Final

Phase I Remedial Investigation for SWMU 56

PERFORMANCE-BASED RESTORATION
JOINT BASE ANDREWS NAVAL AIR FACILITY WASHINGTON
CAMP SPRINGS, MARYLAND

Contract W9128F-10-D-0025, DO #0002

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REPORT CERTIFICATION STATEMENT

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Phase I Remedial Investigation Report

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Phase I Remedial Investigation at SWMU 56
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Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

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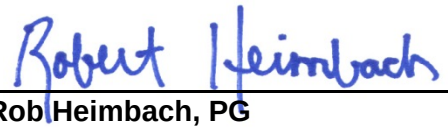
The information contained in this report is true and correct to the best of my knowledge.



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Acronyms and Abbreviations

µg/L.....micrograms per liter
°F .....degrees Fahrenheit
ADR .....automated data review
AFB.....Air Force Base
AOI.....area of interest
Bay West.....Bay West, Inc.
BERA .....Basewide Ecological Risk Assessment
bgs .....below ground surface
BTAG .....Biological Technical Assistance Group
BTEX.....benzene, toluene, ethylbenzene, and xylene
BTOC .....below top of casing
CEC .....chemical exceeding criteria
CERCLA .....Comprehensive Environmental Response, Compensation, and Liability Act
COC .....chemical of concern
COMAR.....Code of Maryland Regulations
CSM .....conceptual site model
CT .....carbon tetrachloride
DCE cis-1,2-dichloroethene
DDD .....dichlorodiphenyldichloroethane
DDE .....dichlorodiphenyldichloroethylene
DDT.....dichlorodiphenyltrichloroethane
delta BHC.....delta hexachlorocyclohexane
DERA .....Defense Environmental Restoration Account
DO.....Delivery Order
DoD.....Department of Defense
DPT.....direct push technology
DRO .....diesel range organics
ESCC .....ecological screening criteria comparison
EcoSSLs .....ecological soil screening levels
ERP.....Environmental Restoration Program
FFA .....Federal Facilities Agreement
GRO.....gasoline range organics
HHSCC .....human health screening criteria comparison
HRS .....hazard rating score
IDW.....investigation derived waste
JBA .....Joint Base Andrews Naval Air Facility Washington
LCS.....laboratory control sample
LCSD .....laboratory control sample duplicate
LOD .....limit of detection
LOQ.....limit of quantitation
MCL .....maximum contaminant level
MCPP .....2-4-chloro-2-methylphenoxypropanoic acid
MDE.....Maryland Department of the Environment
MEK.....2-butanone
mL.....milliliter
mL/min.....milliliters per minute
MS/MSD .....matrix spike/matrix spike duplicate
NCP .....National Oil and Hazardous Substances Contingency Plan
NPL.....National Priorities List
NTU .....nephelometric turbidity unit
PA.....preliminary assessment
PAH .....polynuclear aromatic hydrocarbon
PBR .....performance-based restoration
PCB .....polychlorinated biphenyl
PID.....photoionization detector
ppm.....parts per million
QC .....quality control
QSM .....quality systems manual
RI.....remedial investigation
ROD.....record of decision
RSL.....regional screening level
SB.....soil boring
SI .....site investigation
SOO.....statement of objectives
SVOC .....semi-volatile organic compound
SWMU .....solid waste management unit
TAL .....target analyte list
TCE .....trichloroethene
TCL.....target compound list
TestAmerica. .TestAmerica Laboratories, Inc.
TIC.....tentatively identified compound
TMW .....temporary monitoring well
TPH .....total petroleum hydrocarbons
UFP-QAPP ....Uniform Federal Policy for Quality Assurance Project Plan

USACE.....United States Army Corps of Engineers
USAF .....United States Air Force
USCS.....Unified Soil Classification System
USEPA.....United States Environmental Protection Agency
UST.....underground storage tank
UTL.....upper tolerance limit
UU/UE .....unlimited use/unrestricted exposure
VC.....vinyl chloride
VOC.....volatile organic compound
WSSC.....Washington Suburban Sanitary Commission

EXECUTIVE SUMMARY

A Phase I remedial investigation (RI) was conducted at Solid Waste Management Unit (SWMU) 56 at Joint Base Andrews Naval Air Facility Washington (JBA), located near the community of Camp Springs, Maryland. The Phase I RI objective is to determine whether hazardous substances were released to the environment and/or whether hazardous substances have impacted the environment exceeding human health or environmental exposure criteria in accordance with the SWMU 56 Uniform Federal Policy for Quality Assurance Project Plan (UFP-QAPP; Bay West, 2012). This Phase I RI consists of a sampling and reporting effort equivalent to preliminary assessment/site investigation (PA/SI) as defined by the National Oil and Hazardous Substances Contingency Plan (NCP), minus the hazard rating score (HRS) plus a conceptual site model (CSM) defining exposure pathways. This Phase I RI Report presents the field investigation results, human health and ecological screening criteria, chemicals exceeding criteria (CECs), site-specific CSM, conclusions, and recommendations.

SWMU 56 is composed of two areas of interest (AOIs); the Civil Engineering Storage Yard AOI and the Building 3459 AOI. The Civil Engineering Storage Yard AOI includes the area surrounding Monitoring Well ST14-MW35, which has exhibited elevated pH readings during monitoring events conducted for Environmental Restoration Program (ERP) Site ST-14. Additionally, the Civil Engineering Storage Yard AOI historically stored construction material including lumber, paint, thinners, roofing material, asphalt, pipes and pipe fittings, used and new household appliances, non-polychlorinated biphenyl (PCB) transformers, and miscellaneous drums. Building 3459 AOI is the site of former Building 3459, which was historically used as a pesticides mixing facility.

To further investigate the high pH with this Phase I RI, a purge test was conducted at ST14-MW35. pH was monitored as groundwater was purged at varying rates for approximately five hours. pH in ST14-MW35 decreased from 10.28 to 6.59 while purging at 500 milliliters per minute (mL/min) for approximately two hours. When the purge rate was reduced to 200 mL/min, the groundwater pH stabilized at 6.92. Based on the results of the purge test, the high pH in ST14-MW35 is attributed to the construction of the well. In addition, the high pH conditions are localized to ST14-MW35, as confirmed by the respective pH measurements of 4.97 and 5.00 from Temporary Monitoring Well (TMW)-01, located 5 feet from ST14-MW35, and TMW-09, located 20 feet from ST14-MW35.

Nine soil borings (SB)/TMWs were advanced in the Civil Engineering Storage Yard AOI. A total of 15 soil samples (including one field duplicate) and 10 groundwater samples (including one field duplicate) were collected from the TMWs and analyzed for:

- Target compound list (TCL) volatile organic compounds (VOCs);
- TCL polynuclear aromatic hydrocarbons (PAHs);
- TCL semi-volatile organic compounds (SVOCs);
- Gasoline range organics (GRO)/diesel range organics (DRO);
- TCL pesticides;
- TCL PCBs;
- TCL herbicides; and
- Target analyte list (TAL) metals.

Only benzo[a]pyrene, arsenic, and barium were detected in soil samples at concentrations exceeding the United States Environmental Protection Agency (USEPA) residential regional screening levels (RSLs) Based on site conditions and current and future land use of the site, exposure pathways are complete for the intrusive site worker via dermal contact, ingestion, and

dust inhalation of surface and subsurface soils; therefore, benzo(a)pyrene, arsenic, and barium are considered to be a potential risk to human receptors.

VOCs [chloroform and trichloroethene (TCE)], PAHs (benzo[b]fluoranthene, dibenz(a,h)anthracene, and indeno[1,2,3-cd]pyrene), GRO, DRO, a herbicide [2-4-chloro-2-methylphenoxypropanoic acid (MCPP)], and metals (aluminum, arsenic, chromium [total], cobalt, iron, lead, and manganese) were detected in the groundwater samples at the Civil Engineering Storage Yard AOI at concentrations that exceeded the USEPA residential RSL, USEPA maximum contaminant level (MCL) or MDE Interim Cleanup Standards for GRO and DRO. Based on current conditions and future uses of the site, exposure pathways are potentially complete for the intrusive site worker via dermal contact and ingestion.

Shallow soil samples were collected from four locations within the former building footprint at the Building 3459 AOI and analyzed for pesticides and herbicides. None of the soil samples exceeded the USEPA residential RSLs; therefore, soil at Building 3459 AOI does not present a risk to current or future human receptors. Groundwater at Building 3459 AOI was not investigated because, based on the known building operational history, possible herbicide and pesticide contamination would be limited to surface soils.

Exposure pathways for ecological receptors at both the Civil Engineering Storage Yard and the Building 3459 AOIs are not complete due to the lack of habitat at SWMU 56; therefore, no chemicals pose a potential risk to ecological receptors at SWMU 56.

Benzo(a)pyrene, arsenic, and barium are the only soil CECs (exceeds the residential RSLs) identified at the Civil Engineering Storage Yard AOI. The groundwater CECs (that exceed the respective RSLs, MCLs, or MDE interim residential cleanup standards) identified at the Civil Engineering Storage Yard AOI include:

- Chloroform;
- Arsenic;
- Lead;
- Trichloroethene;
- Benzo[b]fluoranthene;
- Dibenz(a,h)anthracene;
- Indeno[1,2,3-cd]pyrene;
- DRO/GRO;
- MCPP;
- Aluminum;
- Chromium (Total);
- Cobalt;
- Iron;
- Manganese; and
- Thallium.

To evaluate the CECs presented above at the Civil Engineering Storage Yard AOI, an RI is recommended. The RI may include the following:

- Investigation of barium-contaminated soil in the vicinity of TMW-06;
- Investigation of chloroform in the vicinity of TMW-04;
- Investigation of groundwater CECs in the vicinity of TMW-02;
- Analysis of hexavalent chromium in soil;
- Investigation of the source of TCE contamination in groundwater;
- Investigation of Vapor Intrusion Pathways; and,
- Site-specific baseline risk assessment.

Additional investigation at the Building 3459 AOI is not recommended as no CECs were identified.

1.0 INTRODUCTION

1.1 Project Authorization

This Phase I Remedial Investigation (RI) Report has been prepared for Solid Waste Management Unit (SWMU) 56 at Joint Base Andrews Naval Air Facility Washington (JBA), located near the community of Camp Springs, Maryland (**Figure 1-1**). The United States Army Corps of Engineers (USACE) – Omaha District has contracted Bay West, Inc. (Bay West) to perform the performance-based restoration (PBR) at multiple sites at JBA under Contract Number W9128F-10-D-0025, Delivery Order (DO) No. 0002.

In May 1999, JBA was added to the National Priorities List (NPL). The National Superfund electronic database identification number for the base is MD0570024000. SWMU 56 was identified in Section 6.7.2.12 of the Federal Facilities Agreement (FFA) between the United States Environmental Protection Agency (USEPA) and United States Air Force (USAF) (USEPA/USAF, 2011). A Phase I RI, as defined in the PBR Statement of Objectives (SOO), consists of a sampling and reporting effort equivalent to Preliminary Assessment and Site Inspection (PA/SI), as defined in the National Oil and Hazardous Substances Contingency Plan (NCP) requirements, without the Hazard Rating Score (USAF, 2011).

SWMU 56 has previously been referred to as the Civil Engineering Storage Yard near Building 3459 in other historical reports or as HW-2 in the September 2011 FFA for JBA.

1.2 Objective and Scope

The objective of this Phase I RI is to determine whether hazardous substances were released to the environment and/or whether hazardous substances have impacted the environment exceeding human health or environmental exposure criteria. SWMU 56 is identified on **Figure 1-2** as the Civil Engineering Storage Yard Area of Interest (AOI) and the Building 3459 AOI. The Civil Engineering Storage Yard AOI includes the area surrounding Monitoring Well ST14-MW35, which has exhibited elevated pH readings during monitoring events conducted for the Environmental Restoration Program (ERP) Site ST-14. The Building 3459 AOI includes the former Building 3459 footprint. The building, which was demolished in 1994, was reportedly used as a pesticide mixing and storage facility; however, there have been no reports or evidence of releases (URS, 2009).

The work covered under this Phase I RI includes evaluating the source of the elevated pH in ST14-MW35 and determining whether chemicals exceeding criteria (CECs) are present or absent within SWMU 56. Prior to this investigation, the cause for the elevated pH levels in ST14-MW35 was unknown. Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, and total petroleum hydrocarbons (TPH) have been detected at ST14-MW35 (AECOM, 2010); however, none of the detections have exceeded the screening criteria. At the Building 3459 AOI, it was not known if contamination from historical practices existed at the site.

The following analytical methods were completed for both soil and groundwater to determine CECs, if any, at the Civil Engineering Storage Yard AOI:

- Target Compound List (TCL) VOCs;
- TCL polynuclear aromatic hydrocarbons (PAHs);
- TCL SVOCs;
- Gasoline range organics (GRO)/diesel range organics (DRO);
- TCL pesticides;

- TCL polychlorinated biphenyls (PCBs);
- TCL herbicides; and
- Target Analyte List (TAL) metals.

The following analyses were completed for the surface soil samples collected to determine CECs, if any, at the Building 3459 AOI:

- TCL pesticides; and
- TCL herbicides.

The sections of this Phase I RI are organized as follows:

Section 1.0 – Introduction: This section provides the introduction, Phase I RI purpose and objective, and site history.

Section 2.0 – Physical Characteristics: This section provides the Basewide and site-specific geology, hydrogeology, surface water hydrology, land use, and habitat descriptions.

Section 3.0 – Phase I Remedial Investigation Procedures: This section describes the procedures used during this Phase I RI.

Section 4.0 – Phase I Remedial Investigation Results: This section describes the results of the Phase I RI and the screening criteria exceedances.

Section 5.0 – Fate and Transport: This section describes the fate and transport for the contaminated media, if any.

Section 6.0 – Human Health Screening Criteria Comparison: This section provides the comparison of detected concentrations against human health screening criteria.

Section 7.0 – Ecological Screening Criteria Comparison: This section provides the comparison of detected concentrations against ecological screening criteria.

Section 8.0 – Conceptual Site Model and Conclusions: This section provides the conclusions and conceptual site model (CSM).

Section 9.0 – Recommendations: This section provides the recommendations for this site.

Section 10.0 – References: This section provides the references cited in the Phase I RI.

Appendix A – ST-14 TCE Plume Map: This appendix includes the current ST-14 TCE plume map from the 2012 RA-O Report.

Appendix B – Historical Aerial Images: This appendix includes the historical aerial images used during the Phase I RI data review.

Appendix C – Field Documentation: This appendix includes the field documentation from the field work stage of the Phase I RI.

Appendix D – Data Validation Report: This appendix includes the data validation reports from the data collected during the Phase I RI.

Appendix E – Laboratory Analytical Packages: This appendix includes the laboratory analytical packages from the data collected during the Phase I RI.

Appendix F – Regulatory Comment Worksheet: This appendix includes the comment worksheet in Microsoft Word format.

1.3 Site Location and Description

JBA is located in Prince George's County, near the community of Camp Springs, Maryland. Washington, D.C. is located approximately five miles northwest of the base. The base occupies approximately 4,300 acres and consists of runways, airfield operations, an industrial area, housing, and recreational facilities (**Figure 1-1**).

JBA was originally established as the Camp Springs Army Air Field on August 25, 1942. The name was changed to Andrews Air Force Base (AFB) in 1947, when the USAF was established as a separate military service. The base has served as headquarters at various times for the Continental Air Command, the Strategic Air Command, the Military Air Transport Service, and the Air Force Systems Command. The current major tenant command is the Andrews Naval Air Facility. The missions of the Andrews Naval Air Facility are flight operations and photographic reconnaissance. In 1992, Andrews AFB became an Air Mobility Command Base. In 2009, the name of the base was officially changed to Joint Base Andrews Naval Air Facility Washington to more accurately reflect the joint nature of the missions and operations at the base.

A fenced area (designated the Civil Engineering Storage Yard) is bounded by North Carolina Avenue on the north, Pennsylvania Avenue on the east, Tennessee Avenue on the west, and Tampa Street on the south. **Figure 1-1** shows the location of SWMU 56 within JBA. Within the fenced Civil Engineering Storage Yard, SWMU 56 consists of two AOIs. The Civil Engineering Storage Yard AOI is located east of Building 3443, south of Buildings 3449, 3440, and 3434, and both west and north of the Storage Yard fence line (460 feet by 200 feet) (**Figure 1-2**). The Building 3459 AOI encompasses the previously demolished Building 3459 footprint (**Figure 1-2**). Historical reports indicated that SWMU 56 is a 75-foot by 150-foot area near former Building 3459. Based on historical aerials from 1943 to 1990 (included in **Appendix B**), it appears that the area used for storage may have moved locations over the years.

SWMU 56 is also located directly adjacent to and within the groundwater contaminant plume associated with the ERP Site ST-14. ST-14 has a number of permanent monitoring wells and injection wells within and in the vicinity of SWMU 56 as shown on **Figure 1-2**. Monitoring wells ST14-MW34 and ST14-MW35 are located within or adjacent to SWMU 56 and ST14-MW33 and ST14-LCB2 are located down gradient of SWMU 56.

1.4 Site History

As previously described, SWMU 56 is located directly adjacent to and within the groundwater contaminant plume associated with ST-14. Two 10,000-gallon underground storage tanks (USTs), a 250-gallon waste motor oil UST, and petroleum-contaminated soil were removed from ST-14 between 1983 and 1986. ST-14 has a number of monitoring wells associated with the selected remedy, one being ST14-MW35, which is located within the Civil Engineering Storage Yard AOI. ST14-MW35 has exhibited a persistently high pH since it was installed in 2002.

The Civil Engineering Storage Yard AOI associated with SWMU 56 historically stored construction materials including lumber, paint, thinners, roofing material, asphalt, pipes and pipe fittings, used and new household appliances, non-PCB transformers, and miscellaneous drums. It was reported that drums with "flammable" and "hazardous" warning labels and additional drums containing viscous asphalt were observed to be leaking (MDE, 1988). SWMU 56 was also observed to have no retention curb or collection trench installed around the site to collect leaking materials or stormwater from migrating off-site. During the site visit conducted on September 13, 2011, there were small isolated secondary containment pads present that had retention curbs to contain possible material spillage on the containment pad.

Based on a review of historical aerials from 1943 to 1990 conducted during this Phase I RI, Building 3459 was located northeast of the Civil Engineering Storage Yard AOI. The building

was reportedly used as a pesticide mixing and storage facility; however, there have been no reports or evidence of a release (URS, 2009).

1.5 Previous Investigations

To date, no removal actions or RIs have been completed at SWMU 56; however, environmental investigations have been conducted at the base since 1985 and are being conducted under the USAF's ERP. The ERP was developed by the Department of Defense (DoD) in 1981 to identify, investigate, and clean up environmentally contaminated sites on military bases. SWMU 56 was identified as a compliance restoration site through the ERP, following the discovery of the persistently high pH (greater than 11) at ST14-MW35 during the ST-14 Long-Term Groundwater Monitoring Program. ST14-MW35 was installed in 2002 (Shaw, 2005) and has since been monitored as part of the ST-14 ERP in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the ST-14 Record of Decision (ROD) dated September 2007.

1.5.1 ST-14 UST Tank Removal (1992)

Nearby ST-14 has undergone a number of investigations since 1992 following the removal of two 10,000-gallon USTs, a 250-gallon waste motor oil UST, and petroleum-contaminated soil between 1983 and 1986 (D&M, 1994).

1.5.2 Remedial Actions (2007-2010)

ST-14 currently has an approved ROD (USEPA, 2007). The primary contaminants of concern (COCs) identified for ST-14 include: trichloroethene (TCE), cis-1,2-dichloroethene (DCE), vinyl chloride (VC), carbon tetrachloride (CT), and benzene, toluene, ethylbenzene, and xylenes (BTEX). AECOM implemented remedial actions for ST-14 between 2007 and 2010, including a series of injections of a carbon substrate (sodium lactate) to enhance reductive dechlorination through a series of injection points and wells. Several sodium lactate injection events were completed within and adjacent to SWMU 56 (AECOM, 2010).

1.5.3 ST14-MW35 High pH Investigation (2009)

In 2009, URS completed the Final Evaluation Report for Air Force Compliance Clean-Up Sites, Identification and Evaluation of Defense Environmental Restoration Account (DERA) Eligibility report which included a shallow subsurface soil (0 to 2 feet below ground surface [bgs]) investigation surrounding ST14-MW35 to evaluate possible causes of the high pH detections in the groundwater. The locations of the previous subsurface soil samples are shown on **Figure 1-2**. Based on the 2009 analytical results, VOCs, SVOCs, and pesticide compounds were detected; however, they did not exceed the USEPA regional screening levels (RSLs) for soil. DRO and GRO were also detected, but did not exceed Maryland Department of the Environment (MDE) cleanup standards (MDE, 2008) as there are no DRO and GRO RSLs for comparison. PCBs were not detected (URS, 2009). The horizontal and vertical extents of the VOC, SVOC, pesticide, and TPH detections were not evaluated at that time. In addition, a source was not identified.

1.5.4 ST-14 Long-Term Monitoring (2010)

In June 2010, AECOM completed a Long-Term Monitoring Report for ST-14 which identified ST14-MW35 on the eastern boundary of the ST-14 TCE plume. All other contaminant plumes associated with ST-14 are located north of ST14-MW35. The report also stated that the high pH condition at ST14-MW35 is likely caused by grout contamination in the monitoring well and is not suspected to be representative of the local aquifer conditions (AECOM, 2010). During the RI

and long-term monitoring work completed at ST-14, ST14-MW35 has been purged at varying flow rates. At increased purge flow rates, the pH is initially high, but then decreases with time.

1.5.5 ST14-MW35 Groundwater Sampling Event (2011)

In April 2011, AMEC completed a sampling event at ST14-MW35. The groundwater was analyzed for VOCs, SVOCs, dissolved gases, pesticides, PCBs, and metals. Four VOCs and several metals were detected in the groundwater. All detections did not exceed the USEPA residential RSLs and maximum contaminant levels (MCLs) for groundwater.

1.5.6 ST14-MW35 Groundwater Sampling Event (2012)

In November 2012, AMEC completed a remedial action-operations sampling event at ST14-MW35. The groundwater was analyzed for VOCs, dissolved gasses and metals. Six VOCs, one dissolved gas, and several metals were detected in the groundwater. None of the detections exceeded USEPA residential RSLs and MCLs for groundwater except for TCE. TCE was detected at a concentration of 12 micrograms per liter (µg/L), which exceeds the USEPA residential RSL (0.44 µg/L) and MCL (5 µg/L). A map showing the current ST-14 TCE plume configuration is included in Appendix A.

2.0 PHYSICAL CHARACTERISTICS

2.1 Geology

2.1.1 Regional Geology

JBA is located within the Atlantic coastal plain physiographic province, 12 miles east of the Atlantic coastal plain and Appalachian piedmont fall line. The coastal plain is characterized by an eastward thickening wedge of unconsolidated sediments, which overlap the rocks of the eastern piedmont. These unconsolidated sediments consist of gravel, sand, silt, and clay, which were derived from erosion of the piedmont and mountains to the west. The Coastal Plain deposits range in age from Cretaceous to Recent and are approximately 1,600 feet thick in the JBA area. The upper 300 feet consists of, from stratigraphically highest to lowest (i.e., from youngest to oldest): the Upland (Pliocene) Deposits (approximately 3 to 55 feet thick); the Calvert Formation (70 to 100 feet thick); the Nanjemoy Formation (70 to 125 feet thick); the Marlboro Clay (0 to 20 feet thick); and the Aquia Formation (100 to 140 feet thick). The Coastal Plain sediments overlie Pre-Cambrian-age metamorphic crystalline basement rocks (Earth Tech, 2001).

Except for the Upland deposits, the Coastal Plain formations strike northeast and dip gently to the southeast. The Upland Deposits consist of interbedded brown to gray silt and clay, sand and gravel. The Calvert Formation is part of the Chesapeake Group in Maryland, which also includes the Choptank and St. Mary's formations. The Calvert Formation on the western shore is subdivided into the basal Fairhaven Member and the overlying Plum Point Marl Member. The Fairhaven Member ranges in color from brown to white and consists mostly of diatoms in a very fine quartz matrix. Some calcareous material may be present at base of member. The Plum Point Member is described as a series of bluish green to grayish brown and buff sandy clay and marls, containing organic remains, including diatoms (CH2M Hill, 2004).

2.1.2 Site Geology

The land surface at SWMU 56, like most of JBA, is generally flat. Soils have not been specifically logged at SWMU 56 in previous investigations; however, soils at ST-14, which encompasses SWMU 56, consist of partially saturated Quaternary Upland Deposits comprised of three stratigraphic lithologies: silt-clay; an intermediate sand and gravel stratum; and underlying silty fine sand (IT, 2000). The Calvert Formation is generally encountered at 38 to 40 feet bgs in the upgradient portion of the ST-14 area, although it outcrops a few feet below the top of the bank along the Cabin Branch (Shaw, 2005). The Miocene-age Calvert Formation consists of a thick stratigraphic sequence of lower permeability interbedded greenish-gray silt, clay, and fine sand.

2.2 Hydrogeology

2.2.1 Regional Hydrogeology

Both unconfined and confined aquifers are present in Prince George's County and specifically JBA. Unconfined groundwater units consist of sediments that are in direct contact with atmospheric pressure, whereas confined aquifers are overlain by an impervious or semi-impervious layer of geologic material. Confined aquifers are, therefore, under increased hydrostatic pressure. Precipitation evaporates, infiltrates, or runs off after contact with the ground. A percentage of water from precipitation recharges the hydrostratigraphic units. Hydrostratigraphic units consist of gravel, sand, silt, and clay, or combinations thereof, which behave in a similar and synergistic way to either transmit or retard the movement of groundwater both vertically and horizontally. Groundwater moves through the pore spaces of

these hydrostratigraphic units until removal through springs and seeps (next to surface water bodies) or by wells or plant roots (Earth Tech, 2001).

An unconfined groundwater table is present within the surficial Upland Deposits underlying JBA that is derived primarily from precipitation recharge in the vicinity of JBA. The movement of the unconfined groundwater tends to be towards local surface waters. Below the Upland Deposits are the Calvert, Nanjemoy, and Marlboro confining formations followed by the water-bearing Aquia formation. The confining formations separate the Upland Deposits groundwater table from the deeper Aquia formation aquifer.

JBA and most of Prince George's County obtains its potable water supplies from the Washington Suburban Sanitary Commission (WSSC) water utility. The source of the potable water supply is surface water from the Potomac and Patuxent Rivers. No drinking water supply wells are located on JBA and drinking water supply wells are not permitted on JBA.

2.2.2 Site Hydrogeology

Hydrogeology at SWMU 56 has not been specifically investigated; however, groundwater at ST-14 has been measured approximately 15 to 20 feet bgs. The downward migration of groundwater is limited by the Calvert Formation at a depth of approximately 38 to 40 feet bgs.

Groundwater at ST-14 has historically been reported flowing toward the east and northeast; however, comparison of groundwater elevation contours from various monitoring events shows inconsistencies, especially south of North Carolina Avenue, where flow directions have also been reported toward the east and southeast. Hydraulic conductivity has been estimated to range between 0.24 and 3.4 feet per day (IT, 2000). Corresponding groundwater velocities are estimated to be 5.8 to 85 feet per year based on a porosity of 0.3 and a hydraulic gradient of 0.02 feet per foot from the flight line to Cabin Branch (IT, 2000).

Based on the Basewide CSM, SWMU 56 is located on a localized groundwater divide and, therefore, contributes groundwater to two drainage areas, the Cabin Branch and the Charles Branch (AMEC, 2011). Groundwater from the northern portion of the site flows northeast, to the Cabin Branch, approximately 1,300 feet from SWMU 56. Groundwater from the southern portion of the site flows east to the Charles Branch, approximately 1,000 feet from SWMU 56.

As stated previously, drinking water supply wells are not permitted on JBA and SWMU 56 is located approximately 1,400 feet from the east installation boundary line (the closest boundary). Therefore, there are no drinking water supply wells within a minimum of 1,400 feet to the site.

2.3 Surface Water Hydrology

2.3.1 Regional Surface Water Hydrology

JBA is situated on a drainage divide between the Potomac River Basin to the west and the Patuxent River Basin to the east. Surface water originating in the north, west, and south portions of the Base is discharged to the Potomac River via Henson Creek, the Meetinghouse and Paynes Branches of Tinker Creek, and Piscataway Creek. Surface water originating in the eastern portion of the Base flows to the Patuxent River via Cabin Branch and Charles Branch of Western Branch (CH2M Hill, 2005).

The Potomac River and its tributaries identified above are listed in the Code of Maryland Regulations (COMAR) Stream Use Classification Index as Use-IP (Water Contact Recreation and Protection of Aquatic Life). The Patuxent River and its tributaries are also listed in the COMAR Stream Use Classification Index as Use-IP (EA, 2012).

2.3.2 Site Surface Water Hydrology

SWMU 56 is located on the eastern side of the surface water drainage divide. Based on the existing site topography and adjacent stormwater system, surface water from the Civil Engineering Storage Yard AOI drains east to the southern Charles Branch, which is located approximately 510 feet southeast of the site and is the closest surface water body. The Charles Branch ultimately drains into the Patuxent River. Surface water from the Building 3459 AOI drains north to N Carolina Avenue and then west via the storm sewer. Between the runways, it is conveyed south via an open channel to the Piscataway Creek and ultimately to the Potomac River.

There are no surface water bodies or creeks within or in the immediate proximity to SWMU 56.

2.4 Demography and Land Use

2.4.1 Basewide Demography and Land Use

Residential housing, consisting of occupied and unoccupied housing, is the second largest land use area on Base. More than 8,000 full-time military personnel are stationed at JBA, which also employs more than 2,000 civilians. On-Base housing consists of single-family, duplex-type developments, and high-density apartments. The majority of housing is located on the west side of the Base. One residential area is located east of the airfield. Outdoor recreation land use includes golf courses, ball fields, a tennis court, a running track, and picnic areas and the majority are located on the west side of the Base.

Land use adjacent to JBA includes light industrial, commercial, residential, and undeveloped. On the north side of the Base, there is a business park and light industrial area. Most of the area northeast of the Base is currently undeveloped. The area just south of the Base is primarily residential and undeveloped land. Some of the land south of the residential area is used for commercial purposes. Land use on the west side of the base consists of residential, commercial (shopping centers and office), light industrial, and few areas of undeveloped land. On the east side of the Base, land use includes light industrial/business park and residential.

2.4.2 Site Demography and Land Use

SWMU 56 is currently zoned as Industrial and used as a storage yard for JBA's Civil Engineering Department. The future planned land use for the site is industrial and administrative.

2.5 Habitats and Biology

In 2005, a Basewide Ecological Risk Assessment (BERA) was completed to provide a basic conceptual model for the evaluation of potential ecological risks on JBA (CH2M Hill, 2005). The following Basewide and Site-Specific Habitat and Biology are summarized from the BERA.

2.5.1 Basewide Habitats and Biology

2.5.1.1 Wetland and Aquatic Habitats

Wetland and aquatic habitats occur infrequently on JBA. Wetlands, which comprise only about two percent of the JBA land area, are mainly associated with the borders of stream channels. The headwaters of five streams are located on-Base, including Piscataway Creek, Henson Creek, Tinkers Creek (Paynes and Meetinghouse Branches), Cabin Branch (North and South Branches), and Charles Branch. There are five small ponds and one larger surface water body (Base Lake) that encompass a total area of approximately 20 acres (CH2M Hill, 2005).

2.5.1.2 Terrestrial Habitats

JBA is located in the Oak-Pine Forest Region, originally characterized by oaks and hickories, with pines prevalent on sites with poorer soils. Vegetative communities at JBA currently consist of extensively managed areas and unmanaged patches of natural plant communities. Approximately 85 percent of JBA is either developed (e.g., housing, buildings, roads, and runways) or intensely managed. The intensely managed areas include lawns, golf course fairways and greens, and recreational fields, as well as the runway borders, the infield, and approach clear zones. Unimproved areas contain ecological communities such as mixed hardwood forests, mixed hardwood/pine forests, oak forests, oak/hickory forests, oak/pine forests, pine forests, red maple swamp, and shallow emergent marsh.

2.5.1.3 Biota

Various species of birds, mammals, reptiles, amphibians, and aquatic organisms have been observed at JBA and reported in historical documents. The following summarizes the number of species that have been identified in each category:

Species Category	**No. of Species on-Base**
Birds	68
Mammals	11
Reptiles	1
Amphibians	3
Fish:	
- Base Lake and Golf Course Ponds	13
- Berry Pond	1
- Piscataway Creek	27
- Paynes Branch	8
- Meetinghouse Branch	7
- Cabin Branch	0
- Henson Creek	Habitat Limited, Not Surveyed
- Charles Branch	Habitat Limited, Not Surveyed

There is one Federally-listed endangered plant, the sandplain gerardia (Agalinis acuta), on JBA, according to a 1997 Basewide survey. In addition, there is one Federally-listed threatened species, the bald eagle (Haliaeetus leucocephalus), that has been observed at Base Lake during winter bird surveys. No bald eagle nests have been found on JBA to date, and it has been reported the eagles were likely transients from Chesapeake Bay. No additional state or federally listed threatened or endangered species have been identified on JBA (Geo-Marine 2001).

2.5.2 Site Habitat and Biology

2.5.2.1 Wetland and Aquatic Habitat

There are no wetlands or aquatic habitats located at SWMU 56; however, as stated in **Sections 2.2.2** and **2.3.2**, the Civil Engineering Storage Yard AOI contributes both surface water and groundwater to Charles Branch, while Building 3459 AOI contributes surface water to Piscataway Creek and groundwater to Cabin Branch. The following provides a brief summary of the 2005 BERA for the drainage areas that SWMU 56 contributes both groundwater and surface water to:

- Charles Branch has a relatively poor habitat quality for aquatic biota. Based upon the available lines of evidence in the 2005 BERA, potential risks to ecological receptors in this stream were considered to be low and acceptable; no further action was recommended;
- Cabin Branch is relatively small and has been altered dramatically by hydrology and runoff, producing headcuts and erosional areas, resulting in an overall poor habitat quality for aquatic biota. Based upon the available lines of evidence presented in the 2005 BERA, potential risks to ecological receptors in the southern tributary of the Cabin Branch were considered to be relatively low and potentially attributable to pesticides and PAHs in sediment; however, the limited available habitat was stated to significantly reduce potential exposures; and
- Piscataway Creek is characterized by a large, relatively stable channel with pools and long gravel riffles. Banks are generally well vegetated, with trees and shrubs in a narrow riparian zone surrounding the creek. Overall, Piscataway Creek provides good to fair habitat for aquatic biota. Based upon the available lines of evidence presented in the 2005 BERA, potential risks to ecological receptors in surface waters within the Piscataway Creek Drainage Area were considered low and acceptable; no further action was recommended for these water bodies (CH2M Hill, 2005).

2.5.2.2 Terrestrial Habitats

The Civil Engineering Storage Yard AOI consists of a flat, paved, storage area surrounded by maintenance and storage buildings. The Building 3459 AOI consists of a limited area of maintained grass and is surrounded by paved areas. Both areas are detailed on **Figure 1-2**. The limited area of mowed grass and lack of fields and forested habitats at the Civil Engineering Storage Yard AOI and the Building 3459 AOI results in an overall poor habitat quality for terrestrial receptors.

2.5.2.3 Biota

Biota has not been specifically investigated at SWMU 56; however, SWMU 56 was included in the Cabin Branch Drainage Area in the 2005 BERA. In addition, because SWMU 56 contributes surface water and groundwater to Charles Branch, Cabin Branch, and Piscataway Creek, **Sections 2.5.2.3.1** through **2.5.2.3.4** below detail the aquatic and terrestrial receptor species identified in the 2005 BERA.

2.5.2.3.1 Charles Branch Biota

Biota were not sampled in Charles Branch; however, the following semi-aquatic upper trophic level receptors were chosen for the BERA exposure modeling in the Charles Branch drainage:

- Great blue heron (Ardea herodias) – semi-aquatic avian piscivore;
- Mallard (Anas platyrhynchos) – semi-aquatic avian omnivore;
- Muskrat (Ondatra zibethicus) – semi-aquatic mammalian herbivore;
- Raccoon (Procyon lotor) – semi-aquatic mammalian omnivore; and
- Spotted sandpiper (Actitus macularia) – semi-aquatic avian invertivore.

2.5.2.3.2 Cabin Branch Biota

The following semi-aquatic upper trophic level receptors were chosen for the BERA exposure modeling in the Cabin Branch drainage:

- Great blue heron (Ardea herodias) – semi-aquatic avian piscivore;
- Raccoon (Procyon lotor) – semi-aquatic mammalian omnivore; and
- Spotted sandpiper (Actitus macularia) – semi-aquatic avian invertivore.

2.5.2.3.3 Piscataway Creek Biota

The following semi-aquatic upper trophic level receptors were chosen for the BERA exposure modeling in the Piscataway Creek drainage:

- Belted kingfisher (Ceryle alcyon) – semi-aquatic avian invertivore/piscivore;
- Great blue heron (Ardea herodias) – semi-aquatic avian piscivore;
- Mallard (Anas platyrhynchos) – semi-aquatic avian omnivore;
- Muskrat (Ondatra zibethicus) – semi-aquatic mammalian herbivore;
- Raccoon (Procyon lotor) – semi-aquatic mammalian omnivore; and
- Spotted sandpiper (Actitus macularia) – semi-aquatic avian invertivore.

2.5.2.3.4 Terrestrial Biota

The following terrestrial upper trophic level receptors were chosen for the BERA exposure modeling in mowed grass/field habitats:

- American kestrel (Falco sparverius) – terrestrial avian insectivore/carnivore;
- American robin (Turdus migratorius) – terrestrial avian invertivore/omnivore;
- Killdeer (Charadrius vociferous) – terrestrial avian invertivore;
- Meadow vole (Microtus pennsylvanicus) – terrestrial mammalian herbivore;
- Mourning dove (Zenaida macroura) – terrestrial avian herbivore;
- Red fox (Vulpes vulpes) – terrestrial mammalian carnivore;
- Short-tailed shrew (Blarina brevicauda) – terrestrial mammalian invertivore; and
- White-footed mouse (Peromyscus leucopus) – terrestrial mammalian omnivore.

The following terrestrial upper trophic level receptors were chosen for the BERA exposure modeling in forested habitats:

- American robin (Turdus migratorius) – terrestrial avian invertivore/omnivore;
- Gray fox (Urocyon cinereoargenteus) – terrestrial mammalian carnivore;
- Red-tailed hawk (Buteo jamaicensis) – terrestrial avian carnivore;
- Short-tailed shrew (Blarina brevicauda) – terrestrial mammalian invertivore;
- White-footed mouse (Peromyscus leucopus) – terrestrial mammalian omnivore; and
- White-tailed deer (Odocoileus virginianus) – terrestrial mammalian herbivore.

2.6 Meteorology and Climate

JBA has a continental type of climate with well-defined seasons in a transition zone between a humid continental climate zone to the north and west and a humid subtropical climate zone to the south. Both of these zones, in addition to the nearby water bodies, influence the climate at JBA. JBA is on the upper end of a peninsula formed by the Potomac River on the west and south and the Chesapeake Bay on the east. Further to the east, across the Delmarva Peninsula, is the Atlantic Ocean.

Based on data collected at the Upper Marlboro National Climatic Data Center Station located approximately 5 miles to the northeast of the Base, the mean annual temperature for JBA is 54

degrees Fahrenheit (°F), with the warmest month being July (monthly average temperature of 76°F) and the coldest month being January (monthly average temperature of 32°F). The annual precipitation at JBA averages about 42 inches of rain, and the monthly distribution of precipitation is fairly uniform during the year (URS, 2006).

3.0 PHASE I REMEDIAL INVESTIGATION PROCEDURES

3.1 Aerial Image Review

Prior to the initiation of field activities at SWMU 56, a review of aerial imagery from 1943 to 2010 was conducted to determine the location of miscellaneous material storage. Information obtained during the imagery review was used to select the locations of each temporary monitoring well (TMW) at the Civil Engineering Storage Yard AOI and of shallow soil borings (SB) at the Building 3459 AOI. The aerial images reviewed during this Phase I RI are included in **Appendix B**. The results of the aerial imagery review are presented in **Section 4.1**.

3.2 Site Permits and Utility Locate

Prior to conducting the field investigation, subsurface utilities were located at each direct push TMW and SB location. On-site utility clearances were obtained by completing Air Force Form 103 – Work Clearance Request and by submitting a Maryland 811 Miss Utility locate request. All TMW and SB locations were cleared by Air Force personnel and a private utility locator. No TMW or SB locations were moved based on subsurface utilities; however, TMW-02 was adjusted based on proximity to on-site storage buildings. Final TMW and SB locations are shown on **Figure 3-1**.

3.3 ST14-MW35 pH Purge Test

On 7 December 2012, a purge test was conducted on ST14-MW35 to assess the source of high pH detected in ST14-MW35 during previous groundwater sampling events. The purge test included documenting the pH of groundwater purged from the well over time at varying purge rates. Groundwater was purged from ST14-MW35 through Teflon-lined tubing using a peristaltic pump at flow rates ranging from 150 milliliters per minute (mL/min) to 500 mL/min for approximately five hours. During the purging test, turbidity and pH was monitored at 5-minute intervals and the groundwater level was measured to monitor drawdown. The depth of the tubing intake was adjusted over time as the drawdown increased. Results of the ST14-MW35 purge test are presented in **Section 4.3**.

3.4 Environmental Sampling

On 3-7 December 2012, environmental sampling at SWMU 56 was conducted in accordance with the Uniform Federal Policy for Quality Assurance Project Plan (UFP-QAPP) for the Phase I RI at SWMU 56 developed by Bay West and approved by the project stakeholders. Environmental sample collection consisted of soil and groundwater samples at the Civil Engineering Storage Yard AOI and shallow soil samples at the Building 3459 AOI. The following sections describe the procedures used to collect environmental samples:

3.4.1 Civil Engineering Storage Yard Area of Interest

3.4.1.1 Soil Sampling

A total of nine TMWs within the Civil Engineering Storage (**Figure 3-1**) were advanced with a Direct Push Technology (DPT) Geoprobe™ 6820 drill rig to a depth of approximately 30 feet bgs, with the exception of TMW-08, which was advanced to a depth of 32 feet bgs. Borehole drilling was conducted by a State of Maryland-Licensed driller.

Soil was collected from each TMW using 4-foot Macro-Core samplers. Soil cores were logged, documented, and headspace screened for organic vapors using a photoionization detector (PID). Soil descriptions were logged in accordance with the Unified Soil Classification System

(USCS) and recorded on the TMW boring logs (**Appendix C**). Observations recorded on the logs include descriptions of soil type, grain size distribution, changes in lithology, soil stains, olfactory observations (mild to strong), soil moisture, depth intervals of laboratory samples, sample recovery, total depth of boring, pH screening results, and PID screening results. Soil pH screening was conducted using a Hanna HI 99121 direct soil pH measurement kit. Headspace screening technique was conducted in accordance with the UFP-QAPP.

Soil was collected for physical classification and headspace analysis continuously from the ground surface to the terminus depth of each TMW and logged by a field geologist as described above. Soil samples were collected for laboratory analysis in accordance with the UFP-QAPP. Soil collected for VOC analysis was collected directly from the Macro-Core sampler and placed in laboratory containers (40 milliliter [mL] vials) as soon as possible after the sampler was opened. Soil was field screened for VOCs using a handheld PID at 2-foot intervals. One or two samples were selected from each TMW for fixed-base laboratory analysis based on the following criteria:

- Interval corresponding to the highest pH, PID result, or olfactory/visual indication of contamination; and
- Interval directly above the soil/groundwater interface.

A total of 14 soil samples and one field duplicate were collected, labeled, sealed under chain-of-custody, and shipped to TestAmerica Laboratories, Inc., (TestAmerica) in Denver, Colorado and analyzed using the methods described in **Section 3.5**. The Civil Engineering Storage Yard AOI soil analytical results are presented in **Section 4.3.1**.

3.4.1.2 Groundwater Sampling

Groundwater samples were collected from the Civil Engineering Storage Yard AOI to investigate the presence of contamination, if any, and to investigate the source of unusually high pH observed in ST14-MW35. Groundwater samples were collected from TMWs at the locations designated on **Figure 3-1**. As described in **Section 3.4.1.1**, the TMWs were advanced using a Geoprobe® DPT stainless-steel retractable screen sampler.

After the DPT groundwater sampler was installed and the screen was retracted, groundwater was purged at a rate of 300 to 500 mL/min from the TMW to remove sediment using a variable speed peristaltic pump and Teflon-lined tubing in accordance with the UFP-QAPP. Turbidity and pH were measured during purging using a flow-through cell water quality meter. The groundwater sampling goal for turbidity was 10 nephelometric turbidity units (NTUs) prior to sampling; however, this goal was not always obtainable due to site conditions. Deviations from this goal were documented in the field logbook and are discussed in **Section 4.3.2**.

Once the TMW was purged, low-flow purging (approximately 150 ml/min) and sampling techniques were used during the collection of groundwater samples for laboratory analysis to further minimize turbidity in the samples. A final turbidity reading was recorded prior to collecting groundwater samples. If groundwater reached the turbidity goal of 10 NTUs during high flow purging (300 mL/min to 500 mL/min), the flow rate was not adjusted prior to sample collection. Photographs of initial and final purge water and groundwater sample collection forms containing sample collection information and field parameters are included in **Appendix C**. A total of nine groundwater samples and one field duplicate were collected, labeled, sealed under chain-of-custody, and shipped to TestAmerica. Groundwater sample analytical results are presented in **Section 4.3.2**.

3.4.2 Building 3459 Area of Interest

3.4.2.1 Soil Sampling

SBs within the Building 3459 AOI were advanced with a DPT Geoprobe™ 6820 drill rig to a depth of 2 feet bgs. Soil samples were collected using a 4-foot Macro-Core sampler, logged and field screened, as described in **Section 3.4.1.1**, except the soils were not screened for pH. The soil samples were collected for laboratory analysis from a depth of 1 to 2 feet bgs, the assumed bottom of the building foundation. Four soil samples were collected, labeled, sealed under chain-of-custody, and shipped to TestAmerica and analyzed using the laboratory methods described in **Section 3.5**. The Building 3459 AOI soil analytical results are presented in **Section 4.3.1**.

3.4.2.2 Groundwater Sampling

Groundwater at Building 3459 AOI was not investigated because based on the known building operational history discussed in **Section 1.4**, possible herbicide and pesticide contamination would be limited to surface soils.

3.5 Sample Analytical Methods

Soil and groundwater samples were analyzed by TestAmerica. Samples collected from the Civil Engineering Storage Yard AOI were analyzed for:

- TCL VOCs plus tentatively identified compounds (TICs) by SW-846 Method 8260B;
- TCL PAHs by SW-846 Method 8270-SIM;
- TCL SVOCs plus TICs by SW-846 Method 8270D;
- DRO/GRO by SW-846 Method 8015C;
- TCL pesticides by SW-846 Method 8081B;
- PCBs by SW-846 Method 8082A;
- TCL herbicides by SW-846 Method 8151A; and
- TAL metals by SW-846 Methods 6010B, 7470A, and 7471B.

The Building 3459 AOI samples were analyzed for:

- TCL pesticides by SW-846 Method 8081B; and
- TCL herbicides by SW-846 Method 8151A.

Quality control (QC) samples were analyzed for the same parameters and are discussed in **Section 3.6**.

3.6 Sample Quality Assurance/Quality Control Measures

QC samples were collected as part of the soil and groundwater investigation including matrix spike/matrix spike duplicates (MS/MSD), field duplicates, equipment rinsate blanks, trip blanks, temperature blanks, and field blanks.

3.6.1 Field Quality Assurance/Quality Control

Field QC samples included field duplicates, MS/MSDs, equipment rinsate blanks, trip blanks (VOCs only), temperature blanks, and field blanks. Field duplicates were collected at the required frequency of 10 percent per method and matrix. Equipment rinsate blanks were collected at the required frequency of 5 percent per method and matrix, only when non-disposable sampling equipment was used. Field blanks were collected at the required frequency

of one per source of water (e.g. decontamination rinse water). One trip blank was included in each cooler with VOC samples and temperature blanks were included in all sample coolers.

QC procedures for pH, specific conductance, temperature, and turbidity measurements during groundwater sampling and PID screening during soil sampling included calibrating the instruments, as specified in the UFP-QAPP, and checking the reproducibility of the measurements by taking multiple readings on a single sample or reference standard.

3.6.2 Laboratory Quality Assurance/Quality Control

MS/MSDs were analyzed at a frequency of 5 percent per method and matrix. A triple volume of groundwater samples was collected to ensure adequate sample for MS/MSD analysis. In addition, the laboratory analyzed method blanks and laboratory control samples (LCSs) at a frequency of 5 percent per method and matrix. If a MS/MSD was not included in an analytical batch, a laboratory control sample duplicate (LCSD) was analyzed in order to measure precision. Surrogates were also spiked into all organic field and QC samples.

3.6.3 Data Validation and Verification

Bay West used Laboratory Data Consultants, Inc. Automated Data Review (ADR) software to perform an automated data review equivalent to an USEPA Tier II evaluation and to provide preliminary discrete data qualification. During the full data validation, data were evaluated for precision, accuracy, representativeness, completeness, comparability, and sensitivity. Data qualifiers were appended to each result, as necessary, in the electronic data deliverables with validation criteria set at 100% of USEPA Tier III Validation in accordance with the DoD Quality Systems Manual (QSM) for Environmental Laboratories, v4.2 (DoD, 2010), the USEPA's National Functional Guidelines for Superfund Organic Methods Data Review (USEPA, 2008) and the USEPA's National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2010). Data validation reports and laboratory analytical reports are included in **Appendix D** and **Appendix E**, respectively.

3.6.4 Decontamination Procedures

All drilling and sampling equipment utilized during the SWMU 56 Phase I RI field investigation was decontaminated in accordance with the UFP-QAPP. Prior to drilling activities, an equipment decontamination station was constructed near the investigation area. Equipment was decontaminated prior to its initial use and all subsequent sampling. Drilling equipment, including the Geoprobe® DPT retractable screen sampler, was steam cleaned. Sampling equipment decontamination procedures included scrubbing with potable water and a non-phosphate detergent and subsequent rinsing with potable water and deionized water. Groundwater sampling equipment decontamination was performed in accordance with the UFP-QAPP.

3.7 Investigation Derived Waste

Investigation derived waste (IDW) was generated during the DPT SB and decontamination process, as well as during the TMW development and purging while soil and groundwater sampling at SWMU 56.

IDW was managed to avoid additional degradation of the environment. IDW was segregated into solids and liquids, containerized, sampled for disposal categorization, and temporarily held at JBA while awaiting appropriate off-site disposal. IDW documentation including waste disposal manifests and load tickets will be signed by Keith Freihofer, Hazardous Materials Program Manager and included in **Appendix C** of the Draft Final Phase I RI Report.

4.0 PHASE I REMEDIAL INVESTIGATION RESULTS

4.1 Aerial Image Review

As discussed in **Section 3.1**, during the preparation of the UFP-QAPP, Bay West conducted a thorough review of aerial images from 1943 to 2010 to define the Civil Engineering Storage Yard AOI boundaries. Bay West identified areas of historical storage based on the selected historical aerial images. The aerial images used during the UFP-QAPP are included in **Appendix B**. It should be noted that some of the provided aerial images were not georeferenced to the current site conditions. The following items were noted during the historical aerial review:

- **1943** – No evidence of storage within the Civil Engineering Storage Yard AOI. All access ways and driveways appear to be gravel. Portions of Building 3459 are constructed.
- **1948** – No evidence of storage within the Civil Engineering Storage Yard AOI. All access ways and driveways appear to be gravel. Buildings 3459 and 3448 are constructed.
- **1950** – Storage within the Civil Engineering Storage Yard AOI is evident. All access ways and driveways appear to be gravel. Buildings 3444 and 3457 are constructed.
- **1955** – Storage area within the Civil Engineering Storage Yard AOI. All access ways and driveways appear to be gravel. Portions of Buildings 3449 and 3447 are constructed.
- **1964** – Storage within the Civil Engineering Storage Yard AOI is evident. All access ways and driveways appear to be paved. Portions of Buildings 3449 and 3447 are constructed.
- **1968** – Storage within the Civil Engineering Storage Yard AOI is evident. All access ways and driveways appear to be paved and striped.
- **1971** – Storage within the Civil Engineering Storage Yard AOI is evident. All access ways and driveways appear to be paved and striped.
- **1974** – Storage within the Civil Engineering Storage Yard AOI is evident. All access ways and driveways appear to be paved and striped.
- **1982** – Minimal exterior storage is visible on the aerial image. All access ways and driveways appear to be paved and striped. Portions of Buildings 3440 and 3451 are constructed.
- **2000** – Storage within the Civil Engineering Storage Yard AOI is evident. All access ways and driveways appear to be paved and striped. Buildings 3441 and 3442 are constructed. Building 3459 has been demolished.
- **2003** – Minimal exterior storage is visible on the aerial image. All access ways and driveways appear to be paved and striped.
- **2005** – Storage within the Civil Engineering Storage Yard AOI is evident. All access ways and driveways appear to be paved and striped.
- **2007** – Storage within the Civil Engineering Storage Yard AOI is evident on the east side of the area. All access ways and driveways appear to be paved and striped.

4.2 ST14-MW35 pH Purge Test

A purge test was conducted on ST14-MW35 to monitor the pH of groundwater purged from the well over time using the procedures discussed in **Section 3.3**. A total of 91.5 liters of groundwater were purged from the well. During the first 1.5 hours of purging at 150 mL/min, pH measurements ranged from 9.34 to 10.28. The purge rate was then increased to 500 mL/min and, after approximately two hours, pH decreased to 6.59. Groundwater was then purged at a rate of 400 mL/min for 20 minutes, then 200 mL/min for 25 minutes, at which point the pH stabilized at 6.92 for approximately 25 minutes. The groundwater level in ST14-MW35 continually dropped during the purge test; the static water level started at 17.70 feet below top of casing (BTOC) and leveled off at approximately 27.95 feet BTOC with a purge rate of 200 mL/min. The pH purge test results are included in **Table 4-1** and **Figure 4-1**.

4.3 Environmental Sampling

Environmental sampling was conducted in accordance with the UFP-QAPP as described in **Section 3.4**. The following sections present the results of soil and groundwater sampling as well as a comparison of the analytical results to the USEPA residential RSLs, USEPA MCLs, or MDE Interim Final Cleanup Standards, as appropriate. Groundwater chemical concentrations were compared to USEPA RSLs, USEPA MCLs, and MDE interim final cleanup standards (MDE, 2008), as appropriate. The sampling results were also compared to the Basewide background upper tolerance limits (UTLs) for surface soil (0 to 2 feet bgs), SBs (greater than 2 feet bgs), and groundwater, when available. The comparison to Basewide background UTLs was completed for informational purposes only; no chemicals were screened away based on the Basewide background UTLs comparison.

4.3.1 Civil Engineering Storage Yard Area of Interest

4.3.1.1 Soil Sampling

Nine TMWs were advanced in the Civil Engineering Storage Yard AOI to a depth of approximately 30 feet bgs. Each TMW was completed through asphalt. Soil samples were collected continuously from the ground surface to the bottom of each TMW. Soil encountered in the TMWs generally consisted of 5 feet of brown to dark gray clay with sand and gravel (fill material), underlain by grayish brown clay, silt, and fine sand to 10 feet bgs (shallow upland deposits), underlain by yellowish brown to brownish yellow, medium to coarse sands with varying amounts of gravel and clay to approximately 20 feet bgs (intermediate upland deposits), underlain by yellow fine sand with silt to the extent of the TMW (deep upland deposits). The Calvert Formation was encountered in TMW-02 and TMW-08 at a depth of 30 feet bgs and consisted of dark greenish gray clay. Groundwater was typically encountered at 14 to 16 feet bgs. A cross-section of the lithology observed at the site is presented on **Figure 4-2** (A-A' cross-section plan view is included on **Figure 3-1**). TMW logs including full lithology descriptions are included in **Appendix C**.

No physical indications of contamination (staining, odor, sheen, etc.) were observed during field screening in the TMWs, with the exception of a 1-inch black clay layer in TMW-02 at 3 feet bgs that was possibly stained. TMW-02 also exhibited the highest pH measurement of 8.39 at 2 to 4 feet bgs; therefore, the 2- to 4-foot interval was submitted for laboratory analysis. At TMW-01, TMW-03, TMW-05, and TMW-06, the intervals with the highest PID readings above groundwater were sampled and submitted for laboratory analysis. Soil samples collected from SBs TMW-04, TMW-07, TMW-08, and TMW-09 exhibited no field screening or headspace reading indication of contamination; therefore, samples were collected from the interval directly above the soil/groundwater interface. A field duplicate was collected from TMW-01. A summary of Civil Engineering Yard AOI soil screening results and sample collection is presented in

Table 4-2. The soil detections are presented in **Table 4-3** and sample locations are shown on **Figure 3-1**. The following sections provide a summary of the soil sampling analytical results.

4.3.1.1.1 VOCs

VOCs were detected in five soil samples. The following summarizes the VOC detections, number of detections, and detection ranges:

- 1,3,5-trimethylbenzene – one detection at 0.61 µg/kg;
- 2-butanone (MEK) – three detections ranging from 7.8 to 20 µg/kg;
- Acetone – four detections ranging from 9.6 to 97 µg/kg;
- Carbon disulfide – three detections ranging from 0.44 to 0.87 µg/kg;
- cis-1,2-dichloroethene – two detections ranging from 50 to 120 µg/kg;
- Naphthalene – one detection at 1.3 µg/kg;
- Tetrachloroethene – one detection at 1.8 µg/kg;
- Toluene – one detection at 1.2 µg/kg;
- trans-1,2-dichloroethene – two detections ranging from 4.4 to 9.6 µg/kg; and
- Trichloroethene – two detections ranging from 0.49 to 34 µg/kg.

None of the above concentrations exceeded their respective USEPA residential RSLs (USEPA, 2012).

4.3.1.1.2 PAHs

PAHs were detected in four soil samples. The following summarizes the PAH detections, number of detections, and detection ranges:

- Acenaphthene – one detection at 2.2 µg/kg;
- Acenaphthylene – three detections ranging from 1.0 to 7.7 µg/kg;
- Anthracene – two detections ranging from 3.7 to 5.6 µg/kg;
- Benzo[a]anthracene – three detections ranging from 1.9 to 14 µg/kg;
- Benzo[a]pyrene – three detections ranging from 2.2 to 18 µg/kg;
- Benzo[b]fluoranthene – three detections ranging from 5.3 to 34 µg/kg;
- Benzo[g,h,i]perylene – three detections ranging from 4.0 to 18 µg/kg;
- Benzo[k]fluoranthene – three detections ranging from 1.5 to 9.4 µg/kg;
- Chrysene – three detections ranging from 3.7 to 30 µg/kg;
- Dibenz(a,h)anthracene – two detections ranging from 3.4 to 3.9 µg/kg;
- Fluoranthene – three detections ranging from 3.5 to 35 µg/kg;
- Fluorene – two detections ranging from 4.0 to 5.4 µg/kg;
- Indeno[1,2,3-cd]pyrene – three detections ranging from 3.1 to 17 µg/kg;
- Naphthalene – four detections ranging from 0.66 to 37 µg/kg;
- Phenanthrene – three detections ranging from 2.1 to 28 µg/kg; and
- Pyrene – three detections ranging from 4.0 to 42 µg/kg.

Benzo[a]pyrene was detected in two samples at concentrations of 16 and 18 µg/kg at TMW-02 and TMW-01, respectively, that exceeded the USEPA residential RSL of 15 µg/kg.

4.3.1.1.3 SVOCs

SVOCs were detected in six soil samples and the field duplicate. The following summarizes the SVOC detections, number of detections, and detection ranges:

- Benzyl alcohol – six detections ranging from 22 to 42 µg/kg;
- Benzo[b]fluoranthene – one detection at 44 µg/kg;
- Chrysene – one detection at 38 µg/kg; and
- Pyrene – two detections: 20 and 47 µg/kg.

None of the above concentrations exceeded their respective USEPA residential RSLs (USEPA, 2012).

4.3.1.1.4 DRO/GRO

DRO was detected in all 14 soil samples and the duplicate ranging from 810 µg/kg (in duplicate) to 9,500 µg/kg. GRO was detected in nine soil samples and the duplicate ranging from 260 µg/kg (in duplicate) to 4,900 µg/kg. None of the DRO and GRO concentrations exceeded the MDE interim final cleanup standards for DRO and GRO of 230,000 µg/kg (MDE 2008).

4.3.1.1.5 Pesticides

Pesticides were detected in two soil samples. The following summarizes the pesticide detections, number of detections, and detection ranges:

- 4,4'-dichlorodiphenyldichloroethane (DDD) – two detections ranging from 1.7 to 1.8 µg/kg; and
- 4,4'-dichlorodiphenyldichloroethylene (DDE) – two detections ranging from 1.2 to 4.7 µg/kg.

None of the above concentrations exceeded their respective USEPA residential RSLs (USEPA, 2012).

4.3.1.1.6 PCBs

No PCBs were detected greater than the limit of detection (LOD) in the soil samples.

4.3.1.1.7 Herbicides

No herbicides were detected greater than the LOD in the soil samples.

