased high”. Furthermore, these PAL exceedances were only detected in Round #1. Samples collected during Round #2 at these wells indicated that COCs did not exhibit concentrations exceeding WDNR NR 140 criteria or non-detect. Therefore, the Round #1 samples are not considered indicative of Site conditions.

Analytical results are summarized in **Table 4**.

2.5 Surface Water/Sediment

Surface water or sediment is not present at RW010 and have not been identified in previous activities conducted at RW010. Therefore, no surface water or sediment investigation activities have been conducted.

2.6 Soil Vapor

No soil vapor samples were collected as part of the 2016 RI activities as analytical data collected during the SI indicated that no VOCs exceeded criteria in either soil or groundwater.

2.7 Receptors

Wood conducted an ecological risk assessment at RW010 as part the RI activities. It was concluded that the risk to ecological receptors at RW010 is negligible because maximum detected concentrations of soil contaminants in the zone of biological activity (0-2-foot interval) are below conservative ecological benchmarks. No further ecological investigation was necessary.

It should be noted that an ecological risk assessment was completed as part of the RI activities for each of the 6 AOCs (RW010, OW014, TU015, CB018a, CB018b and CG019). Therefore, the

NGB/A4VR

Screening Level Ecological Risk Assessment report provided contains information for each of these sites.

A human-health assessment was not completed for the Site as no COCs exceeded criteria in soil or groundwater.

The Screening Level Ecological Risk Assessment is included in **Appendix A**.

THIS PAGE INTENTIONALLY LEFT BLANK

3.0 REMEDIAL INVESTIGATION DATA ANALYSIS/RISK ASSESSMENT

3.1 Applicable or Relevant and Appropriate Requirements

Applicable or relevant and appropriate requirements (ARARs) are an environmental and/or public health statute used in identifying site contamination that may pose human health or environment concerns at a site. Soil and groundwater standards are federal and state human health- and environment-based requirements and guidelines used to:

- Determine the appropriate levels of site clean-up;
- Define and formulate remedial action alternatives; and,
- Govern implementation and operation of the selected remedial action.

All analytical data are compared to appropriate risk-based screening criteria and/or established regulatory criteria to determine whether further investigation is required. Chemical-specific requirements include limitations set on the amount or concentration of a chemical that can be either present in or discharged to the environment under promulgated federal and/or state regulations. These limits are typically health- or risk-based requirements.

For RW010, the soil concentrations were screened against:

- WDNR RR Program RCLs for Direct Contact, Industrial Direct Contact;
- WDNR RCLs for Non-Industrial Direct Contact; and
- WDNR RR Program Groundwater Protective RCLs.

Groundwater concentrations were screened against:

- NR 140- ES; and
- NR 140-PAL.

The soil and groundwater screening tables are provided by the WDNR website (<https://dnr.wi.gov/topic/Brownfields/Cleanup.html>).

3.2 Soil

Sixteen soil samples were collected and submitted for analysis for SVOCs during the 2016 RI activities. Analytical results indicated that concentrations of COCs in each of the 16 samples were either below the WDNR RCLs or not detected above laboratory limits. Therefore, soil results are consistent with UU/UE criteria and is not a risk to human and/or ecological receptors.

Soil analytical results are presented on **Table 3**.

It should be noted that as no COCs were detected above the RCLs, an isoconcentration/cross section figure was not warranted, and therefore not included in this DD.

3.3 Groundwater

Sixteen groundwater samples were submitted for analysis for SVOCs. During the Round #1 sampling event, DEHP was observed at concentrations in exceedance of the NR 140 PAL of 0.6 µg/L at six monitoring wells (RW010-MW-201, RW010-MW-202, RW010-MW-203, RW010-MW-204, RW010-MW-205, and RW010-MW-207). Exceedances ranged from 1.1 µg/L to 0.68 µg/L. Additionally, chrysene was observed at a concentration of 0.1 µg/L, exceeding the PAL of 0.02 µg/L at monitoring well RW010-MW-202. However, each of these PAL exceedances were below the NR 140 ESs (6.0 µg/L and 0.2 µg/L, respectively).

These detections were each flagged during both the laboratory and Wood validation process as “estimated” and “biased high”. Furthermore, these PAL exceedances were only detected in Round #1. Samples collected during Round #2 at these wells indicated that COCs were not detected at concentrations exceeding NR 140 criteria or were non-detect. Round #1 and Round #2 activities were conducted within one week of each other.

Based on the “flagged” status by both the laboratory and Wood data validator, the lack of PAL exceedances in Round #2 and the minimal level of exceedance of the PALs in Round #1, the exceedances appear to be anomalous rather than representative of site conditions. In addition, the detections were below the NR 140 ESs. Therefore, groundwater samples are consistent with UU/UE criteria and is not a risk to human and/or ecological receptors.

Groundwater analytical results are presented in **Table 4**.

It should be noted that as no COCs were detected above the ESs, an isoconcentration/cross section figure was not warranted, and therefore not included in this DD.

3.4 Soil Vapor

Soil vapor investigation activities were not conducted during the 2016 RI activities as no VOCs are COCs at the Site.

3.5 Surface Water/Sediment

Surface water or sediment investigation activities were not conducted during the 2016 RI activities as no surface water and/or sediment has been observed at the site.

3.6 Summary

Based on the analytical data collected, SVOCs were either not detected or were detected at concentrations below RCLs in soil and ES's in groundwater samples collected. Although DEHP and chrysene were detected in groundwater samples collected during Round #1 in exceedance of the PALs, the concentrations were below the ESs. The detections appeared to be anomalous rather than representative of site conditions.

The conclusions in the risk assessment is that risk to ecological receptors at RW010 is negligible. Further, as soil analytical results and groundwater analytical results were below the WDNR RCLs and NR 140 ESs, respectively, risk to human receptors is negligible. Therefore, no further investigation is warranted, and a status of unlimited use and unrestricted exposure (UU/UE) is requested for RW010.

THIS PAGE INTENTIONALLY LEFT BLANK

4.0 SELECTED ACTION: NO FURTHER ACTION

Soil

Analytical results indicate that concentrations of COCs in soil were either non-detect or below WDNR criteria. NFA for soil is recommended for RW010.

Groundwater

Analytical results indicate that concentrations of COCs in groundwater were either non-detect or below WDNR criteria. NFA for groundwater is recommended for RW010.

It has been determined that the selected remedy of NFA is protective of human health and the environment, attains federal and state requirements that are applicable or relevant and appropriate, and is cost effective. The statutory preference for further investigation is not applicable because RW010 has been determined to present no significant threat to human health or the environment; therefore, UU/UE NFA is warranted for RW010.

THIS PAGE INTENTIONALLY LEFT BLANK

5.0 REFERENCES AND ADMINISTRATIVE RECORD INDEX

Amec Foster Wheeler. 2016. Final Remedial Investigation/Feasibility Studies Work Plan, Great Lakes Region General Mitchell International Airport. Milwaukee, Wisconsin.

Amec Foster Wheeler, 2019. Final Remedial Investigation Report, Great Lakes Region, General Mitchell International Airport. Milwaukee, Wisconsin

ECOS (Environmental Conservation Online System), 2015. United States Fish & Wildlife Service species reports by County. <http://ecos.fws.gov>

HDR (HDR Environmental, Operations and Construction, Inc.), 2014. Final Annual Groundwater Monitoring Report CY 2013, Jet Fuel Offloading Facility, General Mitchell Field Air National Guard Base, Milwaukee, Wisconsin. June 2014.

Leidos, 2015. Preliminary Assessment/Site Investigation Report for Compliance Restoration Program, Wisconsin Air National Guard, General Mitchell International Airport, Milwaukee, Wisconsin.

OpTech (Operational Technologies), 1996. Installation Restoration Program (IRP) Site Investigation Report for Site 4, 128th Air Refueling Wing, Wisconsin Air National Guard, Generally Billy Mitchell Field, Air National Guard Base, Milwaukee, Wisconsin. March.

NOAA (National Oceanic Atmospheric Administration), 2013. Local Climatological Data, Milwaukee, Wisconsin, National Climate Data Center, Asheville, North Carolina.

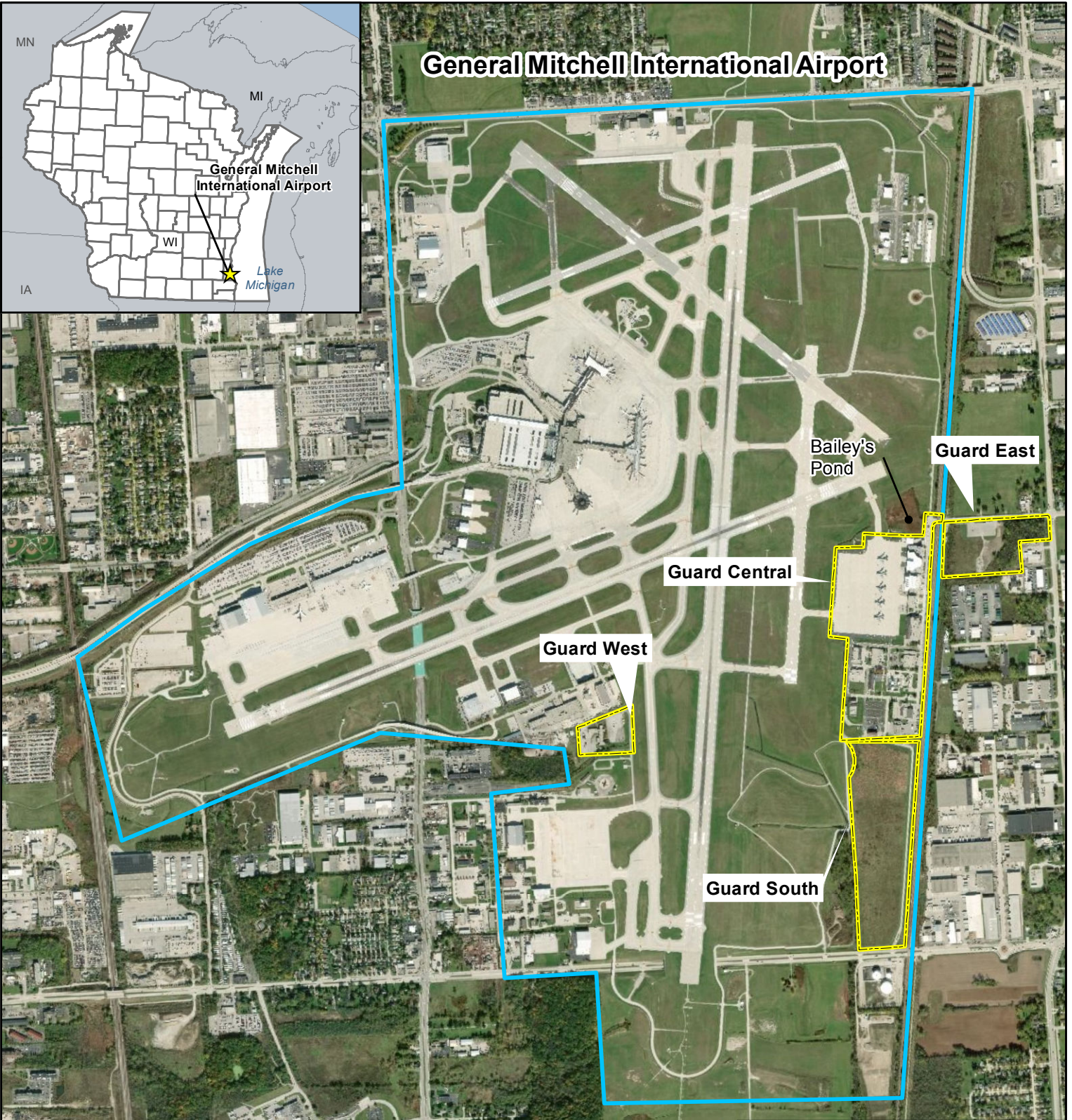
SCS (Soil Conservation Service), 1971. Soil Survey of Milwaukee and Waukesha Counties, Wisconsin. U.S. Department of Agriculture.

Wisconline, 2013. The Geographical Provinces of Wisconsin, the Physical Geography of Wisconsin <http://www.wisconline.com/wisconsin/geoprovinces/index.html>

THIS PAGE INTENTIONALLY LEFT BLANK

FIGURES

General Mitchell International Airport



Legend

- Approximate General Mitchell International Airport Boundary
- Guard Boundaries

0 750 1,500 3,000 Feet

FIGURE 1:
Site Location Map
Wisconsin Air National Guard Base
General Mitchell International Airport
Milwaukee, Wisconsin

Client: **Air National Guard**

Amec Foster Wheeler Environment & Infrastructure Inc.
 46850 Magellan Drive, Ste. 190
 Novi, Michigan 48377
 (248) 926-4008


PROJ: 291330002 Date: | August 2020





Bailey's Pond

RW010

Legend

 Approximate General Mitchell International Airport Boundary

 Guard Boundaries

 Area of Concern

0 375 750 1,500 Feet



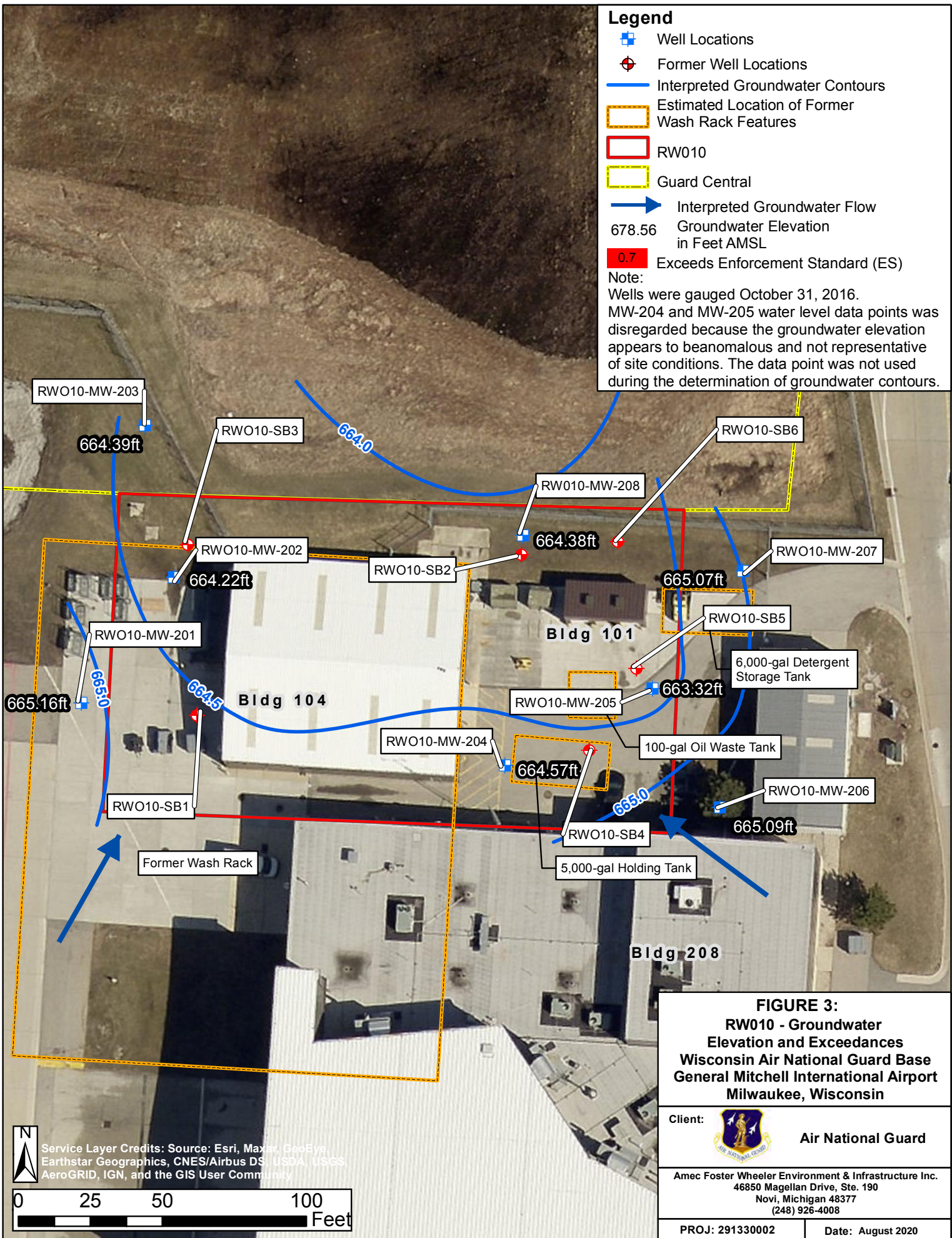


FIGURE 2:
RW010 Location Map
Wisconsin Air National Guard Base
General Mitchell International Airport
Milwaukee, Wisconsin

Client:  **Air National Guard**

Amec Foster Wheeler Environment & Infrastructure Inc.
 46850 Magellan Drive, Ste. 190
 Novi, Michigan 48377
 (248) 926-4008

PROJ: 291330002 Date: August 2020



Legend

- + Well Locations
- + Former Well Locations
- Interpreted Groundwater Contours
- Estimated Location of Former Wash Rack Features
- RW010
- Guard Central
- Interpreted Groundwater Flow
- 678.56 Groundwater Elevation in Feet AMSL
- 0.7 Exceeds Enforcement Standard (ES)

Note:
 Wells were gauged October 31, 2016.
 MW-204 and MW-205 water level data points was disregarded because the groundwater elevation appears to be anomalous and not representative of site conditions. The data point was not used during the determination of groundwater contours.