4.3.1.1.8 Metals

Metals were detected in all of the soil samples and the field duplicate. The following summarizes the metal detections, number of detections, and detection ranges:

- Aluminum – 15 detections ranging from 1,600,000 to 24,000,000 µg/kg;
- Arsenic – 15 detections ranging from 370 to 2,900 µg/kg;
- Barium – 15 detections ranging from 580 to 42,000,000 µg/kg;
- Beryllium – 15 detections ranging from 25 to 310 µg/kg;
- Cadmium – 15 detections ranging from 29 to 180 µg/kg;
- Calcium – 15 detections ranging from 20 to 1,100 µg/kg;
- Chromium – 15 detections ranging from 2,400 to 22,000 µg/kg;
- Cobalt – 15 detections ranging from 100 to 2,700 µg/kg;
- Copper – 15 detections ranging from 1,000 to 5,200 µg/kg;

- Iron – 15 detections ranging from 1,400,000 to 21,000,000 µg/kg;
- Lead – 15 detections ranging from 890 to 16,000 µg/kg;
- Magnesium – 15 detections ranging from 33,000 to 800,000 µg/kg;
- Manganese – 15 detections ranging from 940 to 39,000 µg/kg;
- Mercury – four detections ranging from 11 to 24 µg/kg;
- Molybdenum – 15 detections ranging from 81 to 1,000 µg/kg;
- Nickel – 15 detections ranging from 320 to 5,400 µg/kg;
- Potassium – 15 detections ranging from 68,000 to 440,000 µg/kg;
- Selenium – 15 detections ranging from 170 to 850 µg/kg;
- Silver – seven detections ranging from 21 [in duplicate]to 45 µg/kg;
- Sodium – four detections ranging from 75,000 to 600,000 µg/kg;
- Thallium – 15 detections ranging from 11 to 210 µg/kg;
- Vanadium – 15 detections ranging from 2,600 to 37,000 µg/kg; and
- Zinc – 15 detections ranging from 580 to 20,000 µg/kg.

The detections of arsenic and barium exceeded the USEPA residential RSLs. Arsenic exceeded the USEPA residential RSL of 390 µg/kg in all but one soil sample (the parent sample of the field duplicate pair at TMW01). Barium was detected in one soil sample at TMW-06 at a concentration of 42,000,000 µg/kg that exceeded the USEPA residential RSL of 15,000,000 µg/kg. Total chromium was detected in all of the samples at concentrations exceeding the chromium VI USEPA residential RSL of 290 µg/kg, but did not exceed the chromium III USEPA residential RSL of 120,000,000 µg/kg.

4.3.1.2 Groundwater Sampling

Groundwater samples were collected from each TMW using the procedures described in **Section 3.3.2**. The groundwater sampling turbidity goal of 10 NTUs, prior to sampling, was attained for each of the groundwater samples, with the exception of TMW-02, TMW-05, and TMW-08, which had final turbidity readings of 1,028.5, 12.6, and 52.2 NTUs, respectively. After purging TMW-05 and TMW-08 for a minimum of 2 hours, turbidity did not reach 10 NTUs; therefore, the peristaltic pump was set to the minimum pumping rate of 150 mL/min and water samples were collected. At TMW-02, the recharge rate was not sufficient to collect more than one turbidity reading. After recording one turbidity reading and purging for 2 hours, the water sample was then collected at the minimum pumping rate of 150 mL/min. The possible effects of turbid groundwater samples are discussed in **Section 8.1.1.2**. Water levels within the TMW casings could not be measured because the diameter of the water level indicator probe was greater than the diameter of the top of the DPT groundwater sampler; however, groundwater was measured at 14.01 feet BTOC in ST14-MW35. The location of ST14-MW35 is detailed on **Figure 3-1**.

Groundwater detections are presented in **Table 4-4**. The following sections provide a summary of the Civil Engineering Storage Yard AOI groundwater results:

4.3.1.2.1 VOCs

VOCs were detected in seven groundwater samples and the field duplicate. The following summarizes the VOC detections, the number of detections, and detection ranges:

- 1,1-Dichloroethane – one detection at 0.21 µg/L;
- 1,1-Dichloroethene – three detections ranging from 0.17 to 0.53 µg/L;

- Chloroform – four detections ranging from 0.33 to 490 µg/L;
- cis-1,2-Dichloroethene – six detections ranging from 0.16 to 4.9 µg/L;
- Trichloroethene – six detections ranging from 0.31 to 45 µg/L; and
- Trichlorofluoromethane – one detection at 0.93 µg/L.

Chloroform was detected in four samples at TMW-04, TMW-05, TMW-06, and TMW-07 at concentrations that exceeded the USEPA RSL of 0.19 µg/L and/or MCL of 80 µg/L. TCE was detected in five samples and the field duplicate at TMW-01, TMW-02, TMW-05, TMW06, and TMW-09 at concentrations that exceeded the USEPA RSL of 0.44 µg/L and/or MCL of 5 µg/L.

4.3.1.2.2 PAHs

PAHs were detected in all of the groundwater samples including the field duplicate. The following summarizes the VOC detections, number of detections, and detection ranges:

- Anthracene – one detection at 0.029 µg/L;
- Benzo[b]fluoranthene – one detection at 0.17 µg/L;
- Benzo[g,h,i]perylene – one detection at 0.15 µg/L;
- Benzo[k]fluoranthene – one detection at 0.17 µg/L;
- Dibenz(a,h)anthracene – one detection at 0.16 µg/L;
- Fluoranthene – one detection at 0.092 µg/L;
- Fluorene – two detections ranging from 0.067 to 0.14 µg/L;
- Indeno[1,2,3-cd]pyrene – one detection at 0.17 µg/L;
- Naphthalene – 10 detections ranging from 0.0072 to 0.13 µg/L; and
- Phenanthrene – two detections ranging from 0.11 to 0.23 µg/L.

Benzo[b]fluoranthene, Dibenz(a,h)anthracene, and Indeno[1,2,3-cd]pyrene were detected in TMW-05 at concentrations that exceeded the respective USEPA residential RSLs of 0.029 µg/L, 0.0029 µg/L, and 0.029 µg/L.

4.3.1.2.3 SVOCs

Diethyl phthalate was detected in TMW-06 at a concentration of 0.53 µg/L. No other SVOCs were detected. The diethyl phthalate detection did not exceed the USEPA residential RSL of 11,000 µg/L.

4.3.1.2.4 GRO/DRO

GRO was detected at TMW-04 at a concentration of 83 µg/L. The detection of GRO exceeded the MDE interim residential cleanup standard of 47 µg/L. DRO was detected at TMW-03 at a concentration of 76 µg/L. The detection of DRO exceeded the MDE interim residential cleanup standard of 47 µg/L. GRO/DRO was not detected in the other groundwater samples.

4.3.1.2.5 Pesticides

No pesticides were detected greater than the LOD in the groundwater samples.

4.3.1.2.6 PCBs

No PCBs were detected greater than the LOD in the groundwater samples.

4.3.1.2.7 Herbicides

MCPP was detected at TMW-05 at a concentration of 33 µg/L and at TMW-07 at a concentration of 35 µg/L. No other herbicides were detected. The detections of MCPP exceeded the USEPA residential RSL of 12 µg/L.

4.3.1.2.8 Metals

Metals were detected in all of the groundwater samples including the field duplicate. The following is a list of metal detections, number of detections, and detection ranges:

- Aluminum – 10 detections ranging from 57 to 21,000 µg/L;
- Arsenic – three detections ranging from 0.41 to 21 µg/L;
- Barium – 10 detections ranging from 19 to 210 µg/L;
- Beryllium – 10 detections ranging from 0.085 to 1.9 µg/L;
- Cadmium – 10 detections ranging from 0.14 to 2.4 µg/L;
- Calcium – 10 detections ranging from 1,600 to 11,000 µg/L;
- Chromium (Total) – 10 detections ranging from 1.0 to 170 µg/L;
- Cobalt – 10 detections ranging from 1.0 to 95 µg/L;
- Copper – three detections ranging from 5.2 to 310 µg/L;
- Iron – 10 detections ranging from 740 to 110,000 µg/L;
- Lead – 10 detections ranging from 0.22 to 24 µg/L;
- Magnesium – 10 detections ranging from 750 to 9,100 µg/L;
- Manganese – 10 detections ranging from 19 to 390 µg/L
- Mercury – five detections ranging from 0.065 to 0.39 µg/L;
- Molybdenum – nine detections ranging from 0.19 to 45 µg/L;
- Nickel – 10 detections ranging from 3.8 to 150 µg/L;
- Potassium – 10 detections ranging from 750 to 4,100 µg/L;
- Selenium – two detections ranging from 0.99 to 3.0 µg/L;
- Silver – one detection ranging from 0.36 µg/L;
- Sodium – 10 detections ranging from 3,700 to 57,000 µg/L;
- Thallium – five detections ranging from 0.063 to 1.5 µg/L;
- Vanadium – four detections ranging from 0.77 to 59 µg/L; and
- Zinc – seven detections ranging from 9.0 to 190 µg/L.

Aluminum, arsenic, chromium (total), cobalt, iron, lead, and thallium were detected at TMW-02 at concentrations that exceeded USEPA residential RSLs or MCLs of 16,000 µg/L, 10 µg/L, 100 µg/L, 4.7 µg/L, 11,000 µg/L, 15 µg/L, and 0.16 µg/L, respectively. Arsenic was detected at TMW-05 and TMW-08 at concentrations that exceeded the USEPA RSL of 0.045 µg/L. Cobalt and manganese were detected at TMW-05 at concentrations that exceeded USEPA residential RSLs of 4.7 µg/L and 320 µg/L, respectively.

4.3.2 Building 3459 Area of Interest

Four SBs were advanced in the former Building 3456 footprint to a depth of 2 feet bgs. Each SB was located in the on-site grass except for SB-01, which was located on the asphalt surface. Soil encountered in the SBs consisted of yellowish brown silt and sand with gravel. SB logs from Building 3459 AOI are included in **Appendix C**.

No indications of contamination were observed during field screening. PID readings ranged from 0.5 parts per million (ppm) in SB-02 to 1.3 ppm in SB-03. One soil sample was collected from each SB and submitted to TestAmerica for laboratory analysis. Soil detections are presented in **Table 4-5** and sample locations are shown on **Figure 3-1**. The following sections provide a summary of Building 3459 AOI soil analytical results:

4.3.2.1.1 Pesticides

Pesticides were detected in all of the soil samples. The following is a list of pesticides detections, number of detections, and detection ranges:

- Delta hexachlorocyclohexane (delta BHC) – two detections ranging from 0.51 to 2.5 µg/kg;
- alpha-Chlordane – three detections ranging from 16 to 300 µg/kg;
- gamma-Chlordane – three detections ranging from 18 to 420 µg/kg;
- 4,4'-DDD – one detection at 65 µg/kg;
- 4,4'-DDE – two detections ranging from 2.4 to 27 µg/kg;
- 4,4'-DDT (dichlorodiphenyltrichloroethane) – three detections ranging from 0.99 to 41 µg/kg;
- Endosulfan sulfate – one detection at 6.7 µg/kg;
- Heptachlor – two detections ranging from 0.47 to 14 µg/kg; and
- Heptachlor epoxide – two detections ranging from 0.56 to 2.7 µg/kg.

None of the above concentrations exceeded the USEPA residential RSLs.

4.3.2.1.2 Herbicides

No herbicides were detected greater than the LOD in the soil samples.

4.4 Sample Quality Assurance/Quality Control Measures

All laboratory analytical data were validated by Bay West. Data validation results are discussed in the Data Validation Report included in **Appendix D**. All data were determined to be usable or usable as qualified.

It should be noted that **Table 4-3** through **Table 4-5** includes the detections in the duplicate samples.

Reporting of the first 10 TICs were included in the VOC and SVOC analytical methods as described in the UFP-QAPP. The reported TICs include unknown compounds and common lab contaminants. In addition, one VOC, Acetonitrile, was reported and detected in a soil sample as a TIC; however, the detected concentration of 140 µg/kg did not exceed the USEPA residential RSL of 870,000 µg/kg. The full list of TICs can be found in the lab analytical packages included in **Appendix E** and additional TIC evaluation is included in the Data Validation Report included in **Appendix D**.

4.5 Investigation Derived Waste

At the time of this submittal, the IDW sampling results are pending. The Final Phase I RI Report will include the following:

- Hazardous or non-hazardous characterization of the IDW based on waste characterization sampling results;
- The waste facility in which the IDW was transported to; and
- The waste disposal manifests and load tickets signed by Keith Freihofer, Hazardous Materials Program Manager will be included in **Appendix C**.

5.0 FATE AND TRANSPORT

The fate and transport of CECs are dependent on a wide variety of factors. Fate refers to the expected final state that an element, compound, or group of compounds will achieve following release to the environment. Transport refers to the mechanisms and rates of migration of chemicals away from the source area in which human or ecological receptors can then be exposed.

5.1 Fate of Chemicals Exceeding Criteria

Inorganic compounds cannot be degraded or destroyed, but can be attenuated via insoluble or sorbed states. In the case of inorganics, the primary influence on mobility is typically the compound's solubility. Inorganics will be relatively immobile where it is insoluble or sorbed. Conditions favoring solubility will promote mobility via water born migration (surface water and groundwater).

Organic compounds can be degraded to different states depending on the redox conditions present in the soil and groundwater. Organic compounds can be chemically or biologically degraded. Biological degradation can occur by native microbial populations or by microbial populations introduced into the aquifer.

5.2 Potential Transport and Exposure Pathways

The following sections present potential chemical transport and exposure pathways along with general descriptions of each. Site-specific transport and exposure pathways are discussed in **Sections 6.0** and **7.0**.

5.2.1 Soil

Transport Pathways – Soil transport pathways include: fugitive dust from surface soil; transport of surface soil via precipitation and runoff; uptake or ingestion of surface soil by biota; and leaching and infiltration of water from the surface through the soil column to shallow groundwater.

Exposure Pathways – Soil exposure pathways include: dust inhalation of airborne soil particles from fugitive dust and intrusive activities in surface and subsurface soils; incidental ingestion of and dermal contact with inland surface water and sediments from precipitation and runoff; incidental ingestion and dermal contact with surface and subsurface soil; incidental ingestion of biota; and dermal contact, drinking water ingestion, and incidental ingestion of shallow groundwater.

5.2.2 Surface Water and Sediment

Transport Pathways – Surface water and sediment transport pathways include the transport of impacted soil via surface water runoff.

Exposure Pathways – Surface water and sediment exposure pathways include the incidental ingestion of and dermal contact with chemicals sorbed to sediments being transported with the surface water or stormwater.

5.2.3 Groundwater

Transport Pathways – Groundwater transport pathways include the migration of groundwater to surface water seepages.

Exposure Pathways – Groundwater exposure pathways include: incidental ingestion of and dermal contact with inland surface water; incidental ingestion of biota; ingestion of shallow

groundwater as drinking water; and incidental ingestion of and dermal contact with shallow groundwater. It should be noted that drinking water wells are not permitted within JBA; therefore, the ingestion of drinking water is not a complete pathway at SWMU 56.

5.2.4 Air

Transport Pathways – Air transport pathways include the volatilization of chemicals into the air.

Exposure Pathways – Air exposure pathways include inhalation if volatiles are present in the surface soils.

6.0 HUMAN HEALTH SCREENING CRITERIA COMPARISON

6.1 General Approach

As part of the Phase I RI, a human health screening criteria comparison (HHSCC) was performed for the Civil Engineering Storage Yard and Building 3459 AOIs. The primary objective of the HHSCC is to assess potential health impacts to humans under current conditions relative to current and future uses at the sites resulting from site chemicals. SWMU 56 is currently zoned as industrial and used as a storage yard for the JBA Civil Engineering Department. Future land use is designated as industrial and administrative. Based on these uses, potential human receptor groups include military personnel, non-intrusive site workers (personnel working inside buildings at SWMU 56), and intrusive site workers. Additional land use information in provided in **Section 2.4**. It should be noted, however, that the USAF desires to obtain unlimited use/unrestricted exposure (UU/UE) at its contaminated sites; therefore, future residential human receptors are evaluated with this HHSCC as well. To that end, the USEPA residential RSLs and MCLs are used as the human health screening criteria.

In addition, GRO/DRO analytical results are compared to the MDE cleanup standards as no USEPA residential RSL or MCL is listed for comparison (MDE, 2008). A constituent is identified as a potential risk to human health if a concentration exceeds the USEPA residential RSLs, MCLs, or MDE cleanup standards.

6.2 Human Health Criteria Comparison Evaluation

6.2.1 Civil Engineering Storage Yard Area of Interest

6.2.1.1 Soil

A total of 15 soil samples and 1 duplicate were collected from 9 TMWs at the Civil Engineering Storage Yard AOI. Samples were analyzed using methods discussed in **Section 4.3.1.1**. Only benzo[a]pyrene, arsenic, and barium were detected at concentrations that exceeded the respective USEPA residential RSLs (**Table 4-3**); therefore, these compounds were evaluated in the HHSCC.

Basic statistics regarding the chemicals exceeding human health criteria in soil are presented in **Table 6-1**.

6.2.1.2 Groundwater

Nine groundwater samples were collected from TMWs in the Civil Engineering Yard AOI. Groundwater samples were analyzed using the methods discussed in **Section 4.3.1.1**. Two VOCs, three PAHs, GRO/DRO, one herbicide, and seven metals were detected at concentrations exceeding the USEPA residential RSLs or MCLs (**Table 4-5**), as presented in **Section 4.3.2**. The following chemicals were detected in the groundwater exceeding the screening criteria identified at the Civil Engineering and Storage Yard AOI:

- Chloroform;
- TCE;
- Benzo[b]fluoranthene;
- Dibenz(a,h)anthracene;
- Indeno[1,2,3-cd]pyrene;
- DRO/GRO;
- MCPP;
- Aluminum
- Arsenic;
- Chromium (Total);
- Cobalt;
- Iron;
- Lead;
- Manganese; and

- Thallium.

Basic statistics regarding the chemicals exceeding human health criteria in soil are presented in **Table 6-2**.

6.2.2 Building 3459 Area of Interest

6.2.2.1 Soil

Four soil samples were collected from shallow SBs (1-2 feet bgs) within the footprint of former Building 3459. Samples were analyzed using methods discussed in **Section 4.3.1.2**. Nine different pesticide compounds were detected at the site, as discussed in **Section 4.3.1.2.1**. 4'4'All pesticide detections did not exceed the applicable USEPA residential RSLs and no herbicides were detected (**Table 4-4**); therefore, no pesticides or herbicides were evaluated in the HHSCC for the Building 3459 AOI.

6.2.2.2 Groundwater

Groundwater sampling was not performed at Building 3459 for the Phase I RI.

6.3 Transport and Exposure Pathways

6.3.1 Civil Engineering Storage Yard Area of Interest

6.3.1.1 Soil

The Civil Engineering Storage Yard AOI currently has an asphalt cap as described in **Section 2.4**; however, it should be noted that although the asphalt prevents human exposure to surface and subsurface soils, surface water has the potential to pass through cracks in the asphalt and leach chemicals from the soil to groundwater (**Section 6.3.2**). Because several buildings are located on the Civil Engineering Storage Yard AOI, the soil vapor intrusion transport and exposure pathway was evaluated. Additionally, as discussed in **Section 6.1**, it is the objective of the USAF to obtain UU/UE at its contaminated sites; therefore, soil exposure pathways for future residential human receptors were evaluated. The following soil exposure pathways (**Section 5.2**) are complete or potentially complete:

- The inhalation of VOC contaminated soil vapor that has migrated the from groundwater transport and exposure pathway is potentially complete for all human receptors;
- The inhalation of contaminated airborne soil particles via the fugitive dust transport and exposure pathway is potentially complete for current intrusive site workers and future residents;
- The incidental ingestion of and dermal contact with the contaminated inland surface water and sediments via precipitation and runoff transport and exposure pathway is potentially complete for future residents.
- The inhalation of dust, incidental ingestion of, and dermal contact with the contaminated surface soil transport and exposure pathway is complete for the intrusive site worker and potentially complete for future residents;
- The inhalation of dust, incidental ingestion of, and dermal contact with the contaminated subsurface soil transport and exposure pathway is complete for the intrusive site worker and potentially complete for the future resident; and
- The incidental ingestion of and dermal contact with contaminated shallow groundwater transport and exposure pathway is potentially complete if the site worker is working at a depth in which groundwater would be encountered.

6.3.1.2 Groundwater

The only potentially complete groundwater transport exposure pathway at the Civil Engineering Storage Yard AOI is for the intrusive site worker via incidental ingestion and dermal contact with contaminated groundwater. This pathway will be complete if the intrusive site worker is working at a depth in which groundwater is encountered.

A potential transport and exposure pathway for future residents includes the incidental ingestion of and dermal contact with contaminated surface water in the Charles Branch if shallow groundwater migrates and seeps to the stream. Using the most conservative hydraulic conductivity values for the site (3.4 feet per day, **Section 2.2.2**) to calculate the effective velocity of groundwater, it would take approximately 40 years for groundwater to travel from the site to the Charles Branch via the approximately 1,000-foot groundwater flow path from the site to the Charles Branch. Therefore, this pathway is not considered to be complete.

6.3.2 Building 3459 Area of Interest

Transport and exposure pathways for human receptors at the Building 3459 AOI were not evaluated because contamination was not detected exceeding the USEPA residential RSLs.

6.4 Human Health Screening Criteria Comparison Summary

Analytical results of soil and groundwater samples collected from SWMU 56 were evaluated in the HHSCC to identify potential health impacts to current and future human receptors under current conditions.

Benzo(a)pyrene, arsenic, and barium, exist in soil at concentrations exceeding the screening criteria and exposure pathways are complete for both current and future receptors; therefore, benzo(a)pyrene, arsenic, and barium in the soil is considered to pose a potential risk to current and future human receptors within a limited area surrounding TMW-06 at the Civil Engineering Storage Yard AOI.

As described in **Section 1.0**, SWMU 56 is located within the ERP Site ST-14 TCE plume; therefore, the TCE concentrations detected in groundwater at SWMU 56 are likely attributed to the ST-14 plume; however, TCE and will be further evaluated in this investigation. A map showing the current ST-14 TCE plume configuration is included in **Appendix A**. –

Groundwater chemicals were detected at concentrations that pose a potential risk to both current and future human receptors with respect to SWMU 56. In addition, exposure pathways are complete or potentially complete for both current and future human receptors at the Civil Engineering Storage Yard. The groundwater CECs include:

- Chloroform;
- Trichloroethene
- Benzo[b]fluoranthene;
- Dibenz(a,h)anthracene;
- Indeno[1,2,3-cd]pyrene;
- DRO/GRO;
- MCPP;
- Aluminum
- Arsenic;
- Chromium (Total);
- Cobalt;
- Iron;
- Lead;
- Manganese; and
- Thallium.

7.0 ECOLOGICAL SCREENING CRITERIA COMPARISON

7.1 General Approach

As part of the Phase I RI, an ecological screening criteria comparison (ESCC) was performed for the Civil Engineering Storage Yard and Building 3459 AOIs. The primary objective of the ESCC is to assess potential ecological impacts under current conditions resulting from site-related chemicals. The ESCC evaluates if any of the following three conditions exist:

1. The site contains chemicals exceeding ecological screening benchmarks;
2. Ecological habitat is present on, adjacent to, or potentially impacted by the site; and
3. There are possible chemical transport pathways from the site to ecological receptors.

If **all three** of these conditions are met for a site, a potential risk to the environment is present and additional ecological evaluation may be appropriate. If one or more of the three conditions are not met, there is no risk to ecological receptor species and no further ecological evaluation is warranted. Even with a source of chemicals, without ecological receptors or a pathway for exposure of the receptors, there is no ecological risk.

In order to identify chemicals that pose a potential ecological risk, this ESCC compares the Phase I RI SWMU 56 laboratory analytical data against the USEPA Region 3 Biological Technical Assistance Group (BTAG) freshwater sediment and freshwater screening criteria and USEPA ecological soil screening levels (EcoSSLs) for plant, soil invertebrates, mammals, and birds. A constituent is identified as a potential ecological risk if a concentration exceeds ecological screening criteria.

The BERA (CH2M Hill, 2004) was used to assess site habitats and to determine potential ecological receptors based on the overall drainage area in which SWMU 56 is located (**Section 2.5**). The combination of site habitats and potential ecological receptors were then used to determine the potential for complete transport and exposure pathways.

7.2 Ecological Screening Criteria Comparison Evaluation

7.2.1 Civil Engineering and Storage Yard Area of Interest

7.2.1.1 Soil

A total of 15 soil samples and one duplicate were collected from nine TMWs at the Civil Engineering Storage Yard AOI. Samples were analyzed using the methods discussed in **Section 4.3.1.1**. Soil samples had concentrations of one VOC, three PAHs, one SVOC, one pesticide, and five metals that exceeded the ecological screening values (**Table 7-1**).

Basic statistics regarding the chemicals exceeding ecological criteria are presented in **Table 7-2**. It should be noted that the one of the SVOC exceedances (Benzo(b)fluoranthene) was also included with the PAH exceedances; the PAH analytical method was completed to achieve lower LODs.

7.2.1.2 Groundwater

Nine groundwater samples and one duplicate were collected from TMWs at the Civil Engineering Yard AOI. Groundwater samples were analyzed using methods discussed in **Section 4.3.1.1**. The two VOCs, two PAHs and 17 metals detected at concentrations that exceeded the USEPA Region 3 BTAG freshwater screening criteria (**Table 7-3**), include the following:

- Chloroform;
- TCE;
- Anthracene;
- Fluoranthene;
- Aluminum
- Arsenic;
- Barium;
- Beryllium;
- Cadmium;
- Chromium (Total);
- Cobalt;
- Copper;
- Iron;
- Lead;
- Manganese;
- Mercury;
- Nickel;
- Selenium;
- Thallium;
- Vanadium; and
- Zinc.

7.2.2 Building 3459 Area of Interest

7.2.2.1 Soil

Four soil samples were collected from shallow SBs (1-2 feet bgs) within the footprint of the former Building 3459. Samples were analyzed using methods discussed in **Section 4.3.1.2**. No herbicides were detected greater than laboratory LODs; however, six pesticides were detected at concentrations that exceed ecological screening levels. The following pesticides are present within the Building 3459 AOI at concentrations exceeding the ecological soil screening criteria:

- alpha-chlordane;
- gamma-chlordane;
- 4,4'-DDE;
- 4,4'-DDT;
- Endosulfan sulfate; and
- Heptachlor epoxide.

7.2.2.1 Groundwater

Groundwater sampling was not performed at Building 3459 for the Phase I RI.

7.3 Transport and Exposure Pathways

7.3.1 Civil Engineering and Storage Yard Area of Interest

The Civil Engineering Storage Yard AOI currently has an asphalt cap as described in **Section 2.4.** The asphalt cap limits both the habitat present and possible exposure to surface soil; therefore, there are no complete soil transport and exposure pathways for ecological receptors.

A potentially complete groundwater transport and exposure pathway for ecological receptors exists via ingestion of and dermal contact with inland surface water if contaminated groundwater seeps to the Charles Branch. Potential receptors within the Charles Branch Drainage Area are

discussed in **Section 2.5**; however, as identified in the BERA, the Charles Branch has a relatively poor habitat quality for aquatic biota. In addition, using the most conservative hydraulic conductivity values for the site, as discussed in **Section 6.3**, to calculate the effective velocity of groundwater, it would take approximately 40 years for groundwater to travel from the site to the Charles Branch, located approximately 1,000 feet from the site, allowing for chemicals to naturally attenuate prior to reaching any surface water body. Therefore, this pathway is not considered to be complete and no complete exposure pathways for ecological receptors exist at the site.

7.3.1 Building 3459 Area of Interest

As discussed in **Section 1.3**, the Building 3459 AOI is characterized by paved surfaces and mowed grass, providing little habitat value and no habitat for threatened and endangered species; therefore, no complete transport and exposure pathways for soil exist at the site.

A potentially complete pathway for ecological receptors exists, however, if chemicals in surface soil migrate to shallow groundwater via leaching/infiltration and then seep to the Cabin Branch. This is not considered to be a complete pathway as the Cabin Branch habitat (**Section 2.5**) is of relatively poor quality for aquatic biota. Additionally, using the hydraulic conductivity values discussed in **Section 6.3** to calculate the effective velocity of groundwater, it would take approximately 52 years for groundwater to travel from the site to the Cabin Branch, located approximately 1,300 feet from the site. Therefore, this pathway is not considered to be complete and no complete exposure pathways exist for ecological receptors at the site.

7.4 Ecological Screening Criteria Comparison Summary

Analytical results of soil and groundwater samples collected from SWMU 56 were evaluated in the ESCC to identify potential impacts to ecological receptors through potential transport and exposure pathways under current conditions. The ESCC determined that chemicals were detected at concentrations that pose a potential risk to ecological receptors; however, no complete transport and/or exposure pathways for ecological receptors exist at the site. No chemicals detected at the site pose a risk to ecological receptors.

8.0 CONCEPTUAL SITE MODEL AND CONCLUSIONS

The objective of this Phase I RI is to determine whether hazardous substances were released to the environment and whether hazardous substances have impacted the environment exceeding human health or environmental exposure criteria, resulting in a determination of CECs for the site. Soil and groundwater analytical data were evaluated by performing a HHSCC and ESCC to assess if hazardous substances detected in soil and groundwater pose a potential risk to human health or the environment. The following sections present the conclusions of this Phase I RI consisting of a CSM and identifying data gaps.

8.1 Conceptual Site Model

The HHSCC and ESCC compared chemicals detected at SWMU 56 in soil and groundwater to applicable screening criteria. The chemicals present at concentrations exceeding the screening criteria were then evaluated for complete transport and exposure pathways to human and ecological receptors. This evaluation process is presented graphically with a CSM for soil and groundwater chemicals at the Civil Engineering Storage Yard AOI on **Figure 8-1** and **Figure 8-2**, respectively, and for soil chemicals at the Building 3459 AOI on **Figure 8-3**.

8.1.1 Civil Engineering Storage Yard Area of Interest Conceptual Site Model

8.1.1.1 Soil

Figure 8-1 details that benzo(a)pyrene, arsenic, and barium concentrations present in soils at the Civil Engineering Storage Yard AOI pose a potential risk to human receptors and one VOC, three PAHs, and five metals present in soil that pose a potential risk to ecological receptors. Transport and exposure pathways are not complete or potentially complete at the site for ecological receptors due to the lack of habitat and, therefore, the chemicals present do not pose a risk to ecological receptors. As detailed in **Section 6.3**, transport and exposure pathways are complete and potentially complete for human receptors. Therefore, benzo(a)pyrene, arsenic, and barium are considered to be soil CECs at the Civil Engineering Storage Yard AOI (**Figure 8-4**).

8.1.1.2 Groundwater

Figure 8-2 details that two VOCs, three PAHs, DRO, GRO, one herbicide, and seven metals are present in groundwater at concentrations that pose a potential risk to human receptors and two VOCs, two PAHs, and 17 metals are present at concentrations that pose a potential risk to ecological receptors at the Civil Engineering Storage Yard AOI. Metal transport and exposure pathways are not complete or potentially complete at the site for ecological receptors due to the lack of habitat; therefore, the chemicals present do not pose a risk to ecological receptors.

A potentially complete groundwater transport and exposure pathway for the intrusive site worker was identified; therefore, groundwater CECs were identified for the Civil Engineering Storage Yard AOI. In addition, regardless of whether the groundwater transport pathway is incomplete, the CECs associated with groundwater will need to be further evaluated for the future residential receptors as groundwater is considered a public asset and the USEPA is mandated by law to evaluate risks associated with beneficial use. The HHSCC compared the chemical concentrations to the USEPA residential RSLs, USEPA MCLs, or MDE interim residential cleanup standards. The groundwater CECs identified include:

- Chloroform;
- Arsenic;
- Lead;
- DRO/GRO;
- MCPP;
- Aluminum;

- Trichloroethene;
- Benzo[b]fluoranthene;
- Dibenz(a,h)anthracene;
- Indeno[1,2,3-cd]pyrene;
- Chromium (Total);
- Cobalt;
- Iron;
- Manganese; and
- Thallium.

Figure 8-5 presents the CEC concentrations and TMW locations. The following consideration should be taken into account with regards to the CECs.

Aluminum, Arsenic, Lead, Chromium (Total), Cobalt, Iron, and Thallium – Aluminum, arsenic, lead, chromium, cobalt, and iron, and thallium were detected at concentrations that exceed the USEPA MCLs or RSL in TMW-02. Due to slow recharge rates, TMW-02 produced limited amounts of water for monitoring and sampling and did not reach the turbidity goal of 10 NTUs. The final turbidity reading prior to sampling TMW-02 was 1,028 NTUs. Turbid groundwater samples can cause naturally-occurring metals that are sorbed to suspended solids to desorb into solution during the sample preservation process, causing elevated levels of dissolved metals to be detected. Minor concentrations of arsenic were detected in just two other TMWs (less than the laboratory limit of quantitation [LOQ]). All other detections of lead did not exceed the USEPA MCL.

8.1.2 Building 3459 Area of Interest Conceptual Site Model

8.1.2.1 Soil

Figure 8-3 details the pesticides that exist in soil at the Building 3459 AOI at concentrations that pose a potential risk to ecological receptors. Due to the lack of habitat, no complete or potentially complete transport and exposure pathways exist at the site; therefore, there are no soil CECs identified for the Building 3459 AOI.

8.2 Data Gaps

The following sections detail the data gaps identified following the conclusion of the Phase I RI.

8.2.1 Civil Engineering Storage Yard Area of Interest Data Gaps

The following data gaps have been identified for the Civil Engineering Storage Yard AOI:

- Barium (soil CEC) was detected in TMW-06 at the interval from 2 to 4 feet bgs. The detected concentration exceeded the screening criteria and poses a potential risk to current and future human receptors. The horizontal and vertical extents of barium contamination are not known.
- Chloroform (groundwater CEC) was detected in TMW-04, TMW-05, TMW-06, and TMW-07 and trichloroethene was detected at TMW-01, TMW-02, TMW-05, TMW06, and TMW-09 at concentrations that pose a potential risk to current and future human receptors. The horizontal extent of chloroform contamination, if any, in groundwater is not known.
- Aluminum, arsenic, chromium, cobalt, iron, lead, and thallium (groundwater CECs) were detected in TMW-02. Concentrations of arsenic, cobalt, and manganese were detected in TMW-05 at concentrations that pose a potential risk to current and future humans. Arsenic was also detected in TMW-08 at a concentration that poses a potential risk to current and future humans. The horizontal extent of arsenic, cobalt, iron, lead and thallium contamination, if any, in groundwater is not known.

- Chromium, reported as total chromium, was detected in all of the soil samples from the Civil Engineering Storage Yard AOI. Results for total chromium were compared to the insoluble salts of chromium (III) criterion; however, the total chromium data was not differentiated between chromium (III) and hexavalent chromium; therefore, the associated risk of chromium in soil is not known.
- As SWMU 56 has previously been identified as within the ST-14 TCE plume, the effects of SWMU 56 CECs on the ST-14 COC plume may need to be evaluated.

8.2.2 Building 3459 Area of Interest Data Gaps

No data gaps are identified as there are no soil CECs at the Building 3459 AOI. Additional investigation at the Building 3459 AOI is not warranted.

9.0 RECOMMENDATIONS

The objective of this Phase I RI is to determine whether hazardous substances were released to the environment and/or whether hazardous substances have impacted the environment exceeding human health or environmental exposure criteria. To that end, analysis of the data gathered during this Phase I RI indicates that CECs are present in the soil and groundwater at the Civil Engineering Storage Yard AOI; therefore, a RI is warranted. An RI may include analysis of the TCL VOCs, TCL PAHs, TCL herbicides, and TAL metals as a result of the CECs identified during this Phase I RI. Additionally, an objective of the RI will be to determine if the CECs identified during this Phase I RI in soil and groundwater will ultimately become COCs. The recommended specific investigations may include the following:

Investigation of barium-contaminated soil in the vicinity of TMW-06 – Barium was detected at TMW-06 in soil at a concentration that poses a potential risk to human receptors from 2 to 4 feet bgs. Surface and subsurface soils in the vicinity of TMW-06 should be investigated further to determine whether barium should remain a CEC at SWMU 56 and, if necessary, to define the vertical and horizontal extent of barium contamination in soil.

Investigation of chloroform in the vicinity of TMW-04 – Chloroform was detected at TMW-04, TMW-05, TMW-06, and TMW-07 in groundwater at concentrations that pose a potential risk to human receptors. Additional investigation of groundwater in the vicinity of TMW-04 is needed.

Investigation of groundwater CECs in the vicinity of TMW-02, TMW-05, and TMW-07 – CECs in groundwater were detected at TMW-02, TMW-05, and TMW-07 at concentrations that pose a potential risk to human receptors. Due to the high turbidity of the groundwater sample collected from TMW-02, additional investigation of groundwater is needed in the vicinity of TMW-02 to confirm analytical results, determine whether the CECs should remain with the site, and, if necessary, define the extent of the CECs. Additional investigation of groundwater is needed in the vicinity of TMW-05 and TMW-07 to confirm analytical results, determine whether the CECs should remain with the site, and, if necessary, define the extent of the CECs.

Investigation of chromium in soil – Chromium, reported as total chromium, was detected in all of the soil samples from the Civil Engineering Storage Yard AOI; however, the total chromium data was not differentiated between chromium (III) and hexavalent chromium; therefore, the chromium (III) and hexavalent chromium should be analyzed for in soil.

Evaluation of potentially comingled plumes – If there are COCs associated with SWMU 56, an evaluation of comingled plumes may be necessary to identify the effects of the SWMU 56 COCs on the ST-14 plume.

Investigation of Vapor Intrusion Pathways – As chloroform was detected in groundwater at a concentration that exceeds the USEPA residential RSL and occupied buildings exist at the Civil Engineering Storage Yard, possible vapor intrusion pathways should be investigated.

Site-specific baseline risk assessment – A site-specific baseline risk assessment is warranted following the investigations outlined above to evaluate the risk posed to human receptors by the impacted media and to establish final cleanup levels for the site, if any. Due to the lack of habitat at the site, a site-specific ecological risk assessment is not warranted.

No further investigation is warranted at the Building 3459 AOI as there were no CECs identified.

10.0 REFERENCES

AECOM. 2010. *Draft ST-14 Second Long-Term Monitoring Report, Andrews Air Force Base, Camp Springs, Maryland.* June.

AMEC. 2011. *Annual RA-O Groundwater Monitoring Report for 2011; Former East Side Gas Station: Site ST-14; Joint Base Andrews Naval Air Facility Washington; Camp Springs, Maryland.* June.

CH2M Hill. 2004. Basewide Background Study, Andrews Air Force Base, Maryland. March.

CH2M Hill. 2005. Basewide Ecological Risk Assessment Step 7, Andrews Air Force Base, Maryland. March.

Dames & Moore, Inc. (D&M) 1994. *Final Technical Memorandum of Findings, Site ST08 Investigation, Andrews Air Force Base, Maryland*, prepared for Hazardous Waste Remedial Actions Program, Oak Ridge, Tennessee. November.

DoD. 2010. DoD Quality Systems Manual for Environmental Laboratories, Version 4.2. October 25.

EA Engineering, Science, and Technology (EA). 2012. *Wetland Delineation Report, Joint Base Andrews, Outside the Airfield Wetland Delineation for Areas A – J. Prepared for Joint Base Andrews Naval Air Facility Andrews AFB, Maryland*. December.

Earth Tech. 2001. *Final Work Plan for the Remedial Investigation/Feasibility Study LF-05, Leroy's Lane Landfill Andrews Air Force Base, Maryland.* Prepared for Air Force Center for Environmental Excellence, Brooks AFB, Texas. July.

Geo-Marine, Inc. 2001. *Final Integrated Natural Resources Management Plan. Andrews Air Force Base, Maryland. Prepared for the Department of the Air Force.* November.

IT Corporation, 2000. Final Comprehensive Environmental Investigation, Site ST-14, Andrews *Air Force Base, Maryland*, prepared for Air Force Center for Environmental Excellence, Brooks Air Force base, Texas. December.

Maryland Department of the Environment. 1988. Phase II RCRA Facility Assessment, Andrews Air Force Base, Camp Springs, Maryland.

Maryland Department of the Environment. 2008. Cleanup Standards for Soil and Groundwater, *Interim Final Guidance, Update No. 2.1.* June.

Shaw Environmental, Inc. (Shaw). 2005. *Final Comprehensive Environmental Investigation Addendum, Site ST-14, Andrews Air Force Base, Maryland*, prepared for Air Force *Center for Environmental Excellence, Brooks Air Force Base, Texas. November.*

URS. 2006. Final Basewide Conceptual Site Model; Andrews Air Force Base, Maryland. December.

URS, Inc. 2009. *Volume II Final Evaluation Report, Air Force Compliance Clean-Up Sites, Identification and Evaluation of Defense Environmental Restoration Account (DERA) Eligibility for Air Force Center for Engineering and the Environment (AFCEE), Multiple Locations, Andrews Air Force Base, Maryland.* September.

United States Air Force (USAF). 2011. *Statement of Objectives for Performance-Based Remediation at Joint Base Andrews, Maryland.* 29 April.

United States Environmental Protection Agency/United States Air Force (USEPA/USAF). 2011. *Federal Facility Agreement between the Unites States Environmental Protection Agency and the United States Air Force under CERCLA Section 120 in the matter of U.S. Department of the Air Force, Joint Base Andrews, Prince George's County, Maryland.* September.

USEPA. 2007. *Record of Decision, ST-14 Former East Side Gas Station, Andrews Air Force Base, Maryland.* September.

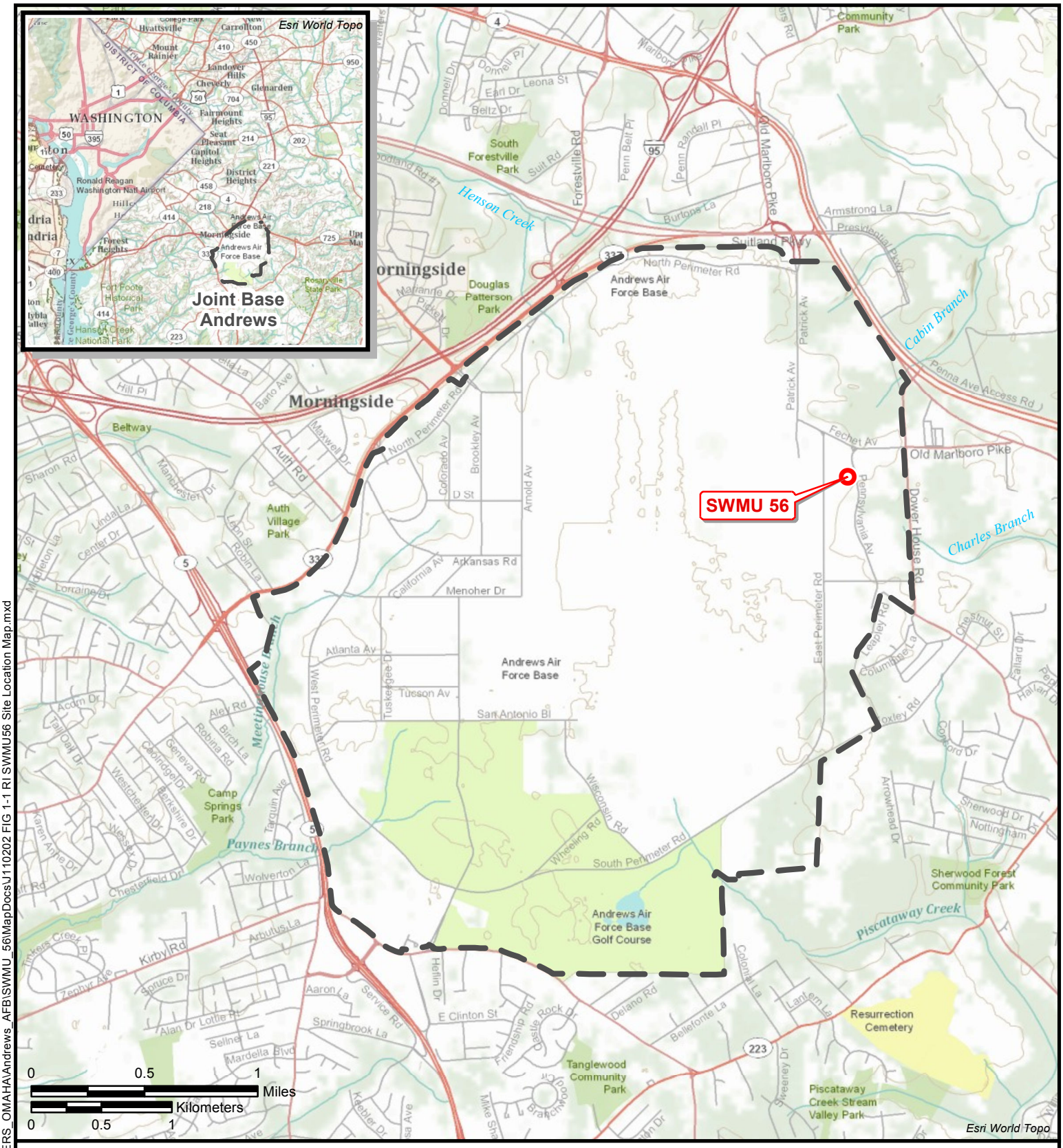
USEPA. 2008. *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, (OSWER 9240.1-48), EPA 540-R-08-01*. June.

USEPA. 2010. *Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, (OSWER 9240.1-51), EPA 540-R-10-011*. January.

USEPA. 2012. *Regional Screening Level/Maximum Contaminant Level Summary Table.* Updated November 2012.

USEPA. 2013. Exposure Assessment. http://www.epa.gov/region8/r8risk/hh_exposure.html. Accessed February 7, 2013.

Figures



MARYLAND

Site of Interest

Installation Boundary

Figure 1-1

Site Location Map
SWMU 56 Phase I RI

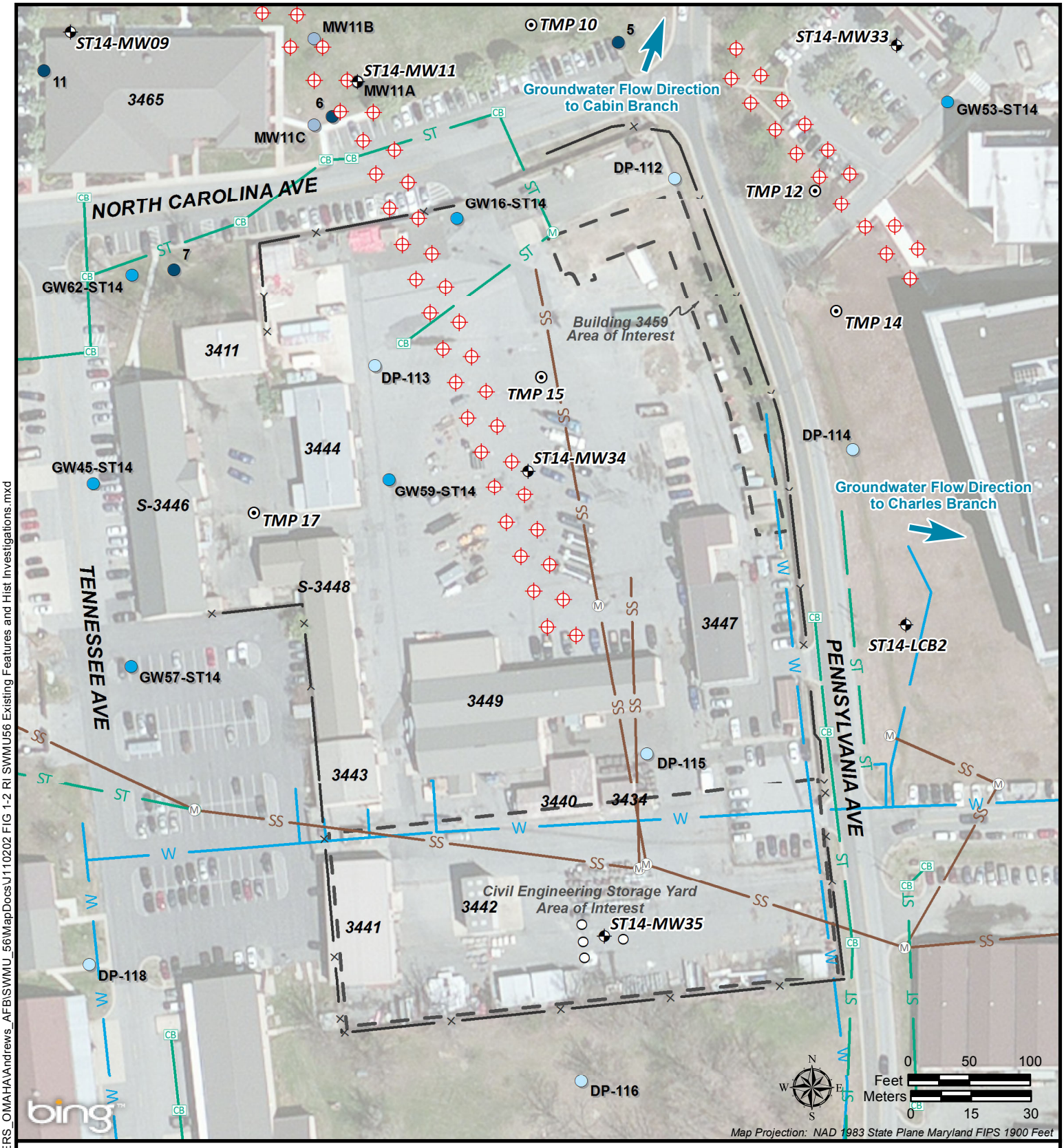
Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

Map Projection: NAD 1983 StatePlane Maryland FIPS 1900 Feet

Drawn By: G.S. Date Drawn/Revised: 7/17/2013 Project No. J110202

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_OMAHA\Andrews_AFB\SWMU_56\MapDocs\J110202 FIG 1-1 RI SWMU56 Site Location Map.mxd



Existing Features

- 3449 Building Number
- Fence
- W Watermain
- SS Sanitary Sewer
- ST Storm Sewer
- M Manhole
- CB Catch Basin
- ST-14 Monitoring Well
- ST-14 Injection Well
- ST-14 Temporary Monitoring Point
- SWMU 56 Areas of Interest

Historical ST-14 Investigations

- DP GW Sample (Dames & Moore 1992)
- DP GW Sample (IT 2000)
- DP GW Sample (MACTEC 2005)
- DP GW Sample (MACTEC 2010)

Historical SWMU 56 Investigation

- Soil Sample 0-2 Feet (URS 2009)

Figure 1-2

Existing Features and Historical Investigations
SWMU 56 Phase I RI
Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

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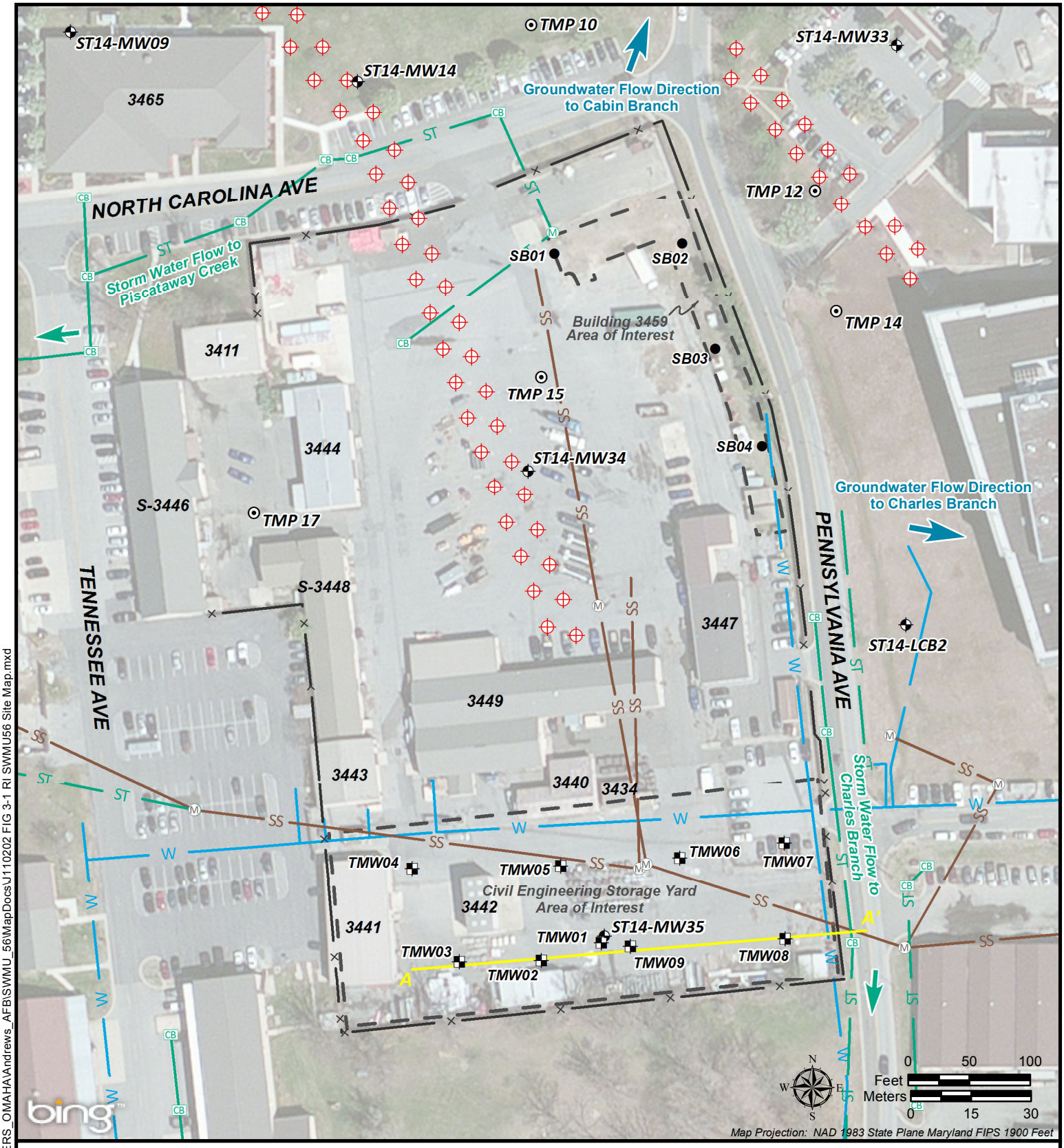
Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_OMAHA\Andrews_AFB\SWMU_56\MapDocs\J110202 FIG 1-2 RI SWMU56 Existing Features and Hist Investigations.mxd



Existing Features

- 3449 Building Number
- Fence
- W Watermain
- SS Sanitary Sewer
- ST Storm Sewer
- M Manhole
- CB Catch Basin
- ST-14 Monitoring Well
- ST-14 Injection Well
- ST-14 Temporary Monitoring Point
- SWMU 56 Areas of Interest

Phase I RI Investigation

- Temporary Monitoring Well
- Soil Boring
- A—A' Cross Section Line (See Figure 4)

Figure 3-1

Soil Boring & Temporary Monitoring Well Locations
SWMU 56 Phase I RI
Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

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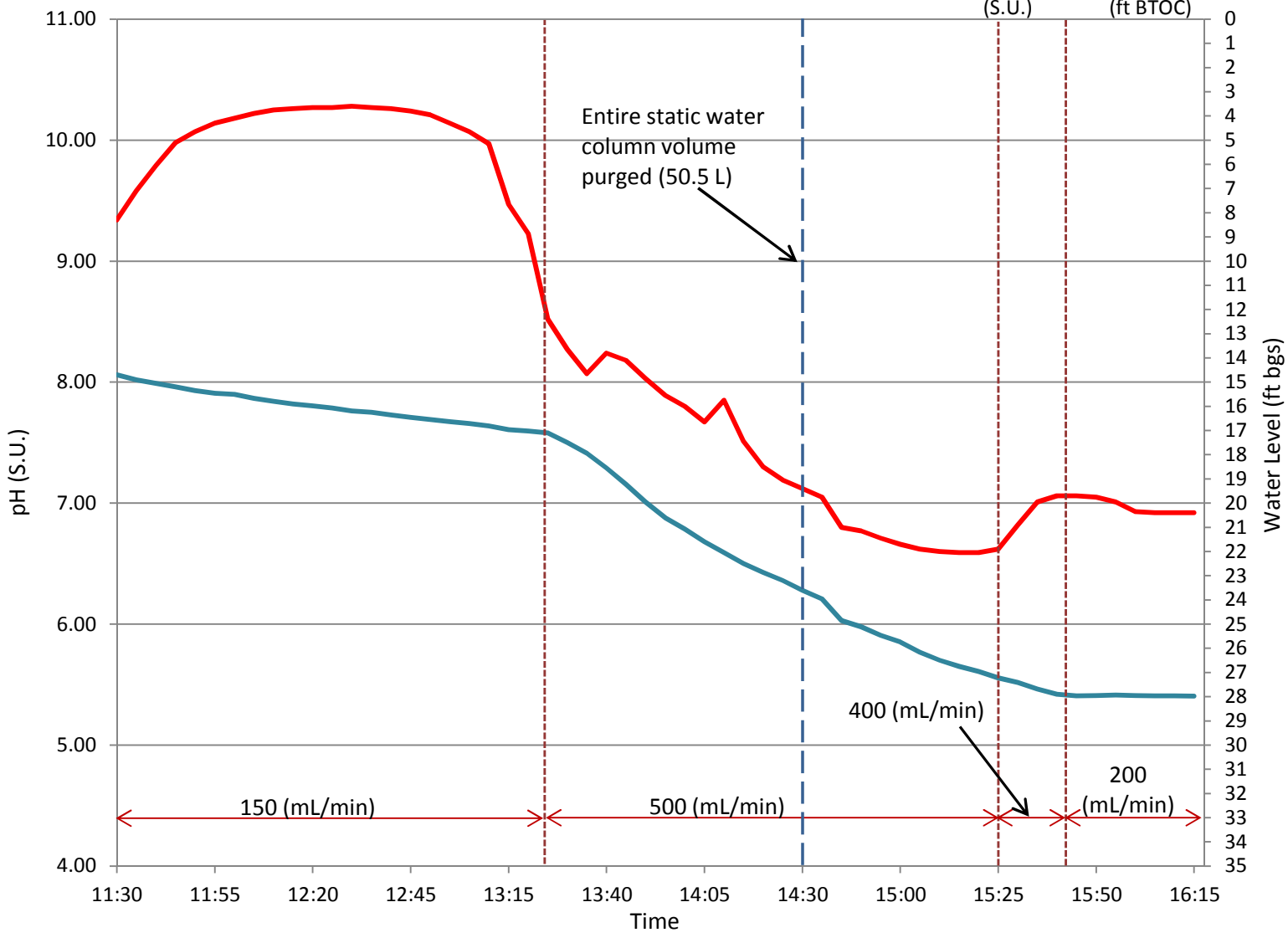
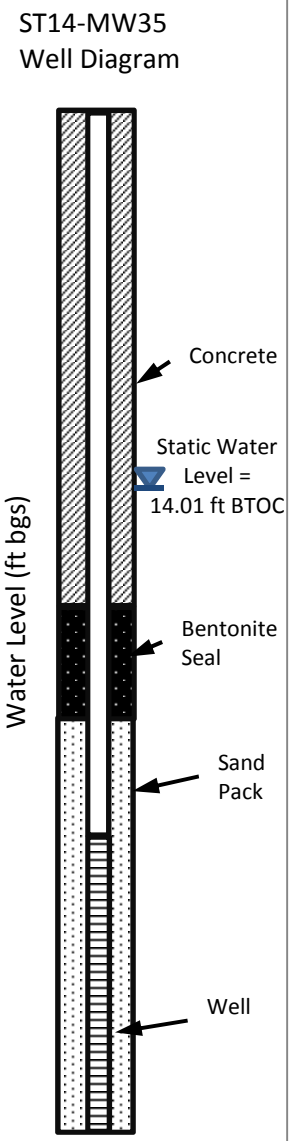
Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_OMAHA\Andrews_AFB\SWMU_56\MapDocs\J110202 FIG 3-1 RI SWMU56 Site Map.mxd

Figure 4-1 ST14-MW35 Purge Test
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland





A

A'

TMW03 (271.25) D = 30ft

TMW02 (270.09) D = 30ft

TMW01 (269.66) D = 30ft
ST14-MW35 (269.66) D = 35ft

TMW09 (269.47) D = 30ft

TMW08 (268.86) D = 30ft

FENCE

ASPHALT

FILL

CLASS C SUBGRADE

PENNSYLVANIAN BASE

SHALLOW UPLAND DEPOSITS

CONCRETE

BENTONITE SEAL

SAND PACK

INTERMEDIATE UPLAND DEPOSITS

4ft WELL SCREEN

10ft WELL SCREEN

Elevation (ft above MSL)

275
270
265
260
255
250
245
240
235

TMW01 (254.16) Temporary Monitoring Well ID with Feet Above Mean Sea Level

D = 30ft Depth of Well is 30 feet

Note: A – A' Plan View Detailed on Figure 3-1

- Groundwater Level
- Asphalt Surface
- Fill
- Grayish Brown Clay, Silt, and Fine Sand
- Brownish Yellow Medium to Course Sand
- Greenish Gray Clay