FIGURE 3:
RW010 - Groundwater Elevation and Exceedances
Wisconsin Air National Guard Base
General Mitchell International Airport
Milwaukee, Wisconsin

Client: **Air National Guard**

Amec Foster Wheeler Environment & Infrastructure Inc.
 46850 Magellan Drive, Ste. 190
 Novi, Michigan 48377
 (248) 926-4008

PROJ: 291330002 Date: August 2020

Service Layer Credits: Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 25 50 100
 Feet

TABLES

Table 1
RW010 Historical Soil Analytical Data
Wisconsin Air National Guard Base
General Mitchell International Airport
Milwaukee, WI

Parameter	Location ID Sample ID Sample Type Depth (ft.) Sample Date	WDNR RR Program Groundwater Protective RCLs (ug/kg)	WDNR RR Program Soil RCLs for Direct Contact, Non- Industrial Scenario (ug/kg)	RW010-SB5 MTC-10-SB-05-01 BORE 2.5 08/28/2014	RW010-SB5 MTC-10-SB-05-02 BORE 8.0 08/28/2014	RW010-SB6 MTC-10-SB-06-01 BORE 2.5 08/28/2014	RW010-SB6 MTC-10-SB-06-02 BORE 5.0 08/28/2014
VOCs							
Acetone		3,676.6	63,800,000	33.9	94.2	<13.9 U	251
Carbon disulfide		592	738,000	<1.74 U	2.58 J	<1.98 U	<2.35 U
Methyl ethyl ketone		1,670	28,400,000	4.25 J	20.6	<6.94 U	58.7
SVOCs							
Anthracene		198,000	17,200,000	<4.26 U	<6.03 U	2.33 J	<4.77 U
Benzo(a)anthracene		NA	148	<4.26 U	<6.03 U	10.80	2.86 J
Benzo(b)fluoranthene		479.3	148	<4.26 U	<6.03 U	14.0	3.57 J
Benzo(g,h,i)perylene		NA	NA	<4.26 U	<6.03 U	6.87 J	<4.77 U
Benzo(k)fluoranthene		NA	1,480	<4.26 U	<6.03 U	6.47 J	<4.77 U
bis(2-Ethylhexyl)phthalate		2,880	34,700	29.6 J	46.7 J	32.9 J	33.3 J
Fluoranthene		88,900	2,290,000	<42.6 U	<60.3 U	28.6 J	<47.7 U
Phenanthrene		NA	NA	<42.6 U	<60.3 U	16.9 J	<47.7 U
Pyrene		54,100	1,720,000	<21.3 U	<30.2 U	21.7 J	<23.8 U



Exceeds Groundwater Protective RCLs



Exceeds Direct Contact, Non-Industrial Scenario RCLs

J - Detected at the estimated concentration shown. U - Not detected at the concentration shown.

U - Not detected above the method detection limit

ND - Non Detect

Bold = values indicate detected concentrations

VOCs = Volatile Organic Compounds

SVOCs = Semi-Volatile Organic Compounds

RCLs = Residual Contaminant Levels

WDNR RR = Wisconsin Department of Natural Resources Remediation and Redevelopment

ug/kg = micrograms per kilogram

ft. = feet

**Table 2
RW010 Historical Groundwater Analytical Data
Wisconsin Air National Guard Base
General Mitchell International Airport
Milwaukee, WI**

Parameter	Location ID Sample ID Sample Type Depth (ft.) Sample Date	NR 140 PAL (ug/L)	NR 140 ES (ug/L)	MCL/RSL ^a (ug/L)	RW010-SB1 MTC-10-GW-01-01 GRAB 0.0 08/28/2014	RW010-SB2 MTC-10-GW-02-01 GRAB 0.0 08/28/2014	RW010-SB3 MTC-10-GW-03-01 GRAB 0.0 08/28/2014	RW010-SB4 MTC-10-GW-04-01 GRAB 8.0 09/02/2014	RW010-SB5 MTC-10-GW-05-01 GRAB 0.0 08/28/2014	RW010-SB5 MTC-10-GW-05-01D GRAB 0.0 08/28/2014	RW010-SB6 MTC-10-GW-06-01 GRAB 0.0 08/29/2014
VOCs											
Acetone		1800	9000	--	<35.0 U	11.6 J	<35.0 U	34.1 J J	<35.0 U	<35.0 U	92.9 J
Methyl ethyl ketone		800	4000	--	<3.50 U	3.77 J	<3.50 U	7.59 J J	<3.50 U	<3.50 U	14.5 J
All other analytes below detection limits		Various	Various	Various	ND	ND	ND	ND	ND	ND	ND
SVOCs											
2,4-Dimethylphenol		NA	NA	360	<1.91 U	1.72 R	<1.90 U	<1.89 U	<1.94 U	<1.83 U	<1.84 U
2,6-Dichlorophenol		NA	NA	NA	<4.78 U	4.29 R	<4.76 U	<4.72 U	<4.86 U	<4.58 U	<4.60 U
bis(2-Ethylhexyl)phthalate		0.6	6	--	6.06 J	5.45 J	6.56 J	6.53 J J	7.06 J	6.12 J	6.1 J
PAHs											
Acenaphthene		NA	NA	530	<0.020 U	<0.020 U	0.16	<0.020 U	<0.021 U	<0.020 U	N/A
Acenaphthylene		NA	NA	NA	<0.012 U	<0.012 U	0.028 J	<0.012 U	<0.013 U	<0.012 U	N/A
Anthracene		600	3000	1800	<0.020 U	<0.020 U	0.05 J	<0.020 U	<0.021 U	<0.020 U	N/A
Benzo(a)anthracene		NA	NA	0.034	<0.0098 U	<0.0099 U	0.082 J	<0.010 U	<0.010 U	<0.010 U	N/A
Benzo(a)pyrene		0.02	0.2	--	<0.0098 U	0.0085 J	0.10	<0.010 U	0.038 J	<0.010 U	N/A
Benzo(b)fluoranthene		0.02	0.2	0.034	<0.0098 U	0.013 J	0.15	0.0069 J	0.036 J	<0.010 U	N/A
Benzo(g,h,i)perylene		NA	NA	NA	<0.0098 U	0.0066 J	0.072 J	0.0049 J	0.094 J	<0.010 U	N/A
Benzo(k)fluoranthene		NA	NA	0.34	<0.0098 U	<0.0099 U	0.063 J	<0.010 U	0.0094 J	<0.010 U	N/A
Chrysene		0.02	0.2	--	<0.0098 U	<0.0099 U	0.12	<0.010 U	0.035 J	<0.010 U	<1.84 ^b U
Dibenzo(a,h)anthracene		NA	NA	0.0034	<0.0098 U	<0.0099 U	0.018 J	<0.010 U	0.011 J	<0.010 U	<1.84 ^b U
Fluoranthene		80	400	--	<0.0098 U	0.017 J	0.18	0.014 J	<0.010 U	<0.010 U	<1.84 ^b U
Fluorene		80	400	290	<0.020 U	<0.020 U	0.15	<0.020 U	<0.021 U	<0.020 U	<1.84 ^b U
Indeno(1,2,3-cd)pyrene		NA	NA	0.034	<0.020 U	<0.020 U	0.06 J	<0.020 U	0.025 J	<0.020 U	<1.84 ^b U
Naphthalene		10	100	--	<0.0098 U	0.026 J	0.11	<0.010 U	<0.010 U	<0.010 U	<1.84 ^b U
Phenanthrene		NA	NA	NA	<0.012 U	0.019 J	0.15	0.013 J	<0.013 U	0.015 J	<1.84 ^b U
Pyrene		50	250	120	<0.0098 U	0.014 J	0.16	0.012 J	0.041 J	<0.010 U	<1.84 ^b U
All other analytes below detection limits		Various	Various	Various	ND	ND	ND	ND	ND	ND	ND

Bold = values indicate detected concentrations

 Exceeds NR 140 PAL
 Exceeds NR 140 ES

J - Estimated concentration

UJ - Not detected at the estimated concentration shown

R - Rejected during validation as quality control criteria were not met

U - Not detected above the method detection limit

^a If no PAL/ES exists for a given analyte, the

^b Reported from Standard SVOC analyses. All other PAH results shown are from low-level SIM

^c For the sum of 1,2,4- and 1,3,5-trimethylbenzenes

^d for the sum of m-, o-, and p- isomers

EPA = U.S. Environmental Protection Agency

ES = Enforcement Standard

ID = Identifier

MCL = Maximum Contaminant Level

NA = Not Available

NR = Natural Resources

PAH = Polycyclic Aromatic Hydrocarbons

ft = feet

PAL = Preventative Action Limit

RSL = Regional Screening Limit

SVOC = Semivolatile Organic Compound

VOC = Volatile Organic Compound

WP = Work Plan

ug/l = micrograms per liter

-- = No Established Criteria

Table 3
2016 RW010 Soil Analytical Data
General Mitchell Air National Guard - 128th Air Refueling Wing

Sample ID Date Collected Depth (bgs)	CAS	WDNR RR Program Soil RCLs for Direct Contact, Non- Industrial Scenario (ug/kg)	WDNR RR Program Soil RCLs for Direct Contact, Industrial Scenario (ug/kg)	WDNR RR Program Groundwater Protective RCLs (ug/kg)	RW010-SB-07				RW010-SB-08				RW010-SB-09				RW010-SB-10					
					09/08/2016				09/08/2016				09/08/2016				09/08/2016					
					3-5		7-9		3-5		5-7		3-5		5-7		5-7 (Duplicate)		2-4	4-6		
PAHs																						
Diethylphthalate	84-66-2	50,600,000	100,000,000	NA	<19	U	<21	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Hexachlorobenzene	118-74-1	252	1,150	12.6	<19	U	<15	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Fluorene	86-73-7	2,390,000	30,100,000	7,415	<5.6	U	<2.2	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
Fluoranthene	206-44-0	2,390,000	30,100,000	44,439	<5.6	U	<1.3	U	<5.7	U	11	0	<6.1	U	<5.8	U	<5.8	U	18	U	9.5	U
Dimethylphthalate	131-11-3	NC	NC	NA	<19	U	<19	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Hexachlorobutadiene	87-68-3	1,630	7,190	NA	<19	U	<26	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Dibenzofuran	132-64-9	73,000	1,040,000	NA	<19	U	<14	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Dibenz(a,h)anthracene	53-70-3	115	2,110	NA	<5.6	U	<2.2	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
Di-n-octyl phthalate	117-84-0	632,000	8,210,000	NA	<19	U	<19	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Di-n-butyl phthalate	84-74-2	6,320,000	82,100,000	2,517	<37	U	<30	U	<38	U	<40	U	<41	U	<39	U	<39	U	<41	U	<39	U
Carbazole	86-74-8	NC	NC	NA	<19	U	<19	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Hexachloroethane	67-72-1	2,520	11,100	NA	<19	U	<13	U	<19	U	<20	U	<20	U	<19	U	<19	UJ	<21	UJ	<20	UJ
Phenanthrene	85-01-8	NC	NC	NA	<5.6	U	<1.6	U	13	7.6	J	21	U	<5.8	U	<5.8	U	12	U	6.3	J	
Chrysene	218-01-9	11,500	2,110,000	72	<5.6	U	<1.9	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
Isophorone	78-59-1	571,000	2,420,000	NA	<19	U	<12	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
n-Nitrosodiethylamine	55-18-5	1	15	NA	<37	UJ	<39	UJ	<38	UJ	<40	UJ	<41	UJ	<39	UJ	<39	U	<41	U	<39	U
n-Nitrosodimethylamine	62-75-9	2	40	NA	<19	UJ	<14	UJ	<19	UJ	<20	UJ	<20	UJ	<19	UJ	<19	UJ	<21	UJ	<20	UJ
n-Nitrosodiphenylamine	86-30-6	111,000	469,000	38	<19	U	<14	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
n-Nitroso-di-n-propylamine	621-64-7	78	328	NA	<19	U	<16	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Naphthalene	91-20-3	5,520	24,100	329	<5.6	U	<2.5	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
Nitrobenzene	98-95-3	7,420	32,400	NA	<19	U	<18	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Butylbenzylphthalate	85-68-7	286,000	1,210,000	NA	<37	U	<33	U	<38	U	<40	U	<41	U	<39	U	<39	U	<41	U	<39	U
Pentachlorophenol	87-86-5	1,020	3,970	NA	<93	U	<110	U	<96	U	<100	U	<100	U	<96	U	<97	UJ	<100	UJ	<98	UJ
Hexachlorocyclopentadiene	77-47-4	2,550	10,800	NA	<93	UJ	<65	UJ	<96	UJ	<100	UJ	<100	UJ	<96	UJ	<97	U	<100	U	<98	U
Phenol	108-95-2	19,000,000	100,000,000	NA	<93	U	<60	U	<96	U	<100	U	<100	U	<96	U	<97	U	<100	U	<98	U
Pyrene	129-00-0	1,790,000	22,600,000	27,273	<5.6	U	<1.4	U	<5.7	U	11	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	9.1	U
Bis(2-ethylhexyl)phthalate	117-81-7	38,800	164,000	1,440	<37	U	<50	U	<38	U	<40	U	<41	U	<39	U	<39	U	<41	U	<39	U
3,3'-Dichlorobenzidine	91-94-1	1,210	5,110	NC	<750	U,R	<720	U,R	<770	U,R	<800	U,R	<820	U,R	<770	U,R	<780	U,R	<830	U,R	<790	U,R
2-Nitrophenol	88-75-5	NC	NC	NC	<93	U	<70	U	<96	U	<100	U	<100	U	<96	U	<97	U	<100	U	<98	U
2-Nitroaniline	88-74-4	627,000	8,010,000	NC	<19	U	<14	U	<19	U	<20	U	<20	U	<19	U	<19	UJ	<21	UJ	<20	UJ
2-Methylphenol	95-48-7	3,160,000	41,000,000	NC	<93	U	<61	U	<96	U	<100	U	<100	U	<96	U	<97	U	<100	U	<98	U
2-Methylnaphthalene	91-57-6	239,000	3,010,000	NC	<5.6	U	<1.3	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
2-Chlorophenol	95-57-8	391,000	5,840,000	NC	<93	U	<59	U	<96	U	<100	U	<100	U	<96	U	<97	U	<100	U	<98	U
2-Chloronaphthalene	91-58-7	4,780,000	60,300,000	NC	<19	U	<19	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
3-Nitroaniline	99-09-2	NC	NC	NC	<19	U	<20	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
2,4-Dinitrotoluene	121-14-2	1,740	7,370	0.0677	<19	U	<25	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
2,4-Dinitrophenol	51-28-5	126,000	1,640,000	NC	<190	U	<160	U	<190	U	<200	U	<200	U	<190	U	<190	UJ	<210	UJ	<200	UJ
2,4-Dimethylphenol	105-67-9	1,260,000	16,400,000	NC	<93	U	<54	U	<96	U	<100	U	<100	U	<96	U	<97	U	<100	U	<98	U
Indeno(1,2,3-cd)pyrene	193-39-5	NC	NC	NC	<5.6	U	<2.3	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
2,4,6-Trichlorophenol	88-06-2	NC	NC	NC	<37	U	<31	U	<38	U	<40	U	<41	U	<39	U	<39	U	<41	U	<39	U
2,4,5-Trichlorophenol	95-95-4	NC	NC	NC	<37	U	<28	U	<38	U	<40	U	<41	U	<39	U	<39	U	<41	U	<39	U
1-Methylnaphthalene	90-12-0	NC	NC	NC	<5.6	U	<2.0	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
1,4-Dichlorobenzene	106-46-7	NC	NC	NC	<19	U	<9.0	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
1,3-Dichlorobenzene	541-73-1	NC	NC	NC	<19	U	<12	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
1,2-Dichlorobenzene	95-50-1	NC	NC	584	<19	U	<12	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
1,2,4-Trichlorobenzene	120-82-1	NC	NC	204	<19	U	<16	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
2,6-Dinitrotoluene	606-20-2	363	1,540	0.0688	<19	U	<27	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Benzo(g,h,i)perylene	191-24-2	NC	NC	NC	<5.6	U	<3.2	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
2,4-Dichlorophenol	120-83-2	190,000	2,460,000	NC	<93	U	<48	U	<96	U	<100	U	<100	U	<96	U	<97	U	<100	U	<98	U
4,6-Dinitro-2-methylphenol	534-52-1	5,060	65,700	NC	<93	UJ	<81	UJ	<96	UJ	<100	UJ	<100	UJ	<96	UJ	<97	U	<100	U	<98	U
Bis(2-chloroethyl)ether	111-44-4	286	1,290	NC	<37	U	<30	U	<38	U	<40	U	<41	U	<39	U	<39	U	<41	U	<39	U
Bis(2-chloroethoxy)methane	111-91-1	190,000	2,460,000	NC	<19	U	<12	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Benzyl alcohol	100-51-6	6,320,000	82,100,000	NC	<19	U	<14	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Benzoic acid	65-85-0	100,000,000	100,000,000	NC	<370	U	<230	U	<380	U	<400	U	<410	U	<390	U	<390	UJ	<410	UJ	<390	UJ
Benzo(k)fluoranthene	207-08-9	11,500	211,000	NC	<5.6	U	<3.2	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
Bis(2-chloroisopropyl)ether	108-60-1	1,020,000	1,020,000	NC	<19	U	<13	U	<19	U	<20	U	<20	U	<19	U	<19	U	<21	U	<20	U
Benzo(e)pyrene	192-97-2	NC	NC	NC	<5.6	U	<2.7	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
Benzo(b)fluoranthene	205-99-2	1,150	21,100	239	<5.6	U	<2.6	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
Benzo(a)pyrene	50-32-8	115	2,110	470	<5.6	U	<2.4	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
Benzo(a)anthracene	56-55-3	1,140	20,800	NC	<5.6	U	<2.3	U	<5.7	U	<6.0	U	<6.1	U	<5.8	U	<5.8	U	<6.2	U	<5.9	U
4-Chloroaniline	106																					

Table 3
2016 RW010 Soil Analytical Data
General Mitchell Air National Guard - 128th Air Refueling Wing

Sample ID Date Collected Depth (bgs)	CAS	WDNR RR Program Soil RCLs for Direct Contact, Non- Industrial Scenario (ug/kg)	WDNR RR Program Soil RCLs for Direct Contact, Industrial Scenario (ug/kg)	WDNR RR Program Groundwater Protective RCLs (ug/kg)	RW010-SB-11				RW010-SB-12				RW010-SB-13				RW010-SB-14					
					09/08/2016				09/08/2016				09/08/2016				09/08/2016					
					2-4		6-8		4-6		6-8		0-2		2-4		2-4 (Duplicate)		0-2		2-4	
PAHs																						
Diethylphthalate	84-66-2	50,600,000	100,000,000	NA	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Hexachlorobenzene	118-74-1	252	1,150	12.6	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Fluorene	86-73-7	2,390,000	30,100,000	7,415	<5.9	U	<8.0	U	<5.8	U	<6.4	U	<5.9	U	<6.0	U	2.8	J	<5.7	U	<6.0	U
Fluoranthene	206-44-0	2,390,000	30,100,000	44,439	15		9.1	J	<5.8	U	<6.4	U	99	U	<6.0	U	<6.0	U	<5.7	U	11	
Dimethylphthalate	131-11-3	NC	NC	NA	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Hexachlorobutadiene	87-68-3	1,630	7,190	NA	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Dibenzofuran	132-64-9	73,000	1,040,000	NA	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Dibenz(a,h)anthracene	53-70-3	115	2,110	NA	<5.9	U	<8.0	U	<5.8	U	<6.4	U	16	U	<6.0	U	<6.0	U	<5.7	U	<6.0	U
Di-n-octyl phthalate	117-84-0	632,000	8,210,000	NA	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Di-n-butyl phthalate	84-74-2	6,320,000	82,100,000	2,517	<39	U	<53	U	<39	U	<43	U	<39	U	<40	U	<40	U	<38	U	<40	U
Carbazole	86-74-8	NC	NC	NA	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Hexachloroethane	67-72-1	2,520	11,100	NA	<20	U	<27	U	<19	UJ	<21	UJ	<20	UJ	<20	UJ	<20	UJ	<19	U	<20	U
Phenanthrene	85-01-8	NC	NC	NA	11		12		<5.8	U	<6.4	U	33	U	<6.0	U	<6.0	U	<5.7	U	<6.0	U
Chrysene	218-01-9	11,500	2,110,000	72	<5.9	U	<8.0	U	<5.8	U	<6.4	U	68	U	31		28		24		<6.0	U
Isophorone	78-59-1	571,000	2,420,000	NA	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
n-Nitrosodiethylamine	55-18-5	1	15	NA	<39	U	<53	U	<39	U	<43	U	<39	U	<40	U	<40	U	<38	U	<40	U
n-Nitrosodimethylamine	62-75-9	2	40	NA	<20	UJ	<27	UJ	<19	UJ	<21	UJ	<20	UJ	<20	UJ	<20	UJ	<19	UJ	<20	UJ
n-Nitrosodiphenylamine	86-30-6	111,000	469,000	38	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
n-Nitroso-di-n-propylamine	621-64-7	78	328	NA	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Naphthalene	91-20-3	5,520	24,100	329	<5.9	U	<8.0	U	<5.8	U	<6.4	U	<5.9	U	3.6	J	3.6	J	<5.7	U	<6.0	U
Nitrobenzene	98-95-3	7,420	32,400	NA	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Butylbenzylphthalate	85-68-7	286,000	1,210,000	NA	<39	U	61	J	<39	U	<43	U	<39	U	<40	U	<40	U	<38	U	<40	U
Pentachlorophenol	87-86-5	1,020	3,970	NA	<98	UJ	<130	UJ	<97	UJ	<110	UJ	<98	UJ	<100	U	<100	UJ	<95	U	<100	U
Hexachlorocyclopentadiene	77-47-4	2,550	10,800	NA	<98	U	<130	U	<97	U	<110	U	<98	U	<100	U	<100	UJ	<95	U	<100	U
Phenol	108-95-2	19,000,000	100,000,000	NA	<98	U	<130	U	<97	U	<110	U	<98	U	<100	U	<100	U	<95	U	<100	U
Pyrene	129-00-0	1,790,000	22,600,000	27,273	13		<8.0	U	<5.8	U	<6.4	U	90	U	<6.0	U	<6.0	U	36		<6.0	U
Bis(2-ethylhexyl)phthalate	117-81-7	38,800	164,000	1,440	<39	U	<53	U	<39	U	<43	U	<39	U	<40	U	<40	U	<38	U	<40	U
3,3'-Dichlorobenzidine	91-94-1	1,210	5,110	NC	<790	U,R	<1,100	U,R	<780	U,R	<850	U,R	<780	U,R	<810	U,R	<800	U,R	<760	U,R	<800	U,R
2-Nitrophenol	88-75-5	NC	NC	NC	<98	U	<130	U	<97	U	<110	U	<98	U	<100	U	<100	U	<95	U	<100	U
2-Nitroaniline	88-74-4	627,000	8,010,000	NC	<20	UJ	<27	UJ	<19	UJ	<21	UJ	<20	UJ	<20	UJ	<20	UJ	<19	UJ	<20	UJ
2-Methylphenol	95-48-7	3,160,000	41,000,000	NC	<98	U	<130	U	<97	U	<110	U	<98	U	<100	U	<100	U	<95	U	<100	U
2-Methylnaphthalene	91-57-6	239,000	3,010,000	NC	<5.9	U	<8.0	U	<5.8	U	<6.4	U	<5.9	U	2.4	J	3.2	J	2.3	J	<6.0	U
2-Chlorophenol	95-57-8	391,000	5,840,000	NC	<98	U	<130	U	<97	U	<110	U	<98	U	<100	U	<100	U	<95	U	<100	U
2-Chloronaphthalene	91-58-7	4,780,000	60,300,000	NC	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
3-Nitroaniline	99-09-2	NC	NC	NC	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
2,4-Dinitrotoluene	121-14-2	1,740	7,370	0.0677	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
2,4-Dinitrophenol	51-28-5	126,000	1,640,000	NC	<200	UJ	<270	UJ	<190	UJ	<210	UJ	<200	UJ	<200	U	<200	UJ	<190	UJ	<200	UJ
2,4-Dimethylphenol	105-67-9	1,260,000	16,400,000	NC	<98	U	<130	U	<97	U	<110	U	<98	U	<100	U	<100	U	<95	U	<100	U
Indeno(1,2,3-cd)pyrene	193-39-5	NC	NC	NC	<5.9	U	<8.0	U	<5.8	U	<6.4	U	43	U	<6.0	U	<6.0	U	<5.7	U	<6.0	U
2,4,6-Trichlorophenol	88-06-2	NC	NC	NC	<39	U	<53	U	<39	U	<43	U	<39	U	<40	U	<40	U	<38	U	<40	U
2,4,5-Trichlorophenol	95-95-4	NC	NC	NC	<39	U	<53	U	<39	U	<43	U	<39	U	<40	U	<40	U	<38	U	<40	U
1-Methylnaphthalene	90-12-0	NC	NC	NC	<5.9	U	<8.0	U	<5.8	U	<6.4	U	<5.9	U	8.1		<6.0	U	7.6	J	<6.0	U
1,4-Dichlorobenzene	106-46-7	NC	NC	NC	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
1,3-Dichlorobenzene	541-73-1	NC	NC	NC	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
1,2-Dichlorobenzene	95-50-1	NC	NC	584	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
1,2,4-Trichlorobenzene	120-82-1	NC	NC	204	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
2,6-Dinitrotoluene	606-20-2	363	1,540	0.0688	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Benzo(g,h,i)perylene	191-24-2	NC	NC	NC	<5.9	U	<8.0	U	<5.8	U	<6.4	U	60	U	<6.0	U	<6.0	U	<5.7	U	<6.0	U
2,4-Dichlorophenol	120-83-2	190,000	2,460,000	NC	<98	U	<130	U	<97	U	<110	U	<98	U	<100	U	<100	U	<95	U	<100	U
4,6-Dinitro-2-methylphenol	534-52-1	5,060	65,700	NC	<98	U	<130	U	<97	U	<110	U	<98	U	<100	U	<100	UJ	<95	UJ	<100	UJ
Bis(2-chloroethyl)ether	111-44-4	286	1,290	NC	<39	U	<53	U	<39	U	<43	U	<39	U	<40	U	<40	U	<38	U	<40	U
Bis(2-chloroethoxy)methane	111-91-1	190,000	2,460,000	NC	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Benzyl alcohol	100-51-6	6,320,000	82,100,000	NC	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Benzoic acid	65-85-0	100,000,000	100,000,000	NC	<390	UJ	<530	UJ	<390	UJ	<430	UJ	<390	UJ	<400	UJ	<400	UJ	<380	UJ	<400	UJ
Benzo(k)fluoranthene	207-08-9	11,500	211,000	NC	<5.9	U	<8.0	U	<5.8	U	<6.4	U	32	U	<6.0	U	<6.0	U	<5.7	U	<6.0	U
Bis(2-chloroisopropyl)ether	108-60-1	1,020,000	1,020,000	NC	<20	U	<27	U	<19	U	<21	U	<20	U	<20	U	<20	U	<19	U	<20	U
Benzo(e)pyrene	192-97-2	NC	NC	NC	<5.9	U	<8.0	U	<5.8	U	<6.4	U	66	U	31		26		18		<6.0	U
Benzo(b)fluoranthene	205-99-2	1,150	21,100	239	<5.9	U	<8.0	U	<5.8	U	<6.4	U	93	U	<6.0	U	<6.0	U	<5.7	U	<6.0	U
Benzo(a)pyrene	50-32-8	115	2,110	470	<5.9	U	<8.0	U	<5.8	U	<6.4	U	65	U	31		20	J	17		<6.0	U
Benzo(a)anthracene	56-55-3	1,140																				

Table 3
Notes
General Mitchell Air National Guard
128th Air Refueling Wing

400	Exceeds GW protections RCLs
400	Exceeds Industrial Direct Contact
400	Exceeds Non-Industrial Direct Contact

Notes:

Criteria from Wisconsin Department of Natural Resources (WDNR) Chapter NR 720, November 11, 2013

mg/kg: milligrams per kilogram

µg/kg: micrograms per kilogram

< : not detected at or above value

U: The analyte concentration is less than the detection limit.

B: A target analyte was detected in an associated blank QC sample.

DUP: Field duplicate sample

ID: Insufficient data to develop criterion.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

M: Calculated criterion is below analytical target detection limit, therefore, criterion defaults to the target detection limit.

NA: Not Analyzed

R = The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

Q = The analyte is both B qualified because of blank detection and J qualified because of an additional QC issue.

NC: No Criteria

RCL: Residual Contaminant Levels

Bolded values indicate concentrations above detection limits

Shaded value indicates exceedance of criteria.

J: Estimated detected concentration.

M: Calculated criterion is below analytical target detection limit, therefore, criterion defaults to the target detection limit.

NA: Not Analyzed

NC: No Criteria

RCL: Residual Contaminant Levels

Bolded values indicate concentrations above detection limits

Shaded value indicates exceedance of criteria.

Table 4
2016 RW010 Groundwater Analytical Data
General Mitchell Air National Guard - 128th Air Refueling Wing

Well	CAS	NR 140 ES	NR 140 PAL	RW010-MW-201		RW010-MW-202		RW010-MW-203			RW010-MW-204										
				10/27/16	11/1/16	10/27/16	11/1/16	10/27/16	10/27/2016 (Duplicate)	11/1/16	10/27/16	11/1/16									
Criteria Reference		1	2																		
SemiVolatile Organic Compounds																					
Butyl benzyl phthalate	85-68-7	NA	NA	<2.4	U	<2.4	U	<2.4	U	<2.3	U	<2.3	U	<2.4	U	<2.4	U	<2.8	U		
Dimethyl phthalate	131-11-3	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
Diethyl phthalate	84-66-2	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
Dibenzofuran	132-64-9	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
Dibenz(a,h)anthracene	53-70-3	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Di-n-octyl phthalate	117-84-0	NA	NA	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.8	U		
Di-n-butyl phthalate	84-74-2	1,000	100	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
Cresols, Total	1319-77-3	NA	NA	<7.1	U	<7.1	U	<7.1	U	<7.3	U	<7.0	U	<7.1	U	<7.1	U	<8.3	U		
Benzo(g,h,i)perylene	191-24-2	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Carbazole	86-74-8	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
Hexachlorocyclopentadiene	77-47-4	NA	NA	<0.94	UJ	<0.95	UJ	<0.94	UJ	<0.97	UJ	<0.93	UJ	<0.95	UJ	<0.94	UJ	<1.1	UJ		
Bis(2-ethylhexyl) phthalate	117-81-7	6	0.6	1.0	J	<0.95	U	0.69	J	<0.97	U	<0.93	U	1.1	J	<0.95	U	0.75	J	<1.1	U
Bis(2-chloroisopropyl) ether	108-60-1	NA	NA	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.3	U	<2.3	U	<2.4	U	<2.4	U		
Bis(2-chloroethyl) ether	111-44-4	NA	NA	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.3	U	<2.3	U	<2.4	U	<2.4	U		
Bis(2-chloroethoxy)methane	111-91-1	NA	NA	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.3	U	<2.3	U	<2.4	U	<2.4	U		
Benzyl alcohol	100-51-6	NA	NA	<2.4	U	<2.4	UJ	<2.4	U	<2.4	UJ	<2.3	U	<2.3	U	<2.4	UJ	<2.4	U		
Benzoic acid	65-85-0	NA	NA	<2.4	UJ	<2.4	UJ	<2.4	UJ	<2.4	UJ	<2.3	UJ	<2.4	UJ	<2.4	UJ	<2.4	UJ		
Benzo(k)fluoranthene	207-08-9	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Chrysene	218-01-9	0.2	0.02	<0.14	U	<0.14	U	0.1	J,B	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Nitrobenzene	98-95-3	NA	NA	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.3	U	<2.3	U	<2.4	U	<2.4	U		
1,2,4-Trichlorobenzene	120-82-1	70	14	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
Pyrene	129-00-0	250	50	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Phenol	108-95-2	2,000	400	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
Phenanthrene	85-01-8	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Pentachlorophenol	87-86-5	1	0.1	<0.94	UJ	<0.95	UJ	<0.94	UJ	<0.97	UJ	<0.93	UJ	<0.95	UJ	<0.94	UJ	<1.1	UJ		
Fluorene	86-73-7	400	80	<0.14	U	<0.14	U	0.1	J,B	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Hexachlorobutadiene	87-68-3	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
Naphthalene	91-20-3	100	10	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
N-Nitrosodi-n-propylamine	621-64-7	NA	NA	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.8	U		
N-Nitrosodiphenylamine	86-30-6	7	0.7	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
N-Nitrosodimethylamine	62-75-9	NA	NA	<0.94	UJ	<0.95	U	<0.94	UJ	<0.97	U	<0.93	UJ	<0.95	UJ	<0.94	UJ	<1.1	U		
N-Nitrosodiethylamine	55-18-5	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Hexachloroethane	67-72-1	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
Fluoranthene	206-44-0	400	80	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Pentachloronitrobenzene	82-68-8	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
2,4-Dichlorophenol	120-83-2	NA	NA	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.3	U	<2.3	U	<2.4	U	<2.8	U		
2-Methylphenol	95-48-7	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
2-Methylnaphthalene	91-57-6	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
2-Chlorophenol	95-57-8	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
2-Chloronaphthalene	91-58-7	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
2,6-Dinitrotoluene	606-20-2	0.05	0.005	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
2,4-Dinitrotoluene	121-14-2	0.05	0.005	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
2-Nitroaniline	88-74-4	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
2,4-Dimethylphenol	105-67-9	NA	NA	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.3	U	<2.3	U	<2.4	U	<2.8	U		
1,3-Dichlorobenzene	541-73-1	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
2,4,6-Trichlorophenol	88-06-2	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
2,4,5-Trichlorophenol	95-95-4	NA	NA	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.8	U		
1-Methylnaphthalene	90-12-0	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
1,4-Dichlorobenzene	106-46-7	NA	NA	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.3	U	<2.3	U	<2.4	U	<2.8	U		
Benzo(e)pyrene	192-97-2	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
1,2-Dichlorobenzene	95-50-1	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
Hexachlorobenzene	118-74-1	NA	NA	<0.94	U	<0.95	U	<0.94	U	<0.97	U	<0.93	U	<0.95	U	<0.94	U	<1.1	U		
2,4-Dinitrophenol	51-28-5	75	15	<9.4	U	<9.5	U	<9.4	U	<9.7	U	<9.3	U	<9.3	U	<9.4	U	<11	U		
Benzaldehyde	100-52-7	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		
Benzo(a)pyrene	50-32-8	0.2	0.02	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Benzo(a)anthracene	56-55-3	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Anthracene	120-12-7	3,000	600	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Acenaphthylene	208-96-8	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
Acenaphthene	83-32-9	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.15	U	<0.14	U	<0.14	U	<0.14	U	<0.17	U		
4-Nitrophenol																					