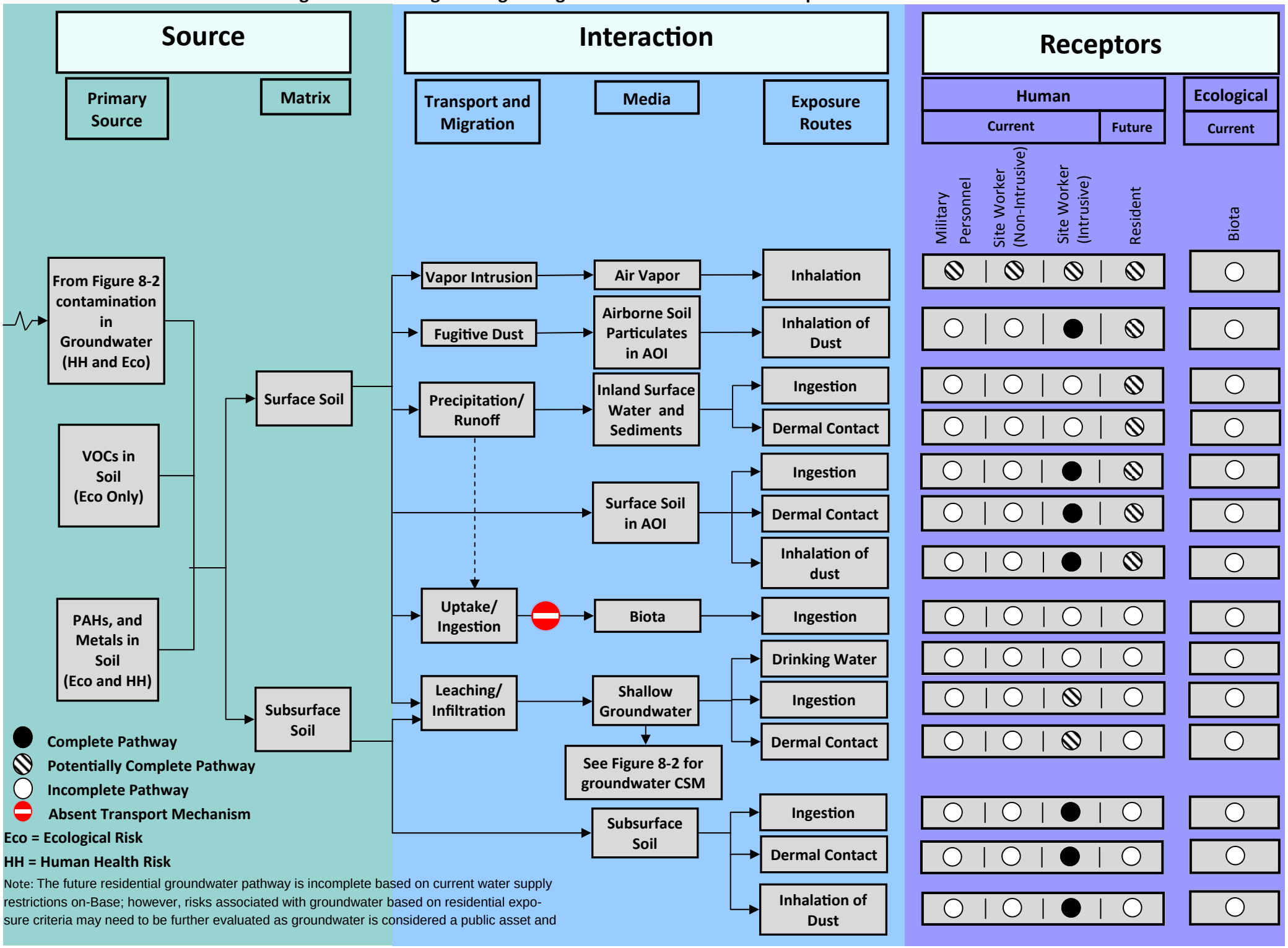
VERTICAL SCALE (FEET) 5

HORIZONTAL SCALE (FEET) 25

ENGR'G	DATE	Bay West Customer-Focused Environmental & Industrial Solutions
DRAWN G.S.	1/21/13	
REV.		
PROJECT NAME	JOINT BASE ANDREWS CAMP SPRINGS, MARYLAND	
TITLE	CROSS-SECTION A TO A'	
DWG. NO. J110202	SCALE	FIGURE # 4-2

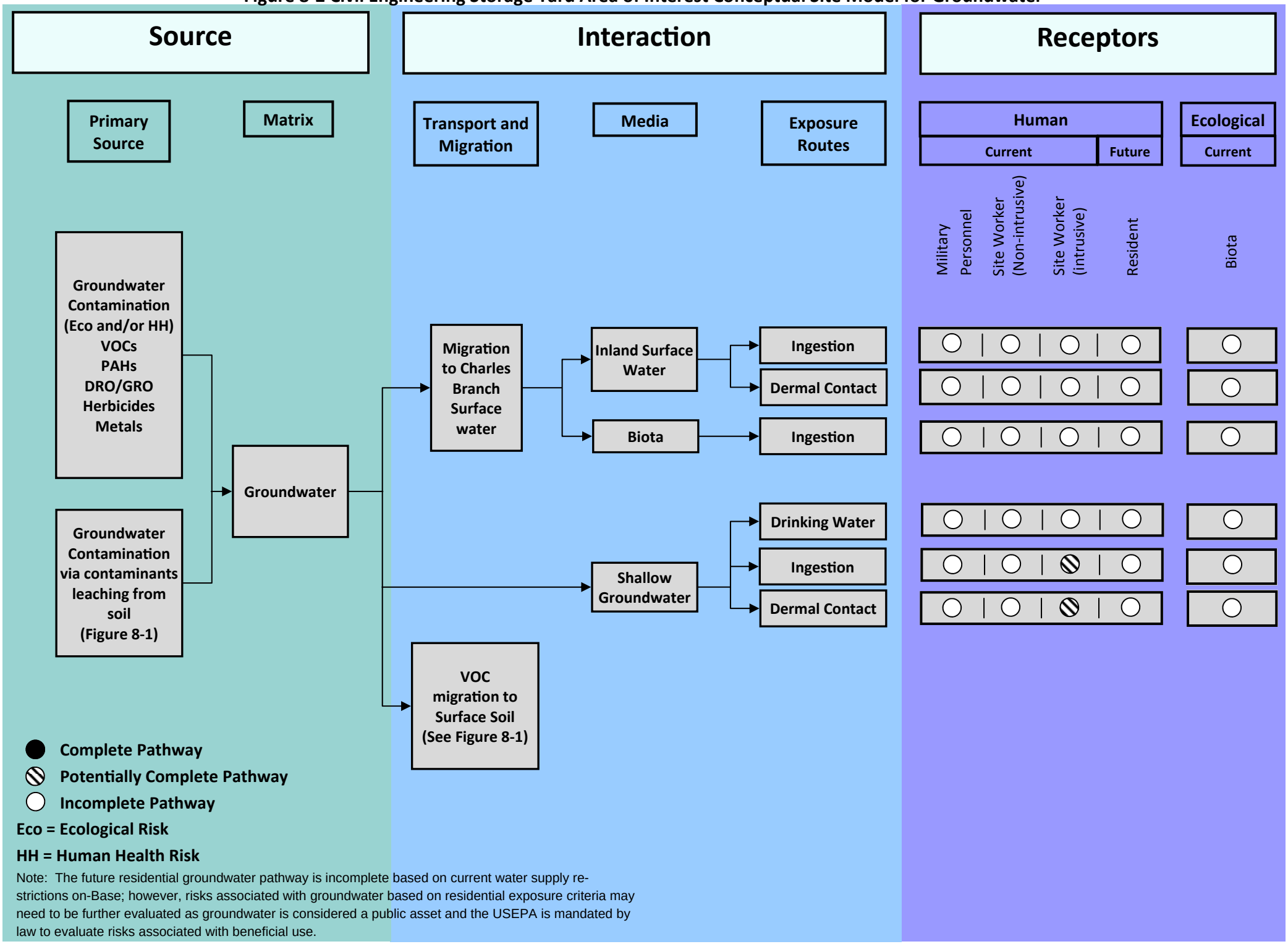
STRATIGRAPHY - B SIZE JBA-SWMU56.GPJ ENV LOG WITH MULTIPLE SAMPLE COLUMNS2.GDT 1/16/13

Figure 8-1 Civil Engineering Storage Yard Area of Interest Conceptual Site Model for Soil



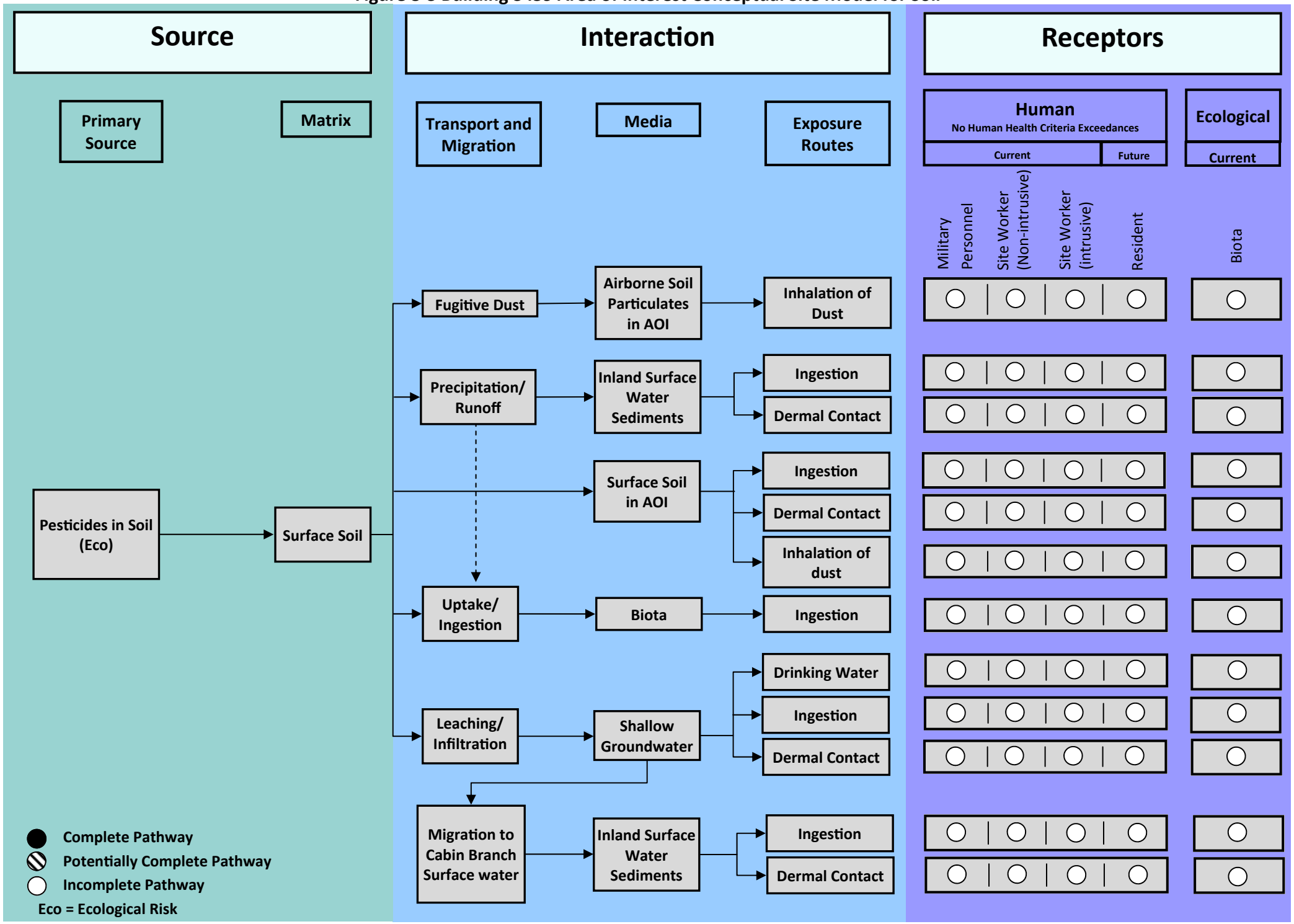
Note: The future residential groundwater pathway is incomplete based on current water supply restrictions on-Base; however, risks associated with groundwater based on residential exposure criteria may need to be further evaluated as groundwater is considered a public asset and

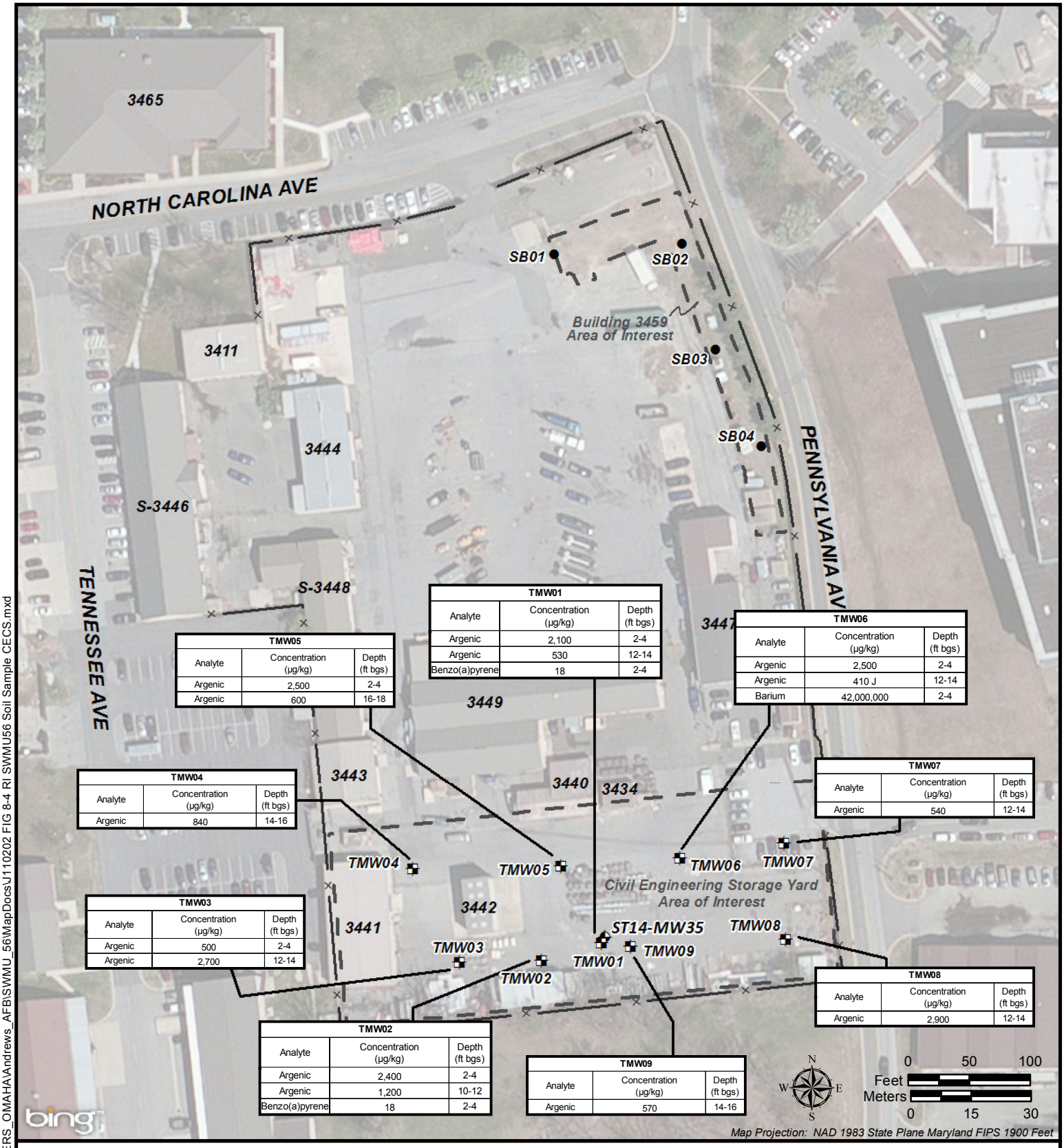
Figure 8-2 Civil Engineering Storage Yard Area of Interest Conceptual Site Model for Groundwater



Note: The future residential groundwater pathway is incomplete based on current water supply restrictions on-Base; however, risks associated with groundwater based on residential exposure criteria may need to be further evaluated as groundwater is considered a public asset and the USEPA is mandated by law to evaluate risks associated with beneficial use.

Figure 8-3 Building 3459 Area of Interest Conceptual Site Model for Soil





Existing Features

3449 Building Number

Phase I RI Investigation

- Temporary Monitoring Well
- Soil Boring
- SWMU 56 Areas of Interest

Note:

CEC = Chemical Exceeding Criteria

Figure 8-4

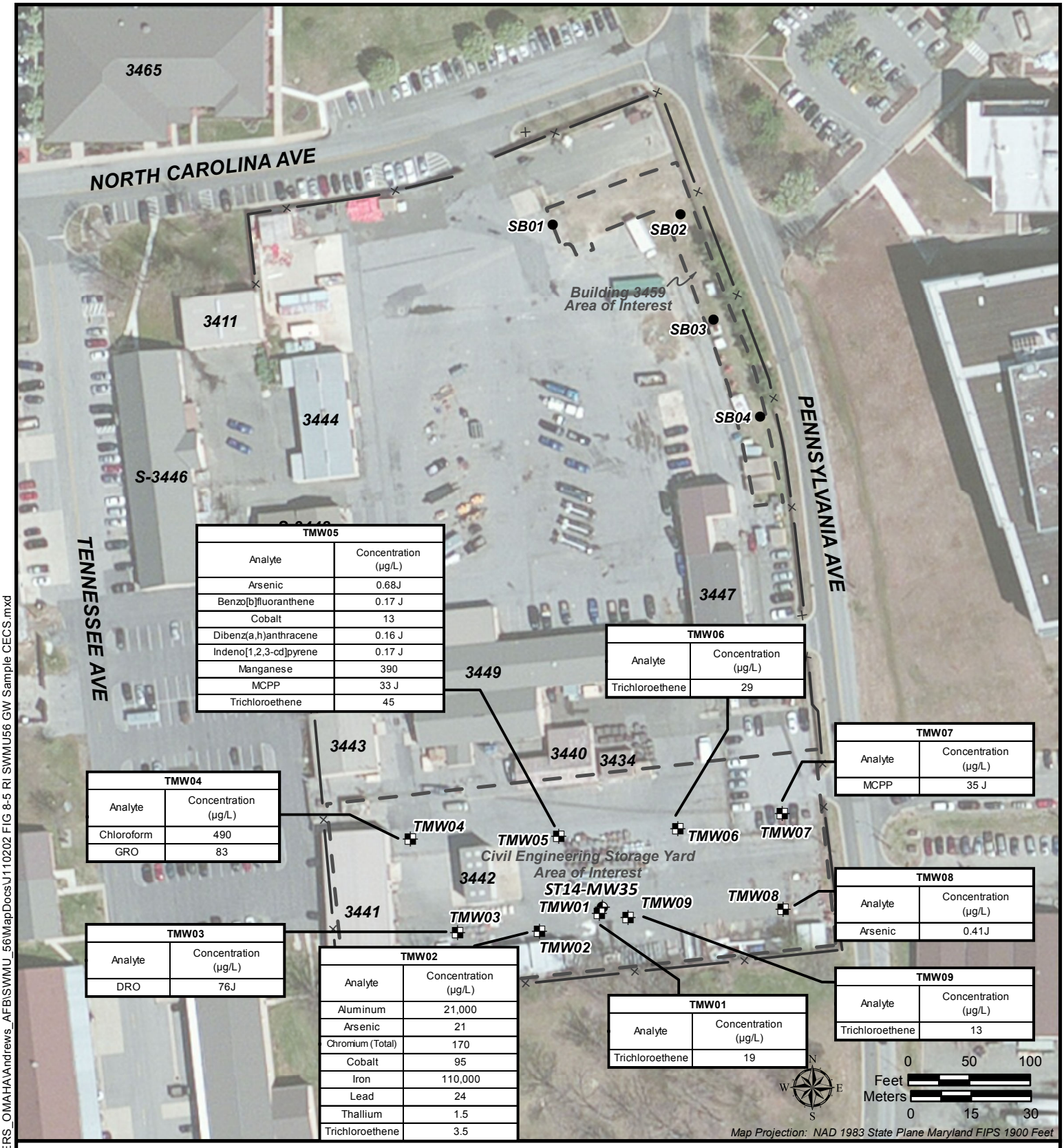
Soil CECs
SWMU 56 Phase I RI

Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: G.S. Date Drawn/Revised: 9/4/2013 Project No. J110202

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_OMAHA\Andrews_AFB\SWMU_56\MapDocs\J110202 FIG 8-4 RI SWMU56 Soil Sample CECS.mxd



TMW05	
Analyte	Concentration (µg/L)
Arsenic	0.68J
Benzo[b]fluoranthene	0.17 J
Cobalt	13
Dibenz(a,h)anthracene	0.16 J
Indeno[1,2,3-cd]pyrene	0.17 J
Manganese	390
MCPP	33 J
Trichloroethene	45

TMW06	
Analyte	Concentration (µg/L)
Trichloroethene	29

TMW07	
Analyte	Concentration (µg/L)
MCPP	35 J

TMW04	
Analyte	Concentration (µg/L)
Chloroform	490
GRO	83

TMW08	
Analyte	Concentration (µg/L)
Arsenic	0.41J

TMW03	
Analyte	Concentration (µg/L)
DRO	76J

TMW09	
Analyte	Concentration (µg/L)
Trichloroethene	13

TMW02	
Analyte	Concentration (µg/L)
Aluminum	21,000
Arsenic	21
Chromium (Total)	170
Cobalt	95
Iron	110,000
Lead	24
Thallium	1.5
Trichloroethene	3.5

TMW01	
Analyte	Concentration (µg/L)
Trichloroethene	19

Map Projection: NAD 1983 State Plane Maryland FIPS 1900 Feet

Existing Features

3449 Building Number

Phase I RI Investigation

- Temporary Monitoring Well
- Soil Boring
- SWMU 56 Areas of Interest

Notes

J The reported positive result is considered estimated because the result is less than the LOQ or because certain quality control criteria were not met.

CEC Chemical Exceeding Criteria

Figure 8-5

Groundwater CECs
SWMU 56 Phase I RI

Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

Drawn By: G.S. Date Drawn/Revised: 9/17/2013 Project No. J110202

Y:\Clients\US_ARMY_CORP_OF_ENGINEERS_OMAHAAndrews_AFB\SWMU_56\MapDocs\J110202 FIG 8-5 RI SWMU56 GW Sample CECS.mxd

Tables

Table 4-1 ST14-MW35 pH Purge Test at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Well Depth: 34.87 ft BTOC
Static Water Level: 14.01 ft BTOC
Top of Screen: 25 ft bgs
Well Diamter: 4 inches
Water Column Volume 51.5 liters

Time	pH (S.U.)	Water Level (ft BTOC)	Tubidity (NTU)	Purge Rate (mL/min)	Tubing Depth (ft BTOC)	Volume Purged (liters)
11:30	9.34	14.70	1.50	150	24.5	0.00
11:35	9.58	14.91	1.20	150	24.5	0.75
11:40	9.79	15.05	0.80	150	24.5	1.50
11:45	9.98	15.20	1.20	150	24.5	2.25
11:50	10.07	15.35	0.90	150	24.5	3.00
11:55	10.14	15.46	1.00	150	24.5	3.75
12:00	10.18	15.50	0.60	150	24.5	4.50
12:05	10.22	15.67	1.00	150	24.5	5.25
12:10	10.25	15.79	0.80	150	24.5	6.00
12:15	10.26	15.90	0.70	150	24.5	6.75
12:20	10.27	15.98	0.60	150	24.5	7.50
12:25	10.27	16.07	0.50	150	24.5	8.25
12:30	10.28	16.19	0.50	150	24.5	9.00
12:35	10.27	16.25	0.20	150	24.5	9.75
12:40	10.26	16.36	0.50	150	24.5	10.50
12:45	10.24	16.46	0.50	150	24.5	11.25
12:50	10.21	16.55	0.30	150	24.5	12.00
12:55	10.14	16.63	0.20	150	24.5	12.75
13:00	10.07	16.71	0.60	150	24.5	13.50
13:05	9.97	16.81	0.30	150	24.5	14.25
13:15	9.47	16.97	0.40	150	24.5	15.75
13:20	9.23	17.02	0.40	150	24.5	16.50
13:25	8.52	17.10	0.70	500	24.5	19.00
13:30	8.27	17.50	1.00	500	24.5	21.50
13:35	8.07	17.94	1.20	500	24.5	24.00
13:40	8.24	18.55	0.90	500	24.5	26.50
13:45	8.18	19.22	0.80	500	24.5	29.00
13:50	8.03	19.95	0.80	500	24.5	31.50
13:55	7.89	20.61	1.20	500	24.5	34.00
14:00	7.80	21.07	0.90	500	24.5	36.50
14:05	7.67	21.60	0.90	500	24.5	39.00
14:10	7.85	22.04	5.10	500	24.5	41.50
14:15	7.51	22.50	2.60	500	24.5	44.00
14:20	7.30	22.86	7.80	500	27.5	46.50
14:25	7.19	23.20	3.30	500	27.5	49.00
14:30	7.12	23.61	5.50	500	27.5	51.50
14:35	7.05	23.96	2.90	500	27.5	54.00
14:45	6.80	24.85	3.50	500	27.5	59.00
14:50	6.77	25.11	2.90	500	27.5	61.50
14:55	6.71	25.46	4.00	500	27.5	64.00
15:00	6.66	25.74	3.00	500	27.5	66.50
15:05	6.62	26.16	2.90	500	27.5	69.00
15:10	6.60	26.49	7.10	500	27.5	71.50
15:15	6.59	26.75	7.10	500	27.5	74.00
15:20	6.59	26.96	5.90	500	27.5	76.50
15:25	6.62	27.22	8.10	400	31.0	78.50
15:30	6.82	27.41	4.90	400	31.0	80.50
15:35	7.01	27.69	3.10	400	31.0	82.50
15:40	7.06	27.90	3.90	400	31.0	84.50
15:45	7.06	27.96	3.90	200	31.0	85.50
15:50	7.05	27.95	3.70	200	31.0	86.50
15:55	7.01	27.93	3.10	200	31.0	87.50
16:00	6.93	27.95	3.50	200	31.0	88.50
16:05	6.92	27.96	3.20	200	31.0	89.50
16:10	6.92	27.96	2.90	200	31.0	90.50

Table 4-1 ST14-MW35 pH Purge Test at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Time	pH (S.U.)	Water Level (ft BTOC)	Tubidity (NTU)	Purge Rate (mL/min)	Tubing Depth (ft BTOC)	Volume Purged (liters)
16:15	6.92	27.98	3.10	200	31.0	91.50

Acronyms:
ft bgs = feet below ground surface
ft BTOC = feet below top of casing
mL/min = milliliters per minute
NTU = nephelometric turbidity unit
S.U. = standard unit

Table 4-2 Soil Field Screening Summary at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Boring ID	PID Range (ppm)		pH Range (S.U.)		Evidence of Contamination	Sample ID	Sample Interval	Laboratory Sample Interval Selection Criteria
	Lowest	Highest	Lowest	Highest			(ft bgs)	
TMW-01	0.5	2.6	4.47	6.83	None observed	SO07	2 – 4	Highest PID reading
	(0-2 ft)	(2-4 ft)	(16-18 ft)	(0-2 ft)		SO05, SO06	12 – 14	Interval above groundwater
TMW-02	1.4	4.4	4.81	8.39	1 inch of stained black organic material at 3 ft	SO08	2 – 4	Highest PID reading, highest pH, area of possible contamination
	(8-10 ft)	(2-4 ft)	(8-10 ft)	(2-4 ft)		SO09	10 – 12	Interval above groundwater
TMW-03	1	2.9	6.35	7.97	None observed	SO12	2 – 4	Near surface sample
	(0-2 ft)	(22-24 ft)	(6-8 ft)	(26-28 ft)		SO11	14 – 16	Interval above groundwater
TMW-04	1.4	5.8	6.88	7.1	None observed	SO13	14 – 16	Interval above groundwater
	(2-4 ft)	(20-22 ft)	(28-30 ft)	(14-16 ft)				
TMW-05	2.6	6.3	6.72	7.11	None observed	SO14	2 – 4	Highest PID reading near surface
	(28-30 ft)	(14-16 ft)	(20-22 ft)	(6-8 ft)		SO15	16 – 18	Interval above groundwater
TMW-06	2	6.9	4.31	6.05	None observed	SO02	2 – 4	Highest PID reading
	(20-22 ft)	(2-4 ft)	(12-14 ft)	(0-2 ft)		SO03	12 – 14	Interval above groundwater
TMW-07	0.4	2.7	5.24	7	None observed	SO01	12 – 14	Interval above groundwater
	(8-10 ft)	(20-22 ft)	(2-4 ft)	(24-26 ft)				
TMW-08	0.8	2.1	4.41	5.49	None observed	SO04	12 – 14	Interval above groundwater
	(8-10 ft)	(0-2 ft)	(26-28 ft)	(12-14 ft)				
TMW-09	0.8	3.7	6.54	7.79	None observed	SO10	14 – 16	Interval above groundwater
	(22-24 ft)	(18-22 ft)	(6-8 ft)	(28-30 ft)				

Acronyms:

ft = feet

ft bgs = feet below ground surface

ID = identification

PID = photoionization detector

ppm = parts per million

TMW = temporary monitoring well

S.U. = standard unit

Table 4-3 Soil Detections at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Residential RSL[2] (µg/kg)	MDE Interim Residential Cleanup Standards[3] (µg/kg)	Background UTL Soil Boring[4] (µg/kg)	SWMU56-TMW01-SO05 12-14ft	SWMU56-TMW01-SO06 (DUP) 12-14ft	SWMU56-TMW01-SO07 2-4ft	SWMU56-TMW02-SO08 2-4ft	SWMU56-TMW02-SO09 10-12ft	SMW56-TMW03-SO11 14-16ft	SMW56-TMW03-SO12 2-4ft	SMW56-TMW04-SO13 14-16ft	SMW56-TMW05-SO14 2-4ft	SMW56-TMW05-SO15 16-18ft	SWMU56-TMW06-SO02 2-4ft	SWMU56-TMW06-SO03 12-14ft	SWMU56-TMW07-SO01 12-14ft	SWMU56-TMW08-SO04 12-14ft	SWMU56-TMW09-SO10 14-16ft
VOCs by SW-846 Method 8260B																		
1,3,5-Trimethylbenzene	780,000	NE	NE	1.1 U	0.78 U	**0.61 J**	1.1 U	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	0.81 U	0.78 U	0.99 U	1.1 U	0.83 U	0.98 U
2-Butanone (MEK)	28,000,000	NE	NE	6.9 U	5.0 U	**13 J**	**20 J**	5.1 U	4.8 U	5.0 U	4.4 U	6.5 U	5.2 U	**7.8 J**	6.3 U	7.0 U	5.3 U	6.2 U
Acetone	61,000,000	NE	NE	**9.6 J**	16 U	**96 J**	**97 J**	16 U	15 U	16 U	14 U	21 U	16 U	**97**	9.9 U	11 U	8.3 U	20 U
Carbon disulfide	820,000	NE	NE	1.1 U	0.78 U	**0.44 J**	**0.87 J**	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	**0.53 J**	0.78 U	0.99 U	1.1 U	0.83 U	0.98 U
cis-1,2-Dichloroethene	160,000	NE	NE	1.1 U	0.78 U	0.76 U	**120 J**	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	0.81 U	**50**	0.99 U	1.1 U	0.83 U	0.98 U
Naphthalene	3,600	NE	NE	1.1 U	0.78 U	**1.3 J**	1.1 U	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	0.81 U	0.78 U	0.99 U	1.1 U	0.83 U	0.98 U
Tetrachloroethene	22,000	NE	NE	1.1 U	0.78 U	0.76 U	1.1 U	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	0.81 U	**1.8 J**	0.99 U	1.1 U	0.83 U	0.98 U
Toluene	5,000,000	NE	NE	1.1 U	0.78 U	0.76 U	**1.2 J**	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	0.81 U	0.78 U	0.99 U	1.1 U	0.83 U	0.98 U
trans-1,2-Dichloroethene	150,000	NE	NE	1.1 U	0.78 U	0.76 U	**9.6 J**	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	0.81 U	**4.4**	0.99 U	1.1 U	0.83 U	0.98 U
Trichloroethene	910	NE	NE	0.86 U	0.63 U	0.61 U	0.89 U	0.64 U	0.60 U	0.62 U	0.55 U	0.82 U	0.65 U	**34**	**0.49 J**	0.88 U	0.66 U	0.78 U
PAHs by SW-846 Method 8270-SIM																		
Acenaphthene	3,400,000	NE	45.9	0.34 U	0.27 U	**2.2 J**	0.31 U	0.29 U	0.28 U	0.27 U	0.27 U	0.31 U	0.28 U	0.31 U	0.28 U	0.27 U	0.27 U	0.31 U
Acenaphthylene	NE	NE	8.8	0.84 U	0.68 U	**7.7**	**4.0 J**	0.72 U	0.70 U	0.69 U	0.68 U	0.77 U	0.69 U	**1.0 J**	0.71 U	0.67 U	0.68 U	0.77 U
Anthracene	17,000,000	NE	NE	3.2 U	2.5 U	**5.6**	**3.7 J**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	2.9 U	2.6 U	2.5 U	2.6 U	2.9 U
Benzo[a]anthracene	150	NE	11.2	3.2 U	2.5 U	**14**	**14**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**1.9 J**	2.6 U	2.5 U	2.6 U	2.9 U
Benzo[a]pyrene	15	NE	3.5	3.2 U	2.5 U	**18**	**16**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**2.2 J**	2.6 U	2.5 U	2.6 U	2.9 U
Benzo[b]fluoranthene	150	NE	7.6	3.2 U	2.5 U	**34**	**23**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**5.3 J**	2.6 U	2.5 U	2.6 U	2.9 U
Benzo[g,h,i]perylene	NE	NE	4.8	3.2 U	2.5 U	**18**	**12**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**4.0 J**	2.6 U	2.5 U	2.6 U	2.9 U
Benzo[k]fluoranthene	1,500	NE	NE	3.2 U	2.5 U	**9.4**	**7.6**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**1.5 J**	2.6 U	2.5 U	2.6 U	2.9 U
Chrysene	15,000	NE	26.6	3.2 U	2.5 U	**30**	**25**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**3.7 J**	2.6 U	2.5 U	2.6 U	2.9 U
Dibenz(a,h)anthracene	15	NE	17	3.2 U	2.5 U	**3.9 J**	**3.4 J**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	2.9 U	2.6 U	2.5 U	2.6 U	2.9 U
Fluoranthene	2,300,000	NE	22.6	3.2 U	2.5 U	**35**	**23**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**3.5 J**	2.6 U	2.5 U	2.6 U	2.9 U
Fluorene	2,300,000	NE	11.8	0.84 U	0.68 U	**5.4 J**	**4.0 J**	0.72 U	0.70 U	0.69 U	0.68 U	0.77 U	0.69 U	0.77 U	0.71 U	0.67 U	0.68 U	0.77 U
Indeno[1,2,3-cd]pyrene	150	NE	5.8	3.2 U	2.5 U	**17**	**11**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**3.1 J**	2.6 U	2.5 U	2.6 U	2.9 U
Naphthalene	3,600	NE	NE	0.84 U	0.68 U	**22**	**37**	0.72 U	0.70 U	0.69 U	0.68 U	**0.66 J**	0.69 U	**1.2 J**	0.71 U	0.67 U	0.68 U	0.77 U
Phenanthrene	NE	NE	9.3	3.2 U	2.5 U	**24**	**28**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**2.1 J**	2.6 U	2.5 U	2.6 U	2.9 U
Pyrene	1,700,000	NE	13.9	3.2 U	2.5 U	**42**	**31**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**4.0 J**	2.6 U	2.5 U	2.6 U	2.9 U
SVOCs by SW-846 Method 8270D																		
Benzyl alcohol	6,100,000	NE	NE	41 U	**26 J**	38 U	**42 J**	**39 J**	680 U	340 U	340 U	**47 J**	360 U	**42 J**	**27 J**	35 U	**22 J**	390 U
Benzo[a]pyrene	15	NE	3.5	41 U	36 U	38 U	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U
Benzo[b]fluoranthene	150	NE	7.6	41 U	36 U	**44 J**	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U
Chrysene	15,000	NE	26.6	41 U	36 U	**38 J**	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U
Dibenz(a,h)anthracene	15	NE	17	41 U	36 U	38 U	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U
N-Nitrosodimethylamine	2.3	NE	NE	82 U	72 U	76 U	77 U	71 U	140 U	69 U	69 U	76 U	71 U	77 U	69 U	69 U	68 U	78 U
N-Nitrosodi-n-propylamine	69	NE	NE	82 U	72 U	76 U	77 U	71 U	140 U	69 U	69 U	76 U	71 U	77 U	69 U	69 U	68 U	78 U
Pyrene	1,700,000	NE	13.9	41 U	36 U	**47 J**	**20 J**	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U

Table 4-3 Soil Detections at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Residential RSL[2] (µg/kg)	MDE Interim Residential Cleanup Standards[3] (µg/kg)	Background UTL Soil Boring[4] (µg/kg)	SWMU56-TMW01-SO05 12-14ft	SWMU56-TMW01-SO06 (DUP) 12-14ft	SWMU56-TMW01-SO07 2-4ft	SWMU56-TMW02-SO08 2-4ft	SWMU56-TMW02-SO09 10-12ft	SMW56-TMW03-SO11 14-16ft	SMW56-TMW03-SO12 2-4ft	SMW56-TMW04-SO13 14-16ft	SMW56-TMW05-SO14 2-4ft	SMW56-TMW05-SO15 16-18ft	SWMU56-TMW06-SO02 2-4ft	SWMU56-TMW06-SO03 12-14ft	SWMU56-TMW07-SO01 12-14ft	SWMU56-TMW08-SO04 12-14ft	SWMU56-TMW09-SO10 14-16ft
GRO/DRO by SW-846 Method 8015C																		
Diesel Range Organics	NE	230,000	NE	**960 J**	**810 J**	**9,500**	**4,000 J**	**1,700 J**	**4,400**	**880 J**	**1,800 J**	**1,900 J**	**830 J**	**4,400**	**1,100 J**	**1,600 J**	**2,000 J**	**2,900 J**
Gasoline Range Organics	NE	230,000	NE	**290 J**	**260 J**	**4,900**	**350 J**	420 U	**1,500**	530 U	510 U	**340 J**	**270 J**	**270 J**	600 U	**370 J**	410 U	**330 J**
Pesticides by SW-846 Method 8081A																		
4,4'-DDD	2,000	NE	NE	0.86 U	0.72 U	**1.8 J**	**1.7 J**	0.74 U	0.73 U	0.74 U	0.73 U	0.77 U	0.74 U	0.79 U	0.75 U	0.73 U	0.72 U	0.78 U
4,4'-DDE	1,400	NE	2.7	0.58 U	0.48 U	**1.2 J**	**4.7**	0.49 U	0.49 U	0.49 U	0.48 U	0.51 U	0.50 U	0.53 U	0.50 U	0.49 U	0.48 U	0.52 U
PCBs by SW-846 Method 8082A																		
PCBs below LOD																		
Herbicides by SW-846 Method 8151A																		
Herbicides below LOD																		
Metals by SW-846 Method 6010B																		
Aluminum	77,000,000	NE	27,900,000	**4,300,000**	**5,100,000**	**12,000,000**	**11,000,000**	**7,000,000**	**24,000,000**	**4,800,000**	**3,600,000**	**24,000,000**	**4,100,000 J**	**18,000,000**	**2,900,000**	**1,800,000**	**1,600,000**	**4,800,000**
Arsenic	390	NE	5,700	**370 J**	**530**	**2,100**	**2,400**	**1,200**	**2,700**	**500**	**840**	**2,500**	**600**	**2,500**	**410 J**	**540**	**2,900**	**570**
Barium	15,000,000	NE	53,600	**10,000**	**11,000**	**31,000**	**40,000**	**11,000**	**42,000**	**7,500**	**7,400**	**40,000**	**13,000**	**42,000,000**	**9,300,000**	**580**	**4,300,000**	**13,000**
Beryllium	160,000	NE	1,060	**42 J**	**94 J**	**250**	**240**	**68 J**	**270**	**33 J**	**50 J**	**220**	**43 J**	**310**	**53 J**	**25 J**	**36 J**	**83 J**
Cadmium	70,000	NE	39	**55 J**	**97 J**	**150**	**140**	**54 J**	**170**	**69 J**	**53 J**	**170**	**58 J**	**180**	**65 J**	**38 J**	**29 J**	**81 J**
Calcium	NE	NE	945,000	**150**	**150**	**580**	**1,100**	**130**	**46 J**	**38 J**	**67 J**	**320**	**30 J**	**480**	**29 J**	**57 J**	**150**	**20 J**
Chromium	120,000,000/290[1]	NE	31,200	**3,700 J**	**6,200 J**	**13,000**	**14,000**	**5,500**	**21,000**	**4,100**	**4,500**	**22,000**	**3,200**	**19,000**	**4,500**	**2,400**	**11,000**	**3,600**
Cobalt	23,000	NE	6,200	**200 J**	**330 J**	**1,900**	**1,800**	**160**	**1,700**	**170**	**200**	**1,600**	**110**	**2,700**	**160**	**100**	**160**	**250**
Copper	3,100,000	NE	11,200	**1,100 J**	**1,700 J**	**5,200**	**3,900**	**1,400 J**	**4,300**	**1,500 J**	**2,300 J**	**3,700**	**2,900**	**4,100**	**1,500 J**	**1,000 J**	**2,000 J**	**1,400 J**
Iron	55,000,000	NE	22,800,000	**1,400,000**	**1,500,000**	**10,000,000**	**9,100,000**	**6,400,000**	**21,000,000**	**1,800,000**	**3,100,000**	**21,000,000**	**2,300,000 J**	**16,000,000**	**1,300,000**	**3,200,000**	**14,000,000**	**1,200,000**
Lead	400,000	NE	37,100	**1,800 J**	**3,200 J**	**16,000**	**12,000**	**2,400**	**9,300**	**1,500**	**1,900**	**10,000**	**1,900**	**9,800**	**3,600**	**1,100**	**890**	**1,500**
Magnesium	NE	NE	1,100,000	**130,000**	**140,000**	**640,000**	**800,000**	**140,000**	**720,000**	**92,000**	**78,000**	**680,000**	**68,000**	**790,000**	**63,000**	**42,000**	**33,000**	**130,000**
Manganese	1,800,000	NE	174,000	**3,600 J**	**5,800 J**	**36,000**	**39,000**	**1,100**	**8,700**	**1,300**	**1,800**	**15,000**	**1,100**	**35,000**	**1,400**	**940**	**4,200**	**1,400**
Mercury	10,000	NE	67	18 U	15 U	**21**	**24**	17 U	16 U	16 U	15 U	**22**	15 U	**11 J**	15 U	16 U	16 U	16 U
Molybdenum	390,000	NE	1,420	**81 J**	**100 J**	**250**	**310**	**85 J**	**230**	**84 J**	**160 J**	**220 J**	**310 J**	**330**	**110 J**	**97 J**	**1,000**	**170 J**
Nickel	1,500,000	NE	11,300	**540 J**	**920 J**	**4,300**	**4,900**	**500**	**4,500**	**610**	**780**	**4,200**	**420**	**5,400**	**420**	**320 J**	**950**	**590**
Potassium	NE	NE	843,000	**240,000 J**	**330,000**	**330,000**	**360,000**	**160,000 J**	**350,000**	**110,000 J**	**92,000 J**	**400,000**	**210,000 J**	**440,000**	**220,000 J**	**89,000 J**	**68,000 J**	**230,000 J**
Selenium	390,000	NE	NE	**310 J**	**480 J**	**680**	**850**	**320 J**	**680**	**400 J**	**420 J**	**700**	**470 J**	**680**	**310 J**	**260 J**	**170 J**	**420 J**
Silver	390,000	NE	NE	71 U	**21 J**	**45 J**	**31 J**	65 U	**26 J**	59 U	**26 J**	**34 J**	57 U	**34 J**	57 U	60 U	58 U	69 U
Sodium	NE	NE	43,400	120,000 U	96,000 U	**75,000 J**	**82,000 J**	95,000 U	100,000 U	**600,000**	97,000 U	**120,000 J**	100,000 U	100,000 U	100,000 U	92,000 U	96,000 U	100,000 U
Thallium	780	NE	332	**37 J**	**65 J**	**120**	**150**	**35 J**	**180**	**26 J**	**27 J**	**190**	**30 J**	**210**	**42 J**	**47 J**	**11 J**	**41 J**
Vanadium	390,000	NE	40,000	**5,500**	**9,900**	**22,000**	**22,000**	**6,800**	**36,000**	**3,600**	**3,700**	**37,000**	**4,900 J**	**33,000**	**6,700**	**3,800**	**2,600**	**6,600**
Zinc	23,000,000	NE	29,200	**1,500 J**	**2,400 J**	**20,000**	**15,000**	**1,000 J**	**8,200**	**1,000 J**	**1,300 J**	**8,600**	**750 J**	**15,000**	**960 J**	**580 J**	**2,100 J**	**1,500 J**

Bold values indicate the analyte was detected.

Result exceeds established screening criteria and the Background UTL, if available.

Result exceeds established screening criteria but is less than Background UTL.

Screening criteria is lower than the LOD.

Notes:

[1] All analyte concentrations are reported in µg/kg.

[2] The Screening Criteria is the USEPA RSL Summary Table updated November 2012 (USEPA 2012).

[3] The Screening Criteria is the MDE Interim Final Cleanup Standards (MDE 2008). The MDE Interim Final Cleanup Standards are to be considered only and not intended to be primary cleanup criteria at CERCLA sites.

Table 4-3 Soil Detections at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Residential RSL[2] (µg/kg)	MDE Interim Residential Cleanup Standards[3] (µg/kg)	Background UTL Soil Boring[4] (µg/kg)	SWMU56-TMW01-SO05 12-14ft	SWMU56-TMW01-SO06 (DUP) 12-14ft	SWMU56-TMW01-SO07 2-4ft	SWMU56-TMW02-SO08 2-4ft	SWMU56-TMW02-SO09 10-12ft	SMW56-TMW03-SO11 14-16ft	SMW56-TMW03-SO12 2-4ft	SMW56-TMW04-SO13 14-16ft	SMW56-TMW05-SO14 2-4ft	SMW56-TMW05-SO15 16-18ft	SWMU56-TMW06-SO02 2-4ft	SWMU56-TMW06-SO03 12-14ft	SWMU56-TMW07-SO01 12-14ft	SWMU56-TMW08-SO04 12-14ft	SWMU56-TMW09-SO10 14-16ft

[4] The Background UTL is from the Basewide Background Study Report March 2004 (CH2M Hill 2004).

[5] Insoluble salts of chromium (III) (16065-83-1) have an RSL of 120,000,000 µg/kg. Chromium (IV) (18540-29-9) has an RSL of 290 µg/Kg. Results for total chromium will be compared to the insoluble salts criterion.

Qualifiers:

J = The reported positive result is considered estimated because the result is less than the LOQ or because certain quality control criteria were not met.

U = The analyte was not detected and is reported as less than the LOD or as defined by the client.

UJ = The analyte was not detected in the sample. The LOD (or LOQ) should be considered estimated and may be inaccurate or imprecise.

Acronyms:

µg/kg = microgram per kilogram
AOI = Area of Interest
DRO = diesel range organics
GRO = gasoline range organics
LOQ = limit of quantitation
LOD = limit of detection
MDE = Maryland Department of the Environment
NE = none established
PAHs = polynuclear aromatic hydrocarbons
PCB = polychlorinated biphenyl
SO = soil
SVOC = semi-volatile organic compound
SWMU = solid waste management unit
RSL = Regional Screening Level
TMW = temporary monitoring well
USEPA = United States Envionmental Protection Agency
UTL = Upper Tolerance Limit
VOC = volatile organic compound

Table 4-4 Groundwater Detections at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Residential RSL[2] (µg/L)	USEPA MCL[2] (µg/L)	MDE Interim Residential Cleanup Standards[3] (µg/L)	Background UTL Groundwater Total[4] (µg/L)	ST14-MW35 December 2012 (µg/L)	SWMU56-TMW01-GW05	SWMU56-TMW01-GW06 (DUP)	SWMU56-TMW02-GW08	SWMU56-TMW03-GW09	SWMU56-TMW04-GW10	SWMU56-TMW05-GW04	SWMU56-TMW06-GW01	SWMU56-TMW07-GW03	SWMU56-TMW08-GW02	SWMU56-TMW09-GW07
VOCs by SW-846 Method 8260B															
1,1,2,2-Tetrachloroethane	0.066	NE	NE	NE	0.20 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
1,1,2-Trichloroethane	0.24	5	NE	NE	0.32 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
1,1-Dichloroethane	2.4	NE	NE	NE	0.16 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.21 J**	0.20 U	0.20 U	0.20 U	0.20 U
1,1-Dichloroethene	260	7	NE	NE	0.14 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.17 J**	**0.53 J**	**0.30 J**	0.20 U J	0.20 U	0.20 U
1,2,3-Trichloropropane	0.00065	NE	NE	NE	0.77 U	0.80 U	0.80 U	0.80 U	0.40 U	0.40 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U
1,2-Dibromo-3-Chloropropane	0.00032	0.2	NE	NE	0.81 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U
1,2-Dibromoethane (Ethylene Dibromide)	0.0065	0.05	NE	NE	0.18 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
1,2-Dichloroethane	0.15	5	NE	NE	0.13 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Carbon tetrachloride	0.39	5	NE	NE	0.19 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U
Chloroform	0.19	80	NE	NE	0.46 U	1.6 U	1.6 U	1.6 U	1.6 U	**490**	**0.38 J**	**0.81 J**	**0.33 J**	0.20 U	1.6 U
cis-1,2-Dichloroethene	28	70	NE	NE	**1.9**	**1.4**	**1.6**	**0.16 J**	0.20 U	1.0 U	**9.0**	**4.9**	0.20 U	0.20 U	**1.1**
Dichlorobromomethane	0.12	80	NE	NE	0.17 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U
Naphthalene	0.14	NE	NE	NE	0.22 U	0.80 U	0.80 U	0.80 U	0.80 U	1.0 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U
Trichloroethene	0.44	5	NE	NE	**12**	**17**	**19**	**3.5**	0.20 U	4.2 U	**45**	**29**	**0.31 J**	0.20 U	**13**
Trichlorofluoromethane	1100	NE	NE	NE	0.29 U	0.80 U	0.80 U	0.80 U	0.80 U	**0.93 J**	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U
Vinyl chloride	0.015	2	NE	NE	0.40 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U
PAHs by SW-846 Method 8270-SIM															
Anthracene	1300	NE	NE	NE	NA	0.020 U	0.020 U	0.021 U	0.022 U	0.021 U	**0.029 J**	0.020 U	0.022 U	0.020 U	0.022 U
Benzo[a]anthracene	0.029	NE	NE	NE	NA	0.10 UJ	0.099 UJ	0.11 U	0.011 U	0.011 U	0.11 UJ	0.10 U	0.011 U	0.010 U	0.11 U
Benzo[a]pyrene	0.0029	0.2	NE	NE	NA	0.010 U	0.0099 U	0.011 U	0.011 U	0.011 U	0.095 UJ	0.010 U	0.011 U	0.010 U	0.011 U
Benzo[b]fluoranthene	0.029	NE	NE	NE	NA	0.10 UJ	0.099 UJ	0.11 U	0.11 UJ	0.011 U	**0.17 J**	0.10 U	0.10 U	0.10 U	0.11 U
Benzo[g,h,i]perylene	NE	NE	NE	NE	NA	0.010 U	0.099 UJ	0.11 U	0.011 U	0.011 U	**0.15 J**	0.010 U	0.011 U	0.010 U	0.11 U
Benzo[k]fluoranthene	0.29	NE	NE	NE	NA	0.010 U	0.0099 U	0.011 U	0.011 U	0.011 U	**0.17 J**	0.010 U	0.011 U	0.010 U	0.011 U
Dibenz(a,h)anthracene	0.0029	NE	NE	NE	NA	0.010 U	0.0099 U	0.011 U	0.011 U	0.011 U	**0.16 J**	0.010 U	0.011 U	0.010 U	0.011 U
Fluoranthene	630	NE	NE	NE	NA	0.010 U	0.0099 U	0.011 U	**0.092 J**	0.11 U	0.14 U J	0.010 U	0.011 U	0.010 U	0.011 U
Fluorene	220	NE	NE	NE	NA	0.020 U	0.020 U	0.021 U	**0.14 J**	**0.067 J**	0.019 U	0.020 U	0.022 U	0.020 U	0.022 U
Indeno[1,2,3-cd]pyrene	0.029	NE	NE	NE	NA	0.020 U	0.020 U	0.021 U	0.022 U	0.021 U	**0.17 J**	0.020 U	0.022 U	0.020 U	0.022 U
Naphthalene	0.14	NE	NE	NE	NA	**0.0072 J**	**0.0086 J**	**0.0079 J**	**0.039 J**	**0.13**	**0.0075 J**	**0.021 J**	**0.0079 J**	**0.016 J**	**0.0080 J**
Phenanthrene	NE	NE	NE	NE	NA	0.012 U	0.012 U	0.013 U	**0.23 J**	**0.11**	0.095 UJ	0.10 U	0.013 U	0.012 U	0.013 U
SVOCs by SW-846 Method 8270D															
1,2,4-Trichlorobenzene	0.99	70	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
1,2-Diphenylhydrazine	0.067	NE	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
1,4-Dichlorobenzene	0.42	75	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
2,2'-Oxybis[1-chloropropane]	0.31	NE	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
2,4-Dinitrotoluene	0.2	NE	NE	NE	NA	3.8 U	4.5 U	4.3 U	4.4 U	4.4 U	3.9 U	3.9 U	4.4 U	4.3 U	3.8 U
3,3'-Dichlorobenzidine	0.11	NE	NE	NE	NA	9.6 U	11 U	11 U	11 U	11 U	9.8 U	9.8 U	11 U	11 U	9.6 U
4,6-Dinitro-2-methylphenol	1.2	NE	NE	NE	NA	9.6 U	11 U	11 U	11 U	11 U	9.8 U	9.8 U	11 U	11 U	9.6 U
4-Chloroaniline	0.32	NE	NE	NE	NA	4.8 U	5.7 U	5.3 U	5.5 U	5.5 U	4.9 U	4.9 U	5.5 U	5.4 U	4.8 U
4-Nitroaniline	3.3	NE	NE	NE	NA	3.8 U	4.5 U	4.3 U	4.4 U	4.4 U	3.9 U	3.9 U	4.4 U	4.3 U	3.8 U
Benzo[a]anthracene	0.029	NE	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U

Table 4-4 Groundwater Detections at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Residential RSL[2] (µg/L)	USEPA MCL[2] (µg/L)	MDE Interim Residential Cleanup Standards[3] (µg/L)	Background UTL Groundwater Total[4] (µg/L)	ST14-MW35 December 2012 (µg/L)	SWMU56-TMW01-GW05	SWMU56-TMW01-GW06 (DUP)	SWMU56-TMW02-GW08	SWMU56-TMW03-GW09	SWMU56-TMW04-GW10	SWMU56-TMW05-GW04	SWMU56-TMW06-GW01	SWMU56-TMW07-GW03	SWMU56-TMW08-GW02	SWMU56-TMW09-GW07
Benzo[a]pyrene	0.029	0.2	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Benzo[b]fluoranthene	0.029	NE	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Benzo[k]fluoranthene	0.29	NE	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Bis(2-chloroethyl)ether	0.012	NE	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Dibenz(a,h)anthracene	0.0029	NE	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Diethyl phthalate	11000	NE	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	**0.53 J**	1.1 U	1.1 U	0.96 U
Hexachlorobenzene	0.042	1	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Hexachlorobutadiene	0.26	NE	NE	NE	NA	9.6 U	11 U	11 U	11 U	11 U	9.8 U	9.8 U	11 U	11 U	9.6 U
Hexachloroethane	0.79	NE	NE	NE	NA	3.8 U	4.5 U	4.3 U	4.4 U	4.4 U	3.9 U	3.9 U	4.4 U	4.3 U	3.8 U
Indeno[1,2,3-cd]pyrene	0.029	NE	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Naphthalene	0.14	NE	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Nitrobenzene	0.12	NE	NE	NE	NA	1.9 U	2.3 U	2.1 U	2.2 U	2.2 U	2.0 U	2.0 U	2.2 U	2.2 U	1.9 U
N-Nitrosodimethylamine	0.00042	NE	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
N-Nitrosodi-n-propylamine	0.0093	NE	NE	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Pentachlorophenol	0.035	1	NE	NE	NA	38 U	45 U	43 U	44 U	44 U	39 U	39 U	44 U	43 U	38 U
GRO/DRO by SW-846 Method 8015C															
Diesel Range Organics	NE	NE	47	NE	NA	98 U	99 U	110 U	**76 J**	110 U	95 U	100 U	110 U	95 U	100 U
Gasoline Range Organics	NE	NE	47	NE	NA	25 UJ	25 UJ	25 UJ	20 U	**83**	25 UJ	25 UJ	25 U	20 U	25 UJ
Pesticides by SW-846 Method 8081A															
Aldrin	0.004	NE	NE	NE	NA	0.011 U	0.0095 U	0.011 U	0.011 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U
alpha-BHC	0.0062	NE	NE	NE	NA	0.011 U	0.0095 U	0.011 U	0.011 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U
Dieldrin	0.0015	NE	NE	NE	NA	0.011 U	0.0095 U	0.011 U	0.011 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U
Heptachlor	0.0018	0.4	NE	NE	NA	0.011 U	0.0095 U	0.011 U	0.011 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U
Heptachlor epoxide	0.0033	0.2	NE	NE	NA	0.011 U	0.0095 U	0.011 U	0.011 U	0.010 U	0.010 U	0.010 U	0.011 U	0.010 U	0.010 U
Toxaphene	0.013	3	NE	NE	NA	0.88 UJ	0.76 UJ	0.85 UJ	0.87 UJ	0.82 UJ	0.81 UJ	0.82 UJ	0.84 UJ	0.83 UJ	0.83 UJ
PCBs by SW-846 Method 8082A															
PCB – 1221	0.004	NE	NE	NE	NA	0.33 U	0.28 U	0.32 U	0.32 U	0.33 U	0.30 U	0.31 U	0.32 U	0.31 U	0.31 U
PCB – 1232	0.004	NE	NE	NE	NA	0.44 U	0.38 U	0.43 U	0.43 U	0.45 U	0.40 U	0.41 U	0.42 U	0.42 U	0.42 U
PCB – 1242	0.034	NE	NE	NE	NA	0.33 U	0.28 U	0.32 U	0.32 U	0.33 U	0.30 U	0.31 U	0.32 U	0.31 U	0.31 U
PCB – 1248	0.034	NE	NE	NE	NA	0.22 U	0.19 U	0.21 U	0.22 U	0.22 U	0.20 U	0.21 U	0.21 U	0.21 U	0.21 U
PCB – 1254	0.034	NE	NE	NE	NA	0.33 U	0.28 U	0.32 U	0.32 U	0.33 U	0.30 U	0.31 U	0.32 U	0.31 U	0.31 U
PCB – 1260	0.034	NE	NE	NE	NA	0.33 U	0.28 U	0.32 U	0.32 U	0.33 U	0.30 U	0.31 U	0.32 U	0.31 U	0.31 U
Herbicides by SW-846 Method 8151A															
MCPP	12	NE	NE	NE	NA	100 U	100 U	100 U	100 U	96 U	**33 J**	96 U	**35 J**	91 U	100 U

Table 4-4 Groundwater Detections at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Residential RSL[2] (µg/L)	USEPA MCL[2] (µg/L)	MDE Interim Residential Cleanup Standards[3] (µg/L)	Background UTL Groundwater Total[4] (µg/L)	ST14-MW35 December 2012 (µg/L)	SWMU56-TMW01-GW05	SWMU56-TMW01-GW06 (DUP)	SWMU56-TMW02-GW08	SWMU56-TMW03-GW09	SWMU56-TMW04-GW10	SWMU56-TMW05-GW04	SWMU56-TMW06-GW01	SWMU56-TMW07-GW03	SWMU56-TMW08-GW02	SWMU56-TMW09-GW07
Metals by SW-846 6010B and 7470A															
Aluminum	16,000	NE	NE	26,900	**220 J**	**160 J**	**73 J**	**21,000**	**220** J	**57** J	**1,700**	**480**	**180 J**	**660**	**110 J**
Arsenic	0.045	10	NE	NE	0.33 U	1.0 U	1.0 U	**21**	1.0 U	1.0 U	**0.68 J**	1.0 U	1.0 U	**0.41 J**	1.0 U
Barium	2,900	2,000	NE	76.6	**160**	**24**	**23**	**75**	**110**	**35**	**210**	**66**	**40**	**19**	**21**
Beryllium	16	4	NE	NE	0.47 U	**0.087 J**	**0.098 J**	**1.9**	**0.46 J**	**0.17 J**	**0.32 J**	**0.25 J**	**0.18 J**	**0.15 J**	**0.085 J**
Cadmium	6.9	5	NE	2.6	0.45 U	**0.25 J**	**0.26 J**	**2.4**	**1.0**	**0.47 J**	**0.39 J**	**0.48 J**	**0.43 J**	**0.15 J**	**0.14 J**
Calcium	NE	NE	NE	167,000	**58,000**	**2,400**	**2,300**	**4,400**	**11,000**	**3,700**	**7,700**	**6,300**	**3,700**	**1,800**	**1,600**
Chromium (Total)	NE	100	NE	34.3	**2.2 J**	**2.7 J**	**1.7 J**	**170**	**3.4 J**	**1.0 J**	**3.1 J**	**2.0 J**	**2.6 J**	**2.8 J**	**1.6 J**
Cobalt	4.7	NE	NE	22.2	1.2 U	**1.3**	**1.3**	**95**	**3.6**	**1.5**	**13**	**3.7**	**2.7**	**1.0**	**1.2**
Copper	620	1,300	NE	29.1	1.4 U	2.0 U	2.0 U	**310**	2.0 U	2.0 U	3.8 U	2.2 U	**5.2**	2.0 U	**44**
Iron	11,000	NE	NE	8,520	22 U	**1,200 J**	**890 J**	**110,000**	**2,400**	**740**	**3,500**	**2,900**	**1,300**	**3,100**	**1,100**
Lead	NE	15	NE	9.47	2.6 U	**0.22 J**	0.50 U	**24**	**0.29 J**	**0.69 J**	**0.86 J**	**0.75 J**	**0.34 J**	**0.23 J**	**2.0 J**
Magnesium	NE	NE	NE	16,000	**130 J**	**1,100**	**1,100**	**3,300**	**4,200**	**1,400**	**9,100**	**2,900**	**1,400**	**750**	**990**
Manganese	320	NE	NE	159	**0.53 J**	**28**	**28**	**280**	**100**	**30**	**390**	**140**	**45**	**19**	**26**
Mercury	0.63	2	NE	NE	0.027 U	0.080 U	0.080 U	**0.15 J**	**0.15 J**	**0.39**	**0.065 J**	**0.25**	0.080 U	0.080 U	0.080 U
Molybdenum	78	NE	NE	1.58	3.1 U	**0.48 J**	**0.25 J**	**45**	**0.41 J**	0.40 U	**0.31 J**	**0.33 J**	**0.24 J**	**0.46 J**	**0.19 J**
Nickel	300	NE	NE	20.2	1.3 U	**6.8**	**6.4**	**150**	**15**	**4.0**	**14**	**13**	**26**	**3.8**	**4.1**
Potassium	NE	NE	NE	18,300	**7,900**	**870 J**	**870 J**	**4,100**	**1,500 J**	**1,200 J**	**1,900 J**	**1,400 J**	**1,500 J**	**1,200 J**	**750 J**
Selenium	78	50	NE	2.6	4.9 U	2.0 U	2.0 U	**3.0 J**	2.0 U	2.0 U	**0.99 J**	2.0 U	2.0 U	2.0 U	2.0 U
Silver	71	NE	NE	NE	0.93 U	0.10 U	0.10 U	**0.36 J**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Sodium	NE	NE	NE	110,000	**36,000**	**6,000**	**5,800**	**3,700 J**	**47,000**	**9,400**	**57,000**	**25,000**	**7,100**	**3,800 J**	**5,500**
Thallium	0.16	2	NE	NE	4.9 U	0.10 U	0.10 U	**1.5**	**0.063 J**	**0.081 J**	**0.091 J**	**0.080 J**	0.10 U	0.10 U	0.10 U
Vanadium	78	NE	NE	15.9	**2.9 J**	1.0 U	1.0 U	**59**	1.0 U	1.0 U	**1.5 J**	**0.77 J**	1.0 U	**1.2 J**	1.0 U
Zinc	4,700	NE	NE	415	**7.2 J**	20 U	20 U	**190**	**19 J**	**9.0 J**	**13 J**	**25**	**16 J**	20 U	**28**

Bold values indicate the analyte was detected.