Table 4
2016 RW010 Groundwater Analytical Data
General Mitchell Air National Guard - 128th Air Refueling Wing

Well	CAS	NR 140 ES	NR 140 PAL	RW010-MW-205		RW010-MW-206		RW010-MW-207		RW010-MW-208									
				10/27/16	11/1/16	10/27/16	11/1/16	10/27/16	11/1/16	10/27/16	11/1/16								
Criteria Reference		1	2																
SemiVolatile Organic Compounds																			
Butyl benzyl phthalate	85-68-7	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U		
Dimethyl phthalate	131-11-3	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.94	U	<0.98	U		
Diethyl phthalate	84-66-2	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.94	U	<0.98	U		
Dibenzofuran	132-64-9	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.94	U	<0.98	U		
Dibenz(a,h)anthracene	53-70-3	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U		
Di-n-octyl phthalate	117-84-0	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U		
Di-n-butyl phthalate	84-74-2	1,000	100	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.94	U	<0.98	U		
Cresols, Total	1319-77-3	NA	NA	<7.1	U	<7.1	U	<7.0	U	<7.1	U	<7.1	U	<7.2	U	<7.4	U		
Benzo(g,h,i)perylene	191-24-2	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U		
Carbazole	86-74-8	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.94	U	<0.98	U		
Hexachlorocyclopentadiene	77-47-4	NA	NA	<0.94	UJ	<0.95	UJ	<0.93	UJ	<0.94	UJ	<0.94	UJ	<0.94	UJ	<0.98	UJ		
Bis(2-ethylhexyl) phthalate	117-81-7	6	0.6	0.68	J	<0.95	U	<0.93	U	<0.94	U	0.95	J	<0.96	U	<0.94	U	<0.98	U
Bis(2-chloroisopropyl) ether	108-60-1	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U		
Bis(2-chloroethyl) ether	111-44-4	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U		
Bis(2-chloroethoxy)methane	111-91-1	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U		
Benzyl alcohol	100-51-6	NA	NA	<2.4	U	<2.4	UJ	<2.3	U	<2.4	UJ	<2.4	U	<2.4	UJ	<2.5	UJ		
Benzoic acid	65-85-0	NA	NA	5	UJ	<2.4	UJ	<2.3	UJ	<2.4	UJ	<2.4	UJ	<2.4	UJ	<2.5	UJ		
Benzo(k)fluoranthene	207-08-9	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U		
Chrysene	218-01-9	0.2	0.02	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U		
Nitrobenzene	98-95-3	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U		
1,2,4-Trichlorobenzene	120-82-1	70	14	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.94	U	<0.98	U		
Pyrene	129-00-0	250	50	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U		
Phenol	108-95-2	2,000	400	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
Phenanthrene	85-01-8	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	0.075	J,B	<0.15	U
Pentachlorophenol	87-86-5	1	0.1	<0.94	UJ	<0.95	UJ	<0.93	UJ	<0.94	UJ	<0.94	UJ	<0.96	UJ	<0.94	UJ	<0.98	UJ
Fluorene	86-73-7	400	80	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U
Hexachlorobutadiene	87-68-3	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
Naphthalene	91-20-3	100	10	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U
N-Nitrosodi-n-propylamine	621-64-7	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U
N-Nitrosodiphenylamine	86-30-6	7	0.7	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
N-Nitrosodimethylamine	62-75-9	NA	NA	<0.94	UJ	<0.95	U	<0.93	UJ	<0.94	U	<0.94	UJ	<0.96	U	<0.94	UJ	<0.98	U
N-Nitrosodiethylamine	55-18-5	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
Indeno(1,2,3-cd)pyrene	193-39-5	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U
Hexachloroethane	67-72-1	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
Fluoranthene	206-44-0	400	80	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U
Pentachloronitrobenzene	82-68-8	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
2,4-Dichlorophenol	120-83-2	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U
2-Methylphenol	95-48-7	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
2-Methylnaphthalene	91-57-6	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U
2-Chlorophenol	95-57-8	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
2-Chloronaphthalene	91-58-7	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
2,6-Dinitrotoluene	606-20-2	0.05	0.005	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
2,4-Dinitrotoluene	121-14-2	0.05	0.005	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
2-Nitroaniline	88-74-4	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
2,4-Dimethylphenol	105-67-9	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U
1,3-Dichlorobenzene	541-73-1	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
2,4,6-Trichlorophenol	88-06-2	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
2,4,5-Trichlorophenol	95-95-4	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U
1-Methylnaphthalene	90-12-0	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U
1,4-Dichlorobenzene	106-46-7	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U
Benzo(e)pyrene	192-97-2	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U
1,2-Dichlorobenzene	95-50-1	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
Hexachlorobenzene	118-74-1	NA	NA	<0.94	U	<0.95	U	<0.93	U	<0.94	U	<0.94	U	<0.96	U	<0.94	U	<0.98	U
2,4-Dinitrophenol	51-28-5	75	15	<9.4	U	<9.5	U	<9.3	U	<9.4	U	<9.4	U	<9.6	U	<9.4	U	<9.8	U
Benzaldehyde	100-52-7	NC	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	0.2	0.02	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U
Benz(a)anthracene	56-55-3	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U
Anthracene	120-12-7	3,000	600	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U
Acenaphthylene	208-96-8	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U
Acenaphthene	83-32-9	NA	NA	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.14	U	<0.15	U
4-Nitrophenol	100-02-7	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U
4-Nitroaniline	100-01-6	NA	NA	<2.4	U	<2.4	U	<2.3	U	<2.4	U	<2.4	U	<2.4	U	<2.4	U	<2.5	U
3/4 Methylphenol	65794-96-9	NA	NA	&															

Table 4
Notes
General Mitchell Air National Guard
128th Air Refueling Wing

400	Exceeds Enforcement Standard (ES)
400	Exceeds Preventative Action Limits (PALs)

Notes:

Criteria from Wisconsin Department of Natural Resources (WDNR) Chapter NR140, July, 2015

Data in microgram per liter ($\mu\text{g/L}$)

mg/kg: milligrams per kilogram

< : not detected at or above value

U: The analyte concentration is less than the detection limit.

B: A target analyte was detected in an associated blank QC sample.

DUP: Field duplicate sample

ID: Insufficient data to develop criterion.

J: Estimated detected concentration.

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

M: Calculated criterion is below analytical target detection limit, therefore, criterion defaults to the target detection limit.

NA: Not Analyzed

R = The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria.

Q = The analyte is both B qualified because of blank detection and J qualified because of an additional QC issue.

NC: No Criteria

RCL: Residual Contaminant Levels

Bolded values indicate concentrations above detection limits

Shaded value indicates exceedance of criteria.

APPENDIX A

SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT



**APPENDIX A
FINAL SCREENING LEVEL ECOLOGICAL
RISK ASSESSMENT (SLERA)
GREAT LAKES REGION
GENERAL MITCHELL INTERNATIONAL AIRPORT
NEWLY EVALUATED RESTORATION SITES**

**128th AIR REFUELING WING
WISCONSIN AIR NATIONAL GUARD BASE
MILWAUKEE, WISCONSIN**

Contract #: W9133L-14-D-0002
Delivery Order 0002

November 21, 2019

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

1.0	Screening Level Ecological Risk Assessment	1
2.0	Problem Formulation	2
2.1	Site Location	2
2.2	Environmental Setting.....	3
2.2.1	Natural Communities	3
2.2.2	Critical Habitat & Threatened/Endangered Species	4
2.2.3	Hydrology.....	4
2.3	Data Used in the SLERA	5
2.4	Complete Exposure Pathways.....	5
2.5	Ecological Conceptual Site Model	6
2.6	Assessment and Measurement Endpoints	6
3.0	Screening Level Effects Evaluation	7
4.0	Screening Level Risk Characterization And Conclusions.....	8
5.0	References	9

FIGURES

- Figure 1 - Site Location Map
- Figure 2 – AOC Location Map
- Figure 3 – RW010 Site Map
- Figure 4 - OW014 and TU015 Site Map
- Figure 5 – CB018a Site Map
- Figure 6 – CB018b Site Map
- Figure 7 – CG019 Site Map
- Figure 8 - RW010-Ecological Conceptual Site Model
- Figure 9 - OW014 and TU015-Ecological Conceptual Site Model
- Figure 10 - CB018a and CB018b-Ecological Conceptual Site Model
- Figure 11 - CG019-Ecological Conceptual Site Model.

TABLES

- Table 1 - Ecological Screening Benchmarks - Soil
- Table 2 - Soil Benchmark Comparison - RW010
- Table 3 - Soil Benchmark Comparison - CB018a
- Table 4 - Soil Benchmark Comparison CB018b

ACRONYMS

Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
ANG	Air National Guard
AOC	area of concern
ARW	Air Refueling Wing
bgs	below ground surface
Base	128 th ARW, Wisconsin ANG
BERA	Baseline Ecological Risk Assessment
COPECs	Contaminants of potential ecological concern.
ECOS	Environmental Conservation Online System
ERAGS	Ecological Risk Assessment Guidance for Superfund
EPC	Exposure Point Concentration
ft	feet/foot
HQ	hazard quotients
GMIA	General Mitchell International Airport
LCS	Laboratory Control Sample
MNDNR	Minnesota Department of Natural Resources
MS	Matrix spike
OWS	oil water separator
PAHs	polynuclear aromatic hydrocarbons
QAPP	Quality Assurance Project Plan
RAGS	Risk Assessment Guidance for Superfund
RI	Remedial Investigation
SI	Site Investigation
SLERA	Screening-level Ecological Risk Assessment
SVOCs	semi-volatile organic compounds
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Services
UST	underground storage tank
VC	Vinyl Chloride
VOCs	volatile organic compounds
WDNR	Wisconsin Department of Natural Resources

1.0 SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT

The purpose of this Screening Level Ecological Risk Assessment (SLERA) is to assess the potential for chemicals detected at six areas of concern (AOCs) at the Wisconsin Air National Guard (ANG) 128th Air Refueling Wing (ARW) (Base) at General Mitchell International Airport (GMIA) in Milwaukee, WI (Figure 1) to adversely affect the environment:

- Former Aircraft Washing Area – RW010
- Oil Water Separator (OWS) at Guard West – OW014
- Former Drain Oil Underground Storage Tank (UST) at Guard West – TU015
- Suspected Petroleum Contamination, Building 522 – CB018a
- Suspected Petroleum Contamination, Prime Beef Drive and Tanker Avenue – CB018b
- Vinyl Chloride (VC) Groundwater Contamination – CG019

This risk assessment is appended to the Remedial Investigation (RI) Report (Amec Foster Wheeler, 2019). The following documents were used as guidance for conducting the risk assessment:

- Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments (USEPA, 1997)
- Framework for Ecological Risk Assessment (USEPA, 1992)
- Guidelines for Ecological Risk Assessment (USEPA, 1998)
- The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments (BERA), ECO Update (USEPA, 2001)
- ECO Updates published between 1991 and 2008 (USEPA 1991-2008)
- Risk Assessment Guidance for Superfund (RAGS), Volume II: Environmental Evaluation Manual (USEPA, 1989)
- Wildlife Exposure Factor Handbook Volumes I and II (USEPA, 1993)

The *Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (USEPA, 1997), herein referred to as the ERAGS, provides an accepted framework for ecological risk.

The ERAGS outlines an iterative two tier approach to ecological risk assessment. The screening-level ecological risk assessment (SLERA) is the first tier. In a SLERA, site-related contaminants and complete ecological exposure pathways are identified, and screening level risk characterizations of contaminants of potential ecological concern (COPECs) are developed by

comparing detected concentrations to conservative ecological screening benchmarks. If the SLERA is inconclusive, the second tier of the risk assessment process is implemented where COPECs are evaluated in greater detail and in the context of site-specific factors as part of a Baseline Ecological Risk Assessment (BERA). If the SLERA shows that risks are negligible then no further action is required.

Thus, in accordance with the ERAGS (USEPA, 1997), this SLERA:

- Documents the environmental setting and natural communities for each AOC;
- Identifies complete exposure pathways;
- Selects COPECs using conservative exposure estimates and risk calculations; and
- Provides conclusions as detailed below.

This SLERA includes the first two of the eight steps of ecological risk assessments identified in the 1997 ERAGS. The first step is the Screening Level Problem Formulation and Screening Level Effects Evaluation (presented in Sections 2 and 3 of this SLERA). The second step is the Screening-Level Risk Characterization and Conclusions (presented in Section 4 of this SLERA). References are presented in Section 5.

This SLERA finds that risk to ecological receptors at the AOCs discussed herein is negligible and no further ecological investigation is necessary.

2.0 PROBLEM FORMULATION

The problem formulation provides the framework upon which the risk assessment is organized. For each AOC, this section:

- Identifies site location;
- Summarizes land uses and natural communities at each AOC;
- Discusses the study area data sets used in this SLERA;
- Identifies complete exposure pathways;
- Presents the Ecological Conceptual Site Model; and
- Identifies assessment and measurement endpoints.

2.1 Site Location

GMIA is located approximately five miles south of the downtown business district of the City of Milwaukee, in Milwaukee County, Wisconsin. GMIA occupies approximately 2,180 acres of land.

The existing Wisconsin ANG facility was constructed in 1962, when base expansion was necessary to accommodate growth. The 128th ARW occupies four main areas at GMIA, referred to as Guard Central, Guard West, Guard East, and Guard South (**Figure 1**). Guard Central includes the largest portion of the site, and is the location of buildings and AOCs discussed within the SLERA. Guard Central houses main administration, equipment storage and vehicle maintenance, an aircraft apron, and parking. Immediately south of Guard Central is a narrow strip of land under lease from the city of Milwaukee known as Guard South. Guard West, located approximately 0.5 miles west of Guard Central, is composed of Buildings 301, 302, and 303 and is the location of two AOCs identified in this RI Report. No AOCs are located at Guard East.

This SLERA evaluates the following AOCs, as shown on Figure 1:

Site Name	Description
RW010	Former Aircraft Washing Area
OW014	Oil Water Separator (OWS) at Guard West
TU015	Former Drain Oil Underground Storage Tank (UST) at Guard West
CB018a	Suspected Petroleum Contamination, Building 522
CB018B	Suspected Petroleum Contamination, Prime Beef Drive and Tanker Avenue
CG019	Vinyl Chloride (VC) Groundwater Contamination

2.2 Environmental Setting

This section describes historical and current land uses and natural communities at each AOC. Operational history and descriptions of each release and AOC are more fully documented in the main text of the RI Report.

2.2.1 Natural Communities

RW010 (**Figure 2**) is an approximately 48,000 sq ft area located in the northern section of Guard Central. Most of the site consists of buildings, pavement, or other impervious surfaces. Approximately 22,500 sq ft of the investigation area extends onto a grassy area to the north.

OW014 and TU015 (**Figure 3**) are located at Guard West. The sites are located below impervious surfaces (concrete apron). There is no habitat located at OW014/TU015.

CB018a (**Figure 4**) is an approximately 72,000 sq ft area located at the western perimeter of

Guard Central. Most of the site consists of buildings and paved parking. Approximately 4,000 sq ft of the investigation area extends onto a grassy area to the west.

CB018b (**Figure 6**) is an approximately 52,800 sq ft area located in the eastern section of Guard Central. Most of the site consists of paved roadway (Tanker Ave, Prime Beef Dr). Approximately 19,200 sq ft of the investigation area extend onto a grassy area to the east.

CG019 (**Figure 7**) is an approximately 167,000 sq ft area located in the middle section of Guard Central. The site extends along Prime Beef Drive. The site is mostly maintained lawns to the north and south of Prime Beef Drive.