Result exceeds established screening criteria and the Background UTL, if available.

Result exceeds established screening criteria but is less than Background UTL.

Screening criteria is lower than the LOD.

Notes:

[1] All analyte concentrations are reported in µg/L.

[2] The Screening Criteria is the USEPA RSL/MCL Summary Table updated November 2012 (USEPA 2012).

[3] The Screening Criteria is the MDE Interim Final Cleanup Standards (MDE 2008). The MDE Interim Final Cleanup Standards are to be considered only and not intended to be primary cleanup criteria at CERCLA sites.

[4] The Background UTL is from the Basewide Background Study Report March 2004 (CH2M Hill 2004).

Qualifiers:

J = The reported positive result is considered estimated because the result is less than the LOQ or because certain quality control criteria were not met.

U = The analyte was not detected and is reported as less than the LOD or as defined by the client.

UJ = The analyte was not detected in the sample. The LOD (or LOQ) should be considered estimated and may be inaccurate or imprecise.

Acronyms:

µg/L = microgram per liter

AOI = Area of Interest

DRO = diesel range organics

GRO = gasoline range organics

Table 4-4 Groundwater Detections at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Residential RSL[2] (µg/L)	USEPA MCL[2] (µg/L)	MDE Interim Residential Cleanup Standards[3] (µg/L)	Background UTL Groundwater Total[4] (µg/L)	ST14-MW35 December 2012 (µg/L)	SWMU56-TMW01-GW05	SWMU56-TMW01-GW06 (DUP)	SWMU56-TMW02-GW08	SWMU56-TMW03-GW09	SWMU56-TMW04-GW10	SWMU56-TMW05-GW04	SWMU56-TMW06-GW01	SWMU56-TMW07-GW03	SWMU56-TMW08-GW02	SWMU56-TMW09-GW07

GW = groundwater
LOQ = limit of quantitation
LOD = limit of detection
MCL = Maximum Contaminant Level
MDE = Maryland Department of the Environment
NA = not analyzed
NE = none established
PAHs = polynuclear aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic compound
SWMU = solid waste management unit
RSL = Regional Screening Level
TMW = temporary monitoring well
USEPA = United States Envionmental Protection Agency
UTL = Upper Tolerance Limit
VOC = volatile organic compound

Table 4-5 Soil Detections at the Building 3459 AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Residential RSL[2] (µg/kg)	Background UTL Surface Soil[3] (µg/kg)	SWMU56-SB01 (1-2ft)	SWMU56-SB02 (1-2ft)	SWMU56-SB03 (1-2ft)	SWMU56-SB04 (1-2ft)
Pesticides by SW-846 Method 8081A						
delta-BHC	NE	NE	**2.5 J**	**0.51 J**	0.73 U	15 U
alpha-Chlordane	NE	15.2	0.54 U	**25**	**16**	**300**
gamma-Chlordane	NE	6.9	0.81 U	**28**	**18**	**420**
4,4'-DDD	2,000	0.97	0.81 U	0.79 U	0.73 U	**65**
4,4'-DDE	1,400	3.2	0.54 U	**2.4 J**	0.48 U	**27 J**
4,4'-DDT	1,700	7.6	0.81 U	**2.7 J**	**0.99 J**	**41 J**
Endosulfan sulfate	NE	0.43	0.54 U	0.52 U	0.48 U	**6.7 J**
Heptachlor	110	NE	0.54 U	0.52 U	**0.47 J**	**14 J**
Heptachlor epoxide	53	1.4	0.81 U	**2.7 J**	**0.56 J**	15 U
Herbicides by SW-846 Method 8151A						
Herbicides below LOD						

Notes:

[1] All analyte concentrations are reported in µg/kg.

[2] The Screening Criteria is the USEPA RSL Summary Table updated November 2012 (USEPA 2012).

[3] The Background UTL is from the Basewide Background Study Report March 2004 (CH2M Hill 2004).

Qualifiers:

J = The reported positive result is considered estimated because the result is less than the LOQ or because certain quality control criteria were not met.

U = The analyte was not detected and is reported as less than the LOD or as defined by the client.

Acronyms:

µg/kg = microgram per kilogram
AOI = Area of Interest
LOQ = limit of quantitation
LOD = limit of detection
NE = none established
SB = soil
SWMU = solid waste management unit
RSL = Regional Screening Level
USEPA = United States Envionmental Protection Agency
UTL = Upper Tolerance Limit

Table 6-1 SLHHRA for Soil at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Residential RSL[2] (µg/kg)	Background UTL Soil Boring[3] (µg/kg)	Basic Statistics					95% UCL		Assessment
			Number of Samples	Number of samples above RSL and Background UTL	Maximum	Minimum	Mean[4]	Most conservative EPC[5] (95% UCL)	Calculation Type	
PAHs by SW-846 Method 8270-SIM										
Benzo[a]pyrene	15	3.5	14	2	18	2.2	3.7	10.26	95% Chebyshev (mean, Sd)	**EPC is less than screening criteria**
Metals by SW-846 Method 6010B										
Barium	15,000,000	53,600	14	1	42,000,000	580	3,900,000	42,436,871	Hall's Bootstrap	**EPC exceeds RSL and Background UTL**

Result exceeds established screening criteria and the Background UTL.

Notes:

[1] All analyte concentrations are reported in µg/kg.

[2] The Screening Criteria is the USEPA RSL Summary Table updated November 2012 (USEPA 2012).

[3] The Background UTL is from the Basewide Background Study Report March 2004 (CH2M Hill 2004).

[4] Mean is calculated by taking 1/2 of all non-detected values and dividing by the total number of samples.

[5] The most conservative EPC is calculated using the ProUCL 4.1 software (USEPA 2010).

Acronyms:

µg/kg = microgram per kilogram
AOI = Area of Interest
EPC = exposure point concentration
PAH = polynuclear aromatic hydrocarbons
RSL = Regional Screening Level
USEPA = United States Environmental Protection Agency
UTL = Upper Tolerance Limit
95% UCL = 95 percent upper confidence level

Table 6-2 SLHHRA for Groundwater at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Residential RSL[2] (µg/L)	USEPA MCL[2] (µg/L)	MDE Interim Residential Cleanup Standards[3] (µg/L)	Background UTL Groundwater Total[4] (µg/L)	ST14-MW35 December 2012 (µg/L)	Basic Statistics					Assessment
						Number of Samples	Number of samples above RSL and Background UTL	Maximum	Minimum	Mean[5]	
VOCs by SW-846 Method 8260B											
Chloroform	0.19	80	NE	NE	0.46 U	9	1	490	0.20 U	55	Exceeds screening criteria
Trichloroethene	0.44	5	NE	NE	12	9	4	45	0.20 U	12	Exceeds screening criteria
PAHs by SW-846 Method 8270-SIM											
Benzo[b]fluoranthene	0.029	NE	NE	NE	NA	9	1	0.17	0.011 U	0.06	Exceeds screening criteria
Dibenz(a,h)anthracene	0.0029	NE	NE	NE	NA	9	1	0.16	0.010 U	0.022	Exceeds screening criteria
Indeno[1,2,3-cd]pyrene	0.029	NE	NE	NE	NA	9	1	0.17	0.020 U	0.028	Exceeds screening criteria
GRO/DRO by SW-846 Method 8015C											
Diesel Range Organics	NE	NE	47	NE	NA	9	1	76	95 U	54	Exceeds screening criteria
Gasoline Range Organics	NE	NE	47	NE	NA	9	1	83	20 U	20	Exceeds screening criteria
Herbicides by SW-846 Method 8151A											
MCPP	12	NE	NE	NE	NA	9	2	35	33	46	Exceeds screening criteria
Metals by SW-846 6010B and 7470A											
Arsenic	0.045	10	NE	NE	0.33 U	9	1	21	0.41	2.8	Exceeds screening criteria
Cobalt	4.7	NE	NE	22.2	1.2 U	9	1	95	1.0	14	Exceeds screening criteria
Iron	11000	NE	NE	8520	22 U	9	1	110,000	740	14,000	Exceeds screening criteria
Lead	NE	15	NE	9.47	2.6 U	9	1	24	0.22	3.3	Exceeds screening criteria
Manganese	320	NE	NE	159	0.53 J	9	1	390	19	120	Exceeds screening criteria

Result exceeds established screening criteria and the Background UTL.
Screening criteria is lower than the analyte laboratory LOD.

Notes:

[1] All analyte concentrations are reported in µg/L.
[2] The Screening Criteria is the USEPA RSL/MCL Summary Table updated November 2012 (USEPA 2012).
[3] The Screening Criteria is the MDE Interim Final Cleanup Standards (MDE 2008). The MDE Interim Final Cleanup Standards are to be considered only and not intended to be primary cleanup criteria at CERCLA sites.
[4] The Background UTL is from the Basewide Background Study Report March 2004 (CH2M Hill 2004).
[5] Mean is calculated by taking 1/2 of all non-detected values and dividing by the total number of samples.

Qualifiers:

J = The reported positive result is considered estimated because the result is less than the LOQ or because certain quality control criteria were not met.
U = The analyte was not detected and is reported as less than the LOD or as defined by the client.

Acronyms:

µg/L = microgram per liter
AOI = Area of Interest
DRO = diesel range organics
GRO = gasoline range organics
GW = groundwater
LOQ = limit of quantitation
LOD = limit of detection
MCL = Maximum Contaminant Level
MDE = Maryland Department of the Environment
NA = not analyzed
NE = none established
PAHs = polynuclear aromatic hydrocarbons
SWMU = solid waste management unit
RSL = Regional Screening Level
USEPA = United States Envionmental Protection Agency
UTL = Upper Tolerance Limit
VOC = volatile organic compound

Table 7-1 Soil Ecological Screening at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Region 3 BTAG Freshwater Sediment[2] (µg/kg)	USEPA EcoSSLs[3] (µg/kg)				Background UTL Soil Boring[4] (µg/kg)	SWMU56-TMW01-SO05	SWMU56-TMW01-SO06 (DUP)	SWMU56-TMW01-SO07	SWMU56-TMW02-SO08	SWMU56-TMW02-SO09	SMW56-TMW03-SO11	SMW56-TMW03-SO12	SMW56-TMW04-SO13	SMW56-TMW05-SO14	SMW56-TMW05-SO15	SWMU56-TMW06-SO02	SWMU56-TMW06-SO03	SWMU56-TMW07-SO01	SWMU56-TMW08-SO04	SWMU56-TMW09-SO10
		Plant	Soil Invert.	Mammalian	Avian		12-14ft	12-14ft	2-4ft	2-4ft	10-12ft	14-16ft	2-4ft	14-16ft	2-4ft	16-18ft	2-4ft	12-14ft	12-14ft	12-14ft	14-16ft
VOCs by SW-846 Method 8260B																					
1,3,5-Trimethylbenzene	NE	NE	NE	NE	NE	NE	1.1 U	0.78 U	**0.61 J**	1.1 U	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	0.81 U	0.78 U	0.99 U	1.1 U	0.83 U	0.98 U
2-Butanone (MEK)	NE	NE	NE	NE	NE	NE	6.9 U	5.0 U	**13 J**	**20 J**	5.1 U	4.8 U	5.0 U	4.4 U	6.5 U	5.2 U	**7.8 J**	6.3 U	7.0 U	5.3 U	6.2 U
Acetone	NE	NE	NE	NE	NE	NE	**9.6 J**	16 U	**96 J**	**97 J**	16 U	15 U	16 U	14 U	21 U	16 U	**97**	9.9 U	11 U	8.3 U	20 U
Carbon disulfide	0.851	NE	NE	NE	NE	NE	1.1 U	0.78 U	**0.44 J**	**0.87 J**	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	**0.53 J**	0.78 U	0.99 U	1.1 U	0.83 U	0.98 U
cis-1,2-Dichloroethene	NE	NE	NE	NE	NE	NE	1.1 U	0.78 U	0.76 U	**120 J**	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	0.81 U	**50**	0.99 U	1.1 U	0.83 U	0.98 U
Naphthalene	176	NE	NE	NE	NE	NE	1.1 U	0.78 U	**1.3 J**	1.1 U	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	0.81 U	0.78 U	0.99 U	1.1 U	0.83 U	0.98 U
Tetrachloroethene	468	NE	NE	NE	NE	NE	1.1 U	0.78 U	0.76 U	1.1 U	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	0.81 U	**1.8 J**	0.99 U	1.1 U	0.83 U	0.98 U
Toluene	NE	NE	NE	NE	NE	NE	1.1 U	0.78 U	0.76 U	**1.2 J**	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	0.81 U	0.78 U	0.99 U	1.1 U	0.83 U	0.98 U
trans-1,2-Dichloroethene	1,050	NE	NE	NE	NE	NE	1.1 U	0.78 U	0.76 U	**9.6 J**	0.80 U	0.75 U	0.78 U	0.69 U	1.0 U	0.81 U	**4.4**	0.99 U	1.1 U	0.83 U	0.98 U
Trichloroethene	96.9	NE	NE	NE	NE	NE	0.86 U	0.63 U	0.61 U	0.89 U	0.64 U	0.60 U	0.62 U	0.55 U	0.82 U	0.65 U	**34**	**0.49 J**	0.88 U	0.66 U	0.78 U
PAHs by SW-846 Method 8270-SIM																					
Acenaphthene	6.7	NE	29,000	100,000	NE	45.9	0.34 U	0.27 U	**2.2 J**	0.31 U	0.29 U	0.28 U	0.27 U	0.27 U	0.31 U	0.28 U	0.31 U	0.28 U	0.27 U	0.27 U	0.31 U
Acenaphthylene	5.9	NE	29,000	100,000	NE	8.8	0.84 U	0.68 U	**7.7**	**4.0 J**	0.72 U	0.70 U	0.69 U	0.68 U	0.77 U	0.69 U	**1.0 J**	0.71 U	0.67 U	0.68 U	0.77 U
Anthracene	57.2	NE	29,000	100,000	NE	NE	3.2 U	2.5 U	**5.6**	**3.7 J**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	2.9 U	2.6 U	2.5 U	2.6 U	2.9 U
Benzo[a]anthracene	108	NE	18,000	1,100	NE	11.2	3.2 U	2.5 U	**14**	**14**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**1.9 J**	2.6 U	2.5 U	2.6 U	2.9 U
Benzo[a]pyrene	150	NE	18,000	1,100	NE	3.5	3.2 U	2.5 U	**18**	**16**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**2.2 J**	2.6 U	2.5 U	2.6 U	2.9 U
Benzo[b]fluoranthene	27.2[b]	NE	18,000	1,100	NE	7.6	3.2 U	2.5 U	**34**	**23**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**5.3 J**	2.6 U	2.5 U	2.6 U	2.9 U
Benzo[g,h,i]perylene	170	NE	18,000	1,100	NE	4.8	3.2 U	2.5 U	**18**	**12**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**4.0 J**	2.6 U	2.5 U	2.6 U	2.9 U
Benzo[k]fluoranthene	27.2[b]	NE	18,000	1,100	NE	NE	3.2 U	2.5 U	**9.4**	**7.6**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**1.5 J**	2.6 U	2.5 U	2.6 U	2.9 U
Chrysene	166	NE	18,000	1,100	NE	26.6	3.2 U	2.5 U	**30**	**25**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**3.7 J**	2.6 U	2.5 U	2.6 U	2.9 U
Dibenz(a,h)anthracene	33	NE	18,000	1,100	NE	17	3.2 U	2.5 U	**3.9 J**	**3.4 J**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	2.9 U	2.6 U	2.5 U	2.6 U	2.9 U
Fluoranthene	423	NE	29,000	100,000	NE	22.6	3.2 U	2.5 U	**35**	**23**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**3.5 J**	2.6 U	2.5 U	2.6 U	2.9 U
Fluorene	77.4	NE	29,000	100,000	NE	11.8	0.84 U	0.68 U	**5.4 J**	**4.0 J**	0.72 U	0.70 U	0.69 U	0.68 U	0.77 U	0.69 U	0.77 U	0.71 U	0.67 U	0.68 U	0.77 U
Indeno[1,2,3-cd]pyrene	17	NE	18,000	1,100	NE	5.8	3.2 U	2.5 U	**17**	**11**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**3.1 J**	2.6 U	2.5 U	2.6 U	2.9 U
Naphthalene	176	NE	29,000	100,000	NE	NE	0.84 U	0.68 U	**22**	**37**	0.72 U	0.70 U	0.69 U	0.68 U	**0.66 J**	0.69 U	**1.2 J**	0.71 U	0.67 U	0.68 U	0.77 U
Phenanthrene	204	NE	29,000	100,000	NE	9.3	3.2 U	2.5 U	**24**	**28**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**2.1 J**	2.6 U	2.5 U	2.6 U	2.9 U
Pyrene	195	NE	18,000	1,100	NE	13.9	3.2 U	2.5 U	**42**	**31**	2.7 U	2.6 U	2.6 U	2.5 U	2.9 U	2.6 U	**4.0 J**	2.6 U	2.5 U	2.6 U	2.9 U
SVOCs by SW-846 Method 8270D																					
1,2-Dichlorobenzene	16.5	NE	NE	NE	NE	NE	41 U	36 U	38 U	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U
2,4-Dimethylphenol	29	NE	NE	NE	NE	NE	160 U	140 U	150 U	150 U	140 U	270 U	140 U	140 U	150 U	140 U	150 U	140 U	140 U	130 U	150 U
2,4-Dinitrotoluene	41.6	NE	NE	NE	NE	NE	160 U	140 U	150 U	150 U	140 U	270 U	140 U	140 U	150 U	140 U	150 U	140 U	140 U	130 U	150 U
2-Chlorophenol	31.2	NE	NE	NE	NE	NE	41 U	36 U	38 U	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U
2-Methylnaphthalene	20.2	NE	NE	NE	NE	6.1	41 U	36 U	38 U	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U
3,3'-Dichlorobenzidine	127	NE	NE	NE	NE	NE	410 U	360 U	380 U	380 U	350 U	680 U	340 U	340 U	380 U	360 U	380 U	350 U	350 U	340 U	390 U
Acenaphthene	6.7	NE	29,000	100,000	NE	45.9	21 U	19 U	20 U	20 U	18 U	35 U	18 U	18 U	20 U	18 U	20 U	18 U	18 U	18 U	20 U
Acenaphthylene	5.9	NE	29,000	100,000	NE	8.8	41 U	36 U	38 U	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U
Anthracene	57.2	NE	29,000	100,000	NE	NE	41 U	36 U	38 U	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U
Benzyl alcohol	NE	NE	NE	NE	NE	NE	41 U	**26 J**	38 U	**42 J**	**39 J**	680 U	340 U	340 U	380 U	360 U	**42 J**	**27 J**	35 U	**22 J**	390 U
Benzo[b]fluoranthene	27.2[b]	NE	18,000	1,100	NE	7.6	41 U	36 U	**44 J**	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U

Table 7-1 Soil Ecological Screening at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Region 3 BTAG Freshwater Sediment[2] (µg/kg)	USEPA EcoSSLs[3] (µg/kg)				Background UTL Soil Boring[4] (µg/kg)	SWMU56-TMW01-SO05	SWMU56-TMW01-SO06 (DUP)	SWMU56-TMW01-SO07	SWMU56-TMW02-SO08	SWMU56-TMW02-SO09	SMW56-TMW03-SO11	SMW56-TMW03-SO12	SMW56-TMW04-SO13	SMW56-TMW05-SO14	SMW56-TMW05-SO15	SWMU56-TMW06-SO02	SWMU56-TMW06-SO03	SWMU56-TMW07-SO01	SWMU56-TMW08-SO04	SWMU56-TMW09-SO10
		Plant	Soil Invert.	Mammalian	Avian		12-14ft	12-14ft	2-4ft	2-4ft	10-12ft	14-16ft	2-4ft	14-16ft	2-4ft	16-18ft	2-4ft	12-14ft	12-14ft	12-14ft	14-16ft
Benzo[k]fluoranthene	27.2[b]	NE	18,000	1,100	NE	NE	82 U	72 U	76 UJ	77 U	71 U	140 U	69 U	69 U	76 U	71 U	77 U	69 U	69 U	68 U	78 U
Chrysene	166	NE	18,000	1,100	NE	26.6	41 U	36 U	**38 J**	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U
Dibenz(a,h)anthracene	33	NE	18,000	1,100	NE	17	41 U	36 U	38 U	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U
Hexachlorobenzene	20	NE	NE	NE	NE	NE	82 U	72 U	76 U	77 U	71 U	140 U	69 U	69 U	76 U	71 U	77 U	69 U	69 U	68 U	78 U
Indeno[1,2,3-cd]pyrene	17	NE	18,000	1,100	NE	5.8	41 U	36 U	38 U	38 U	35 U	68 U	34 U	34 U	38 U	36 U	38 U	35 U	35 U	34 U	39 U
Pentachlorophenol	504	NE	NE	NE	NE	NE	830 U	740 U	780 U	780 U	720 U	1400 U	700 U	700 U	770 U	730 U	780 U	700 U	700 U	700 U	790 U
GRO/DRO by SW-846 Method 8015C																					
Diesel Range Organics	NE	NE	NE	NE	NE	NE	**960 J**	**810 J**	**9,500**	**4,000 J**	**1,700 J**	**4,400**	**880 J**	**1,800 J**	**1,900 J**	**830 J**	**4,400**	**1,100 J**	**1,600 J**	**2,000 J**	**2,900 J**
Organics	NE	NE	NE	NE	NE	NE	**290 J**	**260 J**	**4,900**	**350 J**	420 U	**1,500**	530 U	510 U	**340 J**	**270 J**	**270 J**	600 U	**370 J**	410 U	**330 J**
Pesticides by SW-846 Method 8081A																					
4,4'-DDD	4.88[c]	NE	NE	21[e]	93[e]	NE	0.86 U	0.72 U	**1.8 J**	**1.7 J**	0.74 U	0.73 U	0.74 U	0.73 U	0.77 U	0.74 U	0.79 U	0.75 U	0.73 U	0.72 U	0.78 U
4,4'-DDE	3.16[c]	NE	NE	21[e]	93[e]	2.7	0.58 U	0.48 U	**1.2 J**	**4.7**	0.49 U	0.49 U	0.49 U	0.48 U	0.51 U	0.50 U	0.53 U	0.50 U	0.49 U	0.48 U	0.52 U
PCBs by SW-846 Method 8082A																					
PCBs below LOD	59.8[f]	NE	NE	NE	NE																
Herbicides by SW-846 Method 8151A																					
Herbicides below LOD																					
Dinoseb	0.611	NE	NE	NE	NE	NE	5,700 U	5000 U	5,500 U	5,800 U	5,100 U	5,000 U	5,000 U	4,900 U	5,500 U	5,100 U	6.3 U	5.9 U	5.6 U	5.7 U	5,600 U
Metals by SW-846 Method 6010B																					
Aluminum	NE	NE	NE	NE	NE	27,900,000	**4,300,000**	**5100000**	**12,000,000**	**11,000,000**	**7,000,000**	**24,000,000**	**4,800,000**	**3,600,000**	**24,000,000**	**4,100,000 J**	**18,000,000**	**2,900,000**	**1,800,000**	**1,600,000**	**4,800,000**
Arsenic	9,800	18,000	NE	46,000	43,000	5,700	**370 J**	**530**	**2,100**	**2,400**	**1,200**	**2,700**	**500**	**840**	**2,500**	**600**	**2,500**	**410 J**	**540**	**2,900**	**570**
Barium	NE	NE	330,000	2,000,000	NE	53,600	**10,000**	**11000**	**31,000**	**40,000**	**11,000**	**42,000**	**7,500**	**7,400**	**40,000**	**13,000**	**42,000,000**	**9,300,000**	**580**	**4,300,000**	**13000**
Beryllium	NE	NE	40,000	21,000	NE	1,060	**42 J**	**94 J**	**250**	**240**	**68 J**	**270**	**33 J**	**50 J**	**220**	**43 J**	**310**	**53 J**	**25 J**	**36 J**	**83 J**
Cadmium	990	32,000	140,000	360	770	39	**55 J**	**97 J**	**150**	**140**	**54 J**	**170**	**69 J**	**53 J**	**170**	**58 J**	**180**	**65 J**	**38 J**	**29 J**	**81 J**
Calcium	NE	NE	NE	NE	NE	945,000	**150**	**150**	**580**	**1100**	**130**	**46 J**	**38 J**	**67 J**	**320**	**30 J**	**480**	**29 J**	**57 J**	**150**	**20 J**
Chromium	43,400	NE	NE	34,000	26,000	31,200	**3,700 J**	**6200 J**	**13,000**	**14,000**	**5,500**	**21,000**	**4,100**	**4,500**	**22,000**	**3,200**	**19,000**	**4,500**	**2,400**	**11,000**	**3,600**
Cobalt	50,000	13,000	NE	230,000	120,000	6,200	**200 J**	**330 J**	**1,900**	**1,800**	**160**	**1,700**	**170**	**200**	**1,600**	**110**	**2,700**	**160**	**100**	**160**	**250**
Copper	31,600	70,000	80,000	49,000	28,000	11,200	**1,100 J**	**1700 J**	**5,200**	**3,900**	**1,400 J**	**4,300**	**1,500 J**	**2,300 J**	**3,700**	**2,900**	**4,100**	**1,500 J**	**1,000 J**	**2,000 J**	**1,400 J**
Iron	20,000,000	NE	NE	NE	NE	22,800,000	**1,400,000**	**1500000**	**10,000,000**	**9,100,000**	**6,400,000**	**21,000,000**	**1,800,000**	**3,100,000**	**21,000,000**	**2,300,000 J**	**16,000,000**	**1,300,000**	**3,200,000**	**14,000,000**	**1,200,000**
Lead	35,800	120,000	1,700,000	56,000	11,000	37,100	**1,800 J**	**3200 J**	**16,000**	**12,000**	**2,400**	**9,300**	**1,500**	**1,900**	**10,000**	**1,900**	**9,800**	**3,600**	**1,100**	**890**	**1,500**
Magnesium	NE	NE	NE	NE	NE	1,100,000	**130,000**	**140000**	**640,000**	**800,000**	**140,000**	**720,000**	**92,000**	**78,000**	**680,000**	**68,000**	**790,000**	**63,000**	**42,000**	**33,000**	**130,000**
Manganese	460,000	220,000	450,000	4,000,000	4,300,000	174,000	**3,600 J**	**5800 J**	**36,000**	**39,000**	**1,100**	**8,700**	**1,300**	**1,800**	**15,000**	**1,100**	**35,000**	**1,400**	**940**	**4,200**	**1,400**
Mercury	180	NE	NE	NE	NE	67	18 U	15 U	**21**	**24**	17 U	16 U	16 U	15 U	**22**	15 U	**11 J**	15 U	16 U	16 U	16 U
Molybdenum	NE	NE	NE	NE	NE	1420	**81 J**	**100 J**	**250**	**310**	**85 J**	**230**	**84 J**	**160 J**	**220 J**	**310 J**	**330**	**110 J**	**97 J**	**1,000**	**170 J**
Nickel	22,700	38,000	280,000	130,000	210,000	11,300	**540 J**	**920 J**	**4,300**	**4,900**	**500**	**4,500**	**610**	**780**	**4,200**	**420**	**5,400**	**420**	**320 J**	**950**	**590**
Potassium	NE	NE	NE	NE	NE	843,000	**240,000 J**	**330000**	**330,000**	**360,000**	**160,000 J**	**350,000**	**110,000 J**	**92,000 J**	**400,000**	**210,000 J**	**440,000**	**220,000 J**	**89,000 J**	**68,000 J**	**230,000 J**
Selenium	2,000	520	4,100	630	1,200	NE	**310 J**	**480 J**	**680**	**850**	**320 J**	**680**	**400 J**	**420 J**	**700**	**470 J**	**680**	**310 J**	**260 J**	**170 J**	**420 J**
Silver	1,000	560,000	NE	14,000	4,200	NE	71 U	**21 J**	**45 J**	**31 J**	65 U	**26 J**	59 U	**26 J**	**34 J**	57 U	**34 J**	57 U	60 U	58 U	69 U
Sodium	NE	NE	NE	NE	NE	43,400	120,000 U	96000 U	**75,000 J**	**82,000 J**	95,000 U	100,000 U	**600,000**	97,000 U	**120,000 J**	100,000 U	100,000 U	100,000 U	92,000 U	96,000 U	100,000 U
Thallium	NE	NE	NE	NE	NE	332	**37 J**	**65 J**	**120**	**150**	**35 J**	**180**	**26 J**	**27 J**	**190**	**30 J**	**210**	**42 J**	**47 J**	**11 J**	**41 J**
Vanadium	NE	NE	NE	280,000	7,800	40,000	**5,500**	**9,900**	**22,000**	**22,000**	**6,800**	**36,000**	**3,600**	**3,700**	**37,000**	**4,900 J**	**33,000**	**6,700**	**3,800**	**2,600**	**6,600**
Zinc	121,000	160,000	120,000	79,000	46,000	29,200	**1,500 J**	**2,400 J**	**20,000**	**15,000**	**1,000 J**	**8,200**	**1,000 J**	**1,300 J**	**8,600**	**750 J**	**15,000**	**960 J**	**580 J**	**2,100 J**	**1,500 J**

Table 7-1 Soil Ecological Screening at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Region 3 BTAG Freshwater Sediment[2] (µg/kg)	USEPA EcoSSLs[3] (µg/kg)				Background UTL Soil Boring[4] (µg/kg)	SWMU56-TMW01-SO05	SWMU56-TMW01-SO06 (DUP)	SWMU56-TMW01-SO07	SWMU56-TMW02-SO08	SWMU56-TMW02-SO09	SMW56-TMW03-SO11	SMW56-TMW03-SO12	SMW56-TMW04-SO13	SMW56-TMW05-SO14	SMW56-TMW05-SO15	SWMU56-TMW06-SO02	SWMU56-TMW06-SO03	SWMU56-TMW07-SO01	SWMU56-TMW08-SO04	SWMU56-TMW09-SO10
		Plant	Soil Invert.	Mammalian	Avian		12-14ft	12-14ft	2-4ft	2-4ft	10-12ft	14-16ft	2-4ft	14-16ft	2-4ft	16-18ft	2-4ft	12-14ft	12-14ft	12-14ft	14-16ft

Bold values indicate the analyte was detected.

Result exceeds established screening criteria and the Background UTL, if available.

Result exceeds established screening criteria but is less than Background UTL.

Screening criteria is lower than the analyte laboratory LOD.

Notes:

[1] All analyte concentrations are reported in µg/kg.

[2] The Screening Criteria reference is taken from the USEPA Region 3 BTAG Freshwater Sediment Screening Benchmarks Table (USEPA 2006).

[3] USEPA Ecological Soil Screening Levels (EcoSSLs, USEPA 2010).

[4] The Background UTL is from the Basewide Background Study Report March 2004 (CH2M Hill 2004).

[a] Screening value for m-Xylene.

[b] Screening value for Benzo(b+k)fluoranthene

[c] The Screening Benchmark for DDT/DDE/DDD (total) is 5.28 µg/L.

[d] The Screening Benchmark for Endosulfan I and Endosulfan II (total) is 2.14 µg/L.

[e] The EcoSSL for 4,4'-DDT and metabolites.

[f] The Screening Benchmark for total PCBs.

Qualifiers:

J = The reported positive result is considered estimated because the result is less than the LOQ or because certain quality control criteria were not met.

U = The analyte was not detected and is reported as less than the LOD or as defined by the client.

UJ = The analyte was not detected in the sample. The LOD (or LOQ) should be considered estimated and may be inaccurate or imprecise.

Acronyms:

µg/kg = microgram per kilogram
AOI = Area of Interest
BTAG = Biological Technical Assistance Group
DRO = diesel range organics
EcoSSLs = Ecological Soil Screening Levels
GRO = gasoline range organics
LOQ = limit of quantitation
LOD = limit of detection
NE = none established
PAHs = polynuclear aromatic hydrocarbons
PCB = polychlorinated biphenyl
SO = soil
SVOC = semi-volatile organic compound
SWMU = solid waste management unit
TMW = temporary monitoring well
USEPA = United States Envionmental Protection Agency
UTL = Upper Tolerance Limit
VOC = volatile organic compound

Table 7-2 SLERA Data Summary for Soil at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Region 3 BTAG Freshwater Sediment[2] (µg/kg)	USEPA EcoSSLs[3] (µg/kg)				Background UTL Soil Boring[4] (µg/kg)	Basic Statistics					UCL 95 %		Assessment
		Plant	Soil Invert.	Mammalian	Avian		Number of Samples	Number of samples above Criteria and Background UTL	Maximum	Minimum	Mean[5]	Most Conservative EPC[6] (95% UCL)	Calculation Type	
VOCs by SW-846 Method 8260B														
Carbon disulfide	0.851	NE	NE	NE	NE	NE	14	1	0.87	0.44	0.48	0.54	Approximate Gamma UCL	EPC is less than screening criteria
PAHs by SW-846 Method 8270-SIM														
Benzo[b]fluoranthene	27.2[a]	NE	18,000	1,100	NE	7.6	14	1	34	2.5 U	5.5	17.2	Chebyshev (Mean,Sd)	EPC is less than screening criteria
Indeno[1,2,3-cd]pyrene	17	NE	18,000	1,100	NE	5.8	14	1	17	2.5 U	3.3	8.77	Chebyshev (Mean,Sd)	EPC is less than screening criteria
SVOCs by SW-846 Method 8270D														
Benzo[b]fluoranthene	27.2[a]	NE	18,000	1,100	NE	7.6	14	1	44	34 U	20	21.85	Modified-t	EPC is less than screening criteria
Pesticides by SW-846 Method 8081A														
4,4'-DDE	3.16[b]	NE	NE	21[c]	93[c]	2.7	14	1	4.7	0.48 U	0.64	2.03	Chebyshev (Mean,Sd)	EPC is less than screening criteria
Metals by SW-846 Method 6010B														
Barium	NE	NE	330,000	2,000,000	NE	53,600	14	3	42,000,000	580	3,900,000	42,434,865	Hall's Bootstrap	EPC exceeds Soil Invertebrate EcoSSL, Mamalian EcoSSL, and Background UTL
Selenium	2,000	520	4,100	630	1,200	NE	14	5	850	170	480	573.5	Students-t	EPC exceeds Plant EcoSSL

Result exceeds established screening criteria and the Background UTL.
Screening criteria is lower than the analyte laboratory LOD.

Notes:

[1] All analyte concentrations are reported in µg/kg.
[2] The Screening Criteria reference is taken from the USEPA Region 3 BTAG Freshwater Sediment Screening Benchmarks Table (USEPA 2006).
[3] USEPA Ecological Soil Screening Levels (EcoSSLs, USEPA 2010).
[4] The Background UTL is from the Basewide Background Study Report March 2004 (CH2M Hill 2004).
[5] Mean is calculated by taking 1/2 of all non-detected values and dividing by the total number of samples.
[6] The most conservative EPC is calculated using the ProUCL 4.1 software (USEPA 2010).
[a] Screening value for Benzo(b+k)fluoranthene.
[b] The Screening Benchmark for DDT/DDE/DDD (total) is 5.28 µg/L.
[c] The EcoSSL for 4,4'-DDT and metabolites.

Acronyms:

µg/kg = microgram per kilogram
AOI = Area of Interest
BTAG = Biological Technical Assistance Group
EcoSSLs = Ecological Soil Screening Levels
EPC = exposure point concentration
PAH = polynuclear aromatic hydrocarbons
NE = none established
SVOC = semi-volatile organic compound
SWMU = solid waste management unit
USEPA = United States Environmental Protection Agency
UTL = Upper Tolerance Limit
VOC = volatile organic compound
95% UCL = 95 percent upper confidence level

Table 7-3 Groundwater Ecological Screening at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Region 3 BTAG Freshwater[2] (µg/L)	Background UTL Groundwater Total[3] (µg/L)	ST14-MW35 December 2012 (µg/L)	SWMU56-TMW01-GW05	SWMU56-TMW01-GW06 (DUP)	SWMU56-TMW02-GW08	SWMU56-TMW03-GW09	SWMU56-TMW04-GW10	SWMU56-TMW05-GW04	SWMU56-TMW06-GW01	SWMU56-TMW07-GW03	SWMU56-TMW08-GW02	SWMU56-TMW09-GW07
VOCs by SW-846 Method 8260B													
1,1-Dichloroethane	47	NE	0.16 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.21 J**	0.20 U	0.20 U	0.20 U	0.20 U
1,1-Dichloroethene	25	NE	0.14 U	0.20 U	0.20 U	0.20 U	0.20 U	**0.17 J**	**0.53 J**	**0.30 J**	0.20 U J	0.20 U	0.20 U
Chloroform	1.8	NE	0.46 U	1.6 U	1.6 U	1.6 U	1.6 U	**490**	**0.38 J**	**0.81 J**	**0.33 J**	0.20 U	1.6 U
cis-1,2-Dichloroethene	NE	NE	**1.9**	**1.4**	**1.6**	**0.16 J**	0.20 U	1.0 U	**9.0**	**4.9**	0.20 U	0.20 U	**1.1**
Trichloroethene	21	NE	**12**	**17**	**19**	**3.5**	0.20 U	4.2 U	**45**	**29**	**0.31 J**	0.20 U	**13**
Trichlorofluoromethane	NE	NE	0.29 U	0.80 U	0.80 U	0.80 U	0.80 U	**0.93 J**	0.80 U	0.80 U	0.80 U	0.80 U	0.80 U
PAHs by SW-846 Method 8270-SIM													
Anthracene	0.012	NE	NA	0.020 U	0.020 U	0.021 U	0.022 U	0.021 U	**0.029 J**	0.020 U	0.022 U	0.020 U	0.022 U
Benzo[b]fluoranthene	NE	NE	NA	0.10 UJ	0.099 UJ	0.11 U	0.11 UJ	0.011 U	**0.17 J**	0.10 U	0.10 U	0.10 U	0.11 U
Benzo[g,h,i]perylene	NE	NE	NA	0.010 U	0.099 UJ	0.11 U	0.011 U	0.011 U	**0.15 J**	0.010 U	0.011 U	0.010 U	0.11 U
Benzo[k]fluoranthene	NE	NE	NA	0.010 U	0.0099 U	0.011 U	0.011 U	0.011 U	**0.17 J**	0.010 U	0.011 U	0.010 U	0.011 U
Dibenz(a,h)anthracene	NE	NE	NA	0.010 U	0.0099 U	0.011 U	0.011 U	0.011 U	**0.16 J**	0.010 U	0.011 U	0.010 U	0.011 U
Fluoranthene	0.04	NE	NA	0.010 U	0.0099 U	0.011 U	**0.092 J**	0.11 U	0.14 UJ	0.010 U	0.011 U	0.010 U	0.011 U
Fluorene	3	NE	NA	0.020 U	0.020 U	0.021 U	**0.14 J**	**0.067 J**	0.019 U	0.020 U	0.022 U	0.020 U	0.022 U
Indeno[1,2,3-cd]pyrene	NE	NE	NA	0.020 U	0.020 U	0.021 U	0.022 U	0.021 U	**0.17 J**	0.020 U	0.022 U	0.020 U	0.022 U
Naphthalene	1.1	NE	NA	**0.0072 J**	**0.0086 J**	**0.0079 J**	**0.039 J**	**0.13**	**0.0075 J**	**0.021 J**	**0.0079 J**	**0.016 J**	**0.0080 J**
Phenanthrene	0.4	NE	NA	0.012 U	0.012 U	0.013 U	**0.23 J**	**0.11**	0.095 UJ	0.10 U	0.013 U	0.012 U	0.013 U
Pyrene	0.025	NE	NA	0.010 U	0.0099 U	0.011 U	0.011 U	0.011 U	0.10 UJ	0.010 U	0.011 U	0.010 U	0.011 U
SVOCs by SW-846 Method 8270D													
1,2-Dichlorobenzene	0.7	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
3,3'-Dichlorobenzidine	4.5	NE	NA	9.6 U	11 U	11 U	11 U	11 U	9.8 U	9.8 U	11 U	11 U	9.6 U
Anthracene	0.012	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Benzo[a]anthracene	0.018	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Benzo[a]pyrene	0.015	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Diethyl phthalate	210	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	**0.53 J**	1.1 U	1.1 U	0.96 U
Fluoranthene	0.04	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Hexachlorobenzene	0.0003	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Hexachlorobutadiene	1.3	NE	NA	9.6 U	11 U	11 U	11 U	11 U	9.8 U	9.8 U	11 U	11 U	9.6 U
Pentachlorophenol	0.5	NE	NA	38 U	45 U	43 U	44 U	44 U	39 U	39 U	44 U	43 U	38 U
Phenanthrene	0.4	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
Phenol	4	NE	NA	4.8 U	5.7 U	5.3 U	5.5 U	5.5 U	4.9 U	4.9 U	5.5 U	5.4 U	4.8 U
Pyrene	0.025	NE	NA	0.96 U	1.1 U	1.1 U	1.1 U	1.1 U	0.98 U	0.98 U	1.1 U	1.1 U	0.96 U
GRO/DRO by SW-846 Method 8015C													
Diesel Range Organics	NE	NE	NA	98 U	99 U	110 U	**76 J**	110 U	95 U	100 U	110 U	95 U	100 U
Gasoline Range Organics	NE	NE	NA	25 UJ	25 UJ	25 UJ	20 U	**83**	25 UJ	25 UJ	25 U	20 U	25 UJ
Pesticides by SW-846 Method 8081A													
Pesticides below LOD													

Table 7-3 Groundwater Ecological Screening at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Region 3 BTAG Freshwater[2] (µg/L)	Background UTL Groundwater Total[3] (µg/L)	ST14-MW35 December 2012 (µg/L)	SWMU56-TMW01-GW05	SWMU56-TMW01-GW06 (DUP)	SWMU56-TMW02-GW08	SWMU56-TMW03-GW09	SWMU56-TMW04-GW10	SWMU56-TMW05-GW04	SWMU56-TMW06-GW01	SWMU56-TMW07-GW03	SWMU56-TMW08-GW02	SWMU56-TMW09-GW07
PCBs by SW-846 Method 8082A													
PCB – 1016	0.000074[a]	NE	NA	0.33 U	0.28 U	0.32 U	0.32 U	0.33 U	0.30 U	0.31 U	0.32 U	0.31 U	0.31 U
PCB – 1221	0.000074[a]	NE	NA	0.33 U	0.28 U	0.32 U	0.32 U	0.33 U	0.30 U	0.31 U	0.32 U	0.31 U	0.31 U
PCB – 1232	0.000074[a]	NE	NA	0.44 U	0.38 U	0.43 U	0.43 U	0.45 U	0.40 U	0.41 U	0.42 U	0.42 U	0.42 U
PCB – 1242	0.000074[a]	NE	NA	0.33 U	0.28 U	0.32 U	0.32 U	0.33 U	0.30 U	0.31 U	0.32 U	0.31 U	0.31 U
PCB – 1248	0.000074[a]	NE	NA	0.22 U	0.19 U	0.21 U	0.22 U	0.22 U	0.20 U	0.21 U	0.21 U	0.21 U	0.21 U
PCB – 1254	0.000074[a]	NE	NA	0.33 U	0.28 U	0.32 U	0.32 U	0.33 U	0.30 U	0.31 U	0.32 U	0.31 U	0.31 U
PCB – 1260	0.000074[a]	NE	NA	0.33 U	0.28 U	0.32 U	0.32 U	0.33 U	0.30 U	0.31 U	0.32 U	0.31 U	0.31 U
Herbicides by SW-846 Method 8151A													
Dinoseb	0.05	NE	NA	0.30 U	0.30 U	0.31 U	0.30 U	0.29 U	0.27 U	0.29 U	0.30 UJ	0.27 U	0.31 U
MCPP	NE	NE	NA	100 U	100 U	100 U	100 U	96 U	**33 J**	96 U	**35 J**	91 U	100 U
Metals by SW-846 6010B and 7470A													
Aluminum	87	26,900	**220 J**	**160 J**	**73 J**	**21,000**	**220** J	**57** J	**1,700**	**480**	**180 J**	**660**	**110 J**
Arsenic	5	NE	0.33 U	1.0 U	1.0 U	**21**	1.0 U	1.0 U	**0.68 J**	1.0 U	1.0 U	**0.41 J**	1.0 U
Barium	4	76.6	**160**	**24**	**23**	**75**	**110**	**35**	**210**	**66**	**40**	**19**	**21**
Beryllium	0.66	NE	0.47 U	**0.087 J**	**0.098 J**	**1.9**	**0.46 J**	**0.17 J**	**0.32 J**	**0.25 J**	**0.18 J**	**0.15 J**	**0.085 J**
Cadmium	0.25	2.6	0.45 U	**0.25 J**	**0.26 J**	**2.4**	**1.0**	**0.47 J**	**0.39 J**	**0.48 J**	**0.43 J**	**0.15 J**	**0.14 J**
Calcium	116,000	167,000	**58,000**	**2,400**	**2300**	**4,400**	**11,000**	**3,700**	**7,700**	**6,300**	**3,700**	**1,800**	**1,600**
Chromium (Total)	85	34.3	**2.2 J**	**2.7 J**	**1.7 J**	**170**	**3.4 J**	**1.0 J**	**3.1 J**	**2.0 J**	**2.6 J**	**2.8 J**	**1.6 J**
Cobalt	23	22.2	1.2 U	**1.3**	**1.3**	**95**	**3.6**	**1.5**	**13**	**3.7**	**2.7**	**1.0**	**1.2**
Copper	9	29.1	1.4 U	2.0 U	2.0 U	**310**	2.0 U	2.0 U	3.8 U	2.2 U	**5.2**	2.0 U	**44**
Iron	300	8520	22 U	**1,200 J**	**890 J**	**110,000**	**2,400**	**740**	**3,500**	**2,900**	**1,300**	**3,100**	**1,100**
Lead	2.5	9.47	2.6 U	**0.22 J**	0.50 U	**24**	**0.29 J**	**0.69 J**	**0.86 J**	**0.75 J**	**0.34 J**	**0.23 J**	**2.0 J**
Magnesium	82,000	16,000	**130 J**	**1,100**	**1100**	**3,300**	**4,200**	**1,400**	**9,100**	**2,900**	**1,400**	**750**	**990**
Manganese	120	159	**0.53 J**	**28**	**28**	**280**	**100**	**30**	**390**	**140**	**45**	**19**	**26**
Mercury	0.026	NE	0.027 U	0.080 U	0.080 U	**0.15 J**	**0.15 J**	**0.39**	**0.065 J**	**0.25**	0.080 U	0.080 U	0.080 U
Molybdenum	73	1.58	3.1 U	**0.48 J**	**0.25 J**	**45**	**0.41 J**	0.40 U	**0.31 J**	**0.33 J**	**0.24 J**	**0.46 J**	**0.19 J**
Nickel	52	20.2	1.3 U	**6.8**	**6.4**	**150**	**15**	**4.0**	**14**	**13**	**26**	**3.8**	**4.1**
Potassium	53,000	18,300	**7,900**	**870 J**	**870 J**	**4,100**	**1,500 J**	**1,200 J**	**1,900 J**	**1,400 J**	**1,500 J**	**1,200 J**	**750 J**
Selenium	1	2.6	4.9 U	2.0 U	2.0 U	**3.0 J**	2.0 U	2.0 U	**0.99 J**	2.0 U	2.0 U	2.0 U	2.0 U
Silver	3.2	NE	0.93 U	0.10 U	0.10 U	**0.36 J**	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U
Sodium	680,000	110,000	**36,000**	**6,000**	**5800**	**3,700 J**	**47,000**	**9,400**	**57,000**	**25,000**	**7,100**	**3,800 J**	**5,500**
Thallium	0.8	NE	4.9 U	0.10 U	0.10 U	**1.5**	**0.063 J**	**0.081 J**	**0.091 J**	**0.080 J**	0.10 U	0.10 U	0.10 U
Vanadium	20	15.9	**2.9 J**	1.0 U	1.0 U	**59**	1.0 U	1.0 U	**1.5 J**	**0.77 J**	1.0 U	**1.2 J**	1.0 U
Zinc	120	415	**7.2 J**	20 U	20 U	**190**	**19 J**	**9.0 J**	**13 J**	**25**	**16 J**	20 U	**28**

Bold values indicate the analyte was detected.

Result exceeds established screening criteria and the Background UTL, if available.

Result exceeds established screening criteria but is less than Background UTL.

Screening criteria is lower than the LOD.

Notes:

[1] All analyte concentrations are reported in µg/L.

[2] The Screening Criteria Reference is taken from the US EPA Region 3 Freshwater Screening Benchmarks Table dated July 2006.

Table 7-3 Groundwater Ecological Screening at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Region 3 BTAG Freshwater[2] (µg/L)	Background UTL Groundwater Total[3] (µg/L)	ST14-MW35 December 2012 (µg/L)	SWMU56-TMW01-GW05	SWMU56-TMW01-GW06 (DUP)	SWMU56-TMW02-GW08	SWMU56-TMW03-GW09	SWMU56-TMW04-GW10	SWMU56-TMW05-GW04	SWMU56-TMW06-GW01	SWMU56-TMW07-GW03	SWMU56-TMW08-GW02	SWMU56-TMW09-GW07

[3] The Background UTL is from the Basewide Background Study Report March 2004 (CH2M Hill 2004).

[a] The Screening Benchmark for total PCBs.

Qualifiers:

J = The reported positive result is considered estimated because the result is less than the LOQ or because certain quality control criteria were not met.

U = The analyte was not detected and is reported as less than the LOD or as defined by the client.

UJ = The analyte was not detected in the sample. The LOD (or LOQ) should be considered estimated and may be inaccurate or imprecise.

Acronyms:

µg/L = microgram per liter
AOI = Area of Interest
BTAG = Biological Technical Assistance Group
DRO = diesel range organics
GRO = gasoline range organics
GW = groundwater
LOQ = limit of quantitation
LOD = limit of detection
NA = not analyzed
NE = none established
PAHs = polynuclear aromatic hydrocarbons
PCB = polychlorinated biphenyl
SVOC = semi-volatile organic compound
SWMU = solid waste management unit
TMW = temporary monitoring well
USEPA = United States Envionmental Protection Agency
UTL = Upper Tolerance Limit
VOC = volatile organic compound

Table 7-4 SLERA Data Summary for Groundwater at the Civil Engineering Storage Yard AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Region 3 BTAG Freshwater[2] (µg/L)	Background UTL Groundwater Total[3] (µg/L)	ST14-MW35 December 2012 (µg/L)	Basic Statistics					Assessment
				Number of Samples	Number of samples above Screening Criteria and Background UTL	Maximum	Minimum	Mean[4]	
VOCs by SW-846 Method 8260B									
Chloroform	1.8	NE	0.46 U	9	1	490	0.20 U	49.56	EPC exceeds screening criteria
Trichloroethene	21	NE	12	9	2	45	0.20 U	14.11	EPC exceeds screening criteria
PAHs by SW-846 Method 8270-SIM									
Anthracene	0.012	NE	NA	9	1	0.029	0.02	0.0062	EPC exceeds screening criteria
Fluoranthene	0.04	NE	NA	9	1	0.092	0.01	0.020	EPC exceeds screening criteria
Metals by SW-846 6010B and 7470A									
Arsenic	5	NE	0.33 U	9	1	21	0.68	2.6	EPC exceeds screening criteria
Barium	4	76.6	160	9	2	210	19	62	EPC exceeds screening criteria
Beryllium	0.66	NE	0.47 U	9	1	1.9	0.046	0.329	EPC exceeds screening criteria
Chromium (Total)	85	34.3	2.2	9	1	170	1.0	19	EPC exceeds screening criteria
Cobalt	23	22.2	1.2 U	9	1	95	1.0	12	EPC exceeds screening criteria
Copper	9	29.1	1.4 U	9	2	310	2	37	EPC exceeds screening criteria
Iron	300	8520	22 U	9	1	110,000	740	12,700	EPC exceeds screening criteria
Lead	2.5	9.47	2.6 U	9	1	24	0.22	3.0	EPC exceeds screening criteria
Manganese	120	159	0.53	9	2	390	19	109	EPC exceeds screening criteria
Mercury	0.026	NE	0.027 U	9	5	0.39	0.065		EPC exceeds screening criteria
Nickel	52	20.2	1.3 U	9	1	150	3.8	24	EPC exceeds screening criteria
Selenium	1	2.6	4.9 U	9	1	3.0	0.99	1.2	EPC exceeds screening criteria
Thallium	0.8	NE	4.9 U	9	1	1.5	0.063		EPC exceeds screening criteria
Vanadium	20	15.9	2.9	9	1	59	0.77	6.5	EPC exceeds screening criteria

Result exceeds established screening criteria and the Background UTL.

Notes:

[1] All analyte concentrations are reported in µg/L.

[2] The Screening Criteria Reference is taken from the US EPA Region 3 Freshwater Sediment Screening Benchmarks Table dated August 2006.

[3] The Background UTL is from the Basewide Background Study Report March 2004 (CH2M Hill 2004).

[4] Mean is calculated by taking 1/2 of all non-detected values and dividing by the total number of samples.

Qualifiers:

J = The reported positive result is considered estimated because the result is less than the LOQ or because certain quality control criteria were not met.

U = The analyte was not detected and is reported as less than the LOD or as defined by the client.

UJ = The analyte was not detected in the sample. The LOD (or LOQ) should be considered estimated and may be inaccurate or imprecise.

Acronyms:

µg/L = microgram per liter
AOI = Area of Interest
BTAG = Biological Technical Assistance Group
LOQ = limit of quantitation
LOD = limit of detection
NA = not applicable
NE = not established
PAHs = polynuclear aromatic hydrocarbons
SWMU = solid waste management unit
USEPA = United States Envionmental Protection Agency
UTL = Upper Tolerance Limit

Table 7-5 Soil Ecological Screening at the Building 3459 AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Region 3 BTAG Freshwater Sediment[2] (µg/kg)	USEPA EcoSSLs[3] (µg/kg)				Background UTL Surface Soil[4] (µg/kg)	SWMU56-SB01 (1-2ft)	SWMU56-SB02 (1-2ft)	SWMU56-SB03 (1-2ft)	SWMU56-SB04 (1-2ft)
		Plant	Soil Invert.	Mammalian	Avian					
Pesticides by SW-846 Method 8081A										
delta-BHC	6,400	NE	NE	NE	NE	NE	**2.5 J**	**0.51 J**	0.73 U	15 U
alpha-Chlordane	3.24	NE	NE	NE	NE	15.2	0.54 U	**25**	**16**	**300**
gamma-Chlordane	3.24	NE	NE	NE	NE	6.9	0.81 U	**28**	**18**	**420**
4,4'-DDE	3.16[a]	NE	NE	21[b]	93[b]	3.2	0.54 U	**2.4 J**	0.48 U	**27 J**
4,4'-DDT	4.16[a]	NE	NE	21[b]	93[b]	7.6	0.81 U	**2.7 J**	**0.99 J**	**41 J**
Endosulfan sulfate	5.4	NE	NE	NE	NE	0.43	0.54 U	0.52 U	0.48 U	**6.7 J**
Heptachlor	68	NE	NE	NE	NE	NE	0.54 U	0.52 U	**0.47 J**	**14 J**
Heptachlor epoxide	2.47	NE	NE	NE	NE	1.4	0.81 U	**2.7 J**	**0.56 J**	15 U
Herbicides by SW-846 Method 8151A										
Herbicides below LOD										

Bold values indicate the analyte was detected.

Result exceeds established screening criteria and the Background UTL.

Notes:

[1] All analyte concentrations are reported in µg/kg.

[2] The Screening Criteria reference is taken from the USEPA Region 3 BTAG Freshwater Sediment Screening Benchmarks Table (USEPA 2006).

[3] USEPA Ecological Soil Screening Levels (EcoSSLs, USEPA 2010).

[4] The Background UTL is from the Basewide Background Study Report March 2004 (CH2M Hill 2004).

[a]The Screening Benchmark for DDT/DDE/DDD (total) is 5.28 µg/L.

[b]The EcoSSL for 4,4'-DDT and metabolites.

Qualifiers:

J = The reported positive result is considered estimated because the result is less than the LOQ or because certain quality control criteria were not met.

U = The analyte was not detected and is reported as less than the LOD or as defined by the client.

Acronyms:

µg/kg = microgram per kilogram
AOI = Area of Interest
BTAG = Biological Technical Assistance Group
EcoSSLs = Ecological Soil Screening Levels
LOQ = limit of quantitation
LOD = limit of detection
NE = none established
SB = soil
SWMU = solid waste management unit
USEPA = United States Envionmental Protection Agency
UTL = Upper Tolerance Limit

Table 7-6 SLERA Data Summary for Soil at the Building 3459 AOI
Phase I RI Report for SWMU 56
Performance-Based Restoration
Joint Base Andrews Naval Air Facility Washington
Camp Springs, Maryland

Analyte[1]	USEPA Region 3 BTAG Freshwater Sediment[2] (µg/kg)	USEPA EcoSSLs[3] (µg/kg)				Background UTL Surface Soil[4] (µg/kg)	Basic Statistics					Assessment
		Plant	Soil Invert.	Mammalian	Avian		Number of Samples	Number of samples above Screening Criteria and Background UTL	Maximum	Minimum	Mean[5]	
Pesticides by SW-846 Method 8081A												
alpha-Chlordane	3.24	NE	NE	NE	NE	15.2	4	3	300	0.54	85	EPC exceeds screening criteria
gamma-Chlordane	3.24	NE	NE	NE	NE	6.9	4	3	420	0.81	117	EPC exceeds screening criteria
4,4'-DDE	3.16[a]	NE	NE	21[b]	93[b]	3.2	4	1	27	0.48	7.5	EPC exceeds screening criteria
4,4'-DDT	4.16[a]	NE	NE	21[b]	93[b]	7.6	4	1	41	0.81	16	EPC exceeds screening criteria
Endosulfan sulfate	5.4	NE	NE	NE	NE	0.43	4	1	6.7	0.48	1.9	EPC exceeds screening criteria
Heptachlor epoxide	2.47	NE	NE	NE	NE	1.4	4	1	2.7	0.56	4.7	EPC exceeds screening criteria

Result exceeds established screening criteria and the Background UTL.

Notes:

[1] All analyte concentrations are reported in µg/kg.

[2] The Screening Criteria reference is taken from the USEPA Region 3 BTAG Freshwater Sediment Screening Benchmarks Table (USEPA 2006).

[3] USEPA Ecological Soil Screening Levels (EcoSSLs, USEPA 2010).

[4] The Background UTL is from the Basewide Background Study Report March 2004 (CH2M Hill 2004).

[5] Mean is calculated by taking 1/2 of all non-detected values and dividing by the total number of samples.

[a] The Screening Benchmark for DDT/DDE/DDD (total) is 5.28 µg/L.

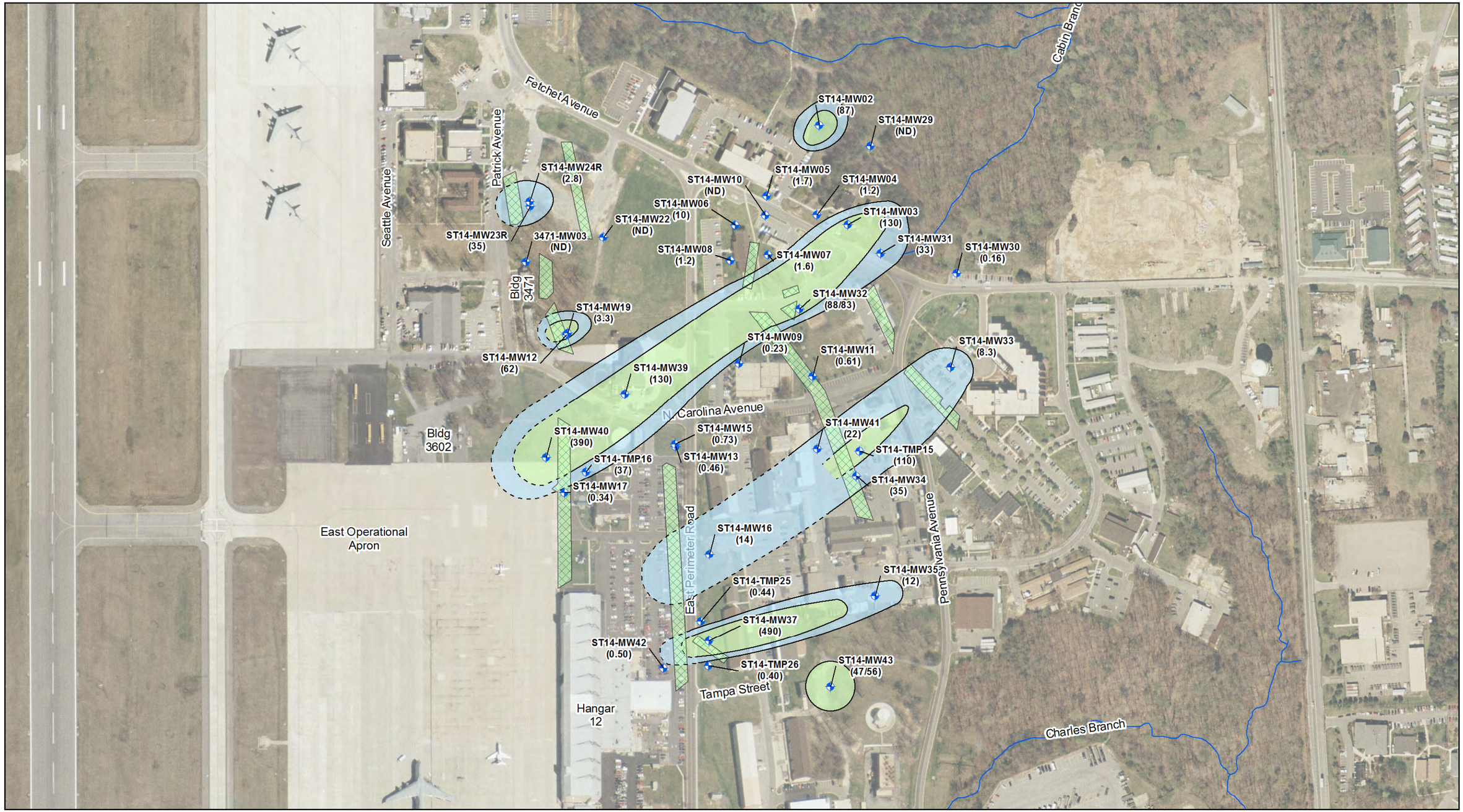
[b] The EcoSSL for 4,4'-DDT and metabolites.