2.2.2 Critical Habitat & Threatened/Endangered Species

According to the U.S. Fish and Wildlife Service (USFWS), the wildlife are federally endangered, threatened, proposed, and/or listed as candidate species in Milwaukee County (ECOS, 2015):

- *Red knot (Calidris canutus rufa)* – Threatened
- *Northern Long-Eared Bat (Myotis septentrionalis)* – Threatened

None of these species are expected to inhabit the AOCs.

The rufa red knot migrates annually between its breeding grounds in the Canadian Arctic and its wintering regions in the southeast US, Gulf of Mexico, and South America (USFWS, 2014). Rufa red knot occurs uncommonly during migration along coastal sandy beaches in Wisconsin from mid-May to early June in spring and from mid-July to early November in fall, and does not breed in Wisconsin (WDNR, 2019).

Northern long-ear bats are generally associated with richly forested areas where they make use of tree roosts, especially near water sources (MNDNR, 2018). As this habitat is absent from MGIA, northern long-eared bats are not expected to occur in any of the AOCs. Additionally, northern long-eared bats forage “on the fly”, and thus would have negligible contact with affected soil even if they were to forage or nest at an AOC.

2.2.3 Hydrology

During 2014 SI activities, groundwater at Guard Central was first encountered within the unconsolidated deposits at depths ranging from 2.8 to 11.0 ft bgs. Across Guard Central, depths to the first encounter of groundwater generally increased from west to east and north to south.

2.3 Data Used in the SLERA

This SLERA evaluates data collected in August 2014 and August/September 2016 from the 0-2 foot interval. The 0-2 foot interval is considered the zone of biological activity (USEPA, 2015). The SLERA considers data only from undeveloped locations that include potential habitat. Samples collected from underneath pavement, buildings, or maintained lawns were excluded because those features are not considered habitat.

Samples were analyzed for Volatile Organic Compounds (VOCs), Semi Volatile Organic Compounds (SVOCs) including polynuclear aromatic hydrocarbons (PAHs) as shown:

- VOCs - CB018a, CG019,
- SVOCs including PAHs - RW010, OW014/TU015,
- Low Level PAHs only - CB018a, CB018b, CG019

Soil data quality was reviewed in accordance with the *Final Quality Assurance Project Plan (QAPP), Great Lakes Region Remedial Investigation/Feasibility Studies*; the analytical methods referenced by RTI Labs; and Amec Foster Wheeler data review procedures. The data quality review included a review of RTI Laboratories data packages to assess chain-of-custody compliance; holding time compliance; initial and continuing calibrations; presence or absence of laboratory contamination as demonstrated by method blanks; laboratory control samples (LCS), and matrix spike (MS) samples; analytical precision as the relative percent difference of analyte concentration between replicate samples (i.e., laboratory and field duplicates) or MS and MS duplicates. This data quality review did not include validation of the raw analytical data. Based on data validation, data from all sites exceeded the QAPP-specified minimum completeness goal of 90% and should be considered valid.

2.4 Complete Exposure Pathways

As explained in **Section 2.2.1**, OW014/TU015 each consist of paved areas, buildings or small, maintained lawns. As a result, there are no complete exposure pathways in those AOCs.

Exposure pathways are potentially complete for RW010, CB018a, and CB018b. Site-related chemicals were detected in the 0-2 foot soil interval at these AOCs, and these AOCs contain undeveloped grassy areas. Though wildlife in these grassy areas may be limited by proximity to the flight line, aprons, or personal vehicle parking areas, and by the presence of chain link fences,

they are connected to larger potential habitats and so were retained for screening so as to not overlook potentially significant exposures.

Exposure pathways are not complete for CG019. No chemicals were detected in either of the two samples (CG019-SB-03, 1-2 ft; SB-08, 1-3 ft) located in potential habitat (undeveloped grassy areas that are not maintained) and collected in the 0-2 foot soil interval.

As explained in **Section 2.3**, the groundwater occurs deeper than 2 ft bgs and thus is below the zone of biological activity. The groundwater exposure pathway is incomplete pathway and not further assessed.

2.5 Ecological Conceptual Site Model

The ecological conceptual site model for RW010 (**Figure 8**), OW014 /TU015 (**Figure 9**), CB018a & CB018b (**Figure 10**), and CG019 (**Figure 11**) illustrates screening level estimates of contaminant fate and transport mechanisms, complete exposure pathways, and receptors. Specific assessment and measurement endpoints are not identified because generic endpoints were used (as discussed in **Section 2.6**). The ecological conceptual site model is based on the current understanding of Site conditions, and serves as a framework for evaluating ecological exposure and risk.

The ecological conceptual site model for each AOC describes:

- The source areas - historical releases;
- Transport mechanisms - processes that partition chemicals among various environmental media;
- Exposure to media - those environmental media from which organisms may be exposed to site-related chemicals; and
- Receptors – potential ecological receptor organisms.

2.6 Assessment and Measurement Endpoints

Endpoints in the SLERA define ecological attributes that are to be protected (assessment endpoints) and a measurable characteristic of those attributes (measurement endpoints) that can be used to gauge the degree of impact that has occurred or may occur.

Assessment endpoints for the SLERA are generic assessment endpoints associated with screening ecotoxicity endpoints. The endpoints are considered generic because they are based on a variety of organisms and are therefore considered to be representative of entire communities.

The assessment and measurement endpoints for the complete exposure pathways shown in **Figure 8** through **Figure 11** are presented below:

Assessment Endpoint	Measurement Endpoints
1. Sustainability (survival, growth, reproduction) of local communities of terrestrial plants and terrestrial invertebrates and populations of birds and mammals exposed to soil at each exposure area.	a. Compare maximum soil analyte concentrations to soil screening benchmarks.

3.0 SCREENING LEVEL EFFECTS EVALUATION

For this SLERA, ecotoxicological screening benchmarks were obtained from:

- USEPA Region 5 Ecological Screening Levels (USEPA, 2003).

Maximum detected analyte concentrations in surface soil from the 0-2 ft interval in each AOC (**Section 2.3**) were selected as screening level exposure point concentrations (EPCs). Maximum detected concentrations were compared to the screening benchmarks identified in **Table 1**. For analytes with a maximum detected concentration greater than their respective screening benchmarks, hazard quotients (HQs) were calculated as follows:

$$HQ_{MAX} = \frac{\text{Maximum Concentration}}{\text{Benchmark Value}} \quad (\text{Equation 1})$$

An $HQ_{MAX} \leq 1$ indicates that the chemical constituent alone is unlikely to cause adverse ecological effects and can be eliminated from further review.

The screening level risk calculations for RW010, CB018a, and CB018b are presented in **Table 2**, **Table 3**, and **Table 4** respectively, along with sample identification, interval, and results. All detected analytes were below corresponding ecological soil screening benchmarks in all three exposure areas. Risks from benzo(e)pyrene and 1-methylpnapthylene could not be evaluated because they lacked ecological soil screening benchmarks.

Screening level risk calculations were not performed for OW014, TU015, and CG019 because ecological exposure pathways at those AOCs are incomplete.

4.0 SCREENING LEVEL RISK CHARACTERIZATION AND CONCLUSIONS

This SLERA concludes that risk to ecological receptors at OW014, TU015, and CG019 is negligible because exposure pathways are incomplete due to lack of habitat (OW014 and TU015), or absence of chemicals associated with historical releases (CG019).

Risk to ecological receptors at RW010, CB018a, CB018b, and CG-019 is negligible because maximum detected concentrations of soil contaminants in the zone of biological activity (0-2 foot interval) are below conservative ecological benchmarks. No further ecological investigation is necessary.

5.0 REFERENCES

- Amec Foster Wheeler. 2019. *Final Remedial Investigation/Feasibility Studies Work Plan, Great Lakes Region General Mitchell International Airport*. Milwaukee, Wisconsin.
- ECOS (Environmental Conservation Online System). 2015. United States Fish & Wildlife Service species reports by County. <http://ecos.fws.gov>
- MNDNR. 2018. Rare Species Guide. Available at <http://www.dnr.state.mn.us/nr/index.html>.
- United States Environmental Protection Agency (USEPA). 2015. Determination of the Biologically Relevant Sampling Depth for Terrestrial and Aquatic Ecological Risk Assessments. EPA 600-R-15-176. October.
- USEPA. 1991-2008. ECO Updates. USEPA Office of Solid Waste and Emergency Response. Various publications, 1991-2008. USEPA. 2003. Region 5, RCRA Ecological Screening Levels. August 22.
- USEPA. 2003. Region 5 RCRA Ecological Screening Levels. August 22.
- USEPA. 2001. The Role of Screening-Level Risk Assessments and Refining Contaminants of Concern in Baseline Ecological Risk Assessments. ECO Update. Office of Solid Waste and Emergency Response. Publication 9345.0-14. EPA 540/F-01/014. June.
- USEPA. 1998. Guidelines for Ecological Risk Assessment. Office of Research and Development. EPA-630-R-95-002F. April.
- USEPA. 1997. Ecological Risk Assessment Guidance for Superfund: Process for Designing and Conducting Ecological Risk Assessments. EPA 540-R-97-006. June.
- USEPA. 1993. Wildlife Exposure Factors Handbook. EPA/600/R-93/187. December, 1993.
- USEPA. 1992. Framework for Ecological Risk Assessment. EPA-630-R-92-001. February.
- USEPA. 1989. Risk Assessment Guidance for Superfund (RAGS) Volume II: Environmental Evaluation Manual. EPA 540-1-89-001.
- USFWS (United States Fish & Wildlife Service). 2014. Rufa Red Knot Background Information and Threats Assessment, Supplement to Endangered and Threatened Wildlife and Plants; Final Threatened Status for the Rufa Red Knot (*Calidris canutus rufa*), Docket No. FWS-R5-ES-2013-0097; RIN AY17. November.

WDNR (Wisconsin Department of Natural Resources). 2019. Wisconsin's Endangered Resources. Available at <https://dnr.wi.gov/topic/EndangeredResources/>.

TABLES

**Table 1. Ecological Screening Benchmarks - Soil
General Mitchell International Airport, 128th Air Refueling Wing
Milwaukee, WI**

Cas. No.	Parameter [a]	Benchmark (ug/kg)	Source
Volatile Organic Compounds			
67-64-1	Acetone	2,500	Reg V
75-09-2	Methylene Chloride	4,050	Reg V
Semi-Volatile Organic compounds			
90-12-0	1-Methylnaphthalene	--	--
91-57-6	2-Methylnaphthalene	3,240	Reg V
208-96-8	Acenaphthylene	682,000	Reg V
83-32-9	Acenaphthene	682,000	Reg V
120-12-7	Anthracene	1,480,000	Reg V
56-55-3	Benzo(a)anthracene	5,210	Reg V
50-32-8	Benzo(a)pyrene	1,520	Reg V
205-99-2	Benzo(b)fluoranthene	59,800	Reg V
192-97-2	Benzo(e)pyrene	--	--
191-24-2	Benzo(g,h,i)perylene	119,000	Reg V
207-08-9	Benzo(k)fluoranthene	148,000	Reg V
218-01-9	Chrysene	4,730	Reg V
53-70-3	Dibenzo(a,h)anthracene	18,400	Reg V
206-44-0	Fluoranthene	122,000	Reg V
86-73-7	Fluorene	122,000	Reg V
193-39-5	Indeno(1,2,3-cd)pyrene	109,000	Reg V
91-20-3	Naphthalene	99	Reg V
85-01-8	Phenanthrene	45,700	Reg V
129-00-0	Pyrene	78,500	Reg V

Created by: AMR 1/6/2017

Checked by: SAM 1/10/2017

Notes:

[a] Benchmarks are shown only for parameters detected in samples collected from potential habitat in the 0-2 foot soil interval.

Reg V - USEPA. 2003. Region V Ecological Screening Levels. August 22.

Table 2. Soil Benchmark Comparison - RW010
General Mitchell International Airport, 128th Air Refueling Wing
Milwaukee, WI

Parameter [a]	Maximum Detection	Soil Screening Benchmark	COPC? [b]	Reason [c]	Hazard Quotient	RW010-SB-13 09/08/2016 0-2	RW010-SB-14 09/08/2016 0-2
Semivolatile Organic Compounds (ug/kg)							
1-Methylnaphthalene	7.6	--	--			1 U	7.6
2-Methylnaphthalene	2.3	3,240	No	BSL	<1	1 U	2.3 J
Anthracene	9.4	1,480,000	No	BSL	<1	9.4	1 U
Benzo(a)anthracene	55	5,210	No	BSL	<1	55	18
Benzo(a)pyrene	65	1,520	No	BSL	<1	65	17
Benzo(b)fluoranthene	93	59,800	No	BSL	<1	93	2 U
Benzo(e)pyrene	66	--	--	--		66	18
Benzo(g,h,i)perylene	60	119,000	No	BSL	<1	60	2.2 U
Benzo(k)fluoranthene	32	148,000	No	BSL	<1	32	2.2 U
Chrysene	68	4,730	No	BSL	<1	68	24
Dibenz(a,h)anthracene	16	18,400	No	BSL	<1	16	1.5 U
Fluoranthene	99	122,000	No	BSL	<1	99	1 U
Indeno(1,2,3-cd)pyrene	43	109,000	No	BSL	<1	43	1.5 U
Phenanthrene	33	45,700	No	BSL	<1	33	1 U
Pyrene	90	78,500	No	BSL	<1	90	36

Created by: AMR 1/6/2017
Checked by: SAM 1/10/2017

Notes:

- [a] Only parameters detected in samples collected from the top 2 feet and located in potential habitat are shown.
- [b] A parameter is identified as a contaminant of potential concern (COPC) if the maximum detected concentration > soil screening benchmark.
- [c] BSL - below screening level.

- Not applicable
- J - estimated concentration
- U - parameter not detected at the indicated reporting limit.
- ug/kg - micrograms per kilogram

Table 3. Soil Benchmark Comparison - CB018a
General Mitchell International Airport, 128th Air Refueling Wing
Milwaukee, WI

Parameter [a]	Maximum Detection	Soil Screening Benchmark	COPC? [b]	Reason [c]	Hazard Quotient	CB018A-SB-08 8/31/16 0-2	CB018A-SB-09 8/31/16 0-2	CB018A-SB-10 8/31/16 0-2	CB018A-SB-11 8/31/16 0-2	CB018A-SB-12 8/31/16 0-2	CB018A-SB-12A 9/14/2016 0-2	CB018A-SB-12B 9/22/2016 0-1.5
Volatile Organic Compounds (ug/kg)												
Acetone	120	2,500	No	BSL	<1	180 U	250 U	450 U	290 U	250 U	120 J	210 U
Methylene Chloride	130	4,050	No	BSL	<1	90 U	130 J	220 U	140 U	130 U	110 U	100 U
Semi-Volatile Organic Compounds (ug/kg)												
1-Methylnaphthalene	5.9	--	--	BSL	<1	5.9 J	2 J	4.8 J	4.8 J	4.6 J	90 U	5.7 U
2-Methylnaphthalene	6	3,240	No	BSL	<1	5.9 J	630 U	4.8 J	6.4 J	4.6 J	90 U	4.9 J
Acenaphthene	21	682,000	No	BSL	<1	21	2.4 J	6 U	6 U	6 U	90 U	21
Acenaphthylene	30	682,000	No	BSL	<1	21	4.9 J	7.1 J	7.2 J	5.1 J	90 U	30
Anthracene	140	1,480,000	No	BSL	<1	81	9.3	12	8 J	6 U	30 J	140
Benzo(a)anthracene	670	5,210	No	BSL	<1	330	63	69	51	6 U	250	670
Benzo(a)pyrene	670	1,520	No	BSL	<1	360	74	84	62	53	220	670
Benzo(b)fluoranthene	1,000	59,800	No	BSL	<1	460	99	130	90	64	280	1,000
Benzo(e)pyrene	540	--	--	BSL	<1	260	55	71	52	44	220	540
Benzo(g,h,i)perylene	230	119,000	No	BSL	<1	180	36	39	28	6 U	230	230
Benzo(k)fluoranthene	380	148,000	No	BSL	<1	180	33	57	48	40	130	380
Chrysene	660	4,730	No	BSL	<1	350	74	97	64	55	170	660
Dibenz(a,h)anthracene	70	18,400	No	BSL	<1	52	11	14	6 U	6 U	90 U	70
Fluoranthene	1,200	122,000	No	BSL	<1	650	130	140	110	96	400	1,200
Fluorene	27	122,000	No	BSL	<1	27	3.2 J	6 U	4 J	2.9 J	90 U	27
Indeno(1,2,3-cd)pyrene	220	109,000	No	BSL	<1	170	34	41	28	6 U	160	220
Phenanthrene	470	45,700	No	BSL	<1	290	9.7	61	45	37	140	470
Pyrene	1,200	78,500	No	BSL	<1	550	6 U	120	89	78	330	1,200

Created by: AMR 1/6/2017
Checked by: SAM 1/10/2017

Notes:

- [a] Only parameters detected in samples collected from the top 2 feet and located in potential habitat are shown.
- [b] A parameter is identified as a contaminant of potential concern (COPC) if the maximum detected concentration > soil screening benchmark
- [c] High Molecular Weight (HWM) PAHs are the sum of concentrations of PAHs with 4 or more rings, evaluated on a sample by sample basis.