Acronyms:

µg/kg = microgram per kilogram
AOI = Area of Interest
BTAG = Biological Technical Assistance Group
EcoSSLs = Ecological Soil Screening Levels
EPC = exposure point concentration
PAH = polynuclear aromatic hydrocarbons
NE = none established
SVOC = semi-volatile organic compound
SWMU = solid waste management unit
USEPA = United States Environmental Protection Agency
UTL = Upper Tolerance Limit
VOC = volatile organic compound
95% UCL = 95 percent upper confidence level

Appendix A

ST-14 TCE Plume Map



Note:
TCE = trichloroethene
ND = Not Detected
Wells with more than one result include a sample and a duplicate.
Results are in ug/L (microgram per liter).

N
0 150 300
Feet

Legend

- Monitoring Well Location
- *(490)* TCE Concentration
- TCE Concentration 5 to 50 ug/L
- TCE Concentation 50 to 500 ug/L
- Sodium Lactate Injection Area

Figure ST14-5
Interpreted TCE Plume, November 2012

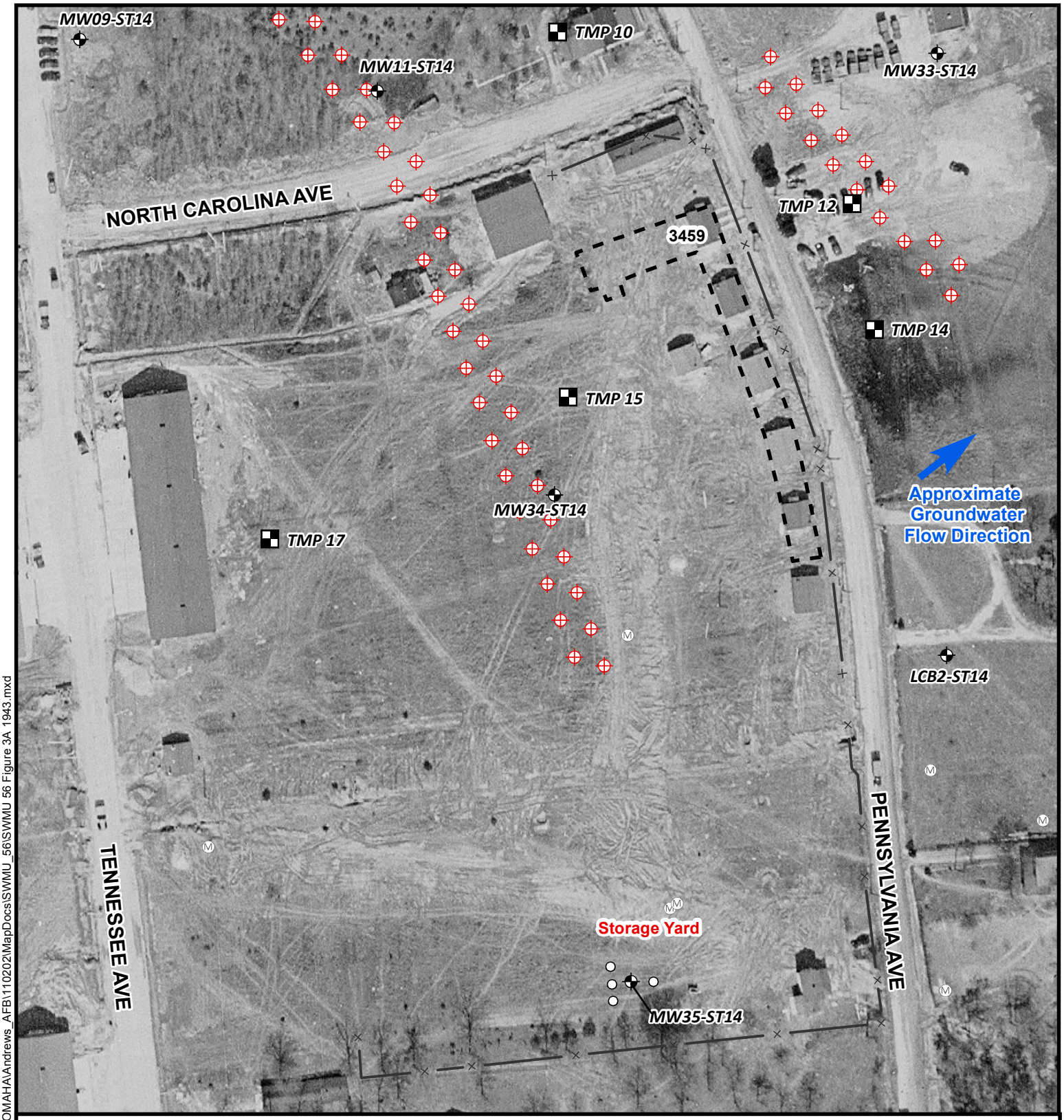
2012 Site ST-14 RA-O Report
Joint Base Andrews, Maryland

Prepared/Date: MJW 03/15/13 | Checked/Date: SWR 03/15/13

Document: P:\Projects\Andrews AFB Environmental\GIS\MapDocuments\ST-14\ST14_Contamination_Plumes_2012_11x17LS.mxd PDF: P:\Projects\Andrews PBR-910111002\ST-14\4.0_Deliverables\4.1_Reports\2012 RA-O rpt\Figures\Figure ST14-8 Benzene Plume.pdf 3/15/2013 12:43 PM michael.washburn

Appendix B

Historical Aerial Images



N
W E
S

0 50 100 Feet
0 15 30 Meters

MARYLAND

Joint Base Andrews

- Previous Sample Location (URS 2009)
- Monitoring Well Location
- Injection Well for ST-14
- Temporary Monitoring Point for ST-14
- Existing Fence
- Former Building 3459 (Demolished 1994)

Figure 3A

SWMU 56 1943 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

Drawn By: M.B. Date Drawn/Revised: 6/14/2012 Project No. J110202

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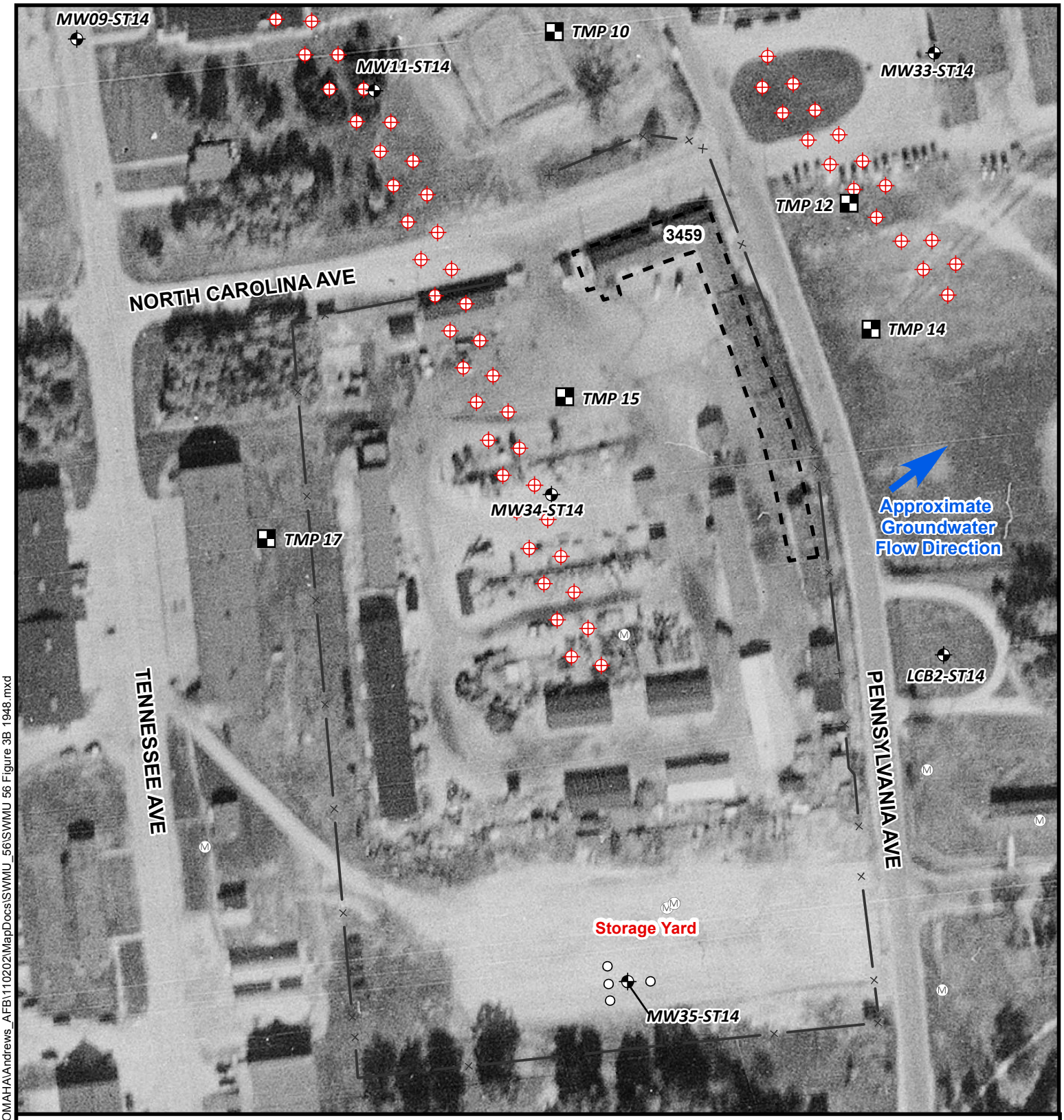

N
W E
S

0 50 100 Feet
0 15 30 Meters

MARYLAND

Joint Base Andrews

Previous Sample Location (URS 2009)
Monitoring Well Location
Injection Well for ST-14
Temporary Monitoring Point for ST-14
Existing Fence
Former Building 3459 (Demolished 1994)

Figure 3B

SWMU 56 1948 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

Drawn By: M.B. Date Drawn/Revised: 6/15/2012 Project No. J110202

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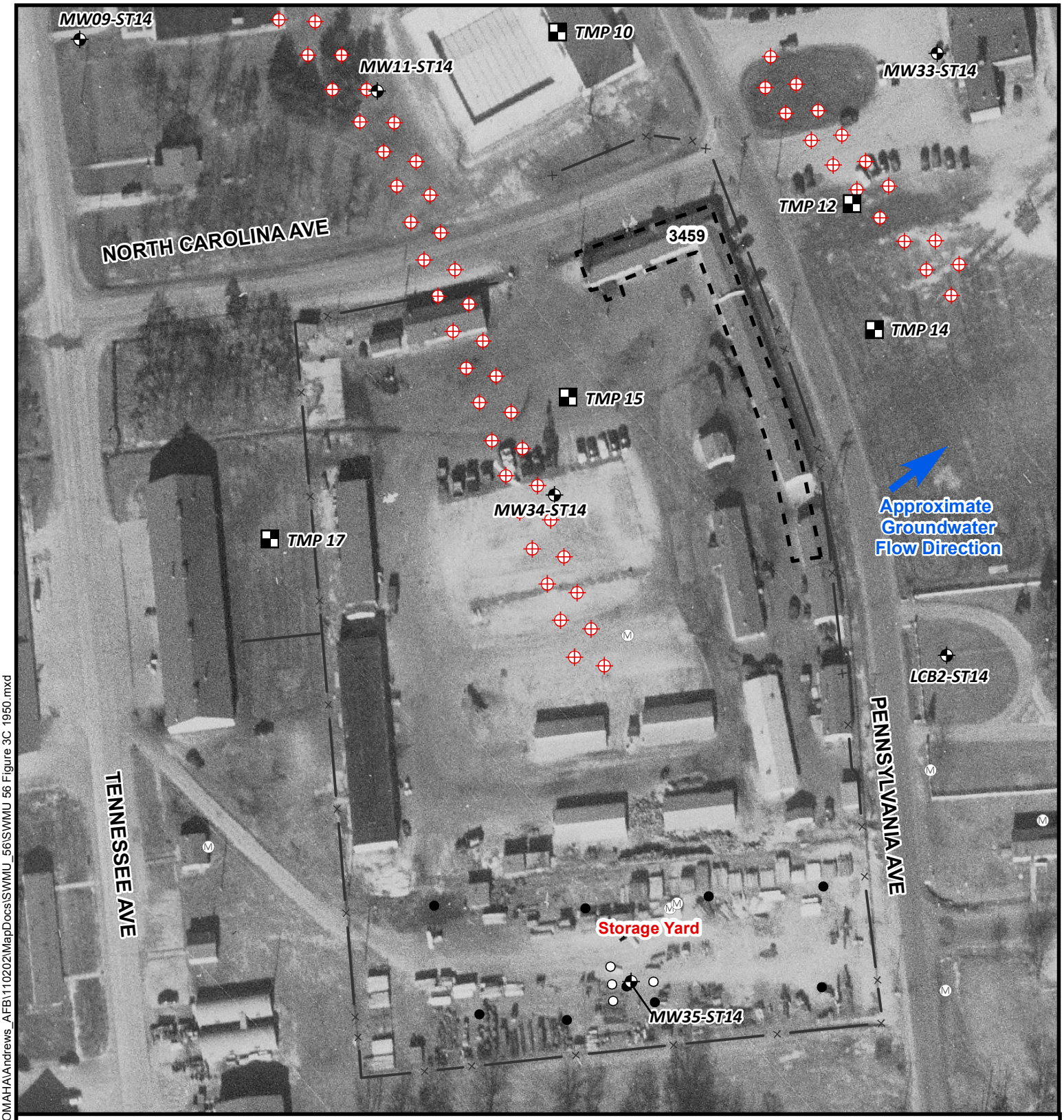

N
W E
S

0 50 100 Feet
0 15 30 Meters

MARYLAND

Joint Base Andrews

Previous Sample Location (URS 2009)
Monitoring Well Location
Injection Well for ST-14
Temporary Monitoring Point for ST-14
Existing Fence
Former Building 3459 (Demolished 1994)

Figure 3C

SWMU 56 1950 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

Drawn By: M.B. Date Drawn/Revised: 6/15/2012 Project No. J110202

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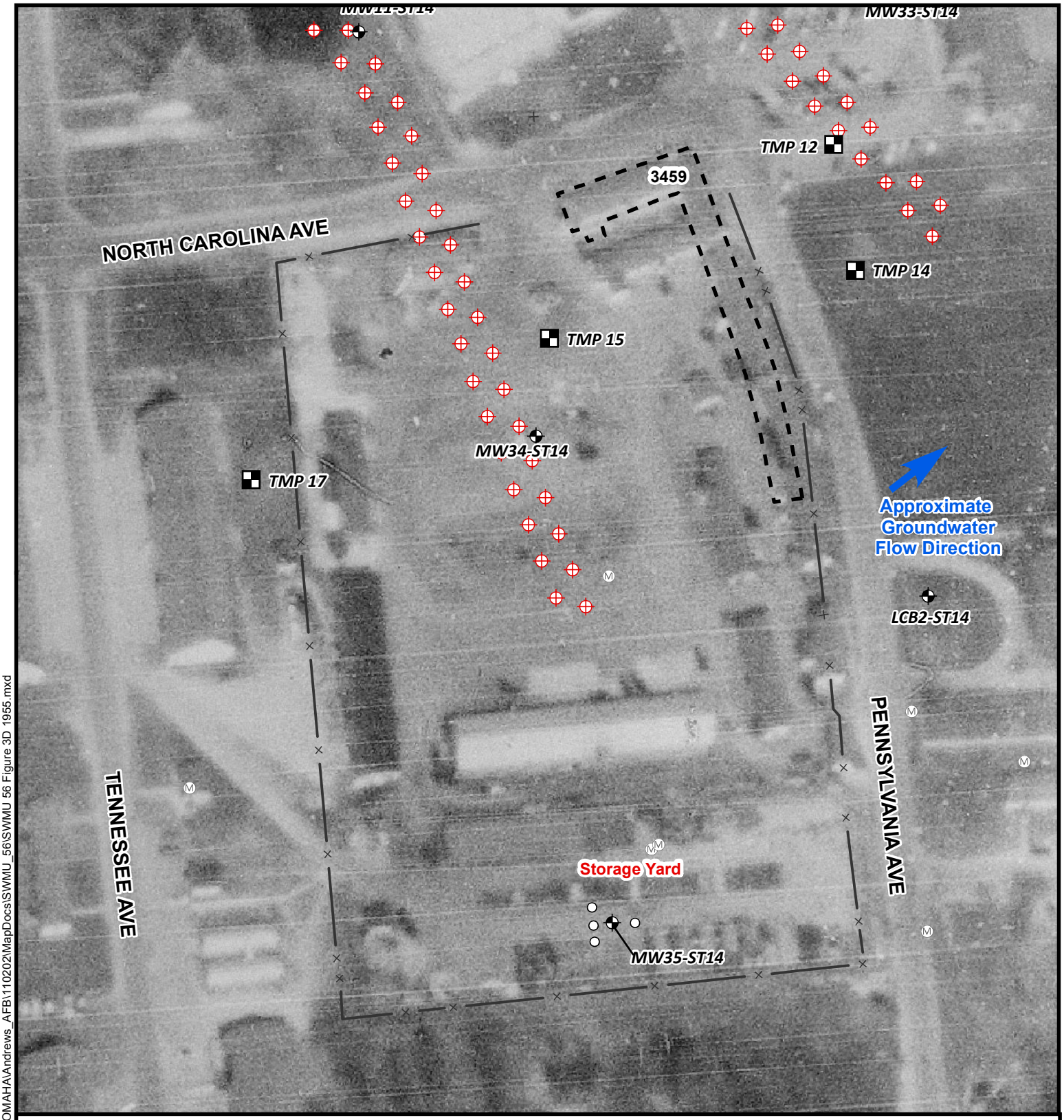

N
W E
S

0 50 100 Feet
0 15 30 Meters

MARYLAND

Joint Base Andrews

Previous Sample Location (URS 2009)
Monitoring Well Location
Injection Well for ST-14
Temporary Monitoring Point for ST-14
Existing Fence
Former Building 3459 (Demolished 1994)

Figure 3D

SWMU 56 1955 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

Drawn By: M.B. Date Drawn/Revised: 6/15/2012 Project No. J110202

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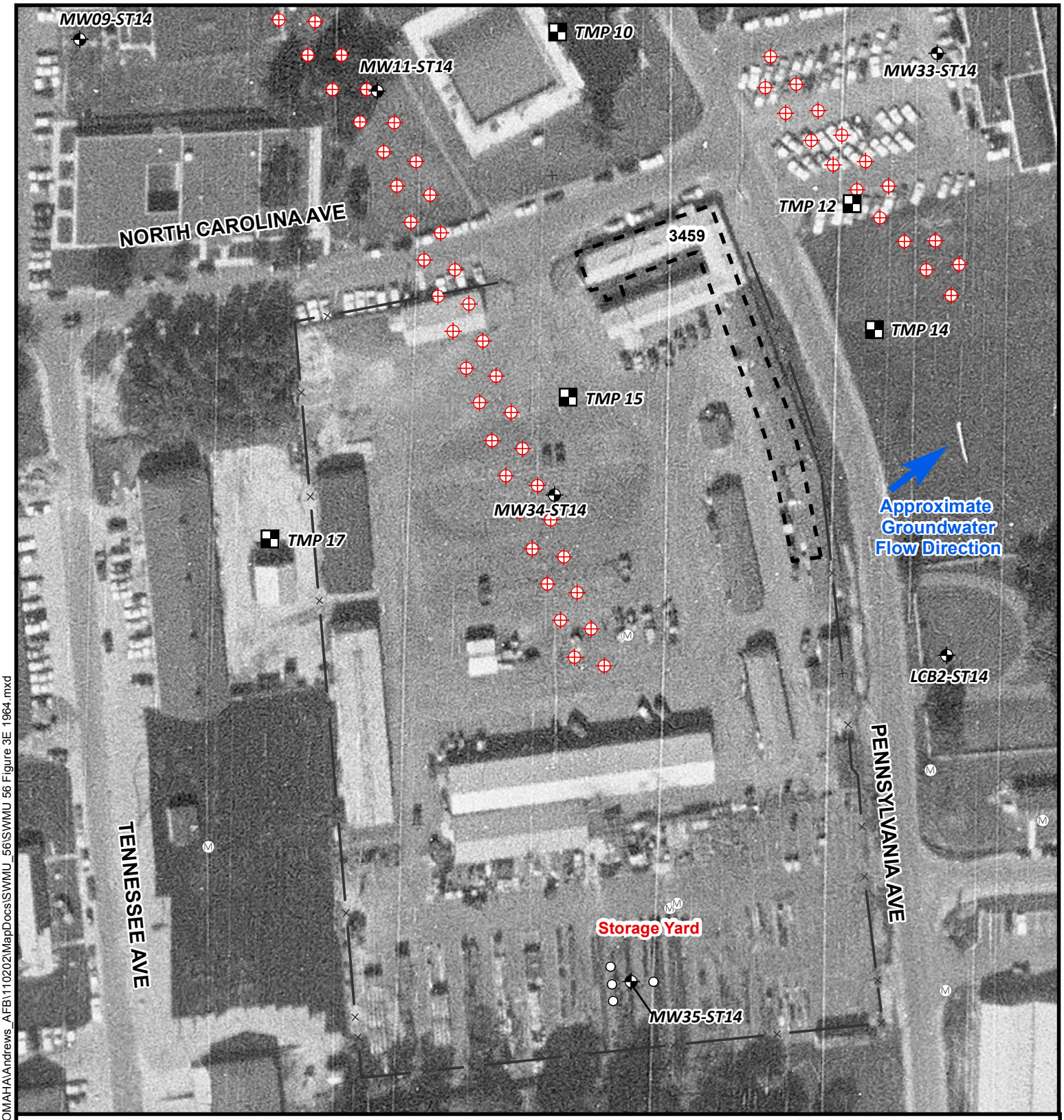

N
W E
S

0 50 100 Feet
0 15 30 Meters

MARYLAND

Joint Base Andrews

Previous Sample Location (URS 2009)
Monitoring Well Location
Injection Well for ST-14
Temporary Monitoring Point for ST-14
Existing Fence
Former Building 3459 (Demolished 1994)

Figure 3E

SWMU 56 1964 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

Drawn By: M.B. Date Drawn/Revised: 6/15/2012 Project No. J110202

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N
W E
S

0 50 100 Feet
0 15 30 Meters

MARYLAND

Joint Base Andrews

Previous Sample Location (URS 2009)
Monitoring Well Location
Injection Well for ST-14
Temporary Monitoring Point for ST-14
Existing Fence
Former Building 3459 (Demolished 1994)

Figure 3F

SWMU 56 1968 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

Drawn By: M.B. Date Drawn/Revised: 6/15/2012 Project No. J110202

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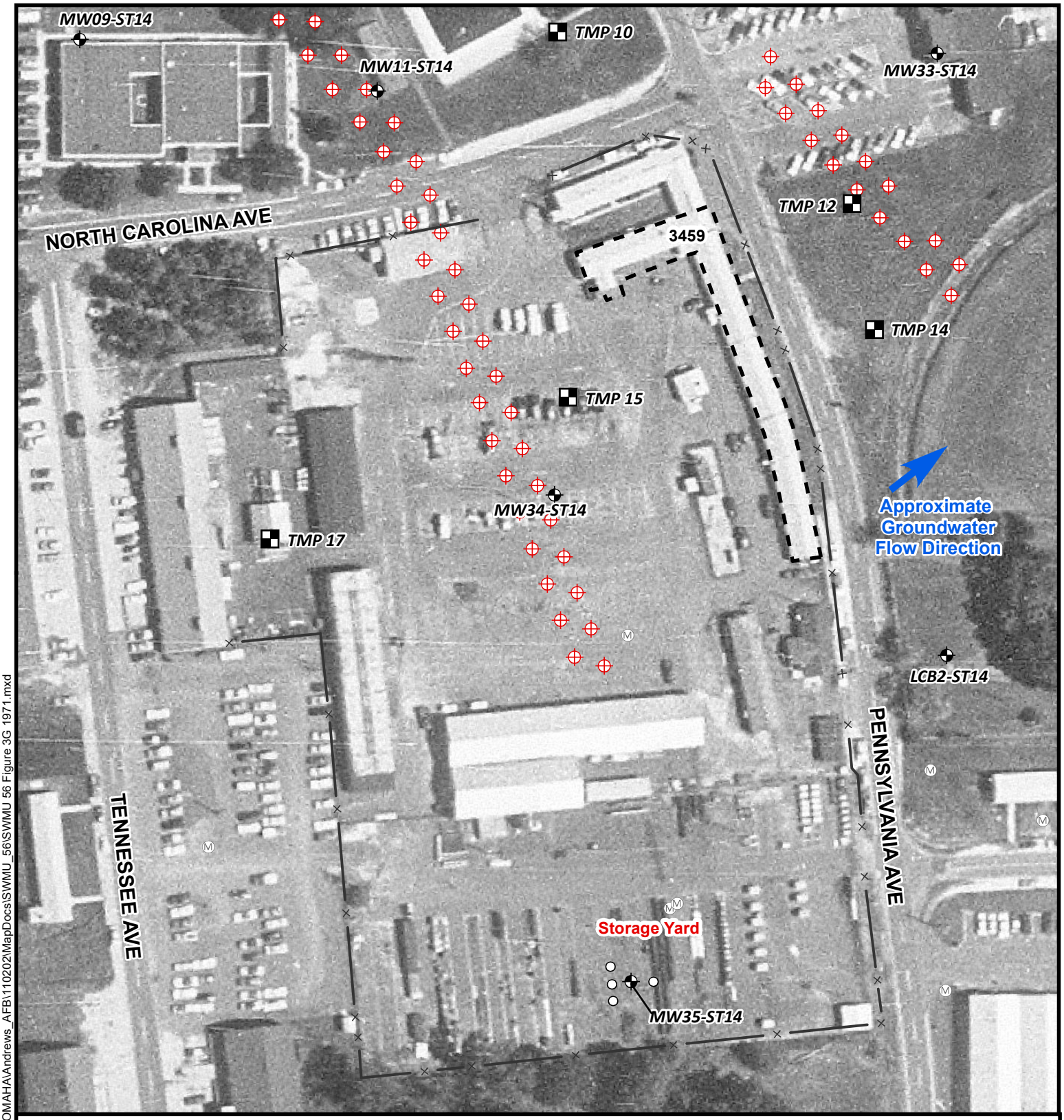

N
W E
S

0 50 100 Feet
0 15 30 Meters

MARYLAND

Joint Base Andrews

Previous Sample Location (URS 2009)
Monitoring Well Location
Injection Well for ST-14
Temporary Monitoring Point for ST-14
Existing Fence
Former Building 3459 (Demolished 1994)

Figure 3G

SWMU 56 1971 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

Drawn By: M.B. Date Drawn/Revised: 6/15/2012 Project No. J110202

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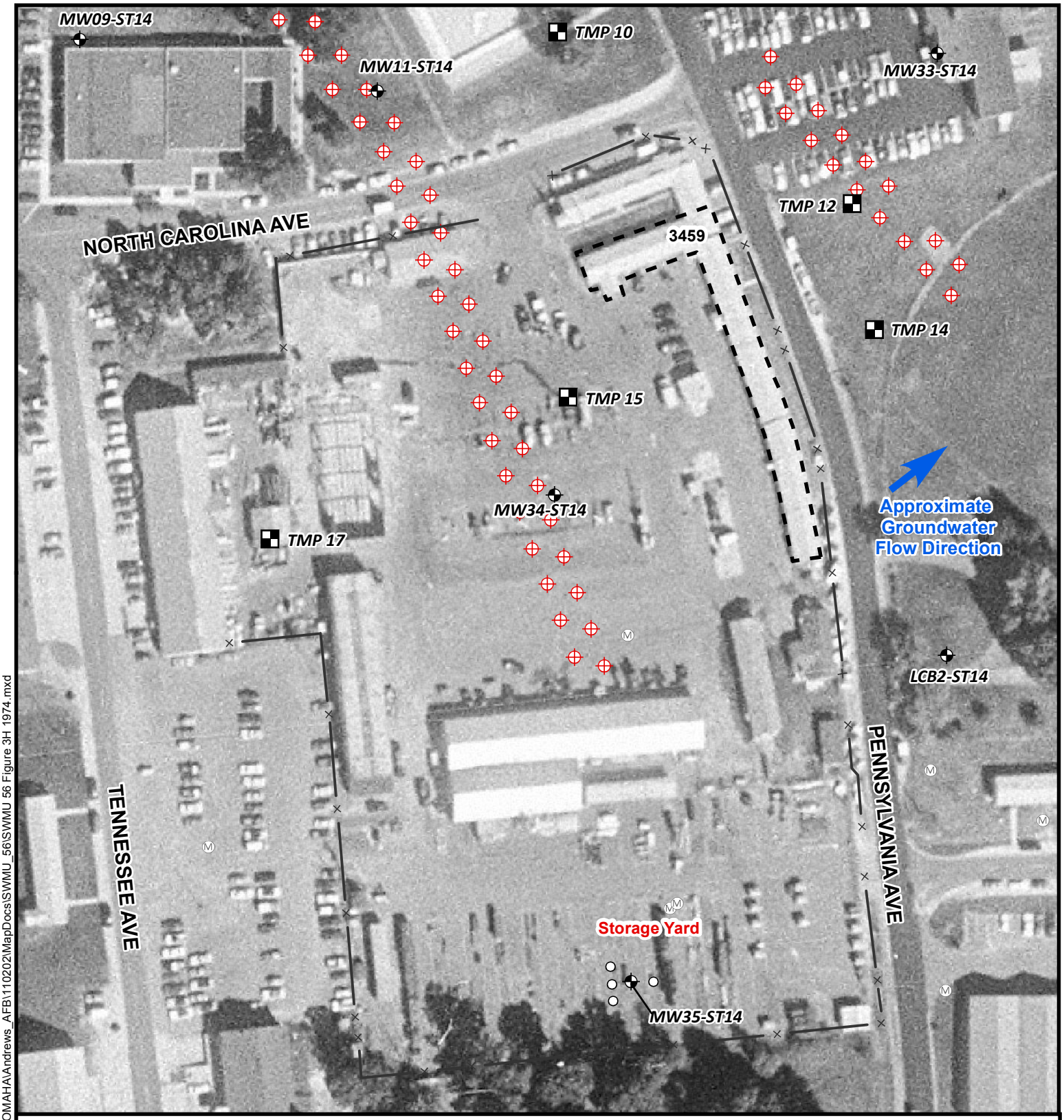

0 50 100 Feet
0 15 30 Meters

MARYLAND
Joint Base Andrews

Previous Sample Location (URS 2009)
Monitoring Well Location
Injection Well for ST-14
Temporary Monitoring Point for ST-14
Existing Fence
Former Building 3459 (Demolished 1994)

Figure 3H

SWMU 56 1974 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

Drawn By: M.B. Date Drawn/Revised: 6/15/2012 Project No. J110202

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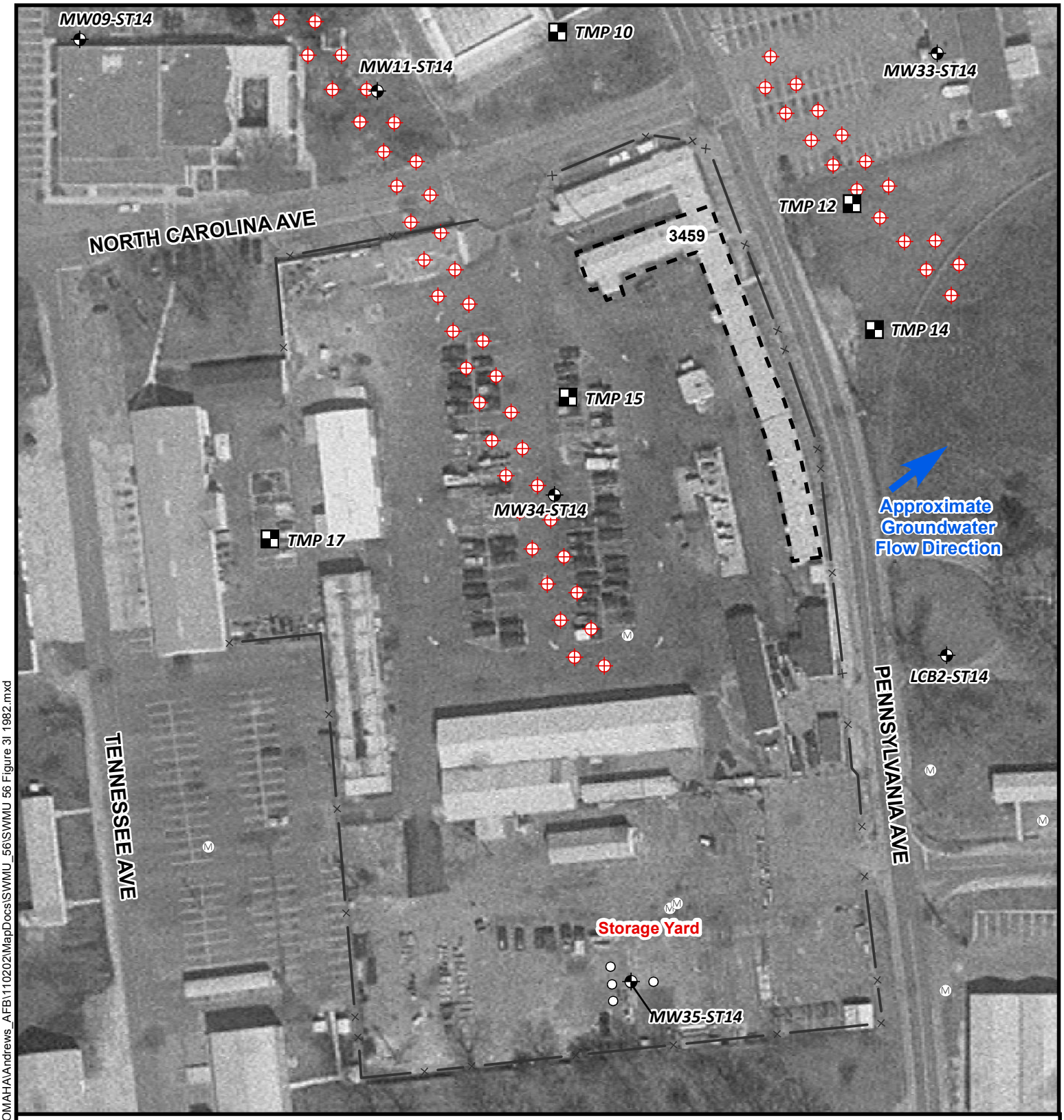

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0 50 100 Feet
0 15 30 Meters

MARYLAND

Joint Base Andrews

Previous Sample Location (URS 2009)
Monitoring Well Location
Injection Well for ST-14
Temporary Monitoring Point for ST-14
Existing Fence
Former Building 3459 (Demolished 1994)

Figure 3I

SWMU 56 1982 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

Bay West
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Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

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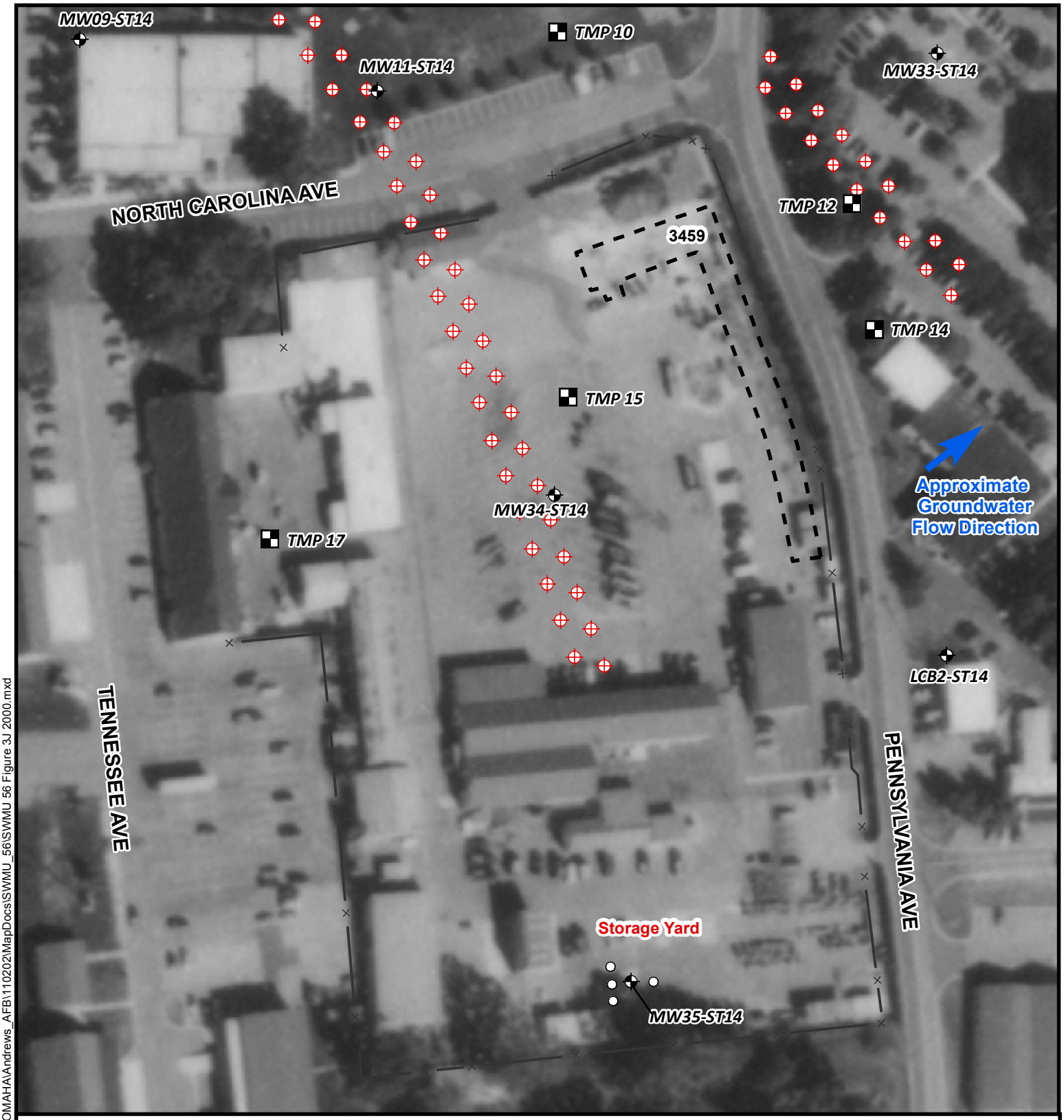

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0 50 100 Feet
0 15 30 Meters

MARYLAND

Joint Base Andrews

- Previous Sample Location (URS 2009)
- Monitoring Well Location
- Injection Well for ST-14
- Temporary Monitoring Point for ST-14
- Existing Fence
- Former Building 3459 (Demolished 1994)

Figure 3J

SWMU 56 2000 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

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Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

Drawn By: M.B. Date Drawn/Revised: 6/15/2012 Project No. J110202

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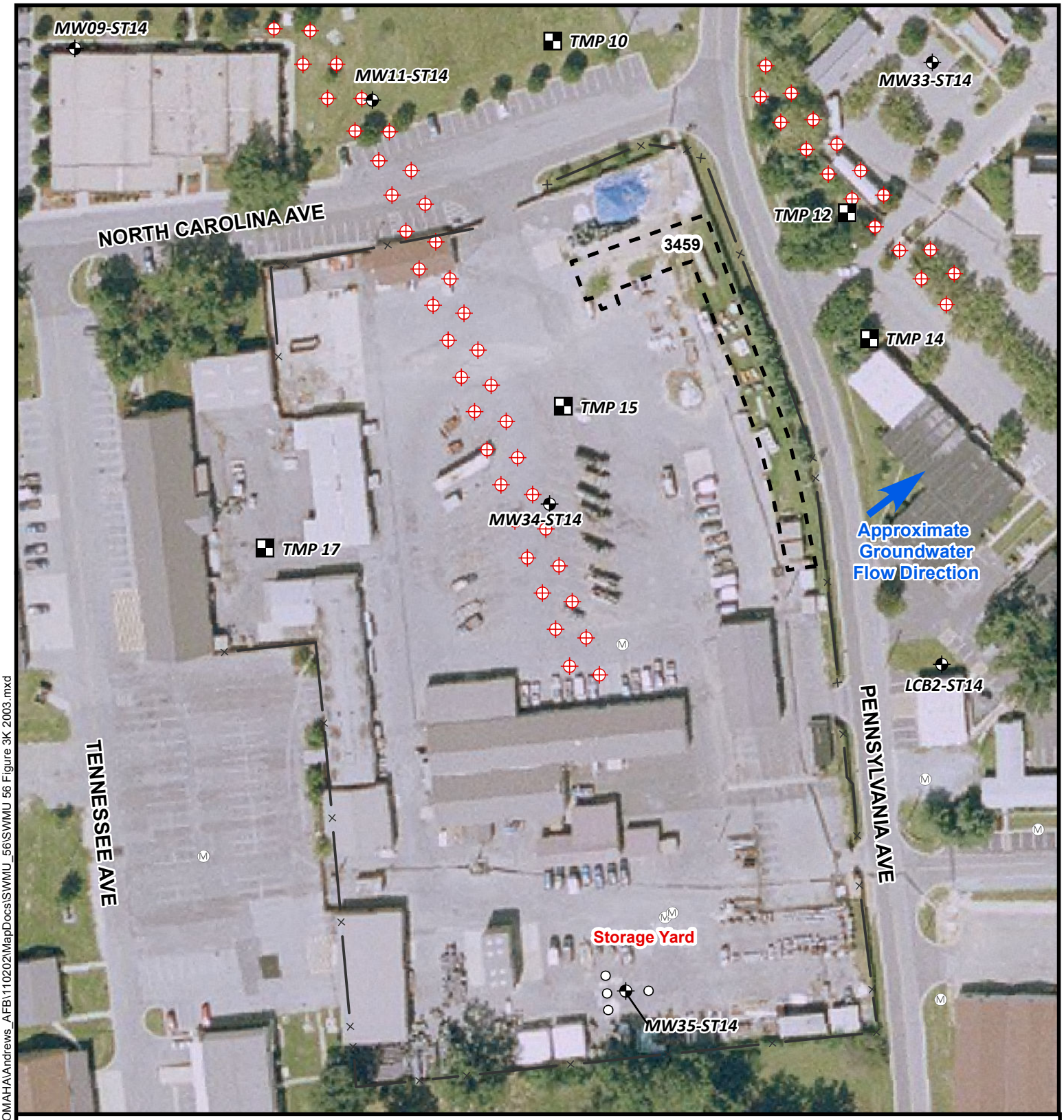

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0 50 100 Feet
0 15 30 Meters

MARYLAND

Joint Base Andrews

- Previous Sample Location (URS 2009)
- Monitoring Well Location
- Injection Well for ST-14
- Temporary Monitoring Point for ST-14
- Existing Fence
- Former Building 3459 (Demolished 1994)

Figure 3K

SWMU 56 2003 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

Bay West
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Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

Drawn By: M.B. Date Drawn/Revised: 6/15/2012 Project No. J110202

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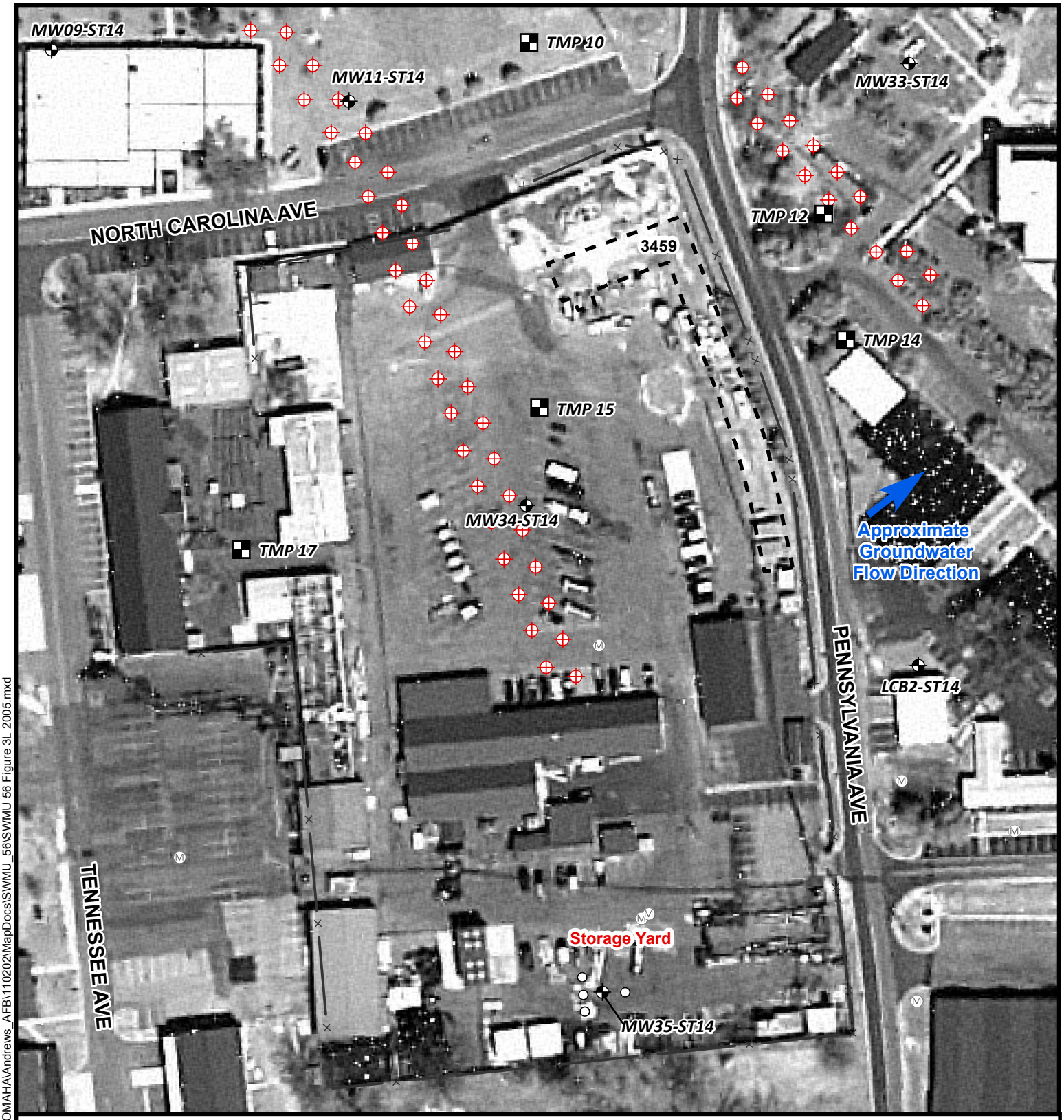

N
W E
S

0 50 100 Feet
0 15 30 Meters

MARYLAND

Joint Base Andrews

Previous Sample Location (URS 2009)
Monitoring Well Location
Injection Well for ST-14
Temporary Monitoring Point for ST-14
Existing Fence
Former Building 3459 (Demolished 1994)

Figure 3L

SWMU 56 2005 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

Bay West
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Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

Drawn By: M.B. Date Drawn/Revised: 6/15/2012 Project No. J110202

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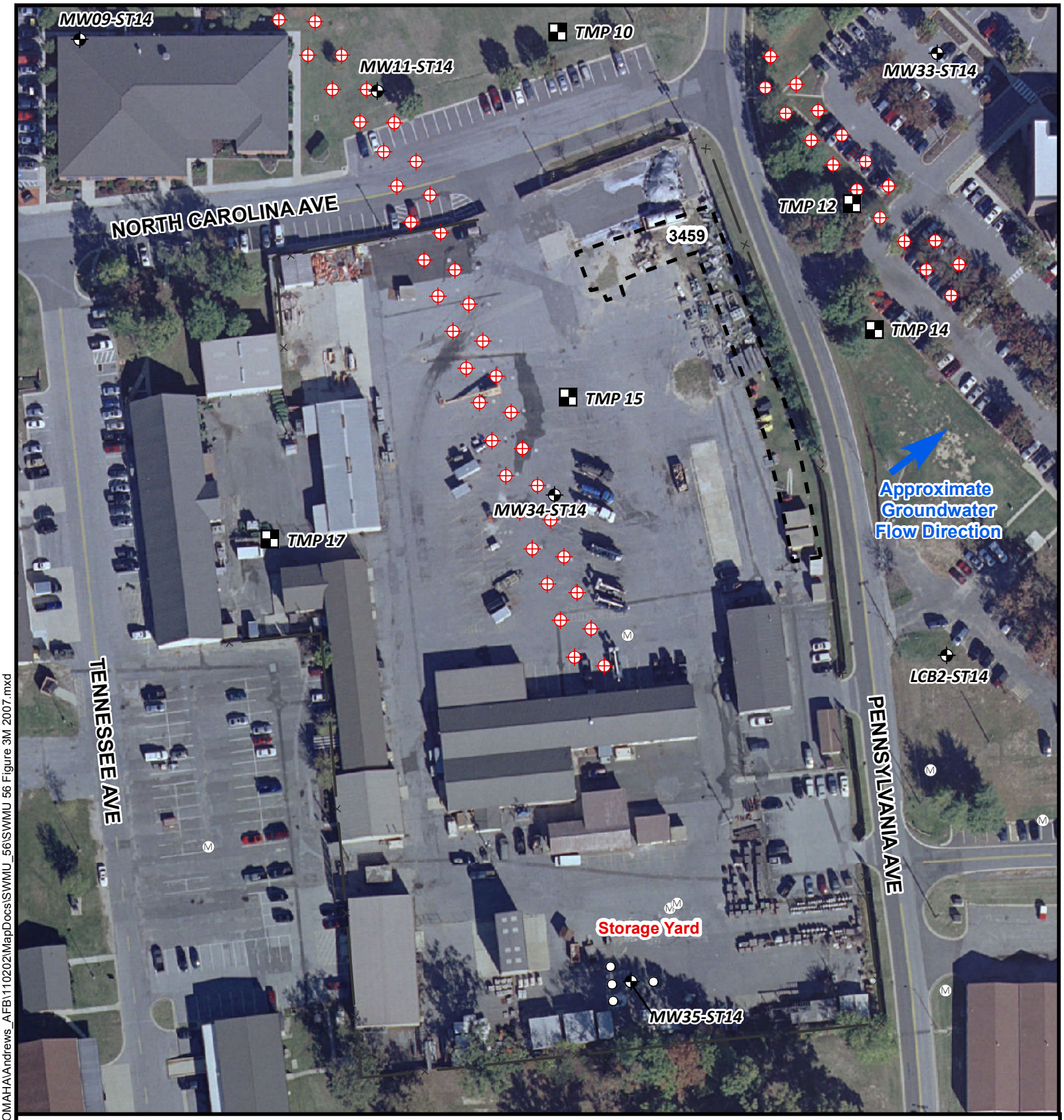

0 50 100 Feet
0 15 30 Meters

MARYLAND
Joint Base Andrews

Previous Sample Location (URS 2009)
Monitoring Well Location
Injection Well for ST-14
Temporary Monitoring Point for ST-14
Existing Fence
Former Building 3459 (Demolished 1994)

Figure 3M

SWMU 56 2007 Aerial Map
Joint Base Andrews
Camp Springs, Maryland

Bay West
Customer-Focused Environmental & Industrial Solutions

Map Projection: NAD_1983_StatePlane_Maryland_FIPS_1900_Feet

Drawn By: M.B. Date Drawn/Revised: 6/15/2012 Project No. J110202

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Appendix C
Field Documentation

C-1 Soil Boring Logs
C-2 Soil Sample Collection Forms
C-3 Groundwater Sampling Forms
C-4 Investigation-Derived Waste Disposal Documentation (pending)
C-5 Photo Log

Appendix C-1

Soil Boring Logs

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

BOREHOLE NO. **SB01**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews**	
APPROVED BY	**Camp Springs, Maryland**	
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Austin Hittinger**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/3/12 - 12/3/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **271.36**	GW SURFACE	GW ELEVATION DATE

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
1		ASPHALT AND GRAVEL			
2		SAND (SP), yellowish brown, fine- to medium-grained, with gravel and trace silt, medium dense, moist [Fill]	SB01		0.6
		CLAY (CL), dark grayish brown, medium stiff, moist			

SOIL BORING LOG JBA-SWMU56.GPJ BAY WEST BORING LOG TEMPLATE.GDT 3/25/13

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

BOREHOLE NO. **SB02**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews**	
APPROVED BY	**Camp Springs, Maryland**	
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Austin Hittinger**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/3/12 - 12/3/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **272.26**	GW SURFACE	GW ELEVATION DATE

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
1		SANDY SILT (MLS), dark yellowish brown, with gravel and organics, moist [Fill]	SB02		0.5
2		CLAYEY SILT (CL-ML), yellowish brown, with gravel, medium stiff, moist			

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

N

BOREHOLE NO. **SB03**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews** **Camp Springs, Maryland**	
APPROVED BY		
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Austin Hittinger**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/3/12 - 12/3/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **272.10**	GW SURFACE	GW ELEVATION DATE

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
1		SILT (ML), dark yellowish brown, with sand and gravel, trace clay and organics, soft, moist [Fill]	SB03		1.3
2		GRAVELLY SAND (SPG), yellowish brown, fine- to medium-grained, loose, moist			

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

BOREHOLE NO. **SB04**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews**	
APPROVED BY	**Camp Springs, Maryland**	
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Austin Hittinger**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/3/12 - 12/3/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **272.82**	GW SURFACE	GW ELEVATION DATE

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
1		SILTY SAND (SM), dark yellowish brown, fine-grained, wiht gravel and organics, loose, moist [Fill]	SB04		0.7
2		SANDY CLAY (CLS), yellowish brown, with gravel, medium stiff, moist			

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

BOREHOLE NO. **TMW-01**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews** **Camp Springs, Maryland**	
APPROVED BY		
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Austin Hittinger**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/6/12 - 12/6/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **269.66**	GW SURFACE **254.16**	GW ELEVATION DATE **12/6/12**

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
		ASPHALT			
		CLAY (CL), dark gray, with sand and gravel, medium stiff, moist [Fill]			0.5
			SO07		2.6
5		CLAY (CL), gray, gravelly, with sand, medium stiff, moist [Shallow Upland Deposits]			1.7
					0.7
					0.5
10					
					0.6
			SO05		0.6
15					0.5
		CLAYEY SAND (SC), gray, medium- to coarse-grained, with gravel, medium dense, wet [Intermediate Upland Deposits]			1.1
		GRAVELLY SAND (SPG), brownish yellow, medium to coarse-grained, with silt, medium dense, wet			0.8
20					0.9
					1.0
		SAND WITH SILT (SP-SM), brownish yellow, fine-grained, 0.1 inch layers of white fine-grained sand, medium dense, wet			
25					1.4
					0.7
					0.6
30					

SOIL BORING LOG JBA-SWMU56.GPJ BAY WEST BORING LOG TEMPLATE.GDT 1/16/13

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

BOREHOLE NO. **TMW-02**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews** **Camp Springs, Maryland**	
APPROVED BY		
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Austin Hittinger**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/6/12 - 12/6/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **270.09**	GW SURFACE **254.09**	GW ELEVATION DATE **12/6/12**

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
		ASPHALT			
		CLAY (CL), yellowish brown, trace sand and organics, low plasticity, medium stiff, moist [Fill]			2.4
		-1 inch layer of black organics and rootlets	SO08		4.4
5					4.0
		CLAY (CL), gray, with sand, trace gravel and organics, low plasticity, very stiff, moist [Shallow Upland Deposits]			3.1
		CLAYEY GRAVEL (GC), fine-grained, sub-rounded, with sand, moist [Intermediate Upland Deposits]			1.4
10		GRAVELLY SAND (SPG), pale brown, medium- to coarse-grained, with clay, dense, moist	SO09		2.5
					2.7
15					No Recovery
		GRAVELLY SAND (SPG), brownish yellow, medium- to coarse-grained, with silt, medium dense, wet			3.3
					2.4
20		SAND WITH SILT (SP-SM), yellow, fine-grained, 0.2 inch lenses of white fine-grained sand, medium dense, wet			2.4
					1.6
25					2.7
					1.8
					1.5
30		CLAY (CL), dark greenish gray, medium plasticity, stiff, moist [Calvert Formation]			

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

BOREHOLE NO. **TMW-03**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews** **Camp Springs, Maryland**	
APPROVED BY		
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Brody**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/7/12 - 12/7/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **271.25**	GW SURFACE **255.25**	GW ELEVATION DATE **12/7/12**

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
		ASPHALT			
		CLAY (CL), yellowish brown, trace sand, stiff, low plasticity, moist [Fill]			1.0
			SO12		1.7
5		CLAY (CL), grayish brown, trace gravel, very stiff, low plasticity, moist [Shallow Upland Deposits]			2.0
					2.4
		-increased gravel and sand content			2.0
10		GRAVELLY SAND WITH CLAY (SP-SC), grayish brown, medium- to coarse-grained, dense, moist [Intermediate Upland Deposits]			2.1
					1.5
15			SO11		2.3
	▽	-color change to brownish yellow, wet			1.5
		SAND WITH SILT (SP-SM), brownish yellow, fine-grained, medium dense, wet			1.4
20					2.8
					2.9
25					2.2
					2.8
30					2.6

SOIL BORING LOG JBA-SWMU56.GPJ BAY WEST BORING LOG TEMPLATE.GDT 1/16/13

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

BOREHOLE NO. **TMW-04**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews** **Camp Springs, Maryland**	
APPROVED BY		
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Brody**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/7/12 - 12/7/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **272.54**	GW SURFACE **256.54**	GW ELEVATION DATE **12/7/12**

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
		ASPHALT			
		CLAY (CL), yellowish brown, trace sand and organics, stiff, low plasticity, moist [Fill]			2.0
					1.3
5					3.6
		-Increasing sand content			3.4
					3.4
10		SILTY SAND (SM), grayish brown, medium- to coarse-grained, with gravel, medium dense, moist [Shallow Upland Deposits]			4.4
		-Gravelly			3.6
		SAND WITH SILT (SP-SM), brownish yellow, medium-grained, with gravel, medium dense, moist [Intermediate Upland Deposits]	SO13		3.5
15		-Wet			3.3
					3.8
20					5.8
		-Grades to fine-grained sand, 0.2 inch white fine-grained sand lenses			5.1
25					4.8
					4.8
30					4.8

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

N

BOREHOLE NO. **TMW-05**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews** **Camp Springs, Maryland**	
APPROVED BY		
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Brody**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/7/12 - 12/7/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **271.32**	GW SURFACE **253.32**	GW ELEVATION DATE **12/7/12**

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
		ASPHALT			
		CLAY (CL), yellowish brown, trace sand, gravel, and organics, low plasticity, moist [Fill]			4.0
			SO14		5.4
5		CLAY (CL), grayish brown, trace sand and gravel, low plasticity, moist [Shallow Upland Deposits]			4.3
					3.3
					3.3
10		CLAYEY SAND (SC), light brownish gray, fine- to medium-grained, with gravel, dense, moist [Intermediate Upland Deposits]			4.6
					4.8
		-Gravelly			
15					6.3
			SO15		4.4
	▽	-Wet			2.1
20		GRAVELLY SAND (SPG), yellow, medium- to coarse-grained, with silt, medium dense, wet			4.0
					3.5
25					4.5
					4.2
					2.6
30					

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

N

BOREHOLE NO. **TMW-06**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews**	
APPROVED BY	**Camp Springs, Maryland**	
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Austin Hittinger**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/5/12 - 12/5/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **270.89**	GW SURFACE **254.89**	GW ELEVATION DATE **12/5/12**

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
		ASPHALT			
		SILT (ML), gray, with trace sand and gravel, medium stiff, dry [Fill]			3.5
			SO02		6.9
5		SILTY CLAY (CL-ML), yellowish brown, very stiff, moist			2.6
					3.8
		SANDY SILT (MLS), gray, with clay and trace gravel, very stiff, moist [Shallow Upland Deposits]			5.6
10					4.2
		SILTY SAND (SM), red, fine- to medium-grained, with gravel, dense, moist [Intermediate Upland Deposits]	SO03		3.3
15					No Recovery
		GRAVELLY SAND (SPG), yellow, medium- to coarse-grained, with silt, medium dense, wet			3.8
					4.1
20					2.0
		-Lens of fine sand			4.3
25					5.7
		SAND WITH SILT (SP-SM), yellow, fine-grained, 0.2 inch lenses of white fine sand, medium dense, wet			5.4
					4.3
30					

SOIL BORING LOG JBA-SWMU56.GPJ BAY WEST BORING LOG TEMPLATE.GDT 1/16/13

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

BOREHOLE NO. **TMW-07**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews** **Camp Springs, Maryland**	
APPROVED BY		
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Austin Hittinger**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/4/12 - 12/4/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **270.74**	GW SURFACE **256.74**	GW ELEVATION DATE **12/4/12**

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
		ASPHALT			
		SILTY CLAY (CL-ML), yellowish brown, trace sand and gravel and organics, moderate plasticity, stiff, moist [Fill]			0.5
					0.7
5		SILT (ML), gray, with sand, medium stiff, moist [Shallow Upland Deposits]			1.0
					0.4
		-Becomes gravelly			0.7
10		SILT SAND (SM), gray, medium- to coarse-grained, with gravel, dense, moist [Intermediate Upland Deposits]			0.7
		SAND (SP), yellowish brown, medium-grained, with gravel and trace silt, medium dense, moist	SO01		1.7
		-Wet			
15					No Recovery
		-Grades to coarse-grained sand			2.0
					No Recovery
20		-Grades to fine-grained sand			2.7
					No Recovery
25					
					2.6
30					

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

BOREHOLE NO. **TMW-08**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews** **Camp Springs, Maryland**	
APPROVED BY		
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Austin Hittinger**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/5/12 - 12/5/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **268.86**	GW SURFACE **254.86**	GW ELEVATION DATE **12/5/12**

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
		ASPHALT			
		CLAY (CL), dark yellowish brown, with trace sand and gravel, stiff, moist [Fill]			2.1
					1.5
5					0.9
		CLAY (CL), grayish brown, with sand, trace gravel, stiff, moist [Shallow Upland Deposits]			No recovery
		GRAVELLY SAND (SPG), yellow, medium-grained, with silt, dense, moist [Intermediate Upland Deposits]			0.8
10					No recovery
		SAND WITH SILT (SP-SM), yellow, medium-grained, with gravel, medium dense, moist	SO04		1.2
▽		-Color change to brownish yellow, wet			
15					1.5
		-Color change to yellow			1.8
					1.3
20		SAND WITH SILT (SP-SM), yellow, fine-grained, medium dense, wet			1.1
					1.4
25					1.1
					1.1
					1.0
30		CLAY (CL), dark greenish gray, trace sand, medium stiff, moderate plasticity, moist [Calvert Formation]			

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SOIL BORING LOG

BOREHOLE LOCATION SKETCH MAP

BOREHOLE NO. **TMW-09**		
PROJECT NO. / NAME **J110202.PA.0 / SWMU56 Phase I RI**	LOCATION **Joint Base Andrews**	
APPROVED BY	**Camp Springs, Maryland**	
DRILLING CONTRACTOR **Vironex**	DRILLER'S NAME **Austin Hittinger**	
DRILLING EQUIPMENT / METHOD **6820 Geoprobe / Direct Push Technology**	SIZE / TYPE OF BIT **2 inch / 4 foot Macro-Core**	START - FINISH DATE **12/6/12 - 12/6/12**
LOGGED BY **Paul Raymaker**	SAMPLING METHOD **Grab**	
ELEVATION OF: (FT.) GROUND SURFACE **269.47**	GW SURFACE **253.47**	GW ELEVATION DATE **12/6/12**

Depth, ft bgs	Graphic Log	Visual Description	Analytical Sample Number	Sample Interval	Headspace Values (ppm)
		ASPHALT			
		SILTY CLAY (CL-ML), grayish brown, with gravel and sand, trace organics, low plasticity, moderately stiff, moist [Fill]			2.3
					3.6
5		CLAY (CL), brown, medium plasticity, soft, moist [Shallow Upland Deposits]			3.6
		-Color change to grayish brown, trace sand			2.9
		-Increasing sand content			2.8
10		CLAYEY SAND (SC), grayish brown, fine-grained, trace gravel, dense, moist [Intermediate Upland Deposits]			1.0
		-Increasing gravel			2.5
15		GRAVELLY SAND (SPG), pale brown, fine- to medium-grained, with clay, dense, moist	SO10		3.6
		-Grades to medium- to coarse-grained sand, wet			3.4
20		-Color change to brownish yellow			3.7
					3.7
					0.8
25		SAND WITH SILT (SP-SM), brownish yellow, fine-grained, medium dense, wet			1.5
					2.0
30					2.3

Appendix C-2

Soil Sample Collection Forms

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: SWMU56 - JBA

PROJECT NO. J110202.PA.0

SAMPLE NO. SWMU56-TMW01-S005

BORING NO. TMW01

DATE/TIME COLLECTED: 12/6/12 @ 0900

PERSONNEL: Paul Raymaker, Alexander Maloney

SAMPLE METHOD / DEPTH: Grab / 12-14

SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO)

SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: (YES) NO

DUPLICATE SAMPLE NO. SWMU56-TMW01-S006 @ 0910

MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
6 x 4oz Jar	None	DRO, PCB, PAH, Pest/Herb, Metals
6x VOAs 40ml	2x MEOH, 4x DI	VOCs
4x 40ml VOA	MEOH	GRO

OVA MEASUREMENTS

Background	0.0
Breathing zone	
Boring	
Headspace	0.6

SAMPLE DESCRIPTION

DEPTH: 12-14 DESCRIPTION: Gray gravelly Clay w/ Sand, med stiff, Moist

GENERAL COMMENTS:

~~Soil Boring~~ Additional soil boring Advanced directly adjacent to original boring and discretely Sampled from 12-14 ft bgs to collect additional soil for lab analysis

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: SBA - SWM456 PROJECT NO. 3110202.PA.0

SAMPLE NO. SWM456-TMW01-S007 BORING NO. TMW01

DATE/TIME COLLECTED: 12/6/12 @ 0843 PERSONNEL: Paul Raymond

SAMPLE METHOD / DEPTH: grab / 2-4 Amanda Mahoney

SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. NA

MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4x 4oz VOA	None	DRO, PCB, PAH, PCP, Herb, Metals
3x 40ml VOA	2x DI, 1x MEOH	VOCs
2x 40ml VOA	2x MEOH	GRO

OVA MEASUREMENTS

Background	0
Breathing zone	
Boring	
Headspace	2.6

SAMPLE DESCRIPTION

DEPTH: 2-4 DESCRIPTION: Dark Gray Clay w/sand and gravel, medium stiff, no. 3t

GENERAL COMMENTS

Hyes PID reading, Higher than Average pH (6.38)

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: OBA - SWMU56 PROJECT NO. J110202.PA.0

SAMPLE NO. SWMU56-TMW02-S008 BORING NO. TMW02

DATE/TIME COLLECTED: 12/6/12 @ 1132 PERSONNEL: Paul Raymer
SAMPLE METHOD / DEPTH: grab / 2-4 Amanda McLaney
SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE
SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA
SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. NA
MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4 x 4oz Jar	None	DRO, PCB, PAH, Pest, Herb, Metals
3 x 40ml VOA	2 x DI, 1 x MEOH	VOCs
2 x 40ml VOA	2 x MEOH	GRO

OVA MEASUREMENTS

Background	0
Breathing zone	
Boring	
Headspace	4.4

SAMPLE DESCRIPTION

DEPTH: 2-4 DESCRIPTION: Yellowish Brown Clay w/trace Sand and organics, low plasticity, M. Stiff, moist

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: OBA-SWMU56 PROJECT NO. J110202.84.0

SAMPLE NO. SWMU56-TMW02-S009 BORING NO. TMW02

DATE/TIME COLLECTED: 12/6/12 @ 1147 PERSONNEL: Paul Raymaker
SAMPLE METHOD / DEPTH: Grab / 10-12 Amanda Maloney
SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE
SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA
SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. NA
MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4x 4oz Jars	None	DRO, SAH, PCB, Pest, Herb, Metals
3 x VOAs 40ml	2 x DI 1x MEOH	VOCs
2 x 40 ml VOA	2 x MEOH	GRO

OVA MEASUREMENTS

Background	0
Breathing zone	
Boring	
Headspace	2.5

SAMPLE DESCRIPTION

DEPTH: 10-12 DESCRIPTION: Pale Brown Gravelly M-C Sand w/ Clay, Damp Moist

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: JBA SWMU56 PROJECT NO. 511020.02.PA.0

SAMPLE NO. SWMU56-TMW03-S011 BORING NO. TMW03

DATE/TIME COLLECTED: 12/7/12 @ 0850 PERSONNEL: Paul Rapp, KS
Amanda Maloney

SAMPLE METHOD / DEPTH: grab / 14-16

SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO)

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. N/A

MS/MSD REQUESTED: YES (NO)

SPLIT SAMPLE NO. N/A

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4x 4oz Jars	None	DRO, PCB, PAH, Pest, Herb, Metals
3x 40ml VOA	2x DI, 1x MEOH	VOCs
2x 40ml VOA	2x MEOH	GRO

OVA MEASUREMENTS

Background	0
Breathing zone	
Boring	
Headspace	2.3

SAMPLE DESCRIPTION

DEPTH: 14-16 DESCRIPTION: Grayish Brown gravelly Medium to Coarse Sand with Clay, Dense, moist

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: SWMU56 - JBA PROJECT NO. J/10202.PA.O

SAMPLE NO. SWMU56-TMW03-SO12 BORING NO. TMW03

DATE/TIME COLLECTED: 12/7/12 @ 0805 PERSONNEL: Rgl Reynolds
Hannah McInney

SAMPLE METHOD / DEPTH: 0-6 / 2-4

SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. NA

MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4x 4oz Jar	None	DRO PCB PAH PCBT Hex Cr TAL
3x 40ml VOA	2x DI, 1x MEOH	VOCs
2x 40ml VOA	2x MEOH	GRO

OVA MEASUREMENTS

Background	~~17~~ 6
Breathing zone	
Boring	
Headspace	1.7

SAMPLE DESCRIPTION

DEPTH: 2-4 DESCRIPTION: Yellowish Brown Clay w/ trace Sand, Stiff, moist

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: SWMU56 - JBA
PROJECT NO. J/10202.PA0

SAMPLE NO. SWMU56-TMW04-S013
BORING NO. TMW04

DATE/TIME COLLECTED: 12/7/12 @ 1105
PERSONNEL: Paul Raymaks
Amanda Mahoney

SAMPLE METHOD / DEPTH: Grab / 14-16
SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE
SAMPLE QA SPLIT: YES (NO)
SPLIT SAMPLE NO. NA
SAMPLE QC DUPLICATE: YES (NO)
DUPLICATE SAMPLE NO. NA
MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4 x 4oz Jar	None	DRO, PCB, PAH, Pest, Herb, Metals
3 x 40ml VOA	2 x DI, 1 x MEOH	VOCs
2 x 40ml VOA	2 x MEOH	GRO

OVA MEASUREMENTS

Background	~~3.5~~ 0
Breathing zone	
Boring	
Headspace	3.5

SAMPLE DESCRIPTION

DEPTH: 14-16
DESCRIPTION: Brownish Yellow Medium Sand w/silt and gravel, M. dense, moist

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: SWMU56 - JBA　　PROJECT NO. J110202.PAO

SAMPLE NO. SWMU56-TMW05-S014　　BORING NO. TMW05

DATE/TIME COLLECTED: 12/7/12 @1210　　PERSONNEL: Paul Raymond / Amanda McInerney

SAMPLE METHOD / DEPTH: Grab 2-4

SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO)　　SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO)　　DUPLICATE SAMPLE NO. NA

MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4x 4oz JAR	None	PCB, DRO, PAH, Pest, Herb, Metals
3x 40ml VOA	2x DI, 1x MEOH	VOCs
2x 40ml VOA	2x MEOH	GRO

OVA MEASUREMENTS

Background	0
Breathing zone	
Boring	
Headspace	5.4

SAMPLE DESCRIPTION

DEPTH: 2-4　　DESCRIPTION: Yellowish brown Clay w/trace Sand Gravel and organics

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: SUMU56 - JBA PROJECT NO. 311022.PA.0

SAMPLE NO. SUMU56 - TMW05 - SOIL 15 BORING NO. TMW05

DATE/TIME COLLECTED: 12/3/12 @ ~~1210~~ VAS 1230 PERSONNEL: RJ Raymaker, Amanda Maloney

SAMPLE METHOD / DEPTH: grab 16-18

SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. NA

MS/MSD REQUESTED: (YES) NO

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
12x 4oz Jars	None	DRO, PCB, PAH, Pest, Herb, Met-6
9x 40ml VOA	6x DI, 3x MEOH	VOCs
6x 40ml VOA	6x MEOH	GRO

OVA MEASUREMENTS

Background	0
Breathing zone	
Boring	
Headspace	4.4

SAMPLE DESCRIPTION

DEPTH: 16-18 DESCRIPTION: Brownish Grey Gravelly Clayey Medium Sand, Dense, moist

GENERAL COMMENTS Triple Volume collected for MS/MSD, additional boring advanced directly adjacent to boring to collect additional soil @ 16-18'

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: JBA - SWMU56 PROJECT NO. J/10202.BA.0

SAMPLE NO. SWMU56 - TMW06-S002 BORING NO. TMW06

DATE/TIME COLLECTED: 12/5/12 @1133 PERSONNEL: Jon L Reynolds

SAMPLE METHOD / DEPTH: grab ~~X~~ 2-4 ft. bgs

SAMPLE MEDIA:	(SOIL)	SEDIMENT	SLUDGE	
SAMPLE QA SPLIT:	YES	~~NO~~		SPLIT SAMPLE NO. NA
SAMPLE QC DUPLICATE:	YES	NO		DUPLICATE SAMPLE NO. NA
MS/MSD REQUESTED:	YES	NO		

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4x 4oz Jar	None	DRO PCB, PAH, Pest, Herb
3x 40ml VOA	1 MeOH, 2 DI	VOCs
2x 40ml VOA	2 MeOH	GRO

OVA MEASUREMENTS

Background	0.0
Breathing zone	
Boring	
Headspace	6.9 ppm

SAMPLE DESCRIPTION

DEPTH: 2-4ft DESCRIPTION: Gray to Yellowish Brown, Silt w trace Sand, Clay and gravel, moist, medium stiff

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: JBA ~~SWMU~~ SWMU 56 PROJECT NO. 511020Z

SAMPLE NO. SWMU56-TMW06-S003 BORING NO. TMW06

DATE/TIME COLLECTED: 12/6/12 @ 1155 PERSONNEL: Paul Raymaker, Amanda Maloney

SAMPLE METHOD / DEPTH: grab / 12-14

SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. NA

MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4x 4oz Jar	None	DRO, PCB, PAH, Pest, Herb, Mercury
3x 40mL VOA	2x DI, 1x MEOH	VOCs
2x 40ml VOA	2x MEOH	GRO

OVA MEASUREMENTS

Background	0.0
Breathing zone	
Boring	
Headspace	3.3

SAMPLE DESCRIPTION

DEPTH: 12-14 DESCRIPTION: Red (2.5YR 4/6) Silty Fine to medium Sand with gravel, dense, Moist

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: JBA SWMU 56 PROJECT NO. 110202.PA.0

SAMPLE NO. SWMU56-TMW07-SO 01 BORING NO. TMW07

DATE/TIME COLLECTED: 12/4/12 @ 0850 PERSONNEL: Paul Raymaker
Amanda Mahoney

SAMPLE METHOD / DEPTH: grab/12-14'

SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. NA

MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4x 4oz Jars	None	DRO, PCBs, PAHs, Pest, Herb, Metals
3x VOA 40mL	2x DI, 1x MEOH	VOCs
2x VOA 40mL	2x MEOH	

OVA MEASUREMENTS

Background	0.0
Breathing zone	
Boring	
Headspace	1.7

SAMPLE DESCRIPTION

DEPTH: 12-14 DESCRIPTION: Yellowish Brown Medium Sand with gravel, trace Silt, Moist

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: JBA - SWMU56 PROJECT NO. J1/0202.14.0

SAMPLE NO. SWMU56-TMW08-S004 BORING NO. TMW08

DATE/TIME COLLECTED: 12/5/12 @ 1445 PERSONNEL: Paul Kuyumjian
Amanda Mahoney

SAMPLE METHOD / DEPTH: Grab 12-14

SAMPLE MEDIA:	(SOIL)	SEDIMENT	SLUDGE	
SAMPLE QA SPLIT:	YES	(NO)		SPLIT SAMPLE NO. NA
SAMPLE QC DUPLICATE:	YES	(NO)		DUPLICATE SAMPLE NO. NA
MS/MSD REQUESTED:	YES	(NO)		

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4 x 4oz Jar	None	DRO, PCB, PAH, Pest, Herb, Metals
3 x 40ml VOA	1x MEOH, 2x DI	VOCs
2 x 40ml VOA	2x MEOH	GRO

OVA MEASUREMENTS

Background	0.0
Breathing zone	
Boring	
Headspace	1.2

SAMPLE DESCRIPTION

DEPTH: 12-14 DESCRIPTION: Yellow medium Sand with Silt and gravel, M.dense, moist

GENERAL COMMENTS

Boring advanced directly adjacent to original boring, discrete sample from 12-14 to obtain additional soil for sampling. VOCs & GRO collected from original Boring. Soil for other analytes homogenized.

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: SDA - SWMU 56 PROJECT NO. J/0202.8A.0

SAMPLE NO. SWMU56-TMW09-5010 BORING NO. TMW09

DATE/TIME COLLECTED: 12/6/12 @ 1430 PERSONNEL: Pam / Reynolds
Amanda Mahoney

SAMPLE METHOD / DEPTH: Grab / 14-16

SAMPLE MEDIA:	(SOIL)	SEDIMENT	SLUDGE	
SAMPLE QA SPLIT:	YES	(NO)	SPLIT SAMPLE NO.	NA
SAMPLE QC DUPLICATE:	YES	(NO)	DUPLICATE SAMPLE NO.	NA
MS/MSD REQUESTED:	YES	(NO)		

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
4x 4oz Jar	None	DRO, PCB, PAH, Pest, Herb, Metals
3x 40ml VOA	2x DI, 1x MEOH	VOCs
2x 40ml VOA	2x MEOH	GRO

OVA MEASUREMENTS

Background	0
Breathing zone	
Boring	
Headspace	3.6

SAMPLE DESCRIPTION

DEPTH: 14-16 DESCRIPTION: Pale brown Clayey gravelly F-M Sand
Some, moist

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: SWMU 56 PROJECT NO. J110202

SAMPLE NO. SWMU56-SB01 BORING NO. SB01

DATE/TIME COLLECTED: 12/03/12 / 1015 PERSONNEL: Paul Raymaker, Amanda Malaney

SAMPLE METHOD / DEPTH: macrocore / 1-2'

SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. ↓

MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
1-4oz	none	pesticides herbicides
1-4oz	↓	

OVA MEASUREMENTS

Background 0

Breathing zone

Boring

Headspace 0.6

SAMPLE DESCRIPTION

DEPTH: 1-2 DESCRIPTION: Silt, dark greyish brown, med. stiff, moist

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: SWMU 56 PROJECT NO. J110202

SAMPLE NO. SWMU 56-SB02 BORING NO. SB02

DATE/TIME COLLECTED: 12/03/12 | 1030 PERSONNEL: Paul Raymaker, Amanda Malaney

SAMPLE METHOD / DEPTH: macro core | 1-2

SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO)

SAMPLE QC DUPLICATE: YES (NO) SPLIT SAMPLE NO. NA

MS/MSD REQUESTED: YES (NO) DUPLICATE SAMPLE NO. ↓

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
1-4oz.	none	pesticides
1-4oz.	↓	herbicides

OVA MEASUREMENTS

Background	0
Breathing zone	
Boring	
Headspace	0.5

SAMPLE DESCRIPTION

DEPTH: 1-2 DESCRIPTION: clayey silt, (yellowish brown (10 YR 5/8)), w/ gravel, med. dense, moist to dry

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: SWMU 56 PROJECT NO. J110202

SAMPLE NO. SWMU56-SB03 BORING NO. SB03

DATE/TIME COLLECTED: 12/03/12 | 1045 PERSONNEL: Paul Raymaker, Amanda Malaney

SAMPLE METHOD / DEPTH: macrocore | 1-2

SAMPLE MEDIA: (SOIL) / SEDIMENT / SLUDGE

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. ↓

MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
1-4oz	none	pesticides herbicides
1-4oz	↓	

OVA MEASUREMENTS

Background	0
Breathing zone	
Boring	
Headspace	1.3

SAMPLE DESCRIPTION

DEPTH: 1-2 DESCRIPTION: gravelly sand yellowish brown (10YR 5/6), loose, moist to dry

GENERAL COMMENTS

SOIL SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: SWMU 56 PROJECT NO. J110202

SAMPLE NO. SWMU 56 - SB04 BORING NO. SB04

DATE/TIME COLLECTED: 12/03/12 / 1100 PERSONNEL: Paul Raymaker, Amanda Malaney

SAMPLE METHOD / DEPTH: Macrocore / 1-2

SAMPLE MEDIA: (SOIL) SEDIMENT SLUDGE

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. ↓

MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
1-40z.	none	pesticides
1-40z.	↓	herbicides

OVA MEASUREMENTS

Background	0
Breathing zone	
Boring	
Headspace	1.0

SAMPLE DESCRIPTION

DEPTH:	DESCRIPTION:
1-1.5	Silty fine sand w/ gravel, organics, yellowish brown (10YR 3/2), loose
1.5-2	Sandy clay, yellowish brown (10YR 5/6), m stiff, w/ gravel

GENERAL COMMENTS

Appendix C-3

Groundwater Sampling Forms

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: JBA - SWMU56 — PROJECT NO.: J10202.PA.0

SAMPLE NO.: SWMU56-TMW01-GW05 (~~GW07~~ naa) — WELL NO.: TMW01

DATE/TIME COLLECTED: 12/5/12 | 0845 — PERSONNEL: Angela Mahoney, Paul Reynolds

SAMPLE METHOD: peristaltic | grab

SAMPLE MEDIA: (Groundwater) / Surface Water

SAMPLE QA SPLIT: YES / (NO) — SPLIT SAMPLE NO.: NA

SAMPLE QC DUPLICATE: (YES) / NO — DUPLICATE SAMPLE NO.: SWMU56-TMW01-GW06 @850

MS/MSD REQUESTED: YES / (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
20 x 1L Amber	None	DRO, PAH, PCB, Pest, Herb
12 ~~6~~ x 40 ml VOA	HCl	GRO, VOC,
2 x 500ml Poly	HNO_3	Metals

WELL PURGING DATA

Date	12/5/12	Well Depth (ft. BTOC)	30ft
Time Started	0745	Depth to Water (ft BTOC)	NA
Time Completed	0840	Water Column Length	
Hnu Measurements		Volume of Water in Well (gal)	
Background	NA	Casing Volumes to Purge	
Breathing Zone	↓	Minimum to Purge (gal)	
Well Head	↓	Actual Purge (gal)	↓

FIELD MEASUREMENTS

Time	Amount Purged (gal)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
0805	8L	5.23					333.2
0811	10.4L	5.12					177.0
0820	14L	5.03					56.0
0830	18L	4.97					18.1
0840	22L	4.97					9.9

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	NA	
Water Quality Meter	YSI 6820 V2	12/5/12

GENERAL COMMENTS

- Tubing intake @ 28' bgs
- Duplicate Sample collected
- purge rate ~~300~~ 400ml/min.
- Sample collection rate 300 ml/min

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: JBA PBC/Sumu-56 | PROJECT NO.: TMW-02

SAMPLE NO.: SWMU56-TMW02-GW08 | WELL NO.: J110202-PA.0

DATE/TIME COLLECTED: 5DEC12 / 1410 | PERSONNEL: JMH

SAMPLE METHOD: peristaltic / Grab.

SAMPLE MEDIA: (Groundwater) Surface Water

SAMPLE QA SPLIT: YES (NO) | SPLIT SAMPLE NO.: NA

SAMPLE QC DUPLICATE: YES (NO) | DUPLICATE SAMPLE NO.: NA.

MS/MSD REQUESTED: YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
6-40mL VOA	HCl	VOCs/GRO
1-500mL poly	HNO_3	metals
10-1L amber	None	Pest/Herb
		DRO/PAH
		PCB

WELL PURGING DATA

Date	12/05/12	Well Depth (ft. BTOC)	30
Time Started	1130	Depth to Water (ft BTOC)	NA
Time Completed	1400	Water Column Length	↓
Hnu Measurements		Volume of Water in Well (gal)	
Background	NA	Casing Volumes to Purge	
Breathing Zone	↓	Minimum to Purge (gal)	
Well Head		Actual Purge (gal)	↓

FIELD MEASUREMENTS

Time	Amount Purged (gal)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1130-1400	0.5L	removed during development w/ surging.					
	0.5L	removed for reading below					
1400		5.73					1028.5

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	NA	
Water Quality Meter	YSI 6820 V2	12/05/12

GENERAL COMMENTS

- Poor recharge after 2.5 hrs surging & development discharged volume for initial pH reading.
Pump at lowest setting
- tubing intake at 28' bgs
- Sample collection rate ~150 mL/min

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: JBA - SWMU 56 (04) PROJECT NO.: J110202.PA.0

SAMPLE NO.: SWMU56-TMW03-GW120 WELL NO.: TMW03

DATE/TIME COLLECTED: 12/6/12 / 0950 PERSONNEL: Jim H.

SAMPLE METHOD: Peristaltic / Grab

SAMPLE MEDIA: (Groundwater) Surface Water

SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO. NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO. NA
MS/MSD REQUESTED	YES	NO	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
10 x 1L Amber	None	DRO, PAHs, PCBs, Pest, Herb
6 x 40ml VOA	HCl	GRO, VOCs
1 x 500ml Poly	HNO3	Metals

WELL PURGING DATA

Date	12/6/12	Well Depth (ft. BTOC)	~~30~~ RR 28
Time Started	0845	Depth to Water (ft BTOC)	NA
Time Completed	0950	Water Column Length	
Hnu Measurements		Volume of Water in Well (gal)	
Background	N/A	Casing Volumes to Purge	
Breathing Zone	↓	Minimum to Purge (gal)	
Well Head	↓	Actual Purge (gal)	↓

FIELD MEASUREMENTS

Time	Amount Purged (gal) L	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
0855	5	6.13					87.2
0900	7.5	5.26		reduced	rate 300mL/min		79.3
0920	11.5	5.09		increased	rate 500mL/min		110
0930	16.5	5.06					48.3
0945	19.0	5.03					9.0

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	N/A	
Water Quality Meter	YSI 6820 V2	12/6/12

GENERAL COMMENTS

- Start @ 500 mL/min.
- tubing intake @ 26' bgs
- sample collection rate 500 mL/min

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME JBA - SWMU56 10 (AP) PROJECT NO. J110202.PA.D

SAMPLE NO. SWMU56-TMW04-GW-1212 WELL NO. TMW04

DATE/TIME COLLECTED 12/6/12 / 1115 PERSONNEL Jim H.

SAMPLE METHOD Peristaltic / Grab

SAMPLE MEDIA:	(Groundwater)	Surface Water	
SAMPLE QA SPLIT:	YES	(NO)	SPLIT SAMPLE NO. NA
SAMPLE QC DUPLICATE:	YES	(NO)	DUPLICATE SAMPLE NO. NA
MS/MSD REQUESTED	YES	(NO)	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
10x 1L Amber	None	DRO, PCB, PAH, Pest, Herb
6x 40ml VOA	HCl	GRO, VOCs
1x 500ml Poly	HNO3	Metals

WELL PURGING DATA

Date	12/6/12	Well Depth (ft. BTOC)	30
Time Started	1043	Depth to Water (ft BTOC)	NA
Time Completed	1112	Water Column Length	
Hnu Measurements		Volume of Water in Well (gal)	
Background	N/A	Casing Volumes to Purge	
Breathing Zone	↓	Minimum to Purge (gal)	
Well Head	↓	Actual Purge (gal)	↓

FIELD MEASUREMENTS

Time	Amount Purged (~~gal~~) L	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1053	5.0	5.51					349.2
1103	10.0	5.03					60.6
1108	12.5	4.97	reduced to	100mL/min			13.9
1110	13.0	4.96					8.4
1112	14.0	4.96					0.5

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	NA	
Water Quality Meter	YSI 6820 V2	12/6/12

GENERAL COMMENTS

Initial dev. @ 500 mL/min.

- tubing intake @ 28' bgs

- sample collection rate @ 100 mL/min

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME JBA - SWMU56 PROJECT NO. J1102021.A.0

SAMPLE NO. SWMU56-TMW05-GW04 WELL NO. SWMU56-TMW05

DATE/TIME COLLECTED 12/4/12 @ 1530 PERSONNEL Amanda Maloney, Paul Raymaker

SAMPLE METHOD peristaltic pump/grab

SAMPLE MEDIA:	(Groundwater)	Surface Water	
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO. NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.
MS/MSD REQUESTED	YES	NO	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
10 - 1L amber	none	PCB, PAH, past., herb., DRO
6 - 40mL vial	HCl	VOCs, GRO
1 - 500 mL plastic	HNO_3	metals

WELL PURGING DATA

Date	12/04/12	Well Depth (ft. BTOC)	30' bgs
Time Started	1330	Depth to Water (ft BTOC)	NA
Time Completed	1530	Water Column Length	
Hnu Measurements		Volume of Water in Well (gal)	
Background	NA	Casing Volumes to Purge	
Breathing Zone		Minimum to Purge (gal)	
Well Head		Actual Purge (gal)	

FIELD MEASUREMENTS

Time	Amount Purged (gal) L	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1330		4.62					1294.8
1415	22.5	4.41					58.1
1445	37.5	4.39					43.2
1455	42.5	4.38					28.0
1505	47.5	4.38					22.9
1515	52.5	4.38					21.7
1525	57.5	4.37					12.7
1530	60.0	4.37					12.6

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	NA	
Water Quality Meter	YSI 6820 V2	12/04/12

GENERAL COMMENTS

- tubing intake set @ 28' bgs
- purge rate 500 mL/min
- Sample collection rate ~150mL/min

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME: SWMU 56 — PROJECT NO.: JBA J110202.PA.0

SAMPLE NO.: SWMU56-TMW06-~~GW01~~ 6W01 — WELL NO.: SWMU 56-TMW06

DATE/TIME COLLECTED: 12/3/12 @ 1410 — PERSONNEL: Paul Paymaker, Amanda Malaney

SAMPLE METHOD: low flow peristaltic

SAMPLE MEDIA: (Groundwater) / Surface Water

SAMPLE QA SPLIT:	YES	(NO)	SPLIT SAMPLE NO.: NA
SAMPLE QC DUPLICATE:	YES	(NO)	DUPLICATE SAMPLE NO.: ↓
MS/MSD REQUESTED	YES	(NO)	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
10x 1L Amber	None	DRO, PAH, Pest/Herb, PCB,
6x 40 mL VOA	HCl	VOCs GRO
1x 500mL Poly	HNO_3	Metals

WELL PURGING DATA

Date	12/3/12	Well Depth (ft. BTOC)	30ft
Time Started	~~1338~~ 1328	Depth to Water (ft BTOC)	NA
Time Completed	1403 (AM) ~~1540~~ ~~1530~~ (AM)	Water Column Length	NA
Hnu Measurements		Volume of Water in Well (gal)	
Background	NA	Casing Volumes to Purge	
Breathing Zone	↓	Minimum to Purge (gal)	
Well Head	↓	Actual Purge (gal)	↓

FIELD MEASUREMENTS

Time (~~PM~~)	Amount Purged (gal)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1330		6.01	1				1304.6
1340	1.3	4.78	6				40
1345	2.0	4.95	8.5				30.1
1355		4.73	13.5				20.7
1400		4.70	16				12.1
1403	4.4	4.73	17.5				10.0

Amount Purged (L)

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	NA	
Water Quality Meter	YSI 6820 V2	12/3/12

GENERAL COMMENTS

- Unable to monitor Ground Water level. Probe does not fit in temp well casing.
- tubing intake at 28' bgs

purge rate - 500 mL/min

sample collection rate - ~~100~~ 150 (AM) mL/min

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME JBA/PBC - SMMU - 56 PROJECT NO. J110202 - PA.0

SAMPLE NO. SWMU56-TMW07~~-05~~GW03 WELL NO. TMW-07

DATE/TIME COLLECTED 4DEC12 / 1215 PERSONNEL Hubbell

SAMPLE METHOD peristaltic / Grab.

	Groundwater	Surface Water	
SAMPLE MEDIA:			
SAMPLE QA SPLIT:	YES	(NO)	SPLIT SAMPLE NO. N/A
SAMPLE QC DUPLICATE:	YES	(NO)	DUPLICATE SAMPLE NO. N/A
MS/MSD REQUESTED	(YES)	NO	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
30 x 1L amber	none	DRO, pest., herb., PCB, PAH
18 x 40mL vials	HCl	VOCs, GRO
3x500mL plastic	HNO_3	metals

WELL PURGING DATA

Date	4DEC12	Well Depth (ft. BTOC)	30
Time Started	1050	Depth to Water (ft BTOC)	NA
Time Completed	1210	Water Column Length	
Hnu Measurements		Volume of Water in Well (gal)	
Background	ϕ	Casing Volumes to Purge	
Breathing Zone	ϕ	Minimum to Purge (gal)	
Well Head	ϕ	Actual Purge (gal)	

FIELD MEASUREMENTS

Time	Amount Purged (gal)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
1050	1.5L	initial	Sediment removal + Development.				
1135	2.5L	5.09					19.7
1145	6.5L	4.90					8.0
1200	12.5L	4.77					3.7
1205	13.3L	4.75					3.2
1210	14.1L	4.75					

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	N/A.	
Water Quality Meter	YSI 650 MDS 10820 VZ	4DEC12

GENERAL COMMENTS

Initial Purge rate @ 400mL/min.

Sample collection rate - 400mL/min

- tubing intake at 28' bgs

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME JBA - SWMU56 PROJECT NO. 3110202.PA.0

SAMPLE NO. SWMU56-TMW08-02 (GW02 over) WELL NO. SWMU56-TMW08

DATE/TIME COLLECTED 12/04/12 / 1045 (MW) 1120 PERSONNEL Amanda Malarkey, Jim Hubbell

SAMPLE METHOD peristaltic pump

SAMPLE MEDIA: (Groundwater) Surface Water

SAMPLE QA SPLIT: YES (NO) SPLIT SAMPLE NO. NA

SAMPLE QC DUPLICATE: YES (NO) DUPLICATE SAMPLE NO. ↓

MS/MSD REQUESTED YES (NO)

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
9 1 amber broke — 10 x 1L amber, 6 x 40mL vial, 1 x 500mL plastic	None, HCl, HNO3	DRO, PAH, pest., herb. PCB, VOCs, GRO, Metals

WELL PURGING DATA

Date	12/3/12 12/04/12 (MW)	Well Depth (ft. BTOC)	30 ft
Time Started	0800	Depth to Water (ft BTOC)	NA
Time Completed	1115	Water Column Length	↓
Hnu Measurements		Volume of Water in Well (gal)	
Background	NA	Casing Volumes to Purge	
Breathing Zone	↓	Minimum to Purge (gal)	
Well Head		Actual Purge (gal)	↓

FIELD MEASUREMENTS

Time	Amount Purged (gal)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
0815		5.38					1240.9
0930	5	4.91					1013.1
1015	10	4.75					302.5
1045 (MW)	14.13	4.74					56.4
1115	15	4.73					522

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	NA	
Water Quality Meter	YSI 6820 V2	12/04/12

GENERAL COMMENTS

- unable to monitor GW level, probe does not fit in SS casing
- a lot of sediment in well, tubing had to be removed several times to clean check ball during initial purging
- tubing intake at 28' bgs

purge rate - 400 mL/min
Samp. collection rate - 150 mL/min

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME JBA - SWMU56 PROJECT NO. 511020Z.PA.0

SAMPLE NO. SWMU56-TMW09-GW07 WELL NO. TMW09

DATE/TIME COLLECTED ~~12/6/12~~ 12/5/12 @ 0950 PERSONNEL Paul Raymaker

SAMPLE METHOD grab

SAMPLE MEDIA:	(Groundwater)	Surface Water	
SAMPLE QA SPLIT:	YES	(NO)	SPLIT SAMPLE NO. NA
SAMPLE QC DUPLICATE:	YES	(NO)	DUPLICATE SAMPLE NO. NA
MS/MSD REQUESTED	YES	(NO)	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
10x 1L Amber	None	PCBs, PAH, DRO, Pest, Herb
6x 40ml VOA	HCl	GRO, VOC
1x 500ml Poly	HNO_3	Metals

WELL PURGING DATA

Date	12/5/12	Well Depth (ft. BTOC)	30 ft
Time Started	0845	Depth to Water (ft BTOC)	NA
Time Completed	0948	Water Column Length	
Hnu Measurements		Volume of Water in Well (gal)	
Background	NA	Casing Volumes to Purge	
Breathing Zone	↓	Minimum to Purge (gal)	
Well Head		Actual Purge (gal)	↓

FIELD MEASUREMENTS

Time	Amount Purged (gal)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
0857	2.4L	5.29					852.5
0914	4.5L	5.18					232.8
0920	6.3L	5.16					171.6
0930	9.3L	5.06					56.6
0948	14.7L	5.00					7.8

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	NA	
Water Quality Meter	YSI 6920 VL	12/5/12

GENERAL COMMENTS

Tubing intake @ 28 ft bgs

- purge & Sample collection rate 300 mL/min

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME JBA SWMU56 PROJECT NO. J110202.PA.0

SAMPLE NO. SWMU56-~~AQF01~~ AQFB01 WELL NO. NA

DATE/TIME COLLECTED 12/3/12 @ 1515 PERSONNEL Paul Raymaker, Amanda Maloney

SAMPLE METHOD ~~Pump~~ Direct flow H2O Tank

SAMPLE MEDIA:	Groundwater	Surface Water	(Source Water)
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO.
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.
MS/MSD REQUESTED	YES	NO	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
10x 1L Amber	None	DRO, PCB, PAH, Pest, Herb
6x 40ml VOA	HCl	GRO, VOC
1 V 500ml Poly	HNO_3	Metals

WELL PURGING DATA

Date	NA	Well Depth (ft. BTOC)	
Time Started		Depth to Water (ft BTOC)	
Time Completed		Water Column Length	
Hnu Measurements		Volume of Water in Well (gal)	
Background		Casing Volumes to Purge	
Breathing Zone		Minimum to Purge (gal)	
Well Head		Actual Purge (gal)	

FIELD MEASUREMENTS

Time	Amount Purged (gal)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
NA	NA	NA	NA	NA	NA	NA	NA

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	NA	
Water Quality Meter	NA	

GENERAL COMMENTS

Field Blank

WATER SAMPLE COLLECTION FIELD SHEET

GENERAL INFORMATION

SITE NAME JBA SWMU56 PROJECT NO. J1102.02.PA.0

SAMPLE NO. SWMU56-AQEB01 WELL NO. NA

DATE/TIME COLLECTED 12/4/12 @ 1430 PERSONNEL Paul Rapstine

SAMPLE METHOD

SAMPLE MEDIA:	Groundwater	Surface Water	DI water/Equip Blank
SAMPLE QA SPLIT:	YES	NO	SPLIT SAMPLE NO. NA
SAMPLE QC DUPLICATE:	YES	NO	DUPLICATE SAMPLE NO.
MS/MSD REQUESTED	YES	NO	

SAMPLE CONTAINERS, PRESERVATIVES, ANALYSIS

Sample Container	Preservative	Analysis Requested
10x 1L Amber	None	DRO PAH PCB Pest Herb
6x 40mL VOA	HCl	GRO VOC
1x 500mL Poly	HNO3	Metals

WELL PURGING DATA

Date	NA	Well Depth (ft. BTOC)	
Time Started		Depth to Water (ft BTOC)	
Time Completed		Water Column Length	
Hnu Measurements		Volume of Water in Well (gal)	
Background		Casing Volumes to Purge	
Breathing Zone		Minimum to Purge (gal)	
Well Head		Actual Purge (gal)	

FIELD MEASUREMENTS

Time	Amount Purged (gal)	pH	Temperature (°C)	Conductivity (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	Turbidity (NTU's)
NA							

FIELD EQUIPMENT AND CALIBRATION

	Model	Calibration
Water Level Probe	NA	
Water Quality Meter	NA	

GENERAL COMMENTS Groundwater Equipment blank

Appendix C-4

Investigation-Derived Waste Disposal Documentation

010968755

CVCC ~~173465~~

CleanVenture/CycleChem

The Environmental Services Source

NON-HAZARDOUS SOLID WASTE

BILL OF LADING

Generator's Name and Mailing Address: JOINT BASE ANDREWS, 3466 NORTH CAROLINA AVE, ANDREWS AFB, MD 20762, ATTN: KEITH FREIHOFER

Generator's Phone: 301 858 3422

BOL: SAME

Transporter 1 Company Name: Clean Venture, Inc.

State Trans. ID-NJDEPE:

Decal No.-

Transporter's Phone (410) 368-9170

Transporter 2 Company Name:

State Trans. ID-NJDEPE:

Decal No.-

Transporter's Phone ( )

Designated Facility Name and Site Address: Cycle Chem, Inc., 550 Industrial Drive, Lewisberry, PA 17339

10. US EPA ID Number: PAD067098822

Facility's Phone (717) 938-4700

	US DOT Description (Including Proper Shipping Name, Hazard Class or Division, ID Number and Packing Group)	Containers No.	Containers Type	Total Quantity	Unit Wt/Vol	Waste No.
a.	Non DOT/EPA Regulated Material (PURGE WATER)	X15	DM	X5100	P	None
b.	NON DOT/EPA REGULATED MATERIAL (SOIL CUTTINGS)	X5	DM	X2000	P	NONE
c.	NON DOT/EPA REGULATED MATERIAL (SLUDGE)	X11	DM	X2100	P	NONE
d.						

J. Additional Descriptions for Materials Listed Above

a. LF-05-5, OWC3640-3, SS-27-2, SWMU-58-T-2, SWMU-60-1, BABEWIDECSM-3

b. BABE WIDE CSM-5

c. BABEWIDECSM-11

CCI Generator # and Product Codes:

Job# 46057.04.09

CVB - NEW

24 hour Emergency Response Phone # (410) 368-9170

a)

GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and are non-hazardous by USEPA & applicable state regulations.

PLACARDS REQUIRED: NO

PLACARDS SUPPLIED: ☐ YES ☒ NO- FURNISHED BY CARRIER

GENERATOR

Printed/Typed Name	Signature	Month Day Year
		9.26.13

TRANSPORTER

Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
ANDREW FEESER	Andrew Feeser	9.26.13

Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

FACILITY

Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest.

Printed/Typed Name	Signature	Month Day Year

SIGNATURE AND INFORMATION *MUST* BE LEGIBLE ON ALL COPIES

COPY 1 - WHITE - GENERATOR COPY 2 - PINK - TRANSPORTER COPY 3 - BLUE - CycleChem COPY 4 - CANARY - FACILITY

www.cyclechem.com

Cycle Chem, Inc.

217 South 1st St.
Elizabeth, NJ 07206
Phone: (908) 355-5800
Fax: (908) 355-0562

550 Industrial Dr.
Lewisberry, PA 17339
Phone: (717) 938-4700
Fax: (717) 938-3301

General Chemical Corporation

133-138 Leland St., Framingham, MA 01701
Phone: (508) 872-5000 Fax: (508) 875-5271

Material Profile Sheet
Gencode - Stream: ____ - ____
Process Code: ____

A. GENERATOR INFORMATION

EPA ID # MD0 570 024 000
GENERATOR NAME ANDREWS AIR FORCE BASE
MAILING ADDRESS 3466 NORTH CAROLINA AVE
ANDREWS AFB MD 20762
GENERATOR CONTACT PATRICIA GRAY
GENERATOR PHONE # 301 858 3472
SITE ADDRESS SAME
PICKUP COUNTY

BILLING COMPANY CUI-04
BILLING ADDRESS
BILLING CONTACT CHUCK PAGANO
BILLING PHONE # ____ FAX ____

PROCESS GENERATING WASTE: WELL DRILLING
NAME OF WASTE: WATER

B. PHYSICAL CHARACTERISTICS OF WASTE (AT 70o F)

Color/Physical Description: VARIES
Strong Incidental Odor Present? ○ Yes ◎ No
Wastewater: ○ Wastewater ◎ Non-wastewater
Specific Gravity: ____

Physical State: ☐ Single Phase ☐ Solid ☐ Gas/Aerosol ☐ Bi-Layered ☒ Liquid ☐ Lab Pack ☐ Multi-Layered ☐ Semi-Solid ☐ Powder ☐ Sludge

Liquid/Solid/Sludge
% Liquid 100
% Suspended Solids ____
% Sludge ____
% Solid ____
Dumpable? ○ Yes ○ No
Pumpable? ○ Yes ○ No
Pourable? ○ Yes ○ No

Flash Point: ○ Flash Point <74 F ○ Flash Point 101-140 F ○ Flash Point >200 F ○ Exact Flash Point: ____
○ Flash Point 74-100 F ○ Flash Point 141-200 F ◎ No Flash Point
○ Open cup ◎ Closed cup

Ignitable Solid? ○ Yes ◎ No
pH: ○ <2.0 ○ 2.01-5.0 ◎ 5.01-9.0 ○ 9.01-12.49 ○ >12.5 ○ Exact pH ____

C. CHEMICAL COMPOSITION

ATTACHMENTS: ☐ MSDS attached ☐ Supplemental Analysis ☐ Additional Information ☐ LDR Attachment

Chemical Composition	Percent	Minimum	Maximum
WATER FROM WELL DRILLING	100		

D. REGULATORY INFORMATION

Is it USEPA haz waste? ○ Yes ◎ No
USEPA Haz Codes: ____
EPA Sub Categories: ____
Is it STATE waste? ○ Yes ◎ No
STATE Haz Codes: ____
DOT Hazardous Material? ○ Yes ◎ No
Proper Shipping Name: NON DOT/EPA REGULATED MATERIAL
Hazard Class: ____ UN/NA #: N.A. P.G.: ____
RQ: ____ ERG#: ____

E. SHIPPING INFORMATION

Shipment Method:
○ Bulk Liquid - Tanker ○ Pallet(s) ◎ Drum(Size): 55G
○ Bulk Solid - Dmp Tlr ○ Tote(s)
○ Bulk Solid - Roll Off ○ Cubic Yard Box(s) ○ Other(Size): ____

Anticipated Volume: 10 Per YR
Quantity: ____ Price: ____ / Unit: ____

F. SPECIAL HANDLING CONSIDERATIONS

☐ Radioactive ☐ PA RW SQG ☐ No Land Filling
☐ Etiologic/Medical Waste ☐ DRMS/DRMO Waste ☐ Incinerate Only
☐ Fuming ☐ CERCLA Waste ☐ Recycle Only
☐ Phenolics ☐ Asbestos ☐ Other:

Indicate if waste contains any of the following:

	Non-Reg.	or Less Then	or Actual
PCBs	☒	☐ 50 PPM	
Cyanides	☒	☐ 250 PPM	
Phenolics	☒	☐ 50 PPM	
Sulfides	☒	☐ 500 PPM	
VOCs	☐	☐ 500PPM	
Chlorides	☒	☐ 1000 PPM	

G. TRANSPORTER ARRANGEMENTS

○ CCI/GCC Provides Transportation
○ Customer Delivers to CCI/GCC
○ Customer Delivers to End Facility via CCI/GCC
◎ Other: CUB

H. OTHER HAZARDOUS CHARACTERISTICS

☐ RCRA REACTIVE ☐ ETIOLOGICAL ☐ EXPLOSIVE/SHOCK SENSITIVE
☐ WATER REACTIVE ☐ TSCA REG ☒ NONE OF THE ABOVE
☐ RADIOACTIVE ☐ OXIDIZING MAT'L
☐ SUBJECT TO SUBPART FF BENZENE REG ☐ PYROPHORIC

1. Is this waste characteristically hazardous for metals or organics (EPA Waste Codes D004 through D043)? ○ Yes ○ No
If YES, please list the constituents and concentrations in section C.

2. Does this waste contain underlying hazardous constituents as defined in 40 CFR 268 Part 2, Section I at concentrations exceeding the UTS treatment standards? ○ Yes ○ No
If YES, please list the constituents and concentrations in section C.

GENERATOR CERTIFICATION: I hereby certify that all information submitted in this and all other attached documents is complete, contains true and accurate descriptions and is representative of the waste material, and that all relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. If CCI/GCC discovers, after having taken the delivery of the waste, that any waste does not conform to the identification or descriptions contained in this MPS then CCI/GCC shall provide notice to Generator and coordinate the return of the non conforming waste to the point of origin as set forth in the manifest or to such other locations designated in writing by the Generator. Generator agrees to reimburse CCI/GCC for all handling, packaging, cleanup and transportation costs or charges, damage to equipment and costs associated with lost time incurred by CCI/GCC during the receipt, handling, temporary storage and return of such non conforming waste to its point of origin or to such other location designated by the Generator. I hereby authorize CCI/GCC to amend and/or correct any information on the MPS with the full understanding that if any amendment or correction is performed, I will be contacted as such to issue any approval.

Authorized Signature: X Title: ILCES/CEIER Date: 9/26/13

CCI/GCC APPROVAL	Sales Code	Tech Initials ____ Date ____	Management Initials ____ Date ____	Residual Waste / Form Code:
	____			____

CCI

www.cyclochem.com

Cycle Chem, Inc.

217 South 1st St.
Elizabeth, NJ 07206
Phone: (908) 355-5800
Fax: (908) 355-0562

550 Industrial Dr.
Lewisberry, PA 17339
Phone: (717) 938-4700
Fax: (717) 938-3301

General Chemical Corporation

133-138 Leland St., Framingham, MA 01701
Phone: (508) 872-5000 Fax: (508) 875-5271

Material Profile Sheet
Gencode - Stream: _____ - _____
Process Code: _____

A. GENERATOR INFORMATION

EPA ID # MD0 570 024 000
GENERATOR NAME ANDREWS AIR FORCE BASE
MAILING ADDRESS 3466 NORTH CAROLINA AVE
ANDREWS AFB MD 20762
GENERATOR CONTACT PATRICIA GRAY
GENERATOR PHONE # 301 858 3472
SITE ADDRESS _____
SAME
PICKUP COUNTY _____

BILLING COMPANY CCI 04
BILLING ADDRESS _____
BILLING CONTACT CHUCK PAGANO
BILLING PHONE # _____ FAX _____

PROCESS GENERATING WASTE: WELL DRILLING
NAME OF WASTE: SLUDGE

B. PHYSICAL CHARACTERISTICS OF WASTE (AT 70o F)

Color/Physical Description: LIGHT GRAY
Strong Incidental Odor Present? ○ Yes ◉ No
Wastewater: ○ Wastewater ○ Non-wastewater
Specific Gravity: _____

Physical State: ☐ Single Phase ☐ Solid ☐ Gas/Aerosol ☐ Bi-Layered ☐ Liquid ☐ Lab Pack ☐ Multi-Layered ☐ Semi-Solid ☐ Powder ☑ Sludge

Liquid/Solid/Sludge
% Liquid _____
% Suspended Solids _____
% Sludge 100
% Solid ~~100~~
Dumpable? ◉ Yes ○ No
Pumpable? ○ Yes ○ No
Pourable? ○ Yes ○ No

Flash Point: ○ Flash Point <74 F ○ Flash Point 74-100 F ○ Flash Point 101-140 F ○ Flash Point 141-200 F ○ Flash Point >200 F ◉ No Flash Point ○ Exact Flash Point: _____
○ Open cup ◉ Closed cup

Ignitable Solid? ○ Yes ◉ No
pH: ○ <2.0 ○ 2.01-5.0 ◉ 5.01-9.0 ○ 9.01-12.49 ○ >12.5 ○ Exact pH _____

C. CHEMICAL COMPOSITION

ATTACHMENTS: ☐ MSDS attached ☐ Supplemental Analysis ☐ Additional Information ☐ LDR Attachment

Chemical Composition	Percent	Minimum	Maximum
SOIL	50	50%	
SLUDGE			
WATER	50	50%	
		100	

D. REGULATORY INFORMATION

Is it USEPA haz waste? ○ Yes ◉ No
USEPA Haz Codes: _____
EPA Sub Categories: _____
Is it STATE waste? ○ Yes ◉ No
STATE Haz Codes: _____
DOT Hazardous Material? ○ Yes ◉ No
Proper Shipping Name: ~~NON DOT/ EPA~~ ~~REGULATED UNDER~~
Hazard Class: _____ UN/NA #: N/A P. G.: _____
RQ: _____ ERG#: _____

E. SHIPPING INFORMATION

Shipment Method:
○ Bulk Liquid - Tanker ○ Pallet(s) ◉ Drum(Size): 55G
○ Bulk Solid - Dmp Tlr ○ Tote(s)
○ Bulk Solid - Roll Off ○ Cubic Yard Box(s) ○ Other(Size): N/A
Anticipated Volume: 10 Per YR
Quantity: _____ Price: _____ / Unit: _____

F. SPECIAL HANDLING CONSIDERATIONS

☐ Radioactive ☐ Etiologic/Medical Waste ☐ Fuming ☐ Phenolics
☐ PA RW SQG ☐ DRMS/DRMO Waste ☐ CERCLA Waste ☐ Asbestos
☐ No Land Filling ☐ Incinerate Only ☐ Recycle Only ☐ Other:

G. TRANSPORTER ARRANGEMENTS

○ CCI/GCC Provides Transportation ◉ Other:
○ Customer Delivers to CCI/GCC
○ Customer Delivers to End Facility via CCI/GCC

H. OTHER HAZARDOUS CHARACTERISTICS

☐ RCRA REACTIVE ☐ WATER REACTIVE ☐ RADIOACTIVE ☐ SUBJECT TO SUBPART FF BENZENE REG
☐ ETIOLOGICAL ☐ TSCA REG ☐ OXIDIZING MATL ☐ PYROPHORIC
☐ EXPLOSIVE/SHOCK SENSITIVE ☑ NONE OF THE ABOVE

Indicate if waste contains any of the following:

	Non-Reg.	or Less Than		or Actual
PCBs	☑	☐	50 PPM	
Cyanides	☑	☐	250 PPM	
Phenolics	☑	☐	50 PPM	
Sulfides	☑	☐	500 PPM	
VOCs	☑	☐	500PPM	
Chlorides	☑	☐	1000 PPM	

1. Is this waste characteristically hazardous for metals or organics (EPA Waste Codes D004 through D043)? ○ Yes ◉ No
If YES, please list the constituents and concentrations in section C.

2. Does this waste contain underlying hazardous constituents as defined in 40 CFR 268 Part 2, Section I at concentrations exceeding the UTS treatment standards? ○ Yes ◉ No
If YES, please list the constituents and concentrations in section C.

GENERATOR CERTIFICATION: I hereby certify that all information submitted in this and all other attached documents is complete, contains true and accurate descriptions and is representative of the waste material, and that all relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. If CCI/GCC discovers, after having taken the delivery of the waste, that any waste does not conform to the identification or descriptions contained in this MPS then CCI/GCC shall provide notice to Generator and coordinate the return of the non conforming waste to the point of origin as set forth in the manifest or to such other locations designated in writing by the Generator. Generator agrees to reimburse CCI/GCC for all handling, packaging, cleanup and transportation costs or charges/damage to equipment and costs associated with lost time incurred by CCI/GCC during the receipt, handling, temporary storage and return of such non conforming waste to its point of origin or to such other location designated by the Generator. I hereby authorize CCI/GCC to amend and/or correct any information on the MPS with the full understanding that if any amendment or correction is performed, I will be contacted as such to issue any approval.

Authorized Signature _____ Title 11 CES/CEIER Date 9/26/17

CCI/GCC APPROVAL	Sales Code	Tech Initials	Date	Management Initials	Date	Residual Waste / Form Code
	_____	_____	_____	_____	_____	_____

Cycle Chem, Inc.

217 South 1st St.
Elizabeth, NJ 07206
Phone: (908) 355-5800
Fax: (908) 355-0562

550 Industrial Dr.
Lewisberry, PA 17339
Phone: (717) 938-4700
Fax: (717) 938-3301

www.cyclechem.com

General Chemical Corporation

133-138 Leland St., Framingham, MA. 01701
Phone: (508) 872-5000 Fax: (508) 875-5271

Material Profile Sheet
Gencode - Stream: _____
Process Code: _____

A. GENERATOR INFORMATION

EPA ID # MD0 570 024 000
GENERATOR NAME ANDREWS AIR FORCE BASE
MAILING ADDRESS 3466 NORTH CAROLINA AVE
ANDREWS AFB MD 20762
GENERATOR CONTACT PATRICIA GRAY
GENERATOR PHONE # 301 858 3472
SITE ADDRESS SAME
PICKUP COUNTY

BILLING COMPANY CCI-04
BILLING ADDRESS
BILLING CONTACT CHUCK PAGANO
BILLING PHONE # _____ FAX _____

PROCESS GENERATING WASTE: WELL DRILLING
NAME OF WASTE: SOIL CUTTINGS

B. PHYSICAL CHARACTERISTICS OF WASTE (AT 70o F)

Color/Physical Description: LIQUID
Strong Incidental Odor Present? ○ Yes ◉ No
Wastewater: ○ Wastewater ○ Non-wastewater
Specific Gravity: _____
Physical State: ☐ Single Phase ☑ Solid ☐ Gas/Aerosol ☐ Bi-Layered ☐ Liquid ☐ Lab Pack ☐ Multi-Layered ☐ Semi-Solid ☐ Powder ☐ Sludge

Liquid/Solid/Sludge
% Liquid _____
% Suspended Solids _____
% Sludge _____
% Solid 100
Dumpable? ◉ Yes ○ No
Pumpable? ○ Yes ○ No
Pourable? ○ Yes ○ No

Flash Point: ○ Flash Point <74 F ○ Flash Point 74-100 F ○ Flash Point 101-140 F ○ Flash Point 141-200 F ○ Flash Point >200 F ◉ No Flash Point ○ Exact Flash Point: _____ ○ Open cup ◉ Closed cup
Ignitable Solid? ○ Yes ◉ No
pH: ○ <2.0 ○ 2.01-5.0 ◉ 5.01-9.0 ○ 9.01-12.49 ○ >12.5 ○ Exact pH _____

C. CHEMICAL COMPOSITION

ATTACHMENTS: ☐ MSDS attached ☐ Supplemental Analysis ☐ Additional Information ☐ LDR Attachment

Chemical Composition	Percent	Minimum	Maximum
SOIL CUTTINGS	100		

D. REGULATORY INFORMATION

Is it USEPA haz waste? ○ Yes ◉ No
USEPA Haz Codes: _____
EPA Sub Categories: _____
Is it STATE waste? ○ Yes ◉ No
STATE Haz Codes: _____
DOT Hazardous Material? ○ Yes ◉ No
Proper Shipping Name: NON DOT / EPA ~~REGULATED~~
Hazard Class: _____ UN/NA #: NA P.G.: _____
RQ: _____ ERG#: _____

E. SHIPPING INFORMATION

Shipment Method:
○ Bulk Liquid - Tanker ○ Pallet(s) ◉ Drum(Size): 55
○ Bulk Solid - Dmp Tlr ○ Tote(s)
○ Bulk Solid - Roll Off ○ Cubic Yard Box(s) ○ Other(Size): _____
Anticipated Volume: 15 Per YR
Quantity: _____ Price: _____ / Unit: _____

F. SPECIAL HANDLING CONSIDERATIONS

☐ Radioactive ☐ PA RW SQG ☐ No Land Filling
☐ Etiologic/Medical Waste ☐ DRMS/DRMO Waste ☐ Incinerate Only
☐ Fuming ☐ CERCLA Waste ☐ Recycle Only
☐ Phenolics ☐ Asbestos ☐ Other:

Indicate if waste contains any of the following:

	Non-Reg.	or Less Than		or Actual
PCBs	☒	☐	50 PPM	
Cyanides	☒	☐	250 PPM	
Phenolics	☒	☐	50 PPM	
Sulfides	☒	☐	500 PPM	
VOCs	☒	☐	500PPM	
Chlorides	☒	☐	1000 PPM	

G. TRANSPORTER ARRANGEMENTS

○ CCI/GCC Provides Transportation
○ Customer Delivers to CCI/GCC
○ Customer Delivers to End Facility via CCI/GCC
◉ Other: CUB

H. OTHER HAZARDOUS CHARACTERISTICS

☐ RCRA REACTIVE ☐ ETIOLOGICAL ☐ EXPLOSIVE/SHOCK SENSITIVE
☐ WATER REACTIVE ☐ TSCA REG ☐ NONE OF THE ABOVE
☐ RADIOACTIVE ☐ OXIDIZING MATL
☐ SUBJECT TO SUBPART FF BENZENE REG ☐ PYROPHORIC

1. Is this waste characteristically hazardous for metals or organics (EPA Waste Codes D004 through D043)? ○ Yes ○ No
If YES, please list the constituents and concentrations in section C.

2. Does this waste contain underlying hazardous constituents as defined in 40 CFR 268 Part 2, Section I at concentrations exceeding the UTS treatment standards? ○ Yes ○ No
If YES, please list the constituents and concentrations in section C.