-- Not applicable
J - estimated concentration
U - parameter not detected at the indicated reporting limit.
ug/kg - micrograms per kilogram

Table 4. Soil Benchmark Comparison - CB018b
General Mitchell International Airport, 128th Air Refueling Wing
Milwaukee, WI

Parameter [a]	Maximum Detection	Soil Screening Benchmark	COPC? [b]	Reason [c]	Hazard Quotient	CB018B-SB-06 09/07/2016 0-2	CB018B-SB-06 (Dup) 09/07/2016 0-2	SB09-(1.5-3.5) 09/08/2016 1.5-3.5
Semivolatile Organic Compounds (ug/kg)								
1-Methylnaphthalene	6.9	--	--	--	--	6.7 J	2.4 J	6.9 J
2-Methylnaphthalene	16	3,240	No	BSL	<1	11	4 J	16
Acenaphthylene	7.3	682,000	No	BSL	<1	4.3 J	4 J	7.3 J
Acenaphthene	4.4	682,000	No	BSL	<1	3.9 J	4.4 J	3.7 J
Anthracene	62	1,480,000	No	BSL	<1	62	15	20
Benzo(a)anthracene	77	5,210	No	BSL	<1	77	74	65
Benzo(a)pyrene	82	1,520	No	BSL	<1	80	82	78
Benzo(b)fluoranthene	160	59,800	No	BSL	<1	110	120	160
Benzo(e)pyrene	80	--	--	--	--	64	66	80
Benzo(g,h,i)perylene	41	119,000	No	BSL	<1	41	6 U	40
Benzo(k)fluoranthene	50	148,000	No	BSL	<1	48	50	44
Chrysene	84	4,730	No	BSL	<1	82	81	84
Dibenz(a,h)anthracene	13	18,400	No	BSL	<1	12	6 U	13
Fluoranthene	160	122,000	No	BSL	<1	150	160	130
Fluorene	4.8	122,000	No	BSL	<1	5.9 U	4.8 J	4.5 J
Indeno(1,2,3-cd)pyrene	43	109,000	No	BSL	<1	40	35	43
Naphthalene	22	99	No	BSL	<1	10	5.6 J	22
Phenanthrene	84	45,700	No	BSL	<1	64	72	84
Pyrene	140	78,500	No	BSL	<1	5.9 U	140	120

Created by: AMR 1/6/2017
Checked by: SAM 1/10/2017

Notes:

[a] Only parameters detected in samples collected from the top 2 feet and located in potential habitat are shown.

[b] A parameter is identified as a contaminant of potential concern (COPC) if the maximum detected concentration > soil screening benchmark

[c] BSL - below screening level.

-- Not applicable

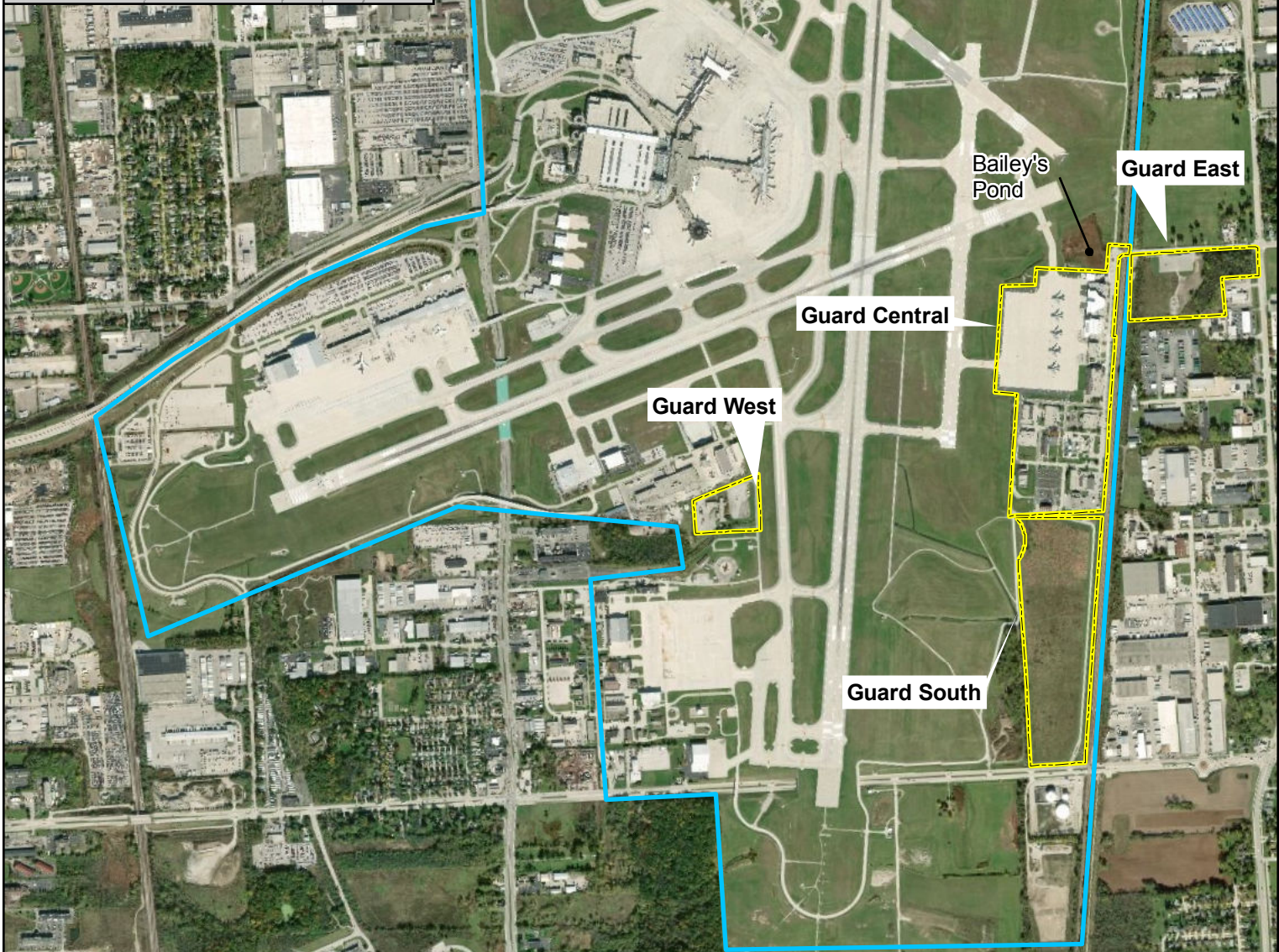
J - estimated concentration

U - parameter not detected at the indicated reporting limit.

ug/kg - micrograms per kilogram



FIGURES

General Mitchell International Airport



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User

Legend

-  Approximate General Mitchell International Airport Boundary
-  Guard Boundaries

0 750 1,500 3,000 Feet





FIGURE 1:
Site Location Map
Wisconsin Air National Guard Base
General Mitchell International Airport
Milwaukee, Wisconsin


Client:  **Air National Guard**


Amec Foster Wheeler Environment & Infrastructure Inc.
 46850 Magellan Drive, Ste. 190
 Novi, Michigan 48377
 (248) 926-4008


PROJ: 291330002 Date: January 2019



Legend


 Approximate General Mitchell International Airport Boundary

 Guard Boundaries

 Area of Concern

0 375 750 1,500 Feet

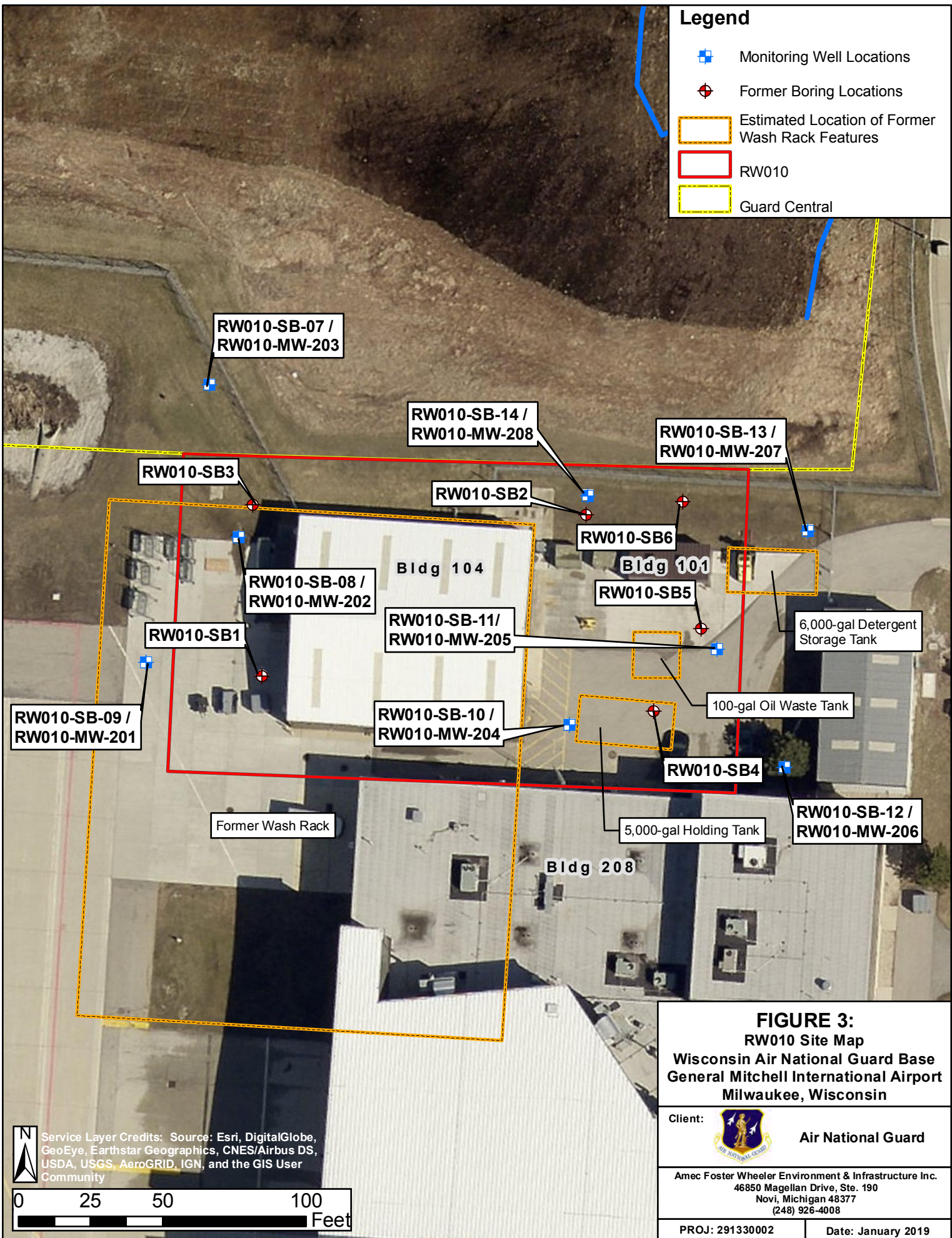
FIGURE 2:
AOC Location Map
Wisconsin Air National Guard Base
General Mitchell International Airport
Milwaukee, Wisconsin

Client:  **Air National Guard**

Amec Foster Wheeler Environment & Infrastructure Inc.
 46850 Magellan Drive, Ste. 190
 Novi, Michigan 48377
 (248) 926-4008

PROJ: 291330002 Date: January 2019

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Legend

- Monitoring Well Locations
- Former Boring Locations
- Estimated Location of Former Wash Rack Features
- RW010
- Guard Central

RW010-SB-07 /
RW010-MW-203

RW010-SB-14 /
RW010-MW-208

RW010-SB-13 /
RW010-MW-207

RW010-SB3

RW010-SB2

RW010-SB6

Bldg 104

Bldg 101

RW010-SB-08 /
RW010-MW-202

RW010-SB5

6,000-gal Detergent
Storage Tank

RW010-SB1

RW010-SB-11 /
RW010-MW-205

100-gal Oil Waste Tank

RW010-SB-09 /
RW010-MW-201

RW010-SB-10 /
RW010-MW-204

RW010-SB4

RW010-SB-12 /
RW010-MW-206

Former Wash Rack

5,000-gal Holding Tank

Bldg 208

FIGURE 3:

RW010 Site Map

**Wisconsin Air National Guard Base
General Mitchell International Airport
Milwaukee, Wisconsin**

Client:



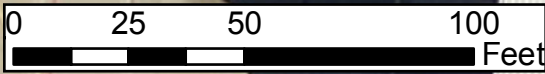
Air National Guard

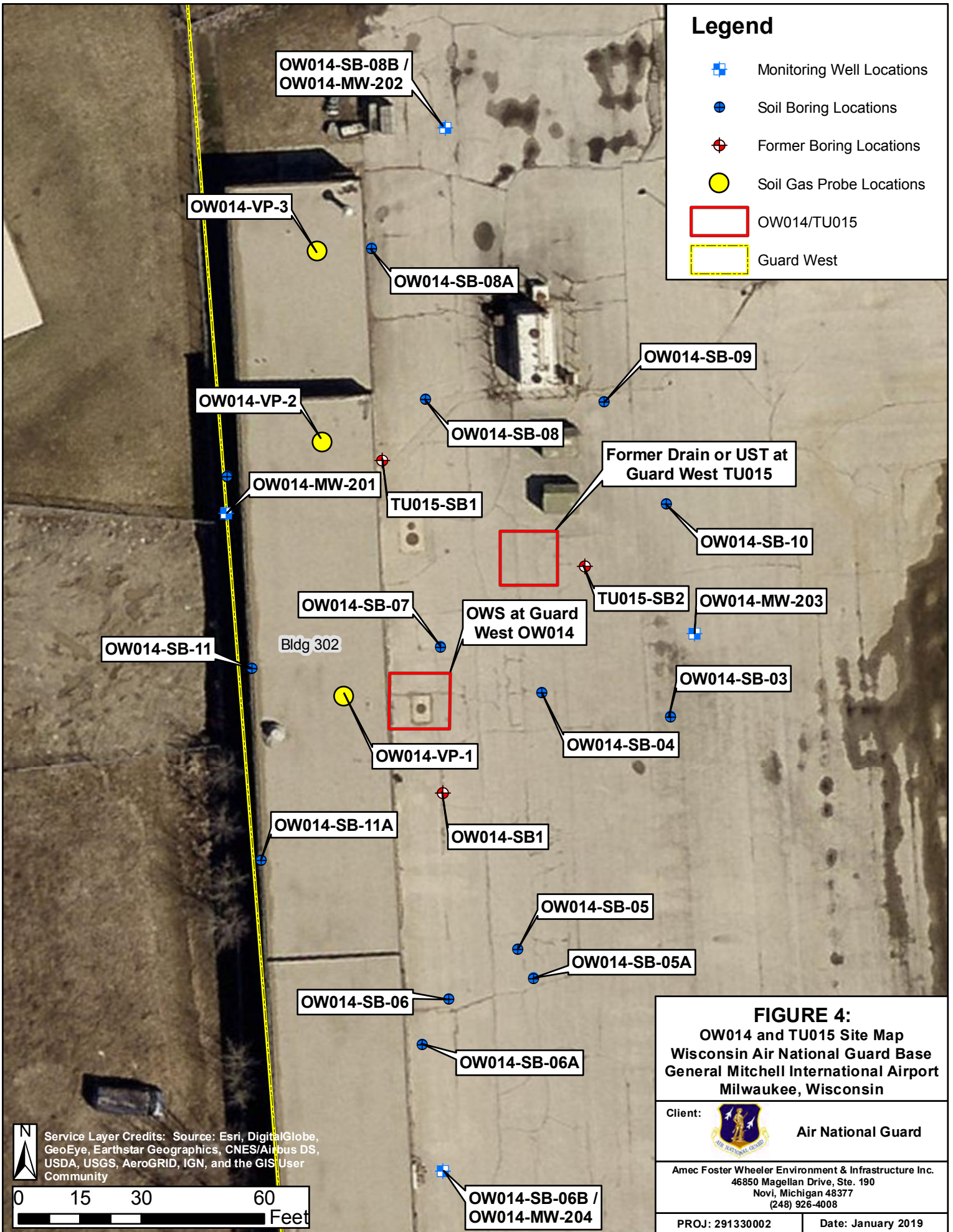
Amec Foster Wheeler Environment & Infrastructure Inc.
46850 Magellan Drive, Ste. 190
Novi, Michigan 48377
(248) 926-4008

PROJ: 291330002

Date: January 2019

Service Layer Credits: Source: Esri, DigitalGlobe,
GeoEye, Earthstar Geographics, CNES/Airbus DS,
USDA, USGS, AeroGRID, IGN, and the GIS User
Community





Legend








-  Monitoring Well Locations
-  Soil Boring Locations
-  Former Boring Locations
-  Soil Gas Probe Locations
-  OW014/TU015
-  Guard West

FIGURE 4:

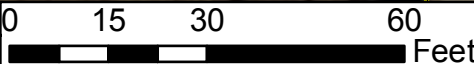
OW014 and TU015 Site Map
 Wisconsin Air National Guard Base
 General Mitchell International Airport
 Milwaukee, Wisconsin

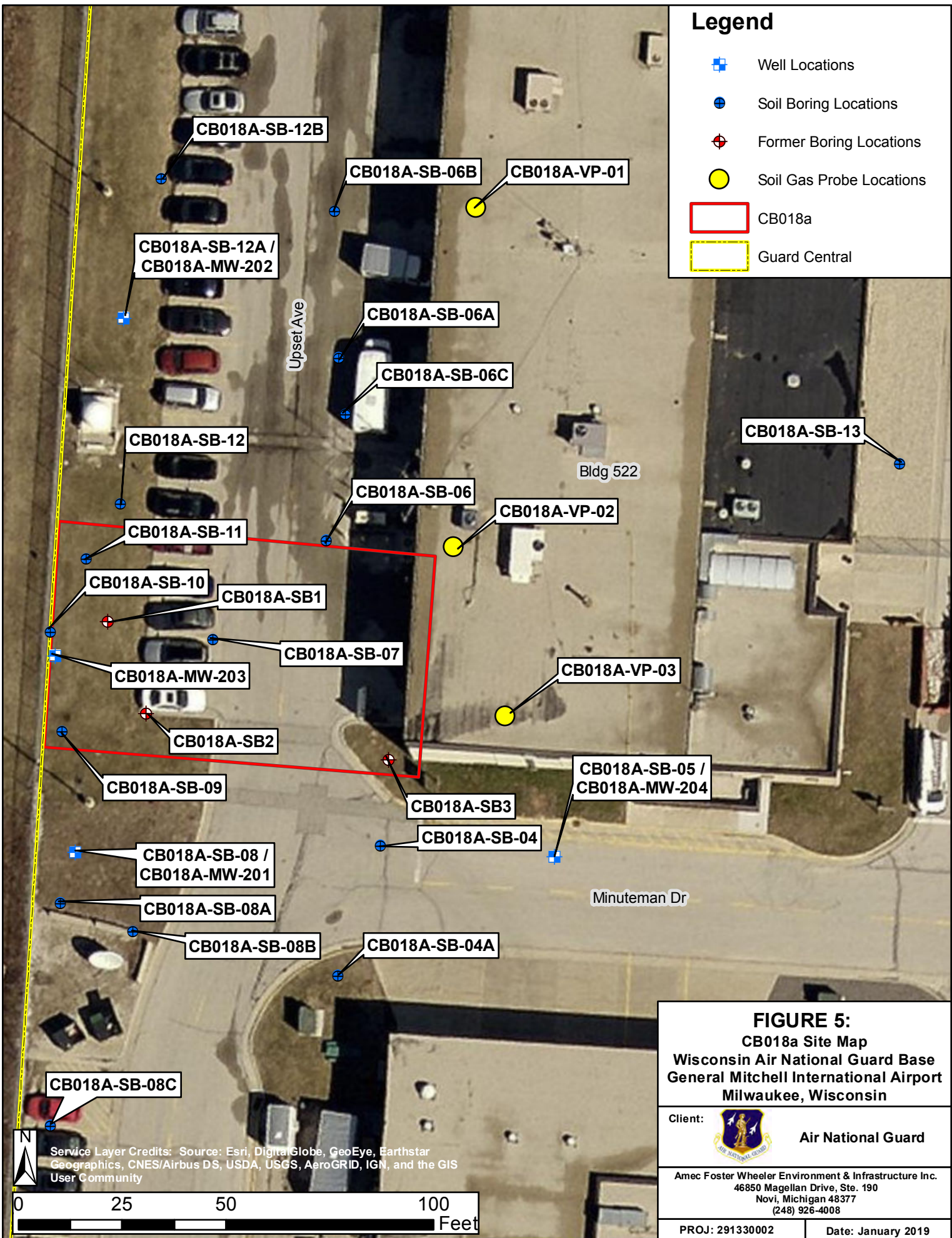
Client:  **Air National Guard**

Amec Foster Wheeler Environment & Infrastructure Inc.
 46850 Magellan Drive, Ste. 190
 Novi, Michigan 48377
 (248) 926-4008

PROJ: 291330002 Date: January 2019

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





Legend

- Well Locations
- ⊕ Soil Boring Locations
- ⊕ Former Boring Locations
- Soil Gas Probe Locations
- CB018a
- Guard Central

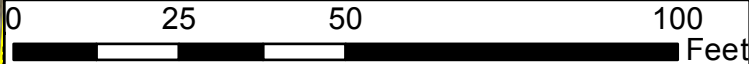
FIGURE 5:
CB018a Site Map
 Wisconsin Air National Guard Base
 General Mitchell International Airport
 Milwaukee, Wisconsin

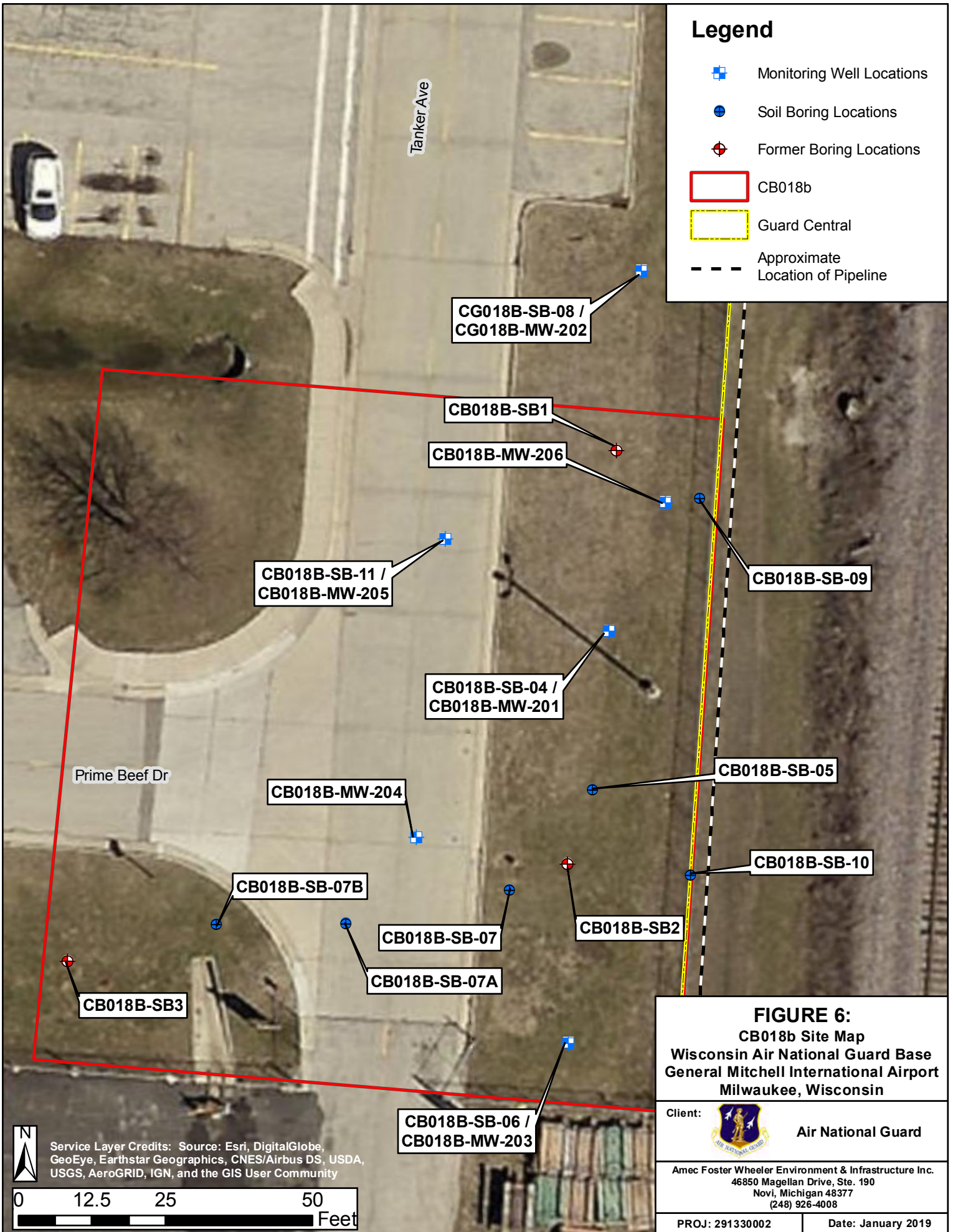
Client: **Air National Guard**

Amec Foster Wheeler Environment & Infrastructure Inc.
 46850 Magellan Drive, Ste. 190
 Novi, Michigan 48377
 (248) 926-4008

PROJ: 291330002 Date: January 2019

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar
 Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS
 User Community





Legend

- Monitoring Well Locations
- Soil Boring Locations
- ⊕ Former Boring Locations
- CB018b
- Guard Central
- Approximate Location of Pipeline

CG018B-SB-08 /
CG018B-MW-202

CB018B-SB1

CB018B-MW-206

CB018B-SB-11 /
CB018B-MW-205

CB018B-SB-04 /
CB018B-MW-201

CB018B-SB-09

Prime Beef Dr

CB018B-MW-204

CB018B-SB-05

CB018B-SB-10

CB018B-SB-07B

CB018B-SB-07

CB018B-SB2

CB018B-SB3

CB018B-SB-07A

CB018B-SB-06 /
CB018B-MW-203

FIGURE 6:
CB018b Site Map
Wisconsin Air National Guard Base
General Mitchell International Airport
Milwaukee, Wisconsin

Client: **Air National Guard**

Amec Foster Wheeler Environment & Infrastructure Inc.
46850 Magellan Drive, Ste. 190
Novi, Michigan 48377
(248) 926-4008

PROJ: 291330002 Date: January 2019

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

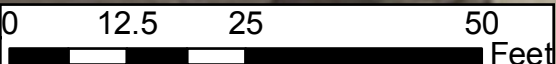
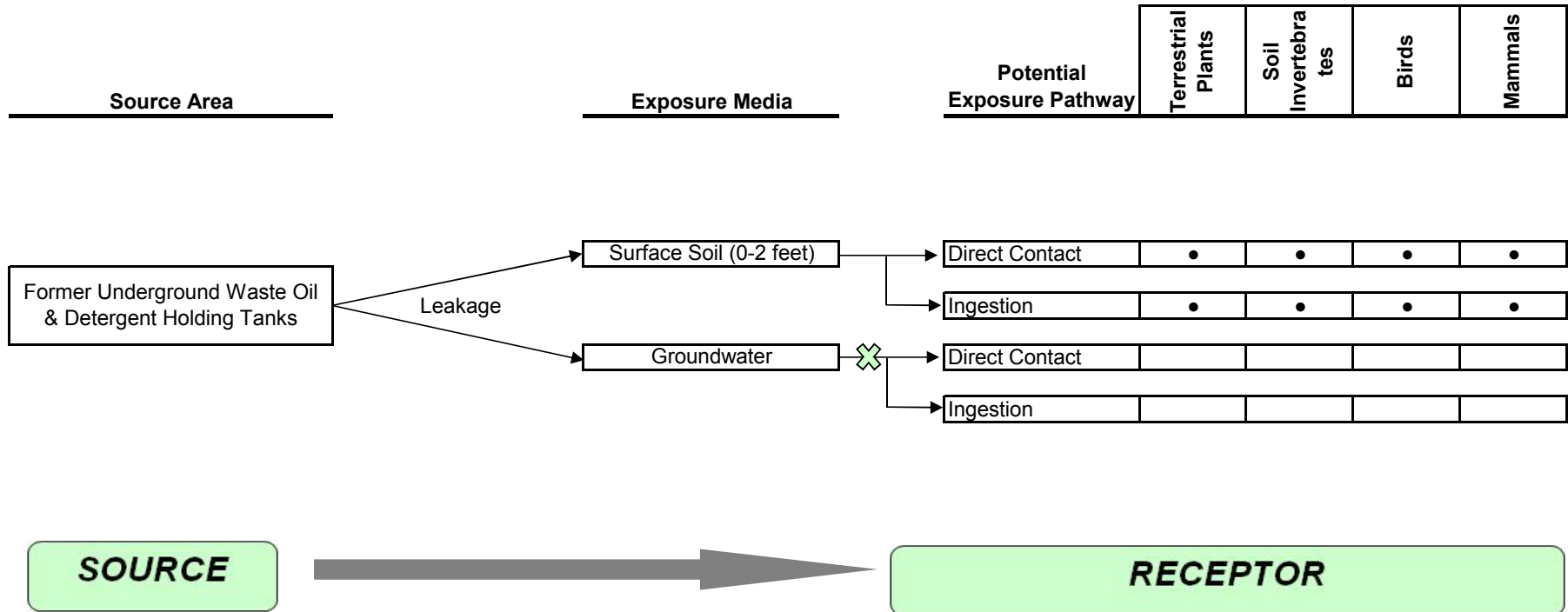




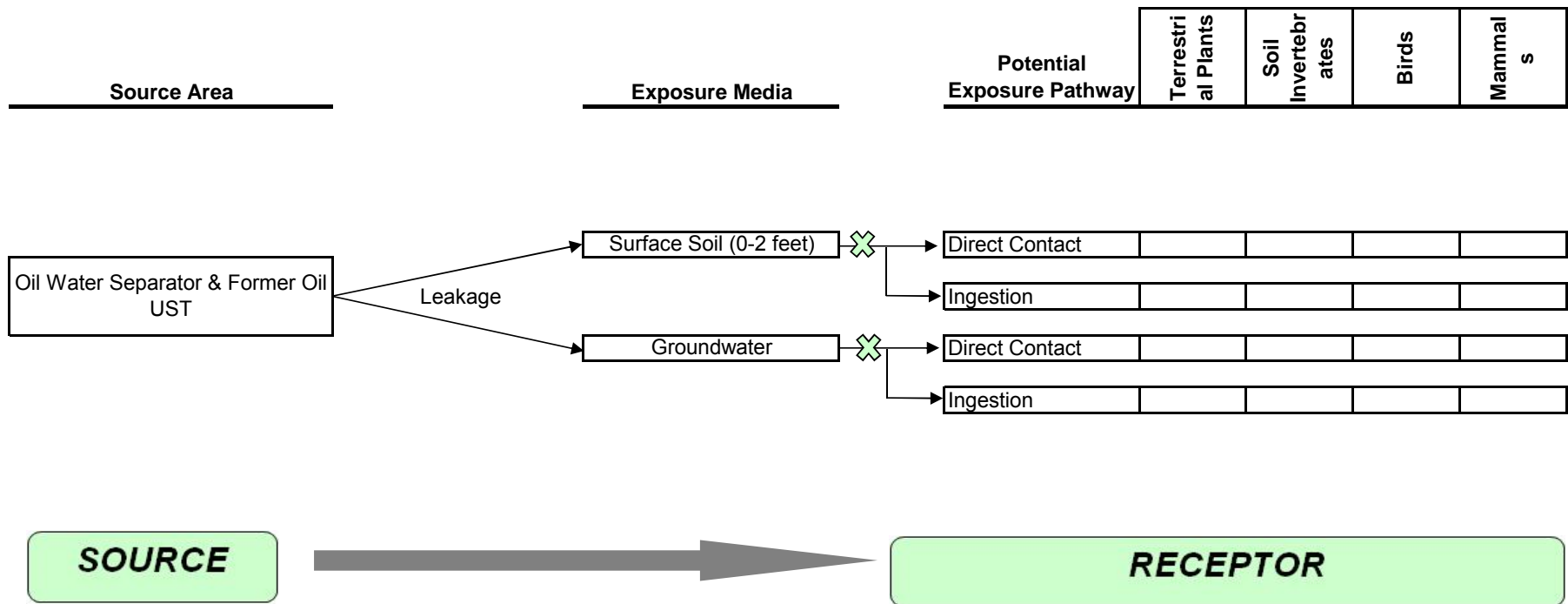
Figure 8.
RW010 - Ecological Conceptual Site Model
General Mitchel International Airport, 128th Air Refueling Wing
Milwaukee, WI



Notes:

- - Indicates a potentially complete exposure pathway.
- ✘ - Exposure of ecological receptors to groundwater is not a complete pathway.
- A blank cell indicates that a pathway is not applicable for the corresponding receptor.