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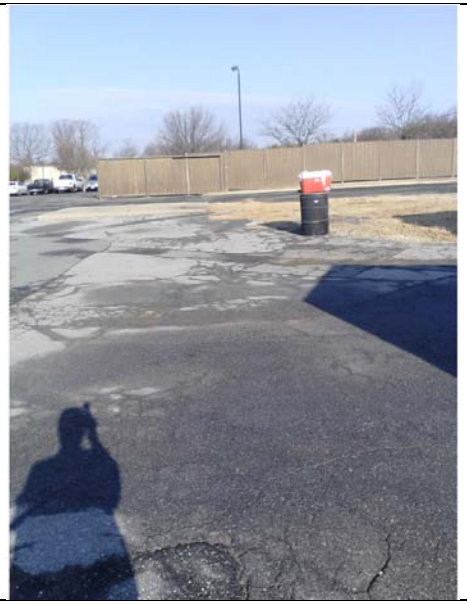
Authorized Signature _____ Title ENGINEER Date 9/26/17

CCI/GCC APPROVAL	Sales Code	Tech Initials	Date	Management Initials	Date	Residual Waste / Form Code

Appendix C-5

Photo Log

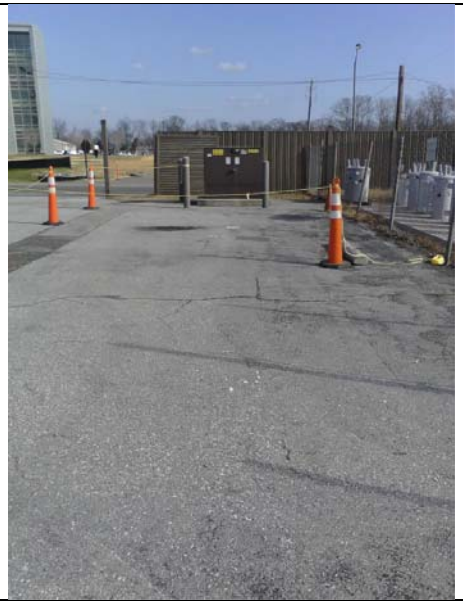


View of:	SB-01
Facing:	North

View of:	SB-02 (foreground) and SB-03 (background)
Facing:	South

View of:	SB-04
Facing:	North

View of:	TMW-08
Facing:	East

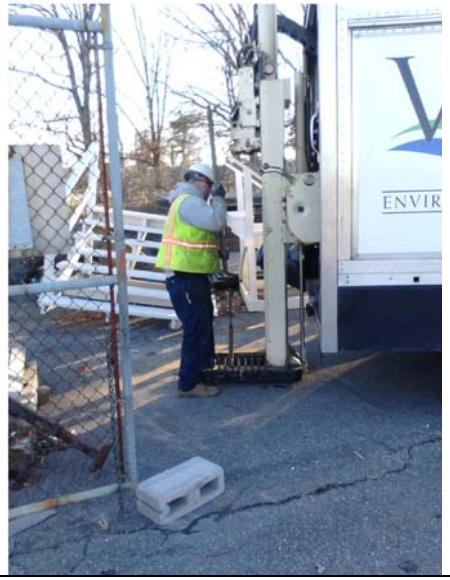


View of:	TMW-07
Facing:	East

View of:	TMW-09, TMW-01, TMW-02, TMW-03 (foreground to background)
Facing:	West

View of:	TMW-05, TMW-04 (front to back)
Facing:	West

View of:	TMW-03
Facing:	West



View of:	Drilling SWMU56-TMW07

View of:	Purging SWMU56-TMW09

View of:	SWMU56-TWM01, Initial Purge

View of:	SWMU56-TMW01, Final Purge

			
View of:	SWMU56-TWM02, Initial Purge	View of:	SWMU56-TMW02, Final Purge
			
View of:	SWMU56-TWM03, Initial Purge	View of:	SWMU56-TMW03, Final Purge

			
View of:	SWMU56-TWM04, Initial Purge	View of:	SWMU56-TMW04, Final Purge

			
View of:	SWMU56-TWM05, Initial Purge	View of:	SWMU56-TMW05, Final Purge

			
View of:	SWMU56-TWM06, Initial Purge	View of:	SWMU56-TMW06, Final Purge
			
View of:	SWMU56-TWM07, Initial Purge	View of:	SWMU56-TMW07, Final Purge

			
View of:	SWMU56-TWM08, Initial Purge	View of:	SWMU56-TMW08, Final Purge
			
View of:	SWMU56-TWM09, Initial Purge	View of:	SWMU56-TMW09, Final Purge

Appendix D

Data Validation Report

Laboratory Analytical Data Validation

Site: JBA SWMU 56
Date Completed: 01-11-2013
Submitted by: Nancy McDonald
Sample Collection Date(s): 12-03-2012 and 12-04-2012
TestAmerica Project Number(s) (LPN): 280-36632-1
Bay West DMS #: 1604991

This data validation memo describes the validation of 6 aqueous samples, 4 soil samples, one Field Blank, one Equipment Blank, and one Trip Blank collected on December 3 and 4, 2012 and analyzed for VOCs (8260B), SVOCs (SW-846 8270C), PAHs (8270-SIM), Organochlorine Pesticides (8081B), PCBs (8082A), Herbicides (8151A), GRO and DRO (8015C), and TAL Metals (6010B, 6020A, 7470A, and 7471B) at TestAmerica Laboratory in Denver, Colorado as sample delivery group (SDG) 280-36632-1. Samples included as part of this validation are listed below:

Sample ID	Date Sampled	TestAmerica, Denver					
		Lab ID	*VOC*	*SVOCs PAHs*	*Herbicides Pesticides PCBs*	*DRO / GRO*	*TAL Metals*
SWMU56-SB-01	12/03/2012	36632-1			X		
SWMU56-SB-02	12/03/2012	36632-2			X		
SWMU56-SB-03	12/03/2012	36632-3			X		
SWMU56-SB-04	12/03/2012	36632-4			X		
SWMU56-TMW07-SO01	12/04/2012	36632-5	X	X	X	X	X
SWMU56-TMW06-GW01	12/04/2012	36632-6	X	X	X	X	X
SWMU56-TMW08-GW02	12/04/2012	36632-7	X	X	X	X	X
SWMU56-TMW07-GW03	12/04/2012	36632-8	X*	X*	X*	X	X
SWMU56-TMW05-GW04	12/04/2012	36632-9	X	X	X	X	X
SWMU56-AQFB01	12/04/2012	36632-10	X	X	X	X	X
SWMU56-AQEB01	12/04/2012	36632-11	X	X	X	X	X
SWMU56-AQTB01	12/03/2012	36632-12	X				

* - Sample selected for MS/MSD analysis

The Data Qualification Summary Table below summarizes the qualifications that were applied during validation:

Sample ID	Date Sampled	TestAmerica, Denver							
		Lab ID	*VOC*	*SVOCs*	*PAHs*	*Pesticides, PCBs*	*Herbicides*	*DRO/GRO*	*TAL Metals*
SWMU56-SB-01	12/03/2012	36632-1				J: delta-BHC UJ: Toxaphene	UJ: All herbicides		
SWMU56-SB-02	12/03/2012	36632-2				J: delta-BHC J: Heptachlor epoxide J: 4,4'-DDE J: 4,4'-DDT UJ: Toxaphene	UJ: Dinoseb		
SWMU56-SB-03	12/03/2012	36632-3				J: Heptachlor epoxide UJ: Toxaphene	UJ: Dinoseb		
SWMU56-SB-04	12/03/2012	36632-4				UJ: Toxaphene	UJ: Dinoseb		
SWMU56-TMW07-SO01	12/04/2012	36632-5	U: Bromoform			UJ: Toxaphene	UJ: Dinoseb		
SWMU56-TMW06-GW01	12/04/2012	36632-6	U: Methylene chloride	U: bis(2-Ethylhexyl)phthalate	U: Benzo(a)anthracene U: Benzo(b)fluoranthene U: Phenanthrene	UJ: Toxaphene		UJ: GRO	U: Copper
SWMU56-TMW08-GW02	12/04/2012	36632-7			U: Benzo(b)fluoranthene	UJ: Toxaphene			U: Copper U: Zinc
SWMU56-TMW07-GW03	12/04/2012	36632-8			U: Benzo(b)fluoranthene	UJ: Toxaphene	J: MCPP	U: GRO	
SWMU56-TMW05-GW04	12/04/2012	36632-9		U: bis(2-Ethylhexyl)phthalate	J: Anthracene UJ: Benzo(a)anthracene J: Benzo(b)fluoranthene J: Benzo(k)fluoranthene UJ: Benzo(a)pyrene J: Benzo(g,h,i)perylene UJ: Chrysene J: Dibenz(a,h)anthracene UJ: Fluoranthene J: Indeno(1,2,3-cd)pyrene J: Naphthalene	UJ: Toxaphene	J: MCPP	UJ: GRO	U: Copper

Sample ID	Date Sampled	TestAmerica, Denver							
					UJ: Phenanthrene UJ: Pyrene				
SWMU56-AQFB01	12/04/2012	36632-10	U: Methylene chloride	UJ: 2,4-Dichlorophenol UJ: 2,4-Dimethylphenol UJ: 2,4-Dinitrophenol UJ: 2,6-Dichlorophenol UJ: 4,6-Dinitro-2-methylphenol UJ: 4-Chloro-3-methylphenol UJ: 4-Nitrophenol UJ: 2-Chlorophenol UJ: 2-Methylphenol UJ: 2-Nitrophenol UJ: Phenol UJ: Pentachlorophenol UJ: 2,4,5-Trichlorophenol UJ: 2,4,6-Trichlorophenol	U: Benzo(a)anthracene U: Benzo(b)fluoranthene U: Benzo(k)fluoranthene U: Benzo(g,h,i)perylene U: Chrysene U: Fluoranthene U: Phenanthrene	UJ: Toxaphene			
SWMU56-AQEB01	12/04/2012	36632-11	U: Methylene chloride		U: Benzo(a)anthracene U: Benzo(b)fluoranthene U: Benzo(g,h,i)perylene U: Chrysene	UJ: Toxaphene			
SWMU56-AQTB01	12/03/2012	36632-12	U: Methylene chloride						

Validation was conducted according to this hierarchy of validation guidance: USACE EM200-1-10 Guidance for Evaluating Performance-Based Chemical Data June 2005 (USACE, 2005), DoD Quality Systems Manual for Environmental Laboratories, v 4.2, October 2010 (DoD, 2010), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (USEPA, 2008), USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2010). The QAPP and analytical methods were consulted during the data validation.

A Level II ADR was also performed on this data and the qualifiers summary report is included in Attachment 1. Target analytes present between the LOQ and MDL were flagged "J" as estimated. In addition, detected pesticide results were qualified "J" as estimated and non-detected results were qualified "R" as rejected in sample SWMU56-SB04. This sample was analyzed at a 20-fold dilution, so no qualifications were applied, because of low surrogate recoveries.

Data Validation Detail:

- **Data Package Completeness**

  The Level IV data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the method. The data package is complete.

- **Laboratory Case Narrative/Cooler Receipt Form**

  No anomalies were noted on the chain-of-custody (CoC) or cooler receipt forms that affected data quality. The laboratory case narrative was accurate and complete and documented that a revised CoC was received from Bay West requesting SVOC analysis plus TICs for selected samples and updated sample IDs.

- **Holding Times, Storage, and Preservation**

  Review of the sample collection and analysis dates involved comparing the CoCs, the summary forms, and the data report for holding time compliance.

  All samples were received correctly, intact and properly preserved with one exception. One of the 1 liter amber bottles for sample SWMU56-TMW07-GW03 was received at the laboratory broken. Sufficient volume remained to proceed with the requested analyses. All samples were prepared and analyzed within the turnaround time required by the project except for the following. SVOC sample SWMU56-AQFB01 was originally extracted within the 7-day holding time; however, the sample was re-extracted outside the holding time due to low surrogate recoveries. PAH sample SWMU56-TMW05-GW04 was originally extracted within the 7-day holding time, but was re-extracted outside holding time due to a high surrogate recovery. No action was required, because the original results were reported in the validated results tables.

- **Instrument Performance Check**

  The instruments met all applicable performance check requirements. The instrument performance check included verification of 4-Bromofluorobenzene (BFB) tunes for VOC

and Decafluorotriphenylphosphine (DFTPP) for PAHs and SVOCs. All samples were analyzed within 12 hours of the BFB and DFTPP tunes.

- **Initial Calibration (ICAL) / Initial Calibration Verification (ICV)**

  ICAL and ICV acceptance criteria were met for all parameters except for the following.

  Pesticide: In the ICAL (12/14/2012), R^2 for 4,4'-DDD (0.989) was below the criterion of 0.990 on column CLP2. No action was required, because R^2 met the criterion on column CLP1. In the ICVs (11/15/2012 and 12/12/2012), % differences for several peaks exceeded the criterion of 15% on both columns with low bias. Toxaphene results were qualified "UJ" as estimated in all samples.

- **Continuing Calibration Verification (CCV)**

  CCV acceptance criteria were met for all parameters with the following exception:

  VOCs: In the CCV (12/07/2012 18:31), % Differences for Chloroethane (23.1%) and Chloromethane (23.3%) were high and outside acceptance criteria of ≤ 20%. No qualifications were required, because of potential high bias and the associated samples were non-detect for Chloroethane and Chloromethane.

  Pesticides: CCV (12/17/2012 21:41) % differences for several Toxaphene peaks were outside acceptance criteria of ≤ 15% on both columns. Toxaphene results were qualified "UJ" as estimated in samples SWMU56-SB01, SWMU56-SB02, SWMU56-SB03, and SWMU56-SB04. In the CCVs (12/18/2012 16:14 and 19:17), % differences for 4,4'-DDD were high and outside acceptance criteria of ≤ 15% on column CLP2. No action was required, because the % differences met criteria on column CLP1.

- **Pesticide Performance Evaluation Mixture (PEM)**

  In the Pesticide analysis, the % breakdown met the acceptance criterion of 15%.

- **CRQL Check Standard**

  All acceptance criteria were met for the CRQL Check Standards.

- **Interference Check Standard**

  The Interference Check Standards met method and DoD QSM acceptance criteria except for the following. The Cadmium and/or Nickel results were greater than the LOD in analytical batches 280-151248 and 280-152050. The laboratory flagged the associated results "Q", as required by DoD QSM. The validator removed the "Q" flag, because the vendor confirmed that Cadmium and Nickel are trace impurities in the ICSA solution.

- **Method Blank, Field Blank, Equipment Blank, and Trip Blank**

  Target analytes were not detected above ½ the Limit of Quantitation (LOQ) in the Method Blanks. However, the following anomalies were noted:

VOCs: Low-level concentrations of analytes < ½ the LOQs were detected in the Method Blanks as follows:

Method Blank ID	Analyte	Result	LOQ
151194/1-A	Bromoform	0.423 ug/kg	5.0 ug/kg
151466/6	1,2,3-Trichlorobenzene	0.252 ug/L	1.0 ug/L
	Methylene chloride	0.704 ug/L	5.0 ug/L
	Naphthalene	0.268 ug/L	1.0 ug/L

Results for Bromoform in sample SWMU56-TMW07-SO01 and Methylene Chloride in samples SWMU56-TMW06-GW01, SWMU56-AQFB01, SWMU56-AQEB01, and SWMU56-AQTB01 were qualified "U" and raised to the LOQ, because the results were < five times the blank concentrations. No further action was required, because 1,2,3-Trichlorobenzene and Naphthalene results were non-detect in the associated samples.

PAHs: Low-level concentrations of the following analytes were detected at concentrations < ½ the LOQs in the aqueous Method Blanks:

Blank ID	Analyte	Result (ug/L)	LOQ (ug/L)
MB 150870/1-A	Benzo(a)anthracene	0.0340	0.10
	Benzo(b)fluoranthene	0.0159	0.10
	Benzo(k)fluoranthene	0.0153	0.10
	Benzo(a)pyrene	0.0104	0.10
	Benzo(g,h,i)perylene	0.00518	0.10
	Chrysene	0.0354	0.10
	Fluoranthene	0.0300	0.15
	Phenanthrene	0.0119	0.10
	Pyrene	0.0341	0.10
MB 152138/2-A	Naphthalene	0.008332	0.10

The following results were qualified "U" and raised to the LOQ (as appropriate), because the results were < five times the blank concentration: Benzo(a)anthracene, Benzo(b)fluoranthene, and Phenanthrene in sample SWMU56-TMW06-GW01; Benzo(b)fluoranthene in samples SWMU56-TMW08-GW02 and SWMU56-TMW07-GW03; Benzo(a)anthracene, Benzo(a)pyrene, Chrysene, Fluoranthene, Phenanthrene, and Pyrene in sample SWMU56-TMW05-GW04; Benzo(a)anthracene; Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Chrysene, Fluoranthene, and Phenanthrene in sample SWMU56-AQFB01; and Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, and Chrysene in sample SWMU56-AQEB01. No further action was required, because results from the re-extraction and reanalysis of sample SWMU56-TMW05-GW04 associated with Method Blank MB 152138/2-A were not reported.

Metals: Low-level concentrations of Barium (0.725 ug/L) and Zinc (2.16 ug/L), < ½ the LOQs, were detected in Method Blank 151248/1-A. The result for Zinc in sample SWMU56-TMW08-GW02 was qualified "U" and raised to the LOQ, because the result was < five times the blank concentration. No further action was required, because Zinc results in all associated samples were > five times the blank concentration.

Equipment Blank and Trip Blank:

VOCs: Low-level concentrations of Acetone, Chlorodibromomethane, and/or Dibromomethane were detected in the equipment blank and trip blank samples. No action was warranted, because associated sample results were non-detect.

SVOCs: Low-level concentration of bis(2-Ethylhexyl)phthalate (2.1 ug/L) and Phenol (2.9 ug/L) were detected in the equipment blank sample SWMU56-AQEB01. Results for bis(2-Ethylhexyl)phthalate in samples SWMU56-TMW06-GW01 and SWMU56-TMW05-GW04 were qualified "U" and raised to the LOQ, because the results were < five times the equipment blank concentration. No further action was required, because Phenol was non-detect in the associated samples.

GRO: A low-level concentration of GRO, < ½ the LOQ, was detected in equipment blank sample SWMU56-AQEB01 (0.017 mg/L). GRO results were flagged "U" and raised to the LOQ in samples SWMU56-TMW06-GW01, SWMU56-TMW07-GW03, and SWMU56-TMW05-GW04, because the results were < five times the equipment blank concentration.

Metals: The following metals were detected in the Equipment Blank Sample:

Blank ID	Analyte	Result (ug/L)
SWMU56-AQEB01	Calcium	47
	Copper	0.89 J
	Manganese	0.42 J

Results for Copper were qualified "U" in samples SWMU56-TMW06-GW01, SWMU56-TMW08-GW02, and SWMU56-TMW05-GW04, because the results were < five times the equipment blank concentration. No further qualification was required, because Calcium and Manganese results were > five times the equipment blank concentrations.

Field Blank: Acetone, Chlorodibromomethane, Chloroform, Dibromomethane, Benzyl Alcohol, Naphthalene, GRO, DRO, Aluminum, Barium, Calcium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Sodium, and Zinc were detected in Field Blank sample SWMU56-AQFB01. No qualifications were applied based on the field blank contamination.

- **Surrogate Spikes**

  Surrogates were added to all samples and QC samples as required by the analytical method. All surrogate recoveries met the required QC criteria except for the following.

  SVOCs: Recoveries for surrogates 2-Fluorophenol (7%) and Phenol-d5 (5%) in sample SWMU56-AQFB01 were biased low and outside criteria of 20-110% and 10-115%,

respectively. Therefore, associated SVOC results were qualified "UJ" as estimated in sample SWMU56-AQFB01.

PAHs: The following Terphenyl-d14 recoveries were biased high and outside acceptance criteria.

Sample	Surrogate	%R	Criteria
SWMU56-TMW06-GW01	Terphenyl-d14	206	47-120
SWMU56-TMW05-GW04	Terphenyl-d14	150	47-120
Method Blank 150870/1-A	Terphenyl-d14	167	47-120
LCSD 150870/19-A	Terphenyl-d14	173	47-120
SWMU56-TMW07-GW03 MS	Terphenyl-d14	155	47-120

Sample SWMU56-TMW05-GW04 was re-extracted and reanalyzed and all surrogate recoveries met acceptance criteria. Associated results from the original analysis were reported, because of the exceeded holding time and qualified "J" as estimated and may be biased high in sample SWMU56-TMW05-GW04. No qualification was required for sample SWMU56-TMW06-GW01, because the surrogate recovery was high and associated sample results were non-detect. No further action was required, because the Method Blank was non-detect and all LCSD recoveries met acceptance criteria.

GRO: Recoveries for surrogate a,a,a-Trifluorotoluene in samples SWMU56-TMW06-GW01 (128%) and SWMU56-TMW05-GW04 (152%) were biased high and outside criteria of 82-110%. GRO results in samples SWMU56-TMW06-GW01 and SWMU56-TMW05-GW04 were qualified "J" as estimated and may be biased high. An overall qualifier of "UJ" was applied, because these results were previously qualified due to equipment blank contamination.

Pesticides: The recovery for surrogate Tetrachloro-m-Xylene (294%) on the back column was biased high and outside criteria of 70-125% in sample SWMU56-SB01. No action was required, because the recovery met criteria on the front column. In addition, surrogates were diluted out in sample SWMU56-SB04. No action was required due to this irregularity.

Herbicides: Recoveries for surrogate 2,4-Dichlorophenylacetic acid (DCPA) of 25% and 16% were biased low and outside criteria of 31-105% in sample SWMU56-SB01 on both GC columns. All herbicide results were qualified "UJ" as estimated in sample SWMU56-SB01. In addition, the DCPA recovery of 126% in sample SWMU56-SB02 was biased high and outside criteria on column DB35MS. No action was required, because no herbicides were detected in this sample and the surrogate met criteria on the other column.

- **Matrix Spike/Matrix Spike Duplicates (MS/MSD)**

VOCs: MS/MSD analyses were performed on sample SWMU56-TMW07-GW03. All recoveries and RPDs were within acceptance criteria except for the following. The MSD recovery for 1,1-Dichloroethene of 132% was biased high and outside criteria of 70-130%. No action was required, because 1,1-Dichloroethene was non-detect in the parent sample.

SVOCs: MS/MSD analyses were performed on sample SWMU56-TMW07-GW03. All recoveries and RPDs were within acceptance criteria.

PAHs: MS/MSD analyses were performed on sample SWMU56-TMW07-GW03. All recoveries and RPDs were within acceptance criteria.

GRO/DRO: MS/MSD analyses were performed on sample SWMU56-TMW07-GW03. All recoveries and RPDs were within acceptance criteria.

Pesticides/PCBs: MS/MSD analyses were performed on sample SWMU56-TMW07-GW03. All recoveries and RPDs were within acceptance criteria.

Herbicides: MS/MSD analyses were performed on sample SWMU56-TMW07-GW03. All recoveries and RPDs were within acceptance criteria except for the following. MSD recoveries for 2,4,5-T (114%) and Dinoseb (99%) were biased high and outside criteria of 35-110% and 20-95%, respectively. No qualification was required, because 2,4,5-T and Dinoseb were non-detect in the parent sample.

Metals: MS/MSD analyses were performed on sample SWMU56-TMW07-GW03. All recoveries and RPDs were within acceptance criteria.

- **Laboratory Control Sample (LCS)**

  All LCS recoveries were within the QAPP and the DoD QSM 4.2 acceptance criteria except for the following. In the herbicide analysis, LCS and LCSD recoveries for Dinoseb (8% and 6%) were biased low and outside QC limits of 5-166% in Preparation Batch 150882. Dinoseb results were qualified "UJ" as estimated and may be biased low in samples SWMU56-SB01, SWMU56-SB02, SWMU56-SB03, SWMU56-SB04, and SWMU56-TMW07-SO01. LCS recoveries for 2,4,5-T (115%) and 2,4-D (116%) were biased high and outside criteria of 35-110% and 35-115%, respectively, in Preparation Blank 150843. LCS recoveries for 2,4,5-T (101%) and 2,4-D (102%) were biased high and outside criteria of 24-98% and 32-97%, respectively, in Preparation Batch 150882. No qualification was required, because 2,4,5-T and 2,4-D were non-detect in the associated samples.

- **ICP Serial Dilution (Dilution Test) and Post-Digestion Spikes**

  All ICP Serial Dilution % differences and Post Digestion Spike (PDS) recoveries were with acceptance criteria.

- **Blind Field Duplicates**

  Blind field duplicates were not included in this SDG.

- **Internal Standards**

  All QC criteria were met for Internal Standards (IS) in all calibrations and all field samples.

- **Target Analyte Identification and Quantitation**

  Target compound identification followed the specific analytical Method. Retention times and Mass Spectra were consistent with the analytical standards. Appropriate wavelengths were chosen for the metals analysis in addition to appropriate interelement correction factors.

  In the pesticide analysis, samples SWMU56-SB02, SWMU56-SB03, and SWMU56-SB04 required Florisil cleanup to reduce matrix interference. In addition, RPDs between the primary and confirmation column exceed the QC control limit of ≤ 40% as follows.

Sample	Analyte	RPD

SWMU56-SB01	delta-BHC	190.1
SWMU56-SB02	delta-BHC	166.1
	Heptachlor epoxide	94.4
	4,4'-DDE	109.2
	4,4'-DDT	132.4
SWMU56-SB03	Heptachlor epoxide	123.1

Results for delta-BHC in sample SWMU56-SB01; delta-BHC, Heptachlor epoxide, 4,4'-DDE, and 4,4'-DDT SWMU56-SB02; and Heptachlor epoxide in sample SWMU56-SB03 were flagged "J" as estimated in accordance with DoD QSM 4.2.

In the PCB analysis, all samples required a Florisil cleanup to reduce matrix interference.

In the herbicide analysis, the RPDs between columns of 55.9% and 57.7% for MCPP exceeded criteria of ≤ 40% in samples SWMU56-TMW07-GW03 and SWMU56-TMW05-GW04. The MCPP result was flagged "J" as estimated in samples SWMU56-TMW07-GW03 and SWMU56-TMW05-GW04.

Non-detected results were reported to the Limit of Detection (LOD) in accordance with DoD QSM 4.2. The laboratory also reported the LOQ for each analyte on the sample result sheet (Form 1). The laboratory reported target analytes, which were qualitatively identified at concentrations below the LOQs, with a "J" qualifier to indicate that the result is estimated as required by DoD QSM 4.2. The "J" qualifier was retained by the validator. In general, the LOQs reported are consistent with the LOQs listed in the QAPP.

Sample dilutions were not required except for the following. Pesticide sample SWMU56-SB04 was analyzed at a 20-fold dilution, because of high target compound concentrations.

- **Tentatively Identified Compounds (TICs)**

  In the VOC and SVOC analyses, TICs were reported for all field samples. Siloxanes were detected in some samples. All siloxane results were qualified "R" as rejected, because siloxanes are considered common laboratory contaminants.

Overall Evaluation

A number of results were qualified as estimated as a result of ICAL, ICV, CCV, and surrogate performance, blank contamination, high RPDs between columns. In addition, TICs reported as siloxanes were rejected. All other validation elements were acceptable and the data, as qualified, with the exception of the TICs is acceptable for its intended use.

Based on the criteria presented above, it is recommended that the results reported for these analyses be accepted a qualified. MS/MSD and LCS/LCSD and surrogate recoveries demonstrated that acceptable levels of accuracy and precision were achieved. In addition, completeness, defined to be the percentage of analytical results to be valid, including estimated values was 99% (excluding TIC values rejected) for this Sample Delivery Group.

Data Validation Qualifiers

Validation Qualifier	Definition
J	The reported positive result is considered estimated, because the result is less than the LOQ or because certain quality control criteria were not met.
U	The analyte was not detected and is reported as less than the LOD or as defined by the client.
UJ	The analyte was not detected in the sample. The LOD (or LOQ) should be considered estimated and may be inaccurate or imprecise.
R	The result for this analyte is unusable. The analyte may or may not be present.

References

USACE EM200-1-10 Guidance for Evaluating Performance-Based Chemical Data, June 2005. (USACE, 2005).

U.S. Department of Defense (DoD). DoD Quality Systems Manual for Environmental Laboratories, Version 4.2, October, 2010. (DoD, 2010).

U.S. Environmental Protection Agency (USEPA). USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June, 2008. (USEPA, 2008).

USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2010).

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SWMU56-TMW07-SO01 **Collected:** 12/4/2012 8:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CALCIUM	57000	J	18000	LOD	92000	LOQ	ug/Kg	J	RI
POTASSIUM	89000	J	46000	LOD	280000	LOQ	ug/Kg	J	RI

Method Category: METALS

Sample ID: SWMU56-AQEB01 **Collected:** 12/4/2012 2:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CALCIUM	47	J	80	LOD	1000	LOQ	ug/L	J	RI

Sample ID: SWMU56-AQFB01 **Collected:** 12/3/2012 3:15:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ALUMINUM	18	J	30	LOD	300	LOQ	ug/L	J	RI
IRON	68	J	30	LOD	100	LOQ	ug/L	J	RI
POTASSIUM	2100	J	250	LOD	3000	LOQ	ug/L	J	RI
SODIUM	2100	J	250	LOD	5000	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW05-GW04 **Collected:** 12/4/2012 3:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
POTASSIUM	1900	J	250	LOD	3000	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW06-GW01 **Collected:** 12/3/2012 2:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
POTASSIUM	1400	J	250	LOD	3000	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW07-GW03 **Collected:** 12/4/2012 12:15:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ALUMINUM	180	J	30	LOD	300	LOQ	ug/L	J	RI
POTASSIUM	1500	J	250	LOD	3000	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SWMU56-TMW08-GW02 **Collected:** 12/4/2012 11:20:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
POTASSIUM	1200	J	250	LOD	3000	LOQ	ug/L	J	RI
SODIUM	3800	J	250	LOD	5000	LOQ	ug/L	J	RI

Method Category: METALS

Sample ID: SWMU56-TMW07-SO01 **Collected:** 12/4/2012 8:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	25	J	65	LOD	100	LOQ	ug/Kg	J	RI
CADMIUM	38	J Q	25	LOD	100	LOQ	ug/Kg	J	RI
COPPER	1000	J	200	LOD	2500	LOQ	ug/Kg	J	RI
MOLYBDENUM	97	J	50	LOD	200	LOQ	ug/Kg	J	RI
NICKEL	320	J Q	75	LOD	350	LOQ	ug/Kg	J	RI
SELENIUM	260	J	250	LOD	500	LOQ	ug/Kg	J	RI
THALLIUM	47	J	10	LOD	100	LOQ	ug/Kg	J	RI
ZINC	580	J	900	LOD	2500	LOQ	ug/Kg	J	RI

Method Category: METALS

Sample ID: SWMU56-AQEB01 **Collected:** 12/4/2012 2:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
COPPER	0.89	J	1.5	LOD	2.0	LOQ	ug/L	J	RI
MANGANESE	0.42	J	0.90	LOD	3.5	LOQ	ug/L	J	RI

Sample ID: SWMU56-AQFB01 **Collected:** 12/3/2012 3:15:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
COBALT	0.062	J	0.10	LOD	1.0	LOQ	ug/L	J	RI
MANGANESE	2.9	J	0.90	LOD	3.5	LOQ	ug/L	J	RI
NICKEL	2.4	J	0.90	LOD	3.0	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SWMU56-TMW05-GW04 **Collected:** 12/4/2012 3:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ARSENIC	0.68	J	1.0	LOD	5.0	LOQ	ug/L	J	RI
BERYLLIUM	0.32	J	0.24	LOD	1.0	LOQ	ug/L	J	RI
CADMIUM	0.39	J Q	0.12	LOD	1.0	LOQ	ug/L	J	RI
CHROMIUM	3.1	J	1.5	LOD	10	LOQ	ug/L	J	RI
LEAD	0.86	J	0.50	LOD	3.0	LOQ	ug/L	J	RI
MOLYBDENUM	0.31	J	0.40	LOD	2.0	LOQ	ug/L	J	RI
SELENIUM	0.99	J	2.0	LOD	5.0	LOQ	ug/L	J	RI
THALLIUM	0.091	J	0.10	LOD	1.0	LOQ	ug/L	J	RI
VANADIUM	1.5	J	1.0	LOD	6.0	LOQ	ug/L	J	RI
ZINC	13	J	6.0	LOD	20	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW06-GW01 **Collected:** 12/3/2012 2:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	0.25	J	0.24	LOD	1.0	LOQ	ug/L	J	RI
CADMIUM	0.48	J Q	0.12	LOD	1.0	LOQ	ug/L	J	RI
CHROMIUM	2.0	J	1.5	LOD	10	LOQ	ug/L	J	RI
LEAD	0.75	J	0.50	LOD	3.0	LOQ	ug/L	J	RI
MOLYBDENUM	0.33	J	0.40	LOD	2.0	LOQ	ug/L	J	RI
THALLIUM	0.080	J	0.10	LOD	1.0	LOQ	ug/L	J	RI
VANADIUM	0.77	J	1.0	LOD	6.0	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW07-GW03 **Collected:** 12/4/2012 12:15:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	0.18	J	0.24	LOD	1.0	LOQ	ug/L	J	RI
CADMIUM	0.43	J Q	0.12	LOD	1.0	LOQ	ug/L	J	RI
CHROMIUM	2.6	J	1.5	LOD	10	LOQ	ug/L	J	RI
LEAD	0.34	J	0.50	LOD	3.0	LOQ	ug/L	J	RI
MOLYBDENUM	0.24	J	0.40	LOD	2.0	LOQ	ug/L	J	RI
ZINC	16	J	6.0	LOD	20	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SWMU56-TMW08-GW02 **Collected:** 12/4/2012 11:20:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ARSENIC	0.41	J	1.0	LOD	5.0	LOQ	ug/L	J	RI
BERYLLIUM	0.15	J	0.24	LOD	1.0	LOQ	ug/L	J	RI
CADMIUM	0.15	J Q	0.12	LOD	1.0	LOQ	ug/L	J	RI
CHROMIUM	2.8	J	1.5	LOD	10	LOQ	ug/L	J	RI
LEAD	0.23	J	0.50	LOD	3.0	LOQ	ug/L	J	RI
MOLYBDENUM	0.46	J	0.40	LOD	2.0	LOQ	ug/L	J	RI
VANADIUM	1.2	J	1.0	LOD	6.0	LOQ	ug/L	J	RI
ZINC	8.6	J	6.0	LOD	20	LOQ	ug/L	U	Mb

Method Category: METALS

Sample ID: SWMU56-TMW05-GW04 **Collected:** 12/4/2012 3:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
MERCURY	0.065	J	0.080	LOD	0.20	LOQ	ug/L	J	RI

Method Category: SVOA

Sample ID: SWMU56-TMW07-SO01 **Collected:** 12/4/2012 8:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	1600	J	2100	LOD	4200	LOQ	ug/Kg	J	RI

Method Category: SVOA

Sample ID: SWMU56-AQFB01 **Collected:** 12/3/2012 3:15:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	91	J M	100	LOD	250	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: SWMU56-SB02 **Collected:** 12/3/2012 10:30:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DELTA-BHC	0.51	J	0.79	LOD	1.9	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-SB03 **Collected:** 12/3/2012 10:45:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
4,4'-DDT	0.99	J	0.73	LOD	2.1	LOQ	ug/Kg	J	RI
HEPTACHLOR	0.47	J	0.48	LOD	1.8	LOQ	ug/Kg	J	RI
HEPTACHLOR EPOXIDE	0.56	J	0.73	LOD	1.8	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-SB04 **Collected:** 12/3/2012 11:00:00 **Analysis Type:** Initial/TOT- **Dilution:** 20

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
4,4'-DDD	65	Q D	15	LOD	37	LOQ	ug/Kg	J	Surr, Surr
4,4'-DDE	27	J Q D	10	LOD	37	LOQ	ug/Kg	J	RI, Surr, Surr
4,4'-DDT	41	J Q D	15	LOD	44	LOQ	ug/Kg	J	RI, Surr, Surr
ALDRIN	10	U Q	10	LOD	37	LOQ	ug/Kg	R	Surr, Surr
ALPHA-BHC	10	U Q	10	LOD	37	LOQ	ug/Kg	R	Surr, Surr
ALPHA-CHLORDANE	300	Q D	10	LOD	37	LOQ	ug/Kg	J	Surr, Surr
BETA-BHC	15	U Q	15	LOD	37	LOQ	ug/Kg	R	Surr, Surr
DELTA-BHC	15	U Q	15	LOD	37	LOQ	ug/Kg	R	Surr, Surr
DIELDRIN	10	U Q	10	LOD	37	LOQ	ug/Kg	R	Surr, Surr
ENDOSULFAN I	10	U Q	10	LOD	37	LOQ	ug/Kg	R	Surr, Surr
ENDOSULFAN II	10	U Q	10	LOD	37	LOQ	ug/Kg	R	Surr, Surr
ENDOSULFAN SULFATE	6.7	J Q D	10	LOD	37	LOQ	ug/Kg	J	RI, Surr, Surr
ENDRIN	10	U Q	10	LOD	37	LOQ	ug/Kg	R	Surr, Surr
ENDRIN ALDEHYDE	10	U Q	10	LOD	37	LOQ	ug/Kg	R	Surr, Surr
ENDRIN KETONE	15	U Q	15	LOD	37	LOQ	ug/Kg	R	Surr, Surr
gamma-BHC (Lindane)	15	U Q	15	LOD	37	LOQ	ug/Kg	R	Surr, Surr
GAMMA-CHLORDANE	420	Q D	15	LOD	37	LOQ	ug/Kg	J	Surr, Surr
HEPTACHLOR	14	J Q D	10	LOD	37	LOQ	ug/Kg	J	RI, Surr, Surr
HEPTACHLOR EPOXIDE	15	U Q	15	LOD	37	LOQ	ug/Kg	R	Surr, Surr
METHOXYCHLOR	15	U Q	15	LOD	73	LOQ	ug/Kg	R	Surr, Surr
TOXAPHENE	590	U Q	590	LOD	3700	LOQ	ug/Kg	R	Surr, Surr

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: **SWMU56-SB01** ***Collected:*** **12/3/2012 10:15:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,4,5-T	6.5	U Q	6.5	LOD	24	LOQ	ug/Kg	UJ	Surr
2,4,5-TP(Silvex)	6.5	U Q	6.5	LOD	24	LOQ	ug/Kg	UJ	Surr
2,4-D	22	U Q	22	LOD	95	LOQ	ug/Kg	UJ	Surr
2,4-DB	6.5	U Q	6.5	LOD	95	LOQ	ug/Kg	UJ	Surr
DALAPON	6.5	U Q	6.5	LOD	48	LOQ	ug/Kg	UJ	Surr
DICAMBA	6.5	U Q M	6.5	LOD	48	LOQ	ug/Kg	UJ	Surr
DICHLOROPROP	6.5	U Q	6.5	LOD	95	LOQ	ug/Kg	UJ	Surr
DINOSEB	6.5	U Q	6.5	LOD	14	LOQ	ug/Kg	UJ	Lcs, Surr
MCPA	5500	U Q	5500	LOD	9500	LOQ	ug/Kg	UJ	Surr
MCPP	5500	U Q	5500	LOD	9500	LOQ	ug/Kg	UJ	Surr

Sample ID: **SWMU56-SB02** ***Collected:*** **12/3/2012 10:30:00** ***Analysis Type:*** **Initial/TOT-** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DINOSEB	6.3	U Q	6.3	LOD	14	LOQ	ug/Kg	UJ	Lcs

Sample ID: **SWMU56-SB03** ***Collected:*** **12/3/2012 10:45:00** ***Analysis Type:*** **Initial/TOT-** ***Dilution:*** **5**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DINOSEB	29	U	29	LOD	63	LOQ	ug/Kg	UJ	Lcs

Sample ID: **SWMU56-SB04** ***Collected:*** **12/3/2012 11:00:00** ***Analysis Type:*** **Initial/TOT-** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DINOSEB	6.1	U	6.1	LOD	13	LOQ	ug/Kg	UJ	Lcs

Sample ID: **SWMU56-TMW07-SO01** ***Collected:*** **12/4/2012 8:50:00** ***Analysis Type:*** **Initial/TOT-** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DINOSEB	5.6	U	5.6	LOD	12	LOQ	ug/Kg	UJ	Lcs

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: SWMU56-TMW05-GW04 **Collected:** 12/4/2012 3:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
MCPP	33	J	88	LOD	380	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW07-GW03 **Collected:** 12/4/2012 12:15:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
MCPP	35	J	100	LOD	430	LOQ	ug/L	J	RI

Method Category: SVOA

Sample ID: SWMU56-AQEB01 **Collected:** 12/4/2012 2:30:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BIS(2-ETHYLHEXYL)PHTHALATE	2.1	J	0.98	LOD	9.8	LOQ	ug/L	J	RI
PHENOL	2.9	J	4.9	LOD	9.8	LOQ	ug/L	J	RI

Sample ID: SWMU56-AQFB01 **Collected:** 12/3/2012 3:15:00 **Analysis Type:** Initial/TOT-ACID **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2,4,5-TRICHLOROPHENOL	1.0	U	1.0	LOD	21	LOQ	ug/L	UJ	Surr
2,4,6-TRICHLOROPHENOL	1.0	U	1.0	LOD	21	LOQ	ug/L	UJ	Surr
2,4-DICHLOROPHENOL	2.1	U Q	2.1	LOD	10	LOQ	ug/L	UJ	Surr
2,4-DIMETHYLPHENOL	4.2	U Q	4.2	LOD	10	LOQ	ug/L	UJ	Surr
2,4-DINITROPHENOL	21	U	21	LOD	84	LOQ	ug/L	UJ	Surr
2,6-DICHLOROPHENOL	4.2	U	4.2	LOD	10	LOQ	ug/L	UJ	Surr
2-CHLOROPHENOL	4.2	U Q	4.2	LOD	10	LOQ	ug/L	UJ	Surr
2-METHYLPHENOL	4.2	U Q	4.2	LOD	10	LOQ	ug/L	UJ	Surr
2-NITROPHENOL	1.0	U Q	1.0	LOD	21	LOQ	ug/L	UJ	Surr
4,6-DINITRO-2-METHYLPHENOL	10	U	10	LOD	84	LOQ	ug/L	UJ	Surr
4-CHLORO-3-METHYLPHENOL	5.2	U	5.2	LOD	21	LOQ	ug/L	UJ	Surr
4-NITROPHENOL	10	U	10	LOD	52	LOQ	ug/L	UJ	Surr
BENZOIC ACID	52	U Q	52	LOD	84	LOQ	ug/L	UJ	Surr
BENZYL ALCOHOL	1.7	J	1.0	LOD	26	LOQ	ug/L	J	RI
BIS(2-ETHYLHEXYL)PHTHALATE	7.2	J	1.0	LOD	10	LOQ	ug/L	J	RI
Butylbenzylphthalate	19	J	4.2	LOD	21	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: SWMU56-AQFB01 **Collected:** 12/3/2012 3:15:00 **Analysis Type:** Initial/TOT-ACID **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PENTACHLOROPHENOL	42	U	42	LOD	84	LOQ	ug/L	UJ	Surr
PHENOL	5.2	U Q	5.2	LOD	10	LOQ	ug/L	UJ	Surr

Sample ID: SWMU56-TMW05-GW04 **Collected:** 12/4/2012 3:30:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BIS(2-ETHYLHEXYL)PHTHALATE	2.2	J	0.98	LOD	9.8	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW06-GW01 **Collected:** 12/3/2012 2:10:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BIS(2-ETHYLHEXYL)PHTHALATE	2.1	J	0.98	LOD	9.8	LOQ	ug/L	J	RI
Diethylphthalate	0.53	J	0.98	LOD	20	LOQ	ug/L	J	RI

Method Category: SVOA

Sample ID: SWMU56-AQEB01 **Collected:** 12/4/2012 2:30:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZO(A)ANTHRACENE	0.0052	J	0.0095	LOD	0.095	LOQ	ug/L	U	Mb
BENZO(B)FLUORANTHENE	0.0037	J	0.0095	LOD	0.095	LOQ	ug/L	U	Mb
BENZO(G,H,I)PERYLENE	0.0042	J	0.0095	LOD	0.095	LOQ	ug/L	U	Mb
CHRYSENE	0.0036	J	0.0095	LOD	0.095	LOQ	ug/L	U	Mb

Sample ID: SWMU56-AQFB01 **Collected:** 12/3/2012 3:15:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZO(A)ANTHRACENE	0.0096	J	0.010	LOD	0.10	LOQ	ug/L	U	Mb
BENZO(B)FLUORANTHENE	0.0061	J M	0.010	LOD	0.10	LOQ	ug/L	U	Mb
BENZO(G,H,I)PERYLENE	0.0069	J	0.010	LOD	0.10	LOQ	ug/L	U	Mb
BENZO(K)FLUORANTHENE	0.0051	J	0.010	LOD	0.10	LOQ	ug/L	U	Mb
CHRYSENE	0.0073	J	0.010	LOD	0.10	LOQ	ug/L	U	Mb
FLUORANTHENE	0.0063	J	0.010	LOD	0.10	LOQ	ug/L	U	Mb
NAPHTHALENE	0.012	J	0.010	LOD	0.10	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: SWMU56-AQFB01 **Collected:** 12/3/2012 3:15:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PHENANTHRENE	0.019	J	0.012	LOD	0.10	LOQ	ug/L	U	Mb

Sample ID: SWMU56-TMW05-GW04 **Collected:** 12/4/2012 3:30:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ANTHRACENE	0.029	J	0.019	LOD	0.095	LOQ	ug/L	J	RI, Surr
BENZO(A)ANTHRACENE	0.11	Q	0.0095	LOD	0.095	LOQ	ug/L	UJ	Mb, Surr
BENZO(A)PYRENE	0.043	J M Q	0.0095	LOD	0.095	LOQ	ug/L	UJ	Mb, Surr
BENZO(B)FLUORANTHENE	0.17	Q	0.0095	LOD	0.095	LOQ	ug/L	J	Surr
BENZO(G,H,I)PERYLENE	0.15	Q	0.0095	LOD	0.095	LOQ	ug/L	J	Surr
BENZO(K)FLUORANTHENE	0.17	Q	0.0095	LOD	0.095	LOQ	ug/L	J	Surr
CHRYSENE	0.17	Q	0.0095	LOD	0.095	LOQ	ug/L	UJ	Mb, Surr
DIBENZO(A,H)ANTHRACENE	0.16	Q	0.0095	LOD	0.095	LOQ	ug/L	J	Surr
FLUORANTHENE	0.14		0.0095	LOD	0.095	LOQ	ug/L	UJ	Mb, Surr
INDENO(1,2,3-CD)PYRENE	0.17	M Q	0.019	LOD	0.095	LOQ	ug/L	J	Surr
NAPHTHALENE	0.0075	J	0.0095	LOD	0.095	LOQ	ug/L	J	RI, Surr
PHENANTHRENE	0.055	J	0.011	LOD	0.095	LOQ	ug/L	UJ	Mb, Surr
PYRENE	0.10		0.0095	LOD	0.095	LOQ	ug/L	UJ	Mb, Surr

Sample ID: SWMU56-TMW05-GW04 **Collected:** 12/4/2012 3:30:00 **Analysis Type:** Reanalysis-01/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
FLUORANTHENE	0.0096	J H	0.010	LOD	0.10	LOQ	ug/L	J	RI
NAPHTHALENE	0.010	J H	0.010	LOD	0.10	LOQ	ug/L	U	Mb
PHENANTHRENE	0.011	J H	0.012	LOD	0.10	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW06-GW01 **Collected:** 12/3/2012 2:10:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZO(A)ANTHRACENE	0.0033	J Q	0.010	LOD	0.10	LOQ	ug/L	UJ	Mb, Surr
BENZO(B)FLUORANTHENE	0.0036	J Q	0.010	LOD	0.10	LOQ	ug/L	UJ	Mb, Surr
NAPHTHALENE	0.021	J	0.010	LOD	0.10	LOQ	ug/L	J	RI, Surr
PHENANTHRENE	0.015	J	0.012	LOD	0.10	LOQ	ug/L	UJ	Mb, Surr

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: SWMU56-TMW07-GW03 **Collected:** 12/4/2012 12:15:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZO(B)FLUORANTHENE	0.0041	J M	0.011	LOD	0.11	LOQ	ug/L	U	Mb
NAPHTHALENE	0.0079	J	0.011	LOD	0.11	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW08-GW02 **Collected:** 12/4/2012 11:20:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZO(B)FLUORANTHENE	0.0035	J	0.010	LOD	0.10	LOQ	ug/L	U	Mb
NAPHTHALENE	0.016	J	0.010	LOD	0.10	LOQ	ug/L	J	RI

Method Category: VOA

Sample ID: SWMU56-TMW07-SO01 **Collected:** 12/4/2012 8:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	370	J	610	LOD	1400	LOQ	ug/Kg	J	RI

Method Category: VOA

Sample ID: SWMU56-AQEB01 **Collected:** 12/4/2012 2:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	17	J	20	LOD	25	LOQ	ug/L	J	RI

Sample ID: SWMU56-AQFB01 **Collected:** 12/3/2012 3:15:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	11	J	20	LOD	25	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW05-GW04 **Collected:** 12/4/2012 3:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	17	J Q	20	LOD	25	LOQ	ug/L	J	RI, Surr

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: VOA

Sample ID: SWMU56-TMW06-GW01 **Collected:** 12/3/2012 2:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	13	J Q	20	LOD	25	LOQ	ug/L	J	RI, Surr

Sample ID: SWMU56-TMW07-GW03 **Collected:** 12/4/2012 12:15:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	12	J	20	LOD	25	LOQ	ug/L	J	RI

Method Category: VOA

Sample ID: SWMU56-TMW07-SO01 **Collected:** 12/4/2012 8:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOFORM	0.42	J	0.88	LOD	5.5	LOQ	ug/Kg	U	Mb

Method Category: VOA

Sample ID: SWMU56-AQEB01 **Collected:** 12/4/2012 2:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.9	J	6.4	LOD	10	LOQ	ug/L	J	RI
METHYLENE CHLORIDE	2.6	J	0.40	LOD	5.0	LOQ	ug/L	J	RI

Sample ID: SWMU56-AQFB01 **Collected:** 12/3/2012 3:15:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.4	J	6.4	LOD	10	LOQ	ug/L	J	RI
BROMOFORM	0.33	J	0.40	LOD	1.0	LOQ	ug/L	J	RI
DIBROMOCHLOROMETHANE	0.76	J	0.40	LOD	1.0	LOQ	ug/L	J	RI
METHYLENE CHLORIDE	0.33	J	0.40	LOD	5.0	LOQ	ug/L	U	Mb

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: VOA

Sample ID: **SWMU56-AQTB01** ***Collected:*** **12/3/2012 10:15:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	2.8	J	6.4	LOD	10	LOQ	ug/L	J	RI
METHYLENE CHLORIDE	0.43	J	0.40	LOD	5.0	LOQ	ug/L	U	Mb

Sample ID: **SWMU56-TMW05-GW04** ***Collected:*** **12/4/2012 3:30:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHANE	0.21	J	0.20	LOD	1.0	LOQ	ug/L	J	RI
1,1-DICHLOROETHENE	0.53	J	0.20	LOD	1.0	LOQ	ug/L	J	RI, Ms
CHLOROFORM	0.38	J	0.20	LOD	1.0	LOQ	ug/L	J	RI

Sample ID: **SWMU56-TMW06-GW01** ***Collected:*** **12/3/2012 2:10:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,1-DICHLOROETHENE	0.30	J	0.20	LOD	1.0	LOQ	ug/L	J	RI
CHLOROFORM	0.81	J	0.20	LOD	1.0	LOQ	ug/L	J	RI
METHYLENE CHLORIDE	0.39	J	0.40	LOD	5.0	LOQ	ug/L	U	Mb

Sample ID: **SWMU56-TMW07-GW03** ***Collected:*** **12/4/2012 12:15:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CHLOROFORM	0.33	J	0.20	LOD	1.0	LOQ	ug/L	J	RI
TRICHLOROETHENE	0.31	J	0.20	LOD	1.0	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36632-1 **Laboratory: TAL DEN**

EDD Filename: 280-36632-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Reason Code Legend

Reason Code	*Description*
Lcs	Laboratory Control Precision
Lcs	Laboratory Control Spike Upper Estimation
Mb	Method Blank Contamination
Ms	Matrix Spike Upper Estimation
RI	Reporting Limit Trace Value
Surr	Surrogate/Tracer Recovery Lower Estimation
Surr	Surrogate/Tracer Recovery Lower Rejection
Surr	Surrogate/Tracer Recovery Upper Estimation

* denotes a non-reportable result

Laboratory Analytical Data Validation

Site: JBA SWMU 56
Date Completed: 01-10-2013
Submitted by: Nancy McDonald
Sample Collection Date(s): 12-05-2012
TestAmerica Project Number(s) (LPN): 280-36669-1
Bay West DMS #: 1605405

This data validation memo describes the validation of 4 aqueous samples, 3 soil samples, and one Trip Blank collected on December 5, 2012 and analyzed for VOCs (8260B), SVOCs (8270C), PAHs (8270-SIM), Organochlorine Pesticides (8081B), PCBs (8082A), Herbicides (8151A), GRO and DRO (8015C), and TAL Metals (6010B, 6020A, 7470A, and 7471B) at TestAmerica Laboratory in Denver, Colorado as sample delivery group (SDG) 280-36669-1. Samples included as part of this validation are listed below:

Sample ID	Date Sampled	TestAmerica, Denver					
		Lab ID	*VOC*	*SVOCs PAHs*	*Herbicides Pesticides PCBs*	*DRO / GRO*	*TAL Metals*
SWMU56-TMW06-SO02	12/05/2012	36669-1	X	X	X*	X	X
SWMU56-TMW06-SO03	12/05/2012	36669-2	X	X	X	X	X
SWMU56-TMW08-SO04	12/05/2012	36669-3	X	X	X	X	X
SWMU56-TMW01-GW05	12/05/2012	36669-4	X	X	X	X	X
SWMU56-TMW01-GW06	12/05/2012	36669-5	X‡	X‡	X‡	X‡	X‡
SWMU56-TMW09-GW07	12/05/2012	36669-6	X	X	X	X	X
SWMU56-TMW02-GW08	12/05/2012	36669-7	X	X	X	X	X
SWMU56-AQTB02	12/05/2012	36669-8TB	X				

‡ - Duplicate sample of SWMU56-TMW01-GW05
* - Pesticide sample selected for MS/MSD analysis.

The Data Qualification Summary Table below summarizes the qualifications that were applied during validation:

Sample ID	Date Sampled	TestAmerica, Denver							
		Lab ID	*VOC*	*SVOCs*	*PAHs*	*Pesticides, PCBs*	*Herbicides*	*DRO/GRO*	*TAL Metals*
SWMU56-TMW06-SO02	12/05/2012	36669-1	U: Bromoform			UJ: Toxaphene	UJ: Dinoseb		
SWMU56-TMW06-SO03	12/05/2012	36669-2	U: Bromoform			UJ: Toxaphene	UJ: Dinoseb		
SWMU56-TMW08-SO04	12/05/2012	36669-3	U: Bromoform			UJ: Toxaphene	UJ: Dinoseb		
SWMU56-TMW01-GW05	12/05/2012	36669-4			UJ: Benzo(a)anthracene UJ: Benzo(b)fluoranthene UJ: Chrysene J: Naphthalene	UJ: Toxaphene		UJ: GRO	U: Copper U: Zinc J: Iron
SWMU56-TMW01-GW06	12/05/2012	36669-5			UJ: Benzo(a)anthracene U:J Benzo(b)fluoranthene UJ: Benzo(g,h,i)perylene UJ: Chrysene J: Naphthalene	UJ: Toxaphene		UJ: GRO	U: Copper U: Zinc J: Iron
SWMU56-TMW09-GW07	12/05/2012	36669-6		U: bis(2-Ethylhexyl)phthalate	U: Benzo(a)anthracene U: Benzo(b)fluoranthene U: Benzo(g,h,i)perylene U: Chrysene	UJ: Toxaphene		UJ: GRO	
SWMU56-TMW02-GW08	12/05/2012	36669-7	U: Acetone		U: Benzo(a)anthracene U: Benzo(b)fluoranthene U: Benzo(g,h,i)perylene	UJ: Toxaphene		UJ: GRO	
SWMU56-AQTB02	12/05/2012	36669-8TB							

Validation was conducted according to this hierarchy of validation guidance: USACE EM200-1-10 Guidance for Evaluating Performance-Based Chemical Data June 2005 (USACE, 2005), DoD Quality Systems Manual for Environmental Laboratories, v 4.2, October 2010 (DoD, 2010), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (USEPA, 2008), USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2010). The QAPP and analytical methods were consulted during the data validation.

A Level II ADR was also performed on this data and the qualifiers summary report is included in Attachment 1. Target analytes present between the LOQ and MDL were flagged "J" as estimated. Field duplicate results for Benzo(g,h,i)perylene, Chromium, Lead, Molybdenum were also qualified "J" as estimated by ADR; however, the validator only calculated RPDs when both the parent and field duplicates results were ≥ the LOQs.

Data Validation Detail:

- **Data Package Completeness**

  The Level IV data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the method. The data package is complete.

- **Laboratory Case Narrative/Cooler Receipt Form**

  No anomalies were noted on the chain-of-custody (CoC) or cooler receipt forms that affected data quality. The laboratory case narrative was accurate and complete and documented that a revised CoC was received from Bay West requesting SVOC analysis plus TICs for selected samples and updated sample IDs. In addition, the relinquished by information was not completed on the CoC. Custody of samples was maintained at all times, so data quality was not affected. In addition, the case narrative documented that sample SWMU56-TMW02-GW08 formed an emulsion during the extraction process for PAHs, pesticides, PCBs, herbicides, and DRO. The emulsion was broken up by pour backs and/or centrifuge.

- **Holding Times, Storage, and Preservation**

  Review of the sample collection and analysis dates involved comparing the CoCs, the summary forms, and the data report for holding time compliance.

  All samples were received correctly, intact and properly preserved. All samples were prepared and analyzed within the turnaround time required by the project.

- **Instrument Performance Check**

  The instruments met all applicable performance check requirements. The instrument performance check included verification of 4-Bromofluorobenzene (BFB) tunes for VOC and Decafluorotriphenylphosphine (DFTPP) for PAHs and SVOCs. All samples were analyzed within 12 hours of the BFB and DFTPP tunes.

- **Initial Calibration (ICAL) / Initial Calibration Verification (ICV)**

  ICAL and ICV acceptance criteria were met for all parameters except for the following.

  Pesticide: In the ICV (11/15/2012), % differences for several peaks exceeded the criterion of 15% on both columns with low bias. Toxaphene results were qualified "UJ" as estimated in all samples.

- **Continuing Calibration Verification (CCV)**

  CCV acceptance criteria were met for all parameters with the following exceptions:

  VOCs: In the CCV (12/11/2012 08:56), % Differences for Chloroethane (23.1%) and Chloromethane (23.3%) were high and outside acceptance criteria of ≤ 20%. No qualifications were required, because of potential high bias and the associated samples were non-detect for Chloroethane and Chloromethane.

  Pesticides: In CCVs [12/17/2012 (14:14) and 12/18/2012 (00:11 and 03:47)], % differences for one Toxaphene peak were outside acceptance criteria of ≤ 15% on one or both columns with low bias. Toxaphene results were qualified "UJ" as estimated in samples SWMU56-TMW06-SO02, SWMU56-TMW06-SO03, and SWMU56-TMW08-SO04. In the CCV (12/12/2012 09:02), the %D for a single Toxaphene peak was outside criteria with high bias on one column. No action was required, because the % difference met criteria on column CLP1. In the CCV (12/18/2012 15:58), the % difference for 4,4'-DDD was outside on column CLP2. No action was required, because the % difference met criteria on column CLP1.

  Herbicides: In the CCV (12/18/2012 19:54), % differences for 2,4,5-T (24.4%) and 2,4-DB (25.2%) on column DB35MW and 2,4,5-T (21.%) on column DB-XLB were outside criteria of ≤ 20% with high bias. No action was required, because these compounds were non-detect in the associated samples.

- **Pesticide Performance Evaluation Mixture (PEM)**

  In the Pesticide analysis, the % breakdown met the acceptance criterion of 15%.

- **CRQL Check Standard**

  All acceptance criteria were met for the CRQL Check Standards.

- **Interference Check Standard**

  The Interference Check Standards met method and DoD QSM acceptance criteria except for the following. The Cadmium and/or Nickel results were greater than the LOD in analytical batches 280-151248 and 280-152050. The laboratory flagged the associated results "Q", as required by DoD QSM. The validator removed the "Q" flag, because the vendor confirmed that Cadmium and Nickel are trace impurities in the ICSA solution.

- **Method Blank and Trip Blank**

  Target analytes were not detected above ½ the Limit of Quantitation (LOQ) in the Method Blanks. However, the following anomalies were noted:

VOCs: A low-level concentration of Bromoform (0.423 ug/kg), < ½ the LOQ of 5.0 ug/kg, was detected in the Method Blank151194/1-A. Results for Bromoform in sample SWMU56-TMW06-SO02, SWMU56-TMW06-SO03, and SWMU56-TMW08-SO04 were qualified "U" and raised to the LOQ, because the results were < five times the blank concentration.

PAHs: Low-level concentrations of the following analytes were detected at concentrations < ½ the LOQs in the aqueous Method Blank:

Blank ID	Analyte	Result (ug/L)	LOQ (ug/L)
MB 150870/1-A	Benzo(a)anthracene	0.0340	0.10
	Benzo(b)fluoranthene	0.0159	0.10
	Benzo(k)fluoranthene	0.0153	0.10
	Benzo(a)pyrene	0.0104	0.10
	Benzo(g,h,i)perylene	0.00518	0.10
	Chrysene	0.0354	0.10
	Fluoranthene	0.0300	0.15
	Phenanthrene	0.0119	0.10
	Pyrene	0.0341	0.10

The following results were qualified "U" and raised to the LOQ (as appropriate), because the results were < five times the blank concentration: Benzo(a)anthracene, Benzo(b)fluoranthene, and Chrysene in samples SWMU56-TMW01-GW05; Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, and Chrysene in samples SWMU56-TMW01-GW06 and SWMU56-TMW09-GW07; and Benzo(a)anthracene, Benzo(b)fluoranthene, and Benzo(g,h,i)perylene in sample SWMU56-TMW02-GW08. No further action was required, because the remaining PAHs were non-detect or > five times the blank concentrations.

Metals: Low-level concentrations of Barium (0.725 ug/L) and Zinc (2.16 ug/L), < ½ the LOQs, were detected in Method Blank 151248/1-A. The result for Zinc in sample SWMU56-TMW01-GW05 and SWMU56-TMW01-GW06 were qualified "U" and raised to the LOQ, because the results were < five times the blank concentration. No further action was required, because Zinc results in all associated samples were > five times the blank concentration.

Equipment Blank and Trip Blank:

VOCs: A low-level concentration of Acetone (2.9 ug/L) was detected in the equipment blank sample (from SDG 36632). The Acetone in sample SWMU56-TMW02-GW08 was qualified "U" and raised to the LOQ, because the result was < five times the blank concentration. No target VOCs were detected in Trip Blank sample SWMU56-AQTB02.

SVOCs: Low-level concentrations of bis(2-Ethylhexyl)phthalate (2.1 ug/L) and Phenol (2.9 ug/L) were detected in the equipment blank sample SWMU56-AQEB01 (from SDG 36632). The bis(2-Ethylhexyl)phthalate result for in sample SWMU56-TMW09-GW07

was qualified "U" and raised to the LOQ, because the result was < five times the equipment blank concentration. No further action was required, because Phenol was non-detect in the associated samples.

GRO: A low-level concentration of GRO, < ½ the LOQ, was detected in equipment blank sample SWMU56-AQEB01 (0.017 mg/L). GRO results were flagged "U" and raised to the LOQ in samples SWMU56-TMW01-GW05, SWMU56-TMW01-GW06, SWMU56-TMW09-GW07, and SWMU56-TMW02-GW08 because the results were < five times the equipment blank concentration.

Metals: The following metals were detected in the Equipment Blank Sample:

Blank ID	Analyte	Result (ug/L)
SWMU56-AQEB01	Calcium	47
	Copper	0.89 J
	Manganese	0.42 J

Results for Copper were qualified "U" in samples SWMU56-TMW01-GW05 and SWMU56-TMW01-GW06, because the results were < five times the equipment blank concentration. No further qualification was required, because Calcium and Manganese results were > five times the equipment blank concentrations.

Field Blank: Acetone, Chlorodibromomethane, Chloroform, Dibromomethane, Benzyl Alcohol, Naphthalene, Phenanthrene, GRO, DRO, Aluminum, Barium, Calcium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Sodium, and Zinc were detected in Field Blank sample SWMU56-AQFB01 (from SDG 36632). No qualification was applied based on the field blank contamination.

- **Surrogate Spikes**

  Surrogates were added to all samples and QC samples as required by the analytical method. All surrogate recoveries met the required QC criteria except for the following.

  PAHs: The following Terphenyl-d14 recoveries were biased high and outside acceptance criteria.

Sample	Surrogate	%R	Criteria
SWMU56-TMW01-GW05	Terphenyl-d14	193	47-120
SWMU56-TMW01-GW06	Terphenyl-d14	181	47-120
Method Blank 150870/1-A	Terphenyl-d14	167	47-120
LCSD 150870/19-A	Terphenyl-d14	173	47-120

No qualification was required for samples SWMU56-TMW01-GW05 and SWMU56-TMW01-GW06 and Method Blank 150870/1-A, because all detected results were less than the reporting limits. No qualification was required based on the high surrogate recovery in the LCSD, because all LCSD recoveries were within QC limits.

GRO: Recoveries for surrogate a,a,a-Trifluorotoluene in samples SWMU56-TMW01-GW05 (120%), SWMU56-TMW01-GW06 (122%), and SWMU56-TMW09-GW07 (116%) were biased high and outside criteria of 82-110%. GRO results in samples SWMU56-TMW01-GW05, SWMU56-TMW01-GW06, and SWMU56-TMW09-GW07 were qualified

"J" as estimated and may be biased high. An overall qualifier of "UJ" was applied, because these results were previously qualified due to equipment blank contamination.

DRO: The recovery for surrogate o-Terphenyl of 116% was biased high and outside QC limits of 50-115% in sample SWMU56-TMW09-GW07. No qualification was required, because DRO was non-detect in this sample.

- **Matrix Spike/Matrix Spike Duplicates (MS/MSD)**

  MS/MSD analyses were performed on pesticide sample SWMU56-TMW06-SO02. All recoveries and RPDs were within acceptance criteria. No other MS/MSD analyses were performed for the other methods; however, the MS/MSD frequency of one per 20 samples (per matrix) was met for SWMU 56 samples.

- **Laboratory Control Sample (LCS)**

  All LCS recoveries were within the QAPP and the DoD QSM 4.2 acceptance criteria except for the following. In the herbicide analysis, LCS and LCSD recoveries for Dinsoseb (8% and 6%) were biased low and outside QC limits of 5-166%. LCS recoveries for 2,4,5-T (101%) and 2,4-D (102%) were biased high and outside criteria of 24-98% and 32-97%, respectively, in Preparation Batch 150882. Dinoseb results were qualified "UJ" as estimated and may be biased low in samples SWMU56-TMW06-SO02, SWMU56-TMW06-SO03, and SWMU56-TMW08-SO04. No further qualification was required, because 2,4,5-T and 2,4-D were non-detect in the associated samples. LCS recoveries for 2,4,5-T (147%), 2,4-D (146%), Dicamba (125%), Dichlorprop (129%), Dinoseb (121%), and 2,4,5-TP (Silvex) (144%) in Preparation Batch 151123. No qualification was required, because these compounds were non-detect in the associated samples.

- **ICP Serial Dilution (Dilution Test) and Post-Digestion Spikes**

  All ICP Serial Dilution % differences and Post Digestion Spike (PDS) recoveries were with acceptance criteria. However, the results were reported in SDG 36632.

- **Blind Field Duplicates**

  Blind field duplicates, SWMU56-TMW01-GW05 and SWMU56-TMW01-GW06, were analyzed for VOCs, SVOCs, PAHs, GRO, DRO, pesticides, PCBs, herbicides, and metals. All RPDs were within the field criteria of ≤ 20% for metals and ≤ 30% for all other parameters except for the following. The RPD for Iron (29.7%) exceeded the criteria. Iron results were qualified "J" as estimated in samples SWMU56-TMW01-GW05 and SWMU56-TMW01-GW06. RPDs are not calculated unless both the parent and duplicate results are ≥ the LOQ.

- **Internal Standards**

  All QC criteria were met for Internal Standards (IS) in all calibrations and all field samples.

- **Target Analyte Identification and Quantitation**

  Target compound identification followed the specific analytical Method. Retention times and Mass Spectra were consistent with the analytical standards. Appropriate

wavelengths were chosen for the metals analysis in addition to appropriate interelement correction factors.

Non-detected results were reported to the Limit of Detection (LOD) in accordance with DoD QSM 4.2. The laboratory also reported the LOQ for each analyte on the sample result sheet (Form 1). The laboratory reported target analytes, which were qualitatively identified at concentrations below the LOQs, with a "J" qualifier to indicate that the result is estimated as required by DoD QSM 4.2. The "J" qualifier was retained by the validator. In general, the LOQs reported are consistent with the LOQs listed in the QAPP and sample dilutions were not required.

- Tentatively Identified Compounds (TICs)

  In the VOC and SVOC analyses, TICs were reported for all field samples. Siloxanes were detected in one VOC sample. All siloxane results were qualified "R" as rejected, because siloxanes are considered common laboratory contaminants. In addition, an unknown peak at RT 2.91 minutes was detected in some SVOC samples. The same peak was detected in the method blank, so the results were qualified "R" as rejected.

Overall Evaluation

A number of results were qualified as estimated as a result of ICV, CCV, and surrogate performance, blank contamination, and a high RPD in the field duplicate pair. In addition, TICs reported as siloxanes and an unknown at RT 2.91 minutes were rejected. All other validation elements were acceptable and the data, as qualified, with the exception of the TICs is acceptable for its intended use.

Based on the criteria presented above, it is recommended that the results reported for these analyses be accepted a qualified. MS/MSD and LCS/LCSD and surrogate recoveries demonstrated that acceptable levels of accuracy and precision were achieved. In addition, completeness, defined to be the percentage of analytical results to be valid, including estimated values was 99% (excluding TIC values rejected) for this Sample Delivery Group.

Data Validation Qualifiers

Validation Qualifier	Definition
J	The reported positive result is considered estimated, because the result is less than the LOQ or because certain quality control criteria were not met.
U	The analyte was not detected and is reported as less than the LOD or as defined by the client.
UJ	The analyte was not detected in the sample. The LOD (or LOQ) should be considered estimated and may be inaccurate or imprecise.
R	The result for this analyte is unusable. The analyte may or may not be present.

References

USACE EM200-1-10 Guidance for Evaluating Performance-Based Chemical Data, June 2005. (USACE, 2005).

U.S. Department of Defense (DoD). DoD Quality Systems Manual for Environmental Laboratories, Version 4.2, October, 2010. (DoD, 2010).

U.S. Environmental Protection Agency (USEPA). USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June, 2008. (USEPA, 2008).

USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2010).

Data Qualifier Summary

Lab Reporting Batch ID: 280-36669-1 **Laboratory: TAL DEN**

EDD Filename: 280-36669-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SWMU56-TMW06-SO03 **Collected:** 12/5/2012 11:55:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CALCIUM	29000	J	20000	LOD	100000	LOQ	ug/Kg	J	RI
POTASSIUM	220000	J	50000	LOD	300000	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW08-SO04 **Collected:** 12/5/2012 2:45:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
POTASSIUM	68000	J	48000	LOD	290000	LOQ	ug/Kg	J	RI

Method Category: METALS

Sample ID: SWMU56-TMW01-GW05 **Collected:** 12/5/2012 8:45:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ALUMINUM	160	J	30	LOD	300	LOQ	ug/L	J	RI, Fd
IRON	1200		30	LOD	100	LOQ	ug/L	J	Fd
POTASSIUM	870	J	250	LOD	3000	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW01-GW06 **Collected:** 12/5/2012 8:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ALUMINUM	73	J	30	LOD	300	LOQ	ug/L	J	RI, Fd
IRON	890		30	LOD	100	LOQ	ug/L	J	Fd
POTASSIUM	870	J	250	LOD	3000	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW02-GW08 **Collected:** 12/5/2012 2:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SODIUM	3700	J	250	LOD	5000	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW09-GW07 **Collected:** 12/5/2012 9:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ALUMINUM	110	J	30	LOD	300	LOQ	ug/L	J	RI
POTASSIUM	750	J	250	LOD	3000	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36669-1 **Laboratory: TAL DEN**

EDD Filename: 280-36669-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SWMU56-TMW06-SO02 **Collected:** 12/5/2012 11:33:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SILVER	34	J	59	LOD	98	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW06-SO03 **Collected:** 12/5/2012 11:55:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ARSENIC	410	J	140	LOD	480	LOQ	ug/Kg	J	RI
BERYLLIUM	53	J	62	LOD	96	LOQ	ug/Kg	J	RI
CADMIUM	65	J Q	24	LOD	96	LOQ	ug/Kg	J	RI
COPPER	1500	J	190	LOD	2400	LOQ	ug/Kg	J	RI
MOLYBDENUM	110	J	48	LOD	190	LOQ	ug/Kg	J	RI
SELENIUM	310	J	240	LOD	480	LOQ	ug/Kg	J	RI
THALLIUM	42	J	9.6	LOD	96	LOQ	ug/Kg	J	RI
ZINC	960	J	860	LOD	2400	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW08-SO04 **Collected:** 12/5/2012 2:45:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	36	J	63	LOD	97	LOQ	ug/Kg	J	RI
CADMIUM	29	J Q	24	LOD	97	LOQ	ug/Kg	J	RI
COPPER	2000	J	190	LOD	2400	LOQ	ug/Kg	J	RI
SELENIUM	170	J	240	LOD	490	LOQ	ug/Kg	J	RI
THALLIUM	11	J	9.7	LOD	97	LOQ	ug/Kg	J	RI
ZINC	2100	J	870	LOD	2400	LOQ	ug/Kg	J	RI

Method Category: METALS

Sample ID: SWMU56-TMW01-GW05 **Collected:** 12/5/2012 8:45:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	0.087	J	0.24	LOD	1.0	LOQ	ug/L	J	RI
CADMIUM	0.25	J Q	0.12	LOD	1.0	LOQ	ug/L	J	RI
CHROMIUM	2.7	J	1.5	LOD	10	LOQ	ug/L	J	RI, Fd
COPPER	1.7	J	1.5	LOD	2.0	LOQ	ug/L	J	RI
LEAD	0.22	J	0.50	LOD	3.0	LOQ	ug/L	J	RI, Fd

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36669-1 **Laboratory: TAL DEN**

EDD Filename: 280-36669-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SWMU56-TMW01-GW05 **Collected:** 12/5/2012 8:45:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
MOLYBDENUM	0.48	J	0.40	LOD	2.0	LOQ	ug/L	J	RI, Fd
ZINC	6.5	J	6.0	LOD	20	LOQ	ug/L	U	Mb

Sample ID: SWMU56-TMW01-GW06 **Collected:** 12/5/2012 8:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	0.098	J	0.24	LOD	1.0	LOQ	ug/L	J	RI
CADMIUM	0.26	J Q	0.12	LOD	1.0	LOQ	ug/L	J	RI
CHROMIUM	1.7	J	1.5	LOD	10	LOQ	ug/L	J	RI, Fd
COPPER	1.4	J	1.5	LOD	2.0	LOQ	ug/L	J	RI
LEAD	0.50	U	0.50	LOD	3.0	LOQ	ug/L	UJ	Fd
MOLYBDENUM	0.25	J	0.40	LOD	2.0	LOQ	ug/L	J	RI, Fd
ZINC	7.5	J	6.0	LOD	20	LOQ	ug/L	U	Mb

Sample ID: SWMU56-TMW02-GW08 **Collected:** 12/5/2012 2:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SELENIUM	3.0	J	2.0	LOD	5.0	LOQ	ug/L	J	RI
SILVER	0.36	J	0.10	LOD	5.0	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW09-GW07 **Collected:** 12/5/2012 9:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	0.085	J	0.24	LOD	1.0	LOQ	ug/L	J	RI
CADMIUM	0.14	J Q	0.12	LOD	1.0	LOQ	ug/L	J	RI
CHROMIUM	1.6	J	1.5	LOD	10	LOQ	ug/L	J	RI
LEAD	2.0	J	0.50	LOD	3.0	LOQ	ug/L	J	RI
MOLYBDENUM	0.19	J	0.40	LOD	2.0	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36669-1 **Laboratory: TAL DEN**

EDD Filename: 280-36669-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SWMU56-TMW02-GW08 **Collected:** 12/5/2012 2:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
MERCURY	0.15	J	0.080	LOD	0.20	LOQ	ug/L	J	RI

Method Category: METALS

Sample ID: SWMU56-TMW06-SO02 **Collected:** 12/5/2012 11:33:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
MERCURY	11	J	17	LOD	22	LOQ	ug/Kg	J	RI

Method Category: SVOA

Sample ID: SWMU56-TMW06-SO03 **Collected:** 12/5/2012 11:55:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	1100	J	2200	LOD	4300	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW08-SO04 **Collected:** 12/5/2012 2:45:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	2000	J	2000	LOD	4100	LOQ	ug/Kg	J	RI

Method Category: SVOA

Sample ID: SWMU56-TMW06-SO02 **Collected:** 12/5/2012 11:33:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DINOSEB	6.3	U	6.3	LOD	14	LOQ	ug/Kg	UJ	Lcs

Sample ID: SWMU56-TMW06-SO03 **Collected:** 12/5/2012 11:55:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DINOSEB	5.9	U	5.9	LOD	13	LOQ	ug/Kg	UJ	Lcs

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36669-1 **Laboratory: TAL DEN**

EDD Filename: 280-36669-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: SWMU56-TMW08-SO04 **Collected:** 12/5/2012 2:45:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DINOSEB	5.7	U	5.7	LOD	12	LOQ	ug/Kg	UJ	Lcs

Method Category: SVOA

Sample ID: SWMU56-TMW06-SO02 **Collected:** 12/5/2012 11:33:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	42	J	38	LOD	380	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW06-SO03 **Collected:** 12/5/2012 11:55:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	27	J	35	LOD	350	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW08-SO04 **Collected:** 12/5/2012 2:45:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	22	J	34	LOD	340	LOQ	ug/Kg	J	RI

Method Category: SVOA

Sample ID: SWMU56-TMW09-GW07 **Collected:** 12/5/2012 9:50:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BIS(2-ETHYLHEXYL)PHTHALATE	2.1	J	0.96	LOD	9.6	LOQ	ug/L	J	RI

Method Category: SVOA

Sample ID: SWMU56-TMW06-SO02 **Collected:** 12/5/2012 11:33:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACENAPHTHYLENE	1.0	J	0.77	LOD	5.8	LOQ	ug/Kg	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36669-1 **Laboratory: TAL DEN**

EDD Filename: 280-36669-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: SWMU56-TMW06-SO02 **Collected:** 12/5/2012 11:33:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZO(A)ANTHRACENE	1.9	J	2.9	LOD	5.8	LOQ	ug/Kg	J	RI
BENZO(A)PYRENE	2.2	J	2.9	LOD	5.8	LOQ	ug/Kg	J	RI
BENZO(B)FLUORANTHENE	5.3	J	2.9	LOD	5.8	LOQ	ug/Kg	J	RI
BENZO(G,H,I)PERYLENE	4.0	J	2.9	LOD	5.8	LOQ	ug/Kg	J	RI
BENZO(K)FLUORANTHENE	1.5	J	2.9	LOD	5.8	LOQ	ug/Kg	J	RI
CHRYSENE	3.7	J	2.9	LOD	5.8	LOQ	ug/Kg	J	RI
FLUORANTHENE	3.5	J	2.9	LOD	5.8	LOQ	ug/Kg	J	RI
INDENO(1,2,3-CD)PYRENE	3.1	J	2.9	LOD	5.8	LOQ	ug/Kg	J	RI
NAPHTHALENE	1.2	J	0.77	LOD	5.8	LOQ	ug/Kg	J	RI
PHENANTHRENE	2.1	J	2.9	LOD	5.8	LOQ	ug/Kg	J	RI
PYRENE	4.0	J	2.9	LOD	5.8	LOQ	ug/Kg	J	RI

Method Category: SVOA

Sample ID: SWMU56-TMW01-GW05 **Collected:** 12/5/2012 8:45:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZO(A)ANTHRACENE	0.0052	J Q	0.010	LOD	0.10	LOQ	ug/L	UJ	Mb, Surr
BENZO(B)FLUORANTHENE	0.0041	J Q	0.010	LOD	0.10	LOQ	ug/L	UJ	Mb, Surr
BENZO(G,H,I)PERYLENE	0.010	U Q	0.010	LOD	0.10	LOQ	ug/L	UJ	Fd
CHRYSENE	0.0038	J Q	0.010	LOD	0.10	LOQ	ug/L	UJ	Mb, Surr
NAPHTHALENE	0.0072	J	0.010	LOD	0.10	LOQ	ug/L	J	RI, Surr

Sample ID: SWMU56-TMW01-GW06 **Collected:** 12/5/2012 8:50:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZO(A)ANTHRACENE	0.0047	J Q	0.0099	LOD	0.099	LOQ	ug/L	UJ	Mb, Surr
BENZO(B)FLUORANTHENE	0.0041	J Q	0.0099	LOD	0.099	LOQ	ug/L	UJ	Mb, Surr
BENZO(G,H,I)PERYLENE	0.0043	J Q	0.0099	LOD	0.099	LOQ	ug/L	UJ	Mb, Surr, Fd
CHRYSENE	0.0036	J Q	0.0099	LOD	0.099	LOQ	ug/L	UJ	Mb, Surr
NAPHTHALENE	0.0086	J	0.0099	LOD	0.099	LOQ	ug/L	J	RI, Surr

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36669-1 **Laboratory: TAL DEN**

EDD Filename: 280-36669-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: SWMU56-TMW02-GW08 **Collected:** 12/5/2012 2:10:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZO(A)ANTHRACENE	0.0041	J	0.011	LOD	0.11	LOQ	ug/L	U	Mb
BENZO(B)FLUORANTHENE	0.0038	J	0.011	LOD	0.11	LOQ	ug/L	U	Mb
BENZO(G,H,I)PERYLENE	0.0046	J	0.011	LOD	0.11	LOQ	ug/L	U	Mb
NAPHTHALENE	0.0079	J	0.011	LOD	0.11	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW09-GW07 **Collected:** 12/5/2012 9:50:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZO(A)ANTHRACENE	0.0064	J	0.011	LOD	0.11	LOQ	ug/L	U	Mb
BENZO(B)FLUORANTHENE	0.0065	J	0.011	LOD	0.11	LOQ	ug/L	U	Mb
BENZO(G,H,I)PERYLENE	0.0052	J	0.011	LOD	0.11	LOQ	ug/L	U	Mb
CHRYSENE	0.0045	J	0.011	LOD	0.11	LOQ	ug/L	U	Mb
NAPHTHALENE	0.0080	J	0.011	LOD	0.11	LOQ	ug/L	J	RI

Method Category: VOA

Sample ID: SWMU56-TMW06-SO02 **Collected:** 12/5/2012 11:33:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	270	J	430	LOD	950	LOQ	ug/Kg	J	RI

Method Category: VOA

Sample ID: SWMU56-TMW01-GW05 **Collected:** 12/5/2012 8:45:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	22	J Q	20	LOD	25	LOQ	ug/L	J	RI, Surr

Sample ID: SWMU56-TMW01-GW06 **Collected:** 12/5/2012 8:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	18	J Q	20	LOD	25	LOQ	ug/L	J	RI, Surr

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36669-1 **Laboratory: TAL DEN**

EDD Filename: 280-36669-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: VOA

Sample ID: SWMU56-TMW02-GW08 **Collected:** 12/5/2012 2:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	12	J	20	LOD	25	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW09-GW07 **Collected:** 12/5/2012 9:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	12	J Q	20	LOD	25	LOQ	ug/L	J	RI, Surr

Method Category: VOA

Sample ID: SWMU56-TMW06-SO02 **Collected:** 12/5/2012 11:33:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2-BUTANONE	7.8	J	5.0	LOD	16	LOQ	ug/Kg	J	RI
BROMOFORM	0.49	J	0.62	LOD	3.9	LOQ	ug/Kg	U	Mb
P-ISOPROPYLTOLUENE	0.68	J	0.78	LOD	3.9	LOQ	ug/Kg	J	RI
TETRACHLOROETHENE	1.8	J	0.78	LOD	3.9	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW06-SO03 **Collected:** 12/5/2012 11:55:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOFORM	0.42	J	0.79	LOD	5.0	LOQ	ug/Kg	U	Mb
TRICHLOROETHENE	0.49	J	0.79	LOD	5.0	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW08-SO04 **Collected:** 12/5/2012 2:45:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BROMOFORM	0.36	J	0.66	LOD	4.1	LOQ	ug/Kg	U	Mb

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36669-1 **Laboratory: TAL DEN**

EDD Filename: 280-36669-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: **VOA**

Sample ID: **SWMU56-TMW02-GW08** ***Collected:*** **12/5/2012 2:10:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	*Lab Result*	*Lab Qual*	*DL*	*DL Type*	*RL*	*RL Type*	*Units*	*Data Review Qual*	*Reason Code*
ACETONE	2.2	J	6.4	LOD	10	LOQ	ug/L	J	RI
CIS-1,2-DICHLOROETHENE	0.16	J	0.20	LOD	1.0	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36669-1 **Laboratory: TAL DEN**

EDD Filename: 280-36669-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Reason Code Legend

Reason Code	*Description*
Fd	Field Duplicate Precision
Lcs	Laboratory Control Precision
Lcs	Laboratory Control Spike Upper Estimation
Mb	Method Blank Contamination
Rl	Reporting Limit Trace Value
Surr	Surrogate/Tracer Recovery Upper Estimation

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Laboratory Analytical Data Validation

Site: JBA SWMU 56
Date Completed: 01-14-2013
Submitted by: Nancy McDonald
Sample Collection Date(s): 12-06-2012 and 12-07-2012
TestAmerica Project Number(s) (LPN): 280-36819-1
Bay West DMS #: 1605943

This data validation memo describes the validation of 2 aqueous samples, 11 soil samples, and 2 Trip Blanks collected on December 6 and 7, 2012 and analyzed for VOCs (8260B), SVOCs (SW-846 8270C), PAHs (8270-SIM), Organochlorine Pesticides (8081B), PCBs (8082A), Herbicides (8151A), GRO and DRO (8015C), and TAL Metals (6010B, 6020A, 7470A, and 7471B) at TestAmerica Laboratory in Denver, Colorado as sample delivery group (SDG) 280-36819-1. In addition, 6 soil samples were analyzed for pH (9045D). Samples included as part of this validation are listed below:

Sample ID	Date Sampled	TestAmerica, Denver						
		Lab ID	*VOC*	*SVOCs PAHs*	*Herbicides Pesticides PCBs*	*DRO / GRO*	*pH*	*TAL Metals*
SWMU56-TMW04-GW10	12/06/2012	36819-1	X	X	X	X		X*
SWMU56-TMW03-GW09	12/06/2012	36819-2	X	X	X	X		X
SWMU56-TMW01-SO05	12/06/2012	36819-3	X	X	X	X	X	X
SWMU56-TMW01-SO06	12/06/2012	36819-4	X‡	X‡	X‡	X‡		X‡
SWMU56-TMW01-SO07	12/06/2012	36819-5	X	X	X	X		X
SWMU56-TMW02-SO08	12/06/2012	36819-6	X	X	X	X		X
SWMU56-TMW02-SO09	12/06/2012	36819-7	X	X	X	X		X
SWMU56-TMW09-SO10	12/06/2012	36819-8	X	X	X	X		X
SWMU56-AQTB03	12/06/2012	36819-9TB	X					
SWMU56-TMW03-SO11	12/07/2012	36819-10	X	X	X	X	X	X
SWMU56-TMW03-SO12	12/07/2012	36819-11	X	X	X	X	X	X
SWMU56-TMW04-SO13	12/07/2012	36819-12	X	X	X	X	X	X
SWMU56-TMW05-SO14	12/07/2012	36819-13	X	X	X	X	X	X
SWMU56-TMW05-SO15	12/07/2012	36819-14	X*	X*	X*	X*	X	X*
SWMU56-AQTB04	12/07/2012	36819-15TB	X					

‡ - Duplicate sample of SWMU56-TMW01-SO05
* - Sample selected for MS/MSD analysis.

The Data Qualification Summary Table below summarizes the qualifications that were applied during validation:

Sample ID	Date Sampled	TestAmerica, Denver								
		Lab ID	*VOC*	*SVOCs*	*PAHs*	*Pesticides, PCBs*	*Herbicides*	*DRO/GRO*	*pH*	*TAL Metals*
SWMU56-TMW04-GW10	12/06/2012	36819-1	U: cis-1,2-Dichloroethene U: Methylene chloride U: Naphthalene U: Trichloroethene	U: bis(2-Ethylhexyl)phthalate	U: Fluoranthene	UJ: Toxaphene				U: Copper
SWMU56-TMW03-GW09	12/06/2012	36819-2	U: Methylene chloride		UJ: Benzo(b)fluoranthene J: Fluoranthene J: Fluorene J: Naphthalene J: Phenanthrene	UJ: Toxaphene				U: Copper
SWMU56-TMW01-SO05	12/06/2012	36819-3	UJ: Chloromethane							J: Chromium J: Cobalt J: Lead J: Manganese J: Nickel J: Vanadium
SWMU56-TMW01-SO06	12/06/2012	36819-4	U: Acetone							J: Chromium J: Cobalt J: Lead J: Manganese J: Nickel J: Vanadium
SWMU56-TMW01-SO07	12/06/2012	36819-5	J: 1,3,5-Trimethylbenzene J: 2-Butanone J: Acetone J: Carbon disulfide J: Naphthalene		J: Benzo(b)fluoranthene UJ: Benzo(k)fluoranthene					
SWMU56-TMW02-SO08	12/06/2012	36819-6	J: 2-Butanone J: Acetone J: Carbon disulfide J: cis-1,2-							

Sample ID	Date Sampled	TestAmerica, Denver								
			Dichloroethene J: Toluene J: trans-1,2-Dichloroethene							
SWMU56-TMW02-SO09	12/06/2012	36819-7	U: Acetone							
SWMU56-TMW09-SO10	12/06/2012	36819-8	U: Acetone	U: Benzyl alcohol						
SWMU56-AQTB03	12/06/2012	36819-9TB	U: Methylene chloride							
SWMU56-TMW03-SO11	12/07/2012	36819-10	U: Acetone	U: Benzyl alcohol						
SWMU56-TMW03-SO12	12/07/2012	36819-11	U: Acetone	U: Benzyl alcohol						
SWMU56-TMW04-SO13	12/07/2012	36819-12	U: Acetone	U: Benzyl alcohol						
SWMU56-TMW05-SO14	12/07/2012	36819-13	U: Acetone							
SWMU56-TMW05-SO15	12/07/2012	36819-14	U: Acetone	U: Benzyl alcohol				J: DRO J: GRO		J: Aluminum UJ: Antimony J: Molybdenum J: Vanadium
SWMU56-AQTB04	12/07/2012	36819-15TB	U: Methylene chloride							

Validation was conducted according to this hierarchy of validation guidance: USACE EM200-1-10 Guidance for Evaluating Performance-Based Chemical Data June 2005 (USACE, 2005), DoD Quality Systems Manual for Environmental Laboratories, v 4.2, October 2010 (DoD, 2010), USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (USEPA, 2008), USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2010). The QAPP and analytical methods were consulted during the data validation.

A Level II ADR was also performed on this data and the qualifiers summary report is included in Attachment 1. Target analytes present between the LOQ and MDL were flagged "J" as estimated. Aluminum and Iron were qualified "J" as estimated in sample SWMU56-TMW06-SO15 due to high MS/MSD recoveries; however, the validator did not apply qualifiers, because the sample results were greater than four times the spike concentrations. GRO results in samples SWMU56-TMW03-GW09 and SWMU56-TMW04-GW10 were qualified "J" as estimated because of the LCS; however, the validator did not apply qualifiers, because the LCS met criteria. Field duplicate results for Arsenic, Benzyl alcohol, Beryllium, Cadmium, Molybdenum, Potassium, Selenium, Silver, Thallium, and Zinc were also qualified "J" as estimated by ADR; however, the validator only calculated RPDs when both the parent and field duplicates results were ≥ the LOQs.

Data Validation Detail:

- **Data Package Completeness**

  The Level IV data package was reviewed to make certain that it contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested for each field sample submitted in the analytical batch, along with requested QC documentation for the method. The data package is complete.

- **Laboratory Case Narrative/Cooler Receipt Form**

  No anomalies were noted on the chain of custody or cooler receipt forms that affected data quality. The laboratory case narrative was accurate and complete and documented that a revised chain-of-custody (CoC) was received from Bay West requesting SVOC analysis plus TICs for all samples except trip blanks. In addition, pH analysis was added for sample SWMU56-TMW01-SO05.

- **Holding Times, Storage, and Preservation**

  Review of the sample collection and analysis dates involved comparing the CoCs, the summary forms, and the data report for holding time compliance.

  All samples were received correctly, intact and properly preserved. All samples were prepared and analyzed within the turnaround time required by the project.

- **Instrument Performance Check**

  The instruments met all applicable performance check requirements. The instrument performance check included verification of 4-Bromofluorobenzene (BFB) tunes for VOC and Decafluorotriphenylphosphine (DFTPP) for PAHs and SVOCs. All samples were analyzed within 12 hours of the BFB and DFTPP tunes.

- **Initial Calibration (ICAL) / Initial Calibration Verification (ICV)**

  ICAL and ICV acceptance criteria were met for all parameters except for the following.

  Pesticides: In the ICV (11/14/2012 21:03), % differences for several peaks exceeded the criterion of 15% on both columns. Toxaphene results were qualified "UJ" as estimated in samples SWMU56-TMW04-GW10 and SWMU56-TMW03-GW09. In the ICV (11/15/2012 18:59), % differences for several peaks exceeded the criterion of 15% on column CLP1. No action was required, because all Toxaphene peaks met criteria on column CLP2.

  PCBs: In the ICV (12/19/2012 02:40), the %D of 22.5% for a single Aroclor 1254 peak was biased high and exceeded criterion of 20%. No qualification was required, because Aroclor 1254 was non-detect in the associated samples.

- **Continuing Calibration Verification (CCV)**

  CCV acceptance criteria were met for all parameters with the following exception:

  VOCs: In the CCV (12/12/2012 19:09), % Differences for Chloromethane (-21.2%), Carbon tetrachloride (27.5%), and 4-Methyl-2-pentanone (20.7%) were outside acceptance criteria of ≤ 20%. The Chloromethane result was qualified "UJ" as estimated in sample SWMU56-TMW01-SO05. No further qualification was required, because of potential high bias for Carbon tetrachloride and 4-Methyl-2-pentanone in this CCV and Carbon tetrachloride and 4-Methyl-2-pentanone were non-detect in sample SWMU56-TMW01-SO05.

  Pesticides: In CCVs [12/17/2012 (14:58 and 21:41), 12/18/2012 (00:54), and 12/19/2012 (18:50)], % differences for several Toxaphene peaks were outside acceptance criteria of ≤ 15% on column CLP1. No action was required, because all Toxaphene peaks met criteria on column CLP2. In the CCVs (12/18/2012 16:14 and 19:17), the % differences for 4,4'-DDD (22.7% and 21.1%) were outside criteria on column CLP2. No action was required, because the % differences met criteria on column CLP1. In the CCV (12/19/2012 18:33), the % differences for 4,4'-DDT (-20.9%) and Methoxychlor (-21.8%) on column CLP1 and Endosulfan sulfate (24.8%) on column CLP2 were outside criteria. No action was required, because the % differences met criteria on the other column.

  PCBs: In the CCVRT (12/21/2012 15:38), % Differences for a single Aroclor 1260 peak (-20.8%) and surrogate Decachlorobiphenyl (DCB) (-23.0%) were biased low and outside the criterion of 20%. No action was required, because only a method blank and LCS were associated with this standard.

  In the CCV (12/12/2012 23:50), the % Difference for a single Aroclor 1260 peak (24.8%) was biased high and outside the criterion of 20%. No action was required, because Aroclor 1260 was non-detect in the associated samples.

  In the CCV (12/13/2012 07:40), % Differences for a single Aroclor 1260 peak (22.5%) and surrogate Decachlorobiphenyl (DCB) (27.0%) were biased high and outside the criterion of 20%. No qualification was required, because Aroclor 1260 was non-detect and all surrogate recoveries met criteria in the associated samples.

Herbicides: In the CCVs (12/14/2012 23:57, 12/15/2012 04:25, 12/18/2012 19:54), % differences for several herbicides were outside criteria of ≤ 20% with high bias on one or both columns. No action was required, because these compounds were non-detect in the associated samples.

- **Pesticide Performance Evaluation Mixture (PEM)**

  In the Pesticide analysis, the % breakdown met the acceptance criterion of 15%.

- **CRQL Check Standard**

  All acceptance criteria were met for the CRQL Check Standards.

- **Interference Check Standard**

  The Interference Check Standards met method and DoD QSM acceptance criteria except for the following. The Cadmium and/or Nickel results were greater than the LOD in analytical batches 280-152424 and 280-152050. The laboratory flagged the associated results "Q", as required by DoD QSM. The validator removed the "Q" flag, because the vendor confirmed that Cadmium and Nickel are trace impurities in the ICSA solution.

- **Method Blank and Trip Blank**

  Target analytes were not detected above ½ the Limit of Quantitation (LOQ) in the Method Blanks except for the following. In the VOC analysis, Chloroform (14 ug/L), cis-1,2-Dichloroethene (0.60 ug/L), Trichloroethene (4.7 ug/L), and Trichlorofluoromethane (1.3 ug/L) results were > ½ LOQs of 1.0 ug/L and 2.0 ug/L in trip blank SWMU56-AQTB03. cis-1,2-Dichloroethene and Trichloroethene results were qualified "U" and raised to the LOQ (as appropriate) in sample SWMU56-TMW04-GW10, because the results were < five times the trip blank concentrations. No further qualification was required, because Chloroform and Trichlorofluoromethane were non-detect in the associated samples. The following anomalies were also noted:

  VOCs: A low-level concentration of Acetone (7.47 ug/kg), < ½ the LOQ of 20 ug/kg, was detected in the Method Blank151707/1-A. Acetone results in samples SWMU56-TMW01-SO06, SWMU56-TMW02-SO09, SWMU56-TMW09-SO10, SWMU56-TMW03-SO11, SWMU56-TMW03-SO12, SWMU56-TMW04-SO13, SWMU56-TMW05-SO14, and SWMU56-TMW05-SO15 were qualified "U" and raised to the LOQ, because the results were < five times the blank concentration.

  Low-level concentrations of 1,2,3-Trichlorobenzene (0.29 ug/L), Methylene chloride (0.674 ug/L), and Naphthalene (0.326 ug/L), < ½ the LOQs of 1.0 ug/L and 5.0 ug/L, were detected in Method Blank 152167/5. Results for Methylene chloride in samples SWMU56-TMW04-GW10, SWMU56-TMW03-GW09, SWMU56-AQTB03, and SWMU56-AQTB04 and Naphthalene in sample SWMU56-TMW04-GW10 were flagged "U" and raised to the LOQ, because the results were < five times the Method Blank concentrations. No further qualification was required, because 1,2,3-Trichlorobenzene was non-detect in the associated samples.

  Low-level concentrations of 1,2,3-Trichlorobenzene (0.271 ug/L), Methylene chloride (0.683 ug/L), and Naphthalene (0.292 ug/L), < ½ the LOQs of 1.0 ug/L and 5.0 ug/L, were detected in Method Blank 152684/5. No qualification was required, because only Chloroform was reported from the sample associated with this Method Blank.

SVOC: A low-level concentration of Benzyl alcohol (9.13 ug/kg), < ½ the LOQ of 300 ug/kg, was detected in Method Blank 151705/1-A. Benzyl alcohol results in samples SWMU56-TMW09-SO010, SWMU56-TMW03-SO011, SWMU56-TMW03-SO012, SWMU56-TMW04-SO013, and SWMU56-TMW05-SO015, were qualified "U" and raised to the LOQ, because the results were < five times the blank concentration.

PAHs: Low-level concentrations of the following analytes were detected at concentrations < ½ the LOQs in the aqueous Method Blank:

Blank ID	Analyte	Result (ug/L)	LOQ (ug/L)
MB 151404/1-A	Benzo(a)anthracene	0.00559	0.10
	Benzo(b)fluoranthene	0.00348	0.10
	Benzo(k)fluoranthene	0.0153	0.10
	Chrysene	0.00437	0.10
	Fluoranthene	0.00808	0.10

The result for Fluoranthene in sample SWMU56-TMW04-GW10 was qualified "U" and raised to the LOQ, because the result were < five times the blank concentration. No further action was required, because the remaining PAHs were non-detect or > five times the blank concentrations.

Equipment Blank:

VOCs: A low-level concentration of Acetone (2.9 ug/L) was detected in the equipment blank sample (from SDG 36632). No action was warranted, because sample results were either non-detect, previously qualified because of method blank contamination, or greater than five times the blank concentration.

SVOCs: Low-level concentrations of bis(2-Ethylhexyl)phthalate (2.1 ug/L) and Phenol (2.9 ug/L) were detected in the equipment blank sample SWMU56-AQEB01. The result for bis(2-Ethylhexyl)phthalate in sample SWMU56-TMW04-GW10 was qualified "U" and raised to the LOQ, because the result was < five times the equipment blank concentration. No further action was required, because Phenol was non-detect in the associated samples.

GRO: A low-level concentration of GRO, < ½ the LOQ, was detected in equipment blank sample SWMU56-AQEB01 (0.017 mg/L). No qualification was required, because GRO results were either non-detect or greater than five times the blank concentration.

Metals: The following metals were detected in the Equipment Blank Sample:

Blank ID	Analyte	Result (ug/L)
SWMU56-AQEB01	Calcium	47
	Copper	0.89 J
	Manganese	0.42 J

Results for Copper were qualified "U" in samples SWMU56-TMW04-GW10 and SWMU56-TMW03-GW09, because the results were < five times the equipment blank concentration. No further qualification was required, because Calcium and Manganese results were > five times the equipment blank concentrations.

Field Blank: Acetone, Chlorodibromomethane, Chloroform, Dibromomethane, Benzyl Alcohol, Naphthalene, Phenanthrene, GRO, DRO, Aluminum, Barium, Calcium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Sodium, and Zinc were detected in Field Blank sample SWMU56-AQFB01 (from SDG 36632). No qualification was applied based on the field blank contamination.

- **Surrogate Spikes**

Surrogates were added to all samples and QC samples as required by the analytical method. All surrogate recoveries met the required QC criteria except for the following.

VOCs: Recoveries for surrogate 4-Bromofluorobenzene (both 126%) in samples SWMU56-TMW01-SO07 and SWMU56-TMW02-SO08 were biased high and outside criteria of 85-120%. Detected VOC results associated with this surrogate were qualified "J" as estimated and may be biased high in these samples.

PAHs: The recovery for surrogate Terphenyl-d14 of 293% was biased high and outside acceptance criteria of 47-120% in sample SWMU56-TMW03-GW09. The detected result for Phenanthrene was qualified "J" as estimated and may be biased high in this sample.

GRO: The recovery for surrogate a,a,a-Trifluorotoluene of 120% in sample SWMU56-TMW03-GW09 was biased high and outside criteria of 82-110%. No action was required, because GRO was non-detect in sample SWMU56-TMW03-GW09.

Herbicides: Recoveries for surrogate 2,4-Dichlorophenyl acetic acid (DCPA) in the following samples exceed acceptance criteria:

Sample	DCPA1 (%R)*	DCPA2 (%R)*	QC Limits
SWMU56-TMW01-SO06	**111**	100	31-105
SWMU56-TMW03-SO12	97	**110**	31-105
SWMU56-TMW03-SO12	94	**109**	31-105

* Bolded values are outside QC limits.

The laboratory applied a "Q" flag to associated sample results. The validator removed the "Q" flags, because the surrogate recoveries were biased high and all herbicides in the above samples were non-detect, so no qualification was warranted.

- **Matrix Spike/Matrix Spike Duplicates (MS/MSD)**

MS/MSD analyses were performed on sample SWMU56-TMW05-SO15 for all methods and sample SWMU56-TMW04-GW10 for metals. All recoveries and RPDs were within acceptance criteria except for the following. In the GRO analysis, the MS recovery of 82% for GRO was biased low and outside acceptance criteria of 85-153% in sample SWMU56-TMW05-SO15. The GRO result was qualified "J" as estimated and may be biased low in the parent sample.

DRO: The RPD for DRO of 26% exceeded acceptance criteria in sample SWMU56-TMW05-SO15. The DRO result was qualified "J" as estimated in the parent sample.

Herbicides: MS/MSD recoveries for 2,4-Dicamba (101% and 95%) and the MS recovery for 2,4-D (102%) were biased high and outside QC limits of 11-87% and 32-97%, respectively, in sample SWMU56-TMW05-SO15. No action was required, because these herbicides were non-detect in the parent sample.

Metals: MS/MSD recoveries for Aluminum (7149% and 7914%), Antimony (4% and 14%), Iron (2350% and 1666%), and Molybdenum (58% and 64%) and the MSD recovery for Vanadium (64%) were outside acceptance criteria in sample SWMU56-TMW05-SO15. Antimony and Molybdenum results were qualified "J" or "UJ", as appropriate, and may be biased low and the Vanadium result was qualified "J" and may be biased high in the parent sample. No qualification was required for Aluminum and Iron, because the sample results were greater than four times the spike concentrations.

- **Laboratory Control Sample (LCS)**

  All LCS recoveries were within the QAPP and the DoD QSM 4.2 acceptance criteria except for the following.

LCS ID	Analyte	LCS (%R)	QC Limits
151410/2-A	2,4,5-T	119	35-110&
	2,4-D	120	35-115%
	Dinoseb	99	20-95%
	2,4,5-TP (Silvex)	124	50-115%
151465/2-A	2,4-D	101	32-97%
	Dicamba	94	11-87%

  No qualification was required, because these compounds were non-detect in the associated samples.

- **Inductively Coupled Plasma (ICP) Serial Dilution (Dilution Test) and Post-Digestion Spikes**

  All ICP Serial Dilution % differences and Post Digestion Spike (PDS) recoveries were with acceptance criteria except for the following. In the ICP Serial Dilution, the % Difference for Iron (42%) was high and exceeded 10% in sample SWMU56-TMW05-SO15. PDS recoveries for Aluminum (33%) and Iron (56%) were biased low and outside QC limits of 75-125%. The Aluminum result was qualified "J" as estimated in sample SWMU56-TMW05-SO15. No further action was required for Iron, because the % Difference for Iron in the Serial Dilution met criteria.

- **Blind Field Duplicates**

  Blind field duplicates, SWMU56-TMW01-SO05 and SWMU56-TMW01-SO06, were analyzed for VOCs, SVOCs, PAHs, GRO, DRO, pesticides, PCBs, herbicides, and metals. All RPDs were within the field criteria of ≤ 20% for metals and ≤ 30% for all other parameters except for the following. RPDs for Chromium (50.5%), Cobalt (40.0%), Lead (56.0%), Manganese (46.8%), Nickel (52.1%), and Vanadium (57.1%) exceeded

the criteria of ≤ 20% for metals. Chromium, Cobalt, Lead, Manganese, Nickel, and Vanadium results were qualified "J" as estimated in samples SWMU56-TMW01-SO05 and SWMU56-TMW01-SO06. RPDs are not calculated unless both the parent and duplicate results are ≥ the LOQ.

- **Internal Standards**

  All QC criteria were met for Internal Standards (IS) in all calibrations and all field samples.

- **Target Analyte Identification and Quantitation**

  Target compound identification followed the specific analytical Method. Retention times and Mass Spectra were consistent with the analytical standards. In the SVOC analysis, Benzo(b)fluoranthene and Benzo(k)fluoranthene could not be resolved in sample SWMU56-TMW01-SO07; therefore, the detected result was reported as Benzo(b)fluoranthene. The peak may be a combination of the two compounds, so both results were qualified "J" or "UJ" as estimated in this sample. Appropriate wavelengths were chosen for the metals analysis in addition to appropriate interelement correction factors.

  Non-detected results were reported to the Limit of Detection (LOD) in accordance with DoD QSM 4.2. The laboratory also reported the LOQ for each analyte on the sample result sheet (Form 1). The laboratory reported target analytes, which were qualitatively identified at concentrations below the LOQs, with a "J" qualifier to indicate that the result is estimated as required by DoD QSM 4.2. The "J" qualifier was retained by the validator. In general, the LOQs reported are consistent with the LOQs listed in the QAPP.

  Sample dilutions were not required except for the following. VOC sample SWMU56-TMW04-GW10 was initially analyzed undiluted; however a 10-fold dilution was required due to a high concentration of Chloroform. Chloroform was reported from the dilution and all other VOC compounds were reported from the undiluted analysis.

  In the SVOC analysis, sample SWMU56-TMW03-SO11 was concentrated to 2 mL instead of the final method required volume of 1 mL, because of matrix interference. The LOQs were adjusted accordingly.

- **Tentatively Identified Compounds (TICs)**

  In the VOC and SVOC analyses, TICs were reported for all field samples.

  VOCs: Siloxanes, cyclohexanones, and cyclohexanes were detected in some VOC samples. All siloxane, cyclohexanones, and cyclohexanes results were qualified "R" as rejected, because siloxanes are considered common laboratory contaminants (probable column bleed) and cyclohexanones and cyclohexanes are solvent preservatives associated with methylene chloride.

  SVOCs: An unknown peak at RT 2.91 minutes and 4-methoxy-4-methyl-2-pentanone, were detected in some samples. The unknown peak and 4-methoxy-4-methyl-2-pentanone were detected in the method blank, so the results were qualified "R" as rejected. In addition, 4-methyl-3-penten-2-one was detected in several samples. These results were qualified "R" as rejected, because this compound is considered an aldol condensation reaction product.

Overall Evaluation

A number of results were qualified as estimated as a result of MS/MSD, surrogate, and ICP serial dilution performance, blank contamination, and high RPDs in the field duplicate pair. Two SVOC results were also qualified as estimated, because of a coelution on the GC column. In addition, a number of TICs were rejected, because of method blank contamination, common laboratory contaminants, or solvent preservatives, and aldol condensation reaction products. All other validation elements were acceptable and the data, as qualified, is acceptable for its intended use.

Based on the criteria presented above, it is recommended that the results reported for these analyses be accepted a qualified. MS/MSD and LCS/LCSD and surrogate recoveries demonstrated that acceptable levels of accuracy and precision were achieved. In addition, completeness, defined to be the percentage of analytical results to be valid, including estimated values was 99% (excluding TIC values rejected) for this Sample Delivery Group.

Data Validation Qualifiers

Validation Qualifier	Definition
J	The reported positive result is considered estimated, because the result is less than the LOQ or because certain quality control criteria were not met.
U	The analyte was not detected and is reported as less than the LOD or as defined by the client.
UJ	The analyte was not detected in the sample. The LOD (or LOQ) should be considered estimated and may be inaccurate or imprecise.
R	The result for this analyte is unusable. The analyte may or may not be present.

References

USACE EM200-1-10 Guidance for Evaluating Performance-Based Chemical Data, June 2005. (USACE, 2005).

U.S. Department of Defense (DoD). DoD Quality Systems Manual for Environmental Laboratories, Version 4.2, October, 2010. (DoD, 2010).

U.S. Environmental Protection Agency (USEPA). USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June, 2008. (USEPA, 2008).

USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (USEPA, 2010).

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SMW56-TMW03-SO11 **Collected:** 12/7/2012 8:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CALCIUM	46000	J	21000	LOD	100000	LOQ	ug/Kg	J	RI

Sample ID: SMW56-TMW03-SO12 **Collected:** 12/7/2012 8:05:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CALCIUM	38000	J	22000	LOD	110000	LOQ	ug/Kg	J	RI
POTASSIUM	110000	J	54000	LOD	320000	LOQ	ug/Kg	J	RI

Sample ID: SMW56-TMW04-SO13 **Collected:** 12/7/2012 11:05:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CALCIUM	67000	J	19000	LOD	97000	LOQ	ug/Kg	J	RI
POTASSIUM	92000	J	49000	LOD	290000	LOQ	ug/Kg	J	RI

Sample ID: SMW56-TMW05-SO14 **Collected:** 12/7/2012 12:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SODIUM	120000	J	110000	LOD	550000	LOQ	ug/Kg	J	RI

Sample ID: SMW56-TMW05-SO15 **Collected:** 12/7/2012 12:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ALUMINUM	4100000	J	3100	LOD	52000	LOQ	ug/Kg	J	Ms
CALCIUM	30000	J	21000	LOD	100000	LOQ	ug/Kg	J	RI
IRON	2300000	J	5200	LOD	83000	LOQ	ug/Kg	J	Ms
POTASSIUM	210000	J	52000	LOD	310000	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW01-SO05 **Collected:** 12/6/2012 9:00:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
POTASSIUM	240000	J	58000	LOD	350000	LOQ	ug/Kg	J	RI, Fd

Sample ID: SWMU56-TMW01-SO06 **Collected:** 12/6/2012 9:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
POTASSIUM	330000		48000	LOD	290000	LOQ	ug/Kg	J	Fd

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SWMU56-TMW01-SO07 **Collected:** 12/6/2012 8:43:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SODIUM	75000	J	110000	LOD	540000	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW02-SO08 **Collected:** 12/6/2012 11:32:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SODIUM	82000	J	110000	LOD	550000	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW02-SO09 **Collected:** 12/6/2012 11:47:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
POTASSIUM	160000	J	47000	LOD	280000	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW09-SO10 **Collected:** 12/6/2012 2:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CALCIUM	20000	J	20000	LOD	100000	LOQ	ug/Kg	J	RI
POTASSIUM	230000	J	51000	LOD	310000	LOQ	ug/Kg	J	RI

Method Category: METALS

Sample ID: SWMU56-TMW03-GW09 **Collected:** 12/6/2012 9:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ALUMINUM	220	J	30	LOD	300	LOQ	ug/L	J	RI
POTASSIUM	1500	J	250	LOD	3000	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW04-GW10 **Collected:** 12/6/2012 11:15:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ALUMINUM	57	J	30	LOD	300	LOQ	ug/L	J	RI
POTASSIUM	1200	J	250	LOD	3000	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SMW56-TMW03-SO11 **Collected:** 12/7/2012 8:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SILVER	26	J	54	LOD	90	LOQ	ug/Kg	J	RI

Sample ID: SMW56-TMW03-SO12 **Collected:** 12/7/2012 8:05:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	33	J	64	LOD	98	LOQ	ug/Kg	J	RI
CADMIUM	69	J Q	25	LOD	98	LOQ	ug/Kg	J	RI
COPPER	1500	J	200	LOD	2500	LOQ	ug/Kg	J	RI
MOLYBDENUM	84	J	49	LOD	200	LOQ	ug/Kg	J	RI
SELENIUM	400	J	250	LOD	490	LOQ	ug/Kg	J	RI
THALLIUM	26	J	9.8	LOD	98	LOQ	ug/Kg	J	RI
ZINC	1000	J	880	LOD	2500	LOQ	ug/Kg	J	RI

Sample ID: SMW56-TMW04-SO13 **Collected:** 12/7/2012 11:05:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	50	J	63	LOD	96	LOQ	ug/Kg	J	RI
CADMIUM	53	J Q	24	LOD	96	LOQ	ug/Kg	J	RI
COPPER	2300	J	190	LOD	2400	LOQ	ug/Kg	J	RI
MOLYBDENUM	160	J	48	LOD	190	LOQ	ug/Kg	J	RI
SELENIUM	420	J	240	LOD	480	LOQ	ug/Kg	J	RI
SILVER	26	J	58	LOD	96	LOQ	ug/Kg	J	RI
THALLIUM	27	J	9.6	LOD	96	LOQ	ug/Kg	J	RI
ZINC	1300	J	870	LOD	2400	LOQ	ug/Kg	J	RI

Sample ID: SMW56-TMW05-SO14 **Collected:** 12/7/2012 12:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
MOLYBDENUM	220	J	57	LOD	230	LOQ	ug/Kg	J	RI
SILVER	34	J	69	LOD	110	LOQ	ug/Kg	J	RI

Sample ID: SMW56-TMW05-SO15 **Collected:** 12/7/2012 12:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ANTIMONY	38	U J	38	LOD	190	LOQ	ug/Kg	UJ	Ms

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: **SMW56-TMW05-SO15** ***Collected:*** **12/7/2012 12:30:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	43	J	62	LOD	96	LOQ	ug/Kg	J	RI
CADMIUM	58	J Q	24	LOD	96	LOQ	ug/Kg	J	RI
MOLYBDENUM	310	J	48	LOD	190	LOQ	ug/Kg	J	Ms
SELENIUM	470	J	240	LOD	480	LOQ	ug/Kg	J	RI
THALLIUM	30	J	9.6	LOD	96	LOQ	ug/Kg	J	RI
VANADIUM	4900	J	96	LOD	480	LOQ	ug/Kg	J	Ms, Ms
ZINC	750	J	860	LOD	2400	LOQ	ug/Kg	J	RI

Sample ID: **SWMU56-TMW01-SO05** ***Collected:*** **12/6/2012 9:00:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ARSENIC	370	J	180	LOD	600	LOQ	ug/Kg	J	RI, Fd
BERYLLIUM	42	J	77	LOD	120	LOQ	ug/Kg	J	RI, Fd
CADMIUM	55	J Q	30	LOD	120	LOQ	ug/Kg	J	RI, Fd
CHROMIUM	3700		210	LOD	240	LOQ	ug/Kg	J	Fd
COBALT	200		21	LOD	120	LOQ	ug/Kg	J	Fd
COPPER	1100	J	240	LOD	3000	LOQ	ug/Kg	J	RI, Fd
LEAD	1800		60	LOD	120	LOQ	ug/Kg	J	Fd
MANGANESE	3600		110	LOD	120	LOQ	ug/Kg	J	Fd
MOLYBDENUM	81	J	60	LOD	240	LOQ	ug/Kg	J	RI, Fd
NICKEL	540	Q	89	LOD	420	LOQ	ug/Kg	J	Fd
SELENIUM	310	J	300	LOD	600	LOQ	ug/Kg	J	RI, Fd
SILVER	71	U	71	LOD	120	LOQ	ug/Kg	UJ	Fd
THALLIUM	37	J	12	LOD	120	LOQ	ug/Kg	J	RI, Fd
VANADIUM	5500		120	LOD	600	LOQ	ug/Kg	J	Fd
ZINC	1500	J	1100	LOD	3000	LOQ	ug/Kg	J	RI, Fd

Sample ID: **SWMU56-TMW01-SO06** ***Collected:*** **12/6/2012 9:10:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ARSENIC	530		150	LOD	500	LOQ	ug/Kg	J	Fd
BERYLLIUM	94	J	65	LOD	100	LOQ	ug/Kg	J	RI, Fd
CADMIUM	97	J Q	25	LOD	100	LOQ	ug/Kg	J	RI, Fd
CHROMIUM	6200		180	LOD	200	LOQ	ug/Kg	J	Fd
COBALT	330		18	LOD	100	LOQ	ug/Kg	J	Fd

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SWMU56-TMW01-SO06 **Collected:** 12/6/2012 9:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
COPPER	1700	J	200	LOD	2500	LOQ	ug/Kg	J	RI, Fd
LEAD	3200		50	LOD	100	LOQ	ug/Kg	J	Fd
MANGANESE	5800		91	LOD	100	LOQ	ug/Kg	J	Fd
MOLYBDENUM	100	J	50	LOD	200	LOQ	ug/Kg	J	RI, Fd
NICKEL	920	Q	76	LOD	350	LOQ	ug/Kg	J	Fd
SELENIUM	480	J	250	LOD	500	LOQ	ug/Kg	J	RI, Fd
SILVER	21	J	60	LOD	100	LOQ	ug/Kg	J	RI, Fd
THALLIUM	65	J	10	LOD	100	LOQ	ug/Kg	J	RI, Fd
VANADIUM	9900		100	LOD	500	LOQ	ug/Kg	J	Fd
ZINC	2400	J	910	LOD	2500	LOQ	ug/Kg	J	RI, Fd

Sample ID: SWMU56-TMW01-SO07 **Collected:** 12/6/2012 8:43:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SILVER	45	J	60	LOD	100	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW02-SO08 **Collected:** 12/6/2012 11:32:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
SILVER	31	J	75	LOD	120	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW02-SO09 **Collected:** 12/6/2012 11:47:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	68	J	70	LOD	110	LOQ	ug/Kg	J	RI
CADMIUM	54	J Q	27	LOD	110	LOQ	ug/Kg	J	RI
COPPER	1400	J	220	LOD	2700	LOQ	ug/Kg	J	RI
MOLYBDENUM	85	J	54	LOD	220	LOQ	ug/Kg	J	RI
SELENIUM	320	J	270	LOD	540	LOQ	ug/Kg	J	RI
THALLIUM	35	J	11	LOD	110	LOQ	ug/Kg	J	RI
ZINC	1000	J	970	LOD	2700	LOQ	ug/Kg	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SWMU56-TMW09-SO10 **Collected:** 12/6/2012 2:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	83	J	74	LOD	110	LOQ	ug/Kg	J	RI
CADMIUM	81	J Q	29	LOD	110	LOQ	ug/Kg	J	RI
COPPER	1400	J	230	LOD	2900	LOQ	ug/Kg	J	RI
MOLYBDENUM	170	J	57	LOD	230	LOQ	ug/Kg	J	RI
SELENIUM	420	J	290	LOD	570	LOQ	ug/Kg	J	RI
THALLIUM	41	J	11	LOD	110	LOQ	ug/Kg	J	RI
ZINC	1500	J	1000	LOD	2900	LOQ	ug/Kg	J	RI

Method Category: METALS

Sample ID: SWMU56-TMW03-GW09 **Collected:** 12/6/2012 9:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	0.46	J	0.24	LOD	1.0	LOQ	ug/L	J	RI
CHROMIUM	3.4	J	1.5	LOD	10	LOQ	ug/L	J	RI
COPPER	1.5	J	1.5	LOD	2.0	LOQ	ug/L	J	RI
LEAD	0.29	J	0.50	LOD	3.0	LOQ	ug/L	J	RI
MOLYBDENUM	0.41	J	0.40	LOD	2.0	LOQ	ug/L	J	RI
THALLIUM	0.063	J	0.10	LOD	1.0	LOQ	ug/L	J	RI
ZINC	19	J	6.0	LOD	20	LOQ	ug/L	J	RI

Sample ID: SWMU56-TMW04-GW10 **Collected:** 12/6/2012 11:15:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BERYLLIUM	0.17	J	0.24	LOD	1.0	LOQ	ug/L	J	RI
CADMIUM	0.47	J Q	0.12	LOD	1.0	LOQ	ug/L	J	RI
CHROMIUM	1.0	J	1.5	LOD	10	LOQ	ug/L	J	RI
COPPER	0.84	J	1.5	LOD	2.0	LOQ	ug/L	J	RI
LEAD	0.69	J	0.50	LOD	3.0	LOQ	ug/L	J	RI
THALLIUM	0.081	J	0.10	LOD	1.0	LOQ	ug/L	J	RI
ZINC	9.0	J	6.0	LOD	20	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: METALS

Sample ID: SWMU56-TMW03-GW09 **Collected:** 12/6/2012 9:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
MERCURY	0.15	J	0.080	LOD	0.20	LOQ	ug/L	J	RI

Method Category: SVOA

Sample ID: SMW56-TMW03-SO11 **Collected:** 12/7/2012 8:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	4400	M	2100	LOD	4100	LOQ	ug/Kg	J	Ms

Sample ID: SMW56-TMW03-SO12 **Collected:** 12/7/2012 8:05:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	880	J	2000	LOD	4100	LOQ	ug/Kg	J	RI, Ms

Sample ID: SMW56-TMW04-SO13 **Collected:** 12/7/2012 11:05:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	1800	J	2100	LOD	4100	LOQ	ug/Kg	J	RI, Ms

Sample ID: SMW56-TMW05-SO14 **Collected:** 12/7/2012 12:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	1900	J	2200	LOD	4500	LOQ	ug/Kg	J	RI, Ms

Sample ID: SMW56-TMW05-SO15 **Collected:** 12/7/2012 12:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	830	J	2100	LOD	4200	LOQ	ug/Kg	J	RI, Ms

Sample ID: SWMU56-TMW01-SO05 **Collected:** 12/6/2012 9:00:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	960	J	2500	LOD	5000	LOQ	ug/Kg	J	RI, Ms

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: SWMU56-TMW01-SO06 **Collected:** 12/6/2012 9:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	810	J	2200	LOD	4400	LOQ	ug/Kg	J	RI, Ms

Sample ID: SWMU56-TMW01-SO07 **Collected:** 12/6/2012 8:43:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	9500	M	2400	LOD	4700	LOQ	ug/Kg	J	Ms

Sample ID: SWMU56-TMW02-SO08 **Collected:** 12/6/2012 11:32:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	4000	J M	2500	LOD