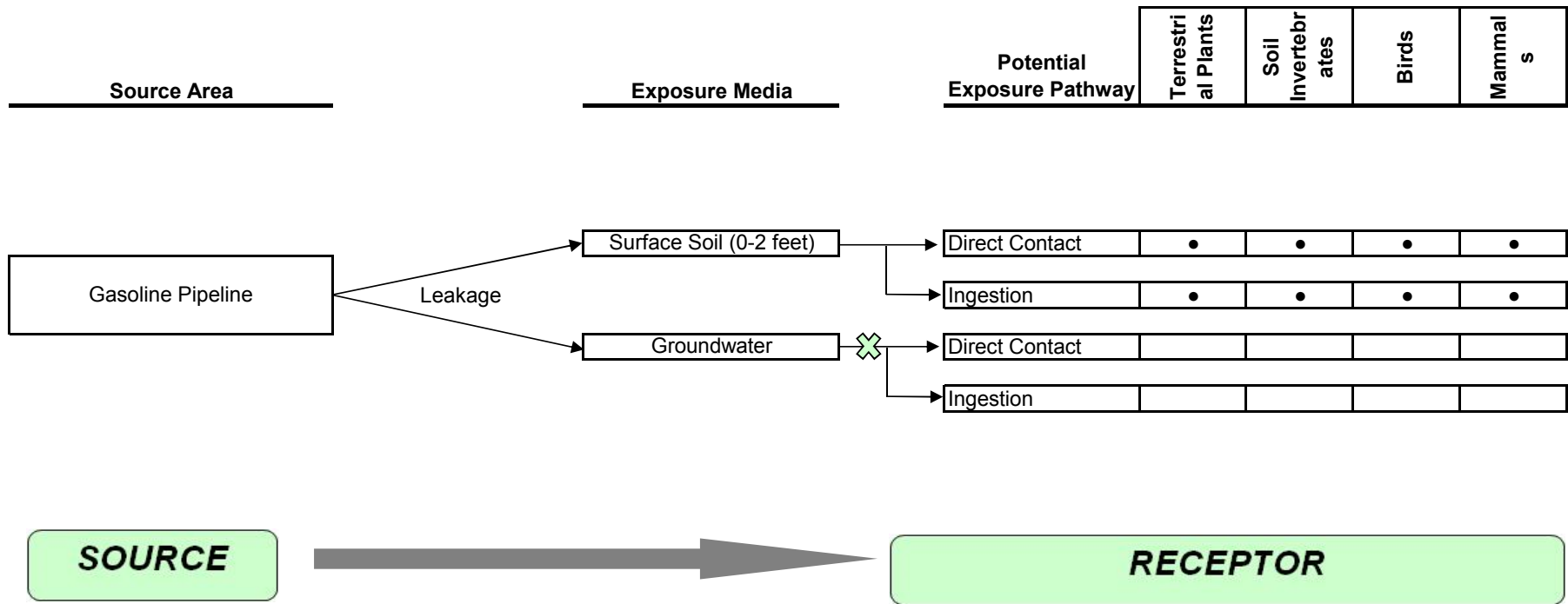
Figure 9.
OW014 and TU015 - Ecological Conceptual Site Model
General Mitchel International Airport, 128th Air Refueling Wing
Milwaukee, WI



Notes:

- - Indicates a potentially complete exposure pathway.
 - ✘ - Exposure of ecological receptors to groundwater is not a complete pathway.
- A blank cell indicates that a pathway is not applicable for the corresponding receptor.

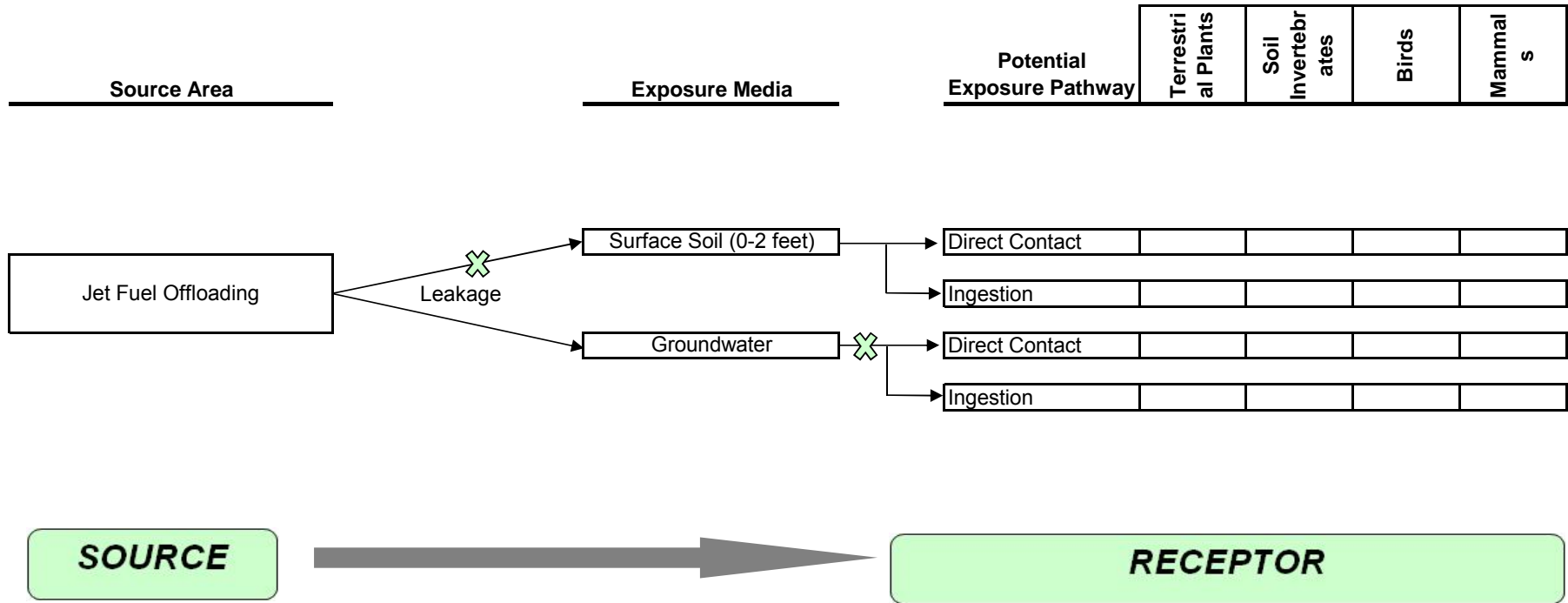
Figure 10.
OCB018a and CB018b - Ecological Conceptual Site Model
General Mitchel International Airport, 128th Air Refueling Wing
Milwaukee, WI



Notes:

- - Indicates a potentially complete exposure pathway.
- ✘ - Exposure of ecological receptors to groundwater is not a complete pathway.
- A blank cell indicates that a pathway is not applicable for the corresponding receptor.

Figure 11.
CG019 - Ecological Conceptual Site Model
General Mitchel International Airport, 128th Air Refueling Wing
Milwaukee, WI



Notes:

- - Indicates a potentially complete exposure pathway.
- ✘ - Exposure of ecological receptors to soil and groundwater is not a complete pathway.
- A blank cell indicates that a pathway is not applicable for the corresponding receptor.

APPENDIX B

WDNR APPROVAL LETTER



November 30, 2018

Mr. Keith Freihofer
ANG/A7OR
3500 Fetchet Avenue
Andrews AFB, MD 20762-5157

Subject: Review of *Draft-Final Remedial Investigation Report*
128th Air Refueling Wing, General Mitchell International Airport, Milwaukee, WI
BRRTS #: 02-41-579106, 02-41-579107, 02-41-579108, 02-41-579109, 02-41-579110
FID #: 241496970

Dear Mr. Freihofer:

On October 6, 2018, the Wisconsin Department of Natural Resources (DNR) received a revised version of the *Draft-Final Remedial Investigation Report (Redline Report)*, prepared on your behalf by your consultant, Wood (formerly Amec Foster Wheeler). Review of the Redline Report and response from the DNR was requested.

Background

The 128th Air Refueling Wing (ARW) is located at the Air National Guard (ANG) base at General Mitchell International Airport (GMIA). The 128th ARW was organized at General Mitchell Field between 1946 and 1948, and began its air refueling mission in the early 1960s. The ARW continues to operate at GMIA, providing fuel to U.S. military and allied aircraft, aero-medical evacuation, and the lift personnel and equipment to strategic locations.

Previous releases at the 128th ARW have been reported to the DNR. Previous and current investigations include, but are not limited to, the 1968 Westshore Pipeline release, during which approximately 600,000 gallons of gasoline were spilled, a jet fuel release from the aboveground receipt headers and associated underground piping at Building 610, known as the legacy spill, and a secondary release of jet fuel from an emergency vent located on the roof of Building 606.

Report Summary

The Redline Report identifies six Areas of Concern (AOCs) at the ANG base at GMIA. The objective of the Redline Report was to fully delineate the nature and extent of site-specific contaminants in soil and groundwater through investigative activities. Each AOC was investigated via soil and groundwater sampling, with two AOCs also being investigated for possible vapor intrusion via sub-slab sampling. Each AOC is described in the review section.

The Redline Report was reviewed for compliance with Wis. Admin. Code ch. NR 716, which explains the requirements for site investigations and site investigation reports. The DNR provides the following general comments:

- The DNR understands that the Final Remedial Investigation Report will include certification by a certified professional hydrogeologist, as required in Wis. Admin. Code § NR 712.07, in addition to a

certification by a professional engineer. Subsequent reports should be certified by the appropriate professional(s), as indicated in Wis. Admin Code § NR 712.07

- The DNR understands that subsequent reports will contain isoconcentration maps and cross sections for each applicable AOC. These figures must illustrate the horizontal and vertical extent of soil and groundwater contamination with concentration lines interpreted between sampling points.
- In subsequent reports, applicable tables and figures, including the isoconcentration maps and cross sections, should be comprehensive, including all relevant data from previous investigations and/or sampling events.
- The DNR understands that in subsequent reports soil concentrations will be compared to Wisconsin's three generic Residual Contaminant Levels (RCLs): groundwater protection pathway, non-industrial direct contact, and industrial direct contact. When comparing soil results, use the newest DNR RCLs, dated June 2018. Additionally, the data on the soil contamination figures should be reflective of the soil data tables in this manner.

The DNR also provides the following comments related to the specific AOCs:

Former Aircraft Washing Area (RW010) – BRRTS #: 02-41-579110

This AOC is the location of the former aircraft washing rack, where aircraft were historically cleaned using the underground detergent, waste oil, and holding tanks. The detergent tank was removed in the 1990s. Decommissioning or removal records for the waste oil and holding tanks have not been located. This AOC is currently used for miscellaneous storage and maintenance. The Redline Report identified groundwater concentrations of Bis(2-ethylhexyl) phthalate (DEHP) exceeding the Wis. Admin. Code ch. NR 140 Preventive Action Limit (PAL) in the first of two sampling rounds from several AOC permanent monitoring wells.

- The DNR understands that no further action is being recommended for this AOC. For the subsequent Decision Document, provide justification for the determination, including discussion regarding DEHP being flagged as a lab contaminant and not being related to site activities, former or current.

Oil-Water Separator (OW014) & Former Drain Oil Underground Storage Tank (TU015) – BRRTS #: 02-41-579108

These two AOCs are located at Guard West. An oil-water separator (OWS) was replaced between 1994 and 1995, during which time other underground storage tanks (USTs) were reportedly removed. Currently, this area, specifically Building 302, is being used for storage. Building 302 was formerly a maintenance building. It is not known whether the drain oil UST was removed, and no documentation pertaining to the OWS removal/replacement was located.

The Redline Report identified concentrations of polycyclic aromatic hydrocarbons (PAHs) in soil exceeding RCLs for direct contact. Naphthalene was also detected in exceedance of its protection of the groundwater pathway RCL. Groundwater samples collected from temporary monitoring wells identified various PAHs exceeding their respective Wis. Admin. Code ch. NR 140 Enforcement Standards (ESs). These exceedances were absent in groundwater samples collected from permanent monitoring wells. Additionally, three sub-slab samples were collected beneath the slab of Building 302, located at the western edge of the AOC. The concentrations of these sub-slab samples were below DNR vapor risk screening levels (VRSLs).

- The DNR understands that Wood is proposing further investigation to define the degree and extent of PAH contamination. The Redline Report indicates that the PAH exceedances appear to be associated with general historical site operations, including, but not limited to, asphalt sealing, repairing, and general maintenance activities. If PAH contamination at the site is attributable to general site conditions, rather

than a discharge from a UST, OWS, or another source, include that discussion in the subsequent report and determine if additional investigation is needed, or if the source of PAH contamination is assumed to be site-wide due to site conditions.

Suspected Petroleum Contamination: Building 522 (CB018a) – BRRTS #: 02-41-579107 & Prime Beef Drive/Tanker Avenue (CB018b) – BRRTS #: 02-41-579109

These two AOCs are located at Guard Central and are within areas associated with the 1968 Westshore Pipeline release. CB018a addresses contamination located adjacent to Building 522, near the intersection of Upset Avenue and Minuteman Drive. The Redline Report identifies PAHs in shallow soil samples exceeding direct contact RCLs. Temporary monitoring well samples also identified PAHs exceeding Wis. Admin. Code ch. NR 140 ESs. These exceedances were absent in groundwater samples collected from permanent monitoring wells. The Redline Report attributes the PAH impacts to general site use rather than a specific source.

Petroleum volatile organic compounds (PVOCs) were identified in soil exceeding the protection of the groundwater pathway RCL. Temporary monitoring well samples also found PVOCs exceeding their respective Wis. Admin. Code ch. NR 140 ESs. In permanent monitoring wells, VOCs were found to exceed their respective Wis. Admin. Code ch. NR 140 PALs and ESs. A fingerprint analysis was performed on groundwater samples collected from temporary monitoring wells. The results of this analysis indicated that the petroleum impacts appeared to be associated with old or highly weathered gasoline. Additionally, three sub-slab samples were collected beneath the slab of Building 522. The concentrations of the sub-slabs samples were below DNR VRSLs.

AOC CB018b addresses contamination near the petroleum, oil, and lubrication facility, at the intersection of Prime Beef Drive and Tanker Avenue. The Redline Report identifies PAHs in soil samples exceeding direct contact RCLs. Temporary monitoring well samples also identified PAHs exceeding Wis. Admin. Code ch. NR 140 PALs and ESs. In permanent monitoring wells, MW-206 had ES exceedances for select PAHs in the first of two sampling rounds. The Redline Report attributes the PAH impacts to the current and historical use of the site. Naphthalene was also detected above the protection of the groundwater pathway RCL at soil boring location SB-04.

- It is the DNR's understanding that these two AOCs will not be investigated in terms of the previously closed 1968 Westshore Pipeline release (BRRTS #: 02-41-000590). However, concentrations of PAHs in soil at both AOCs exceeding direct contact RCLs were identified during the remedial investigation. The Redline Report indicates that the PAHs at these AOCs are attributable to general site conditions rather than a specific discharge, similar to the OW014 & TU015 BRRTS case. If PAH contamination at the site is attributable to general site conditions, rather than a discharge from a specific source, include that discussion in the subsequent report and determine if additional investigation is needed, or if the source of PAH contamination is assumed to be site-wide due to site conditions.
- Chlorinated volatile organic compounds were detected in groundwater at AOC CB018a. These exceedances should be further assessed, and additional groundwater monitoring may be needed to define a concentration trend. Evaluate the potential source of these contaminants.

Vinyl Chloride Groundwater Contamination (CG019) – BRRTS #: 02-41-579106

This AOC identifies a vinyl chloride (VC) groundwater plume located within the southern end of Guard Central. The source of the VC is currently unknown. Historical and current sampling data suggest that the VC contamination is located along the east-west drainage ditch. Wis. Admin. Code ch. NR 140 ES exceedances are noted in the shallow groundwater zone, where wells are screened between 5 and 20 feet below ground surface (bgs), and also in the deeper groundwater zone, where wells are screened from 30 to 40 feet bgs. Two wells

within the drainage ditch were screened from 40 to 50 feet bgs, but VC was not detected in either of the two sampling events at either location.

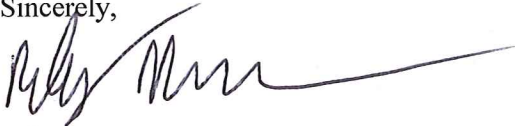
- Data tables and figures should be comprehensive, including all relevant sampling data. Tables and figures should also incorporate data collected during the Henningson, Durham, Richardson, Inc. investigation.
- Use the created isoconcentration figures to assess possible vapor intrusion into nearby buildings and to determine if the degree and extent of VC contamination has been defined. To assess vapor intrusion, refer to the DNR's vapor intrusion guidance, "Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin," RR-800.
- The DNR understands that Wood is recommending remedial action at this AOC. Remedial action should be considered on the basis of potential receptors and migration pathways; whether there is a threat to human health or the environment. Evaluate the need for remedial action, including monitored natural attenuation, in terms of risk.

The site investigation can be an iterative process. If applicable, future sampling results may indicate that further assessment is needed to define the degree and extent of contamination in all affected media.

The DNR understands that Wood intends to submit additional reports/documentation outlining the next steps for these AOCs. The future documents should incorporate the comments outlined in this letter and be in compliance with the Wis. Admin. Code NR 700 series.

The DNR appreciates the efforts you are taking to address the contamination at these AOCs. If you have any questions about this letter, please contact me, the DNR Project Manager, at (414) 263-8699, or by email at Riley.Neumann@wisconsin.gov.

Sincerely,



Riley D. Neumann
Hydrogeologist
Remediation & Redevelopment Program

cc: 2nd Lt. Brian Schrader, Environmental Manager, 128th ARW (electronic)
John Raltson, Project Manager, Wood Group (electronic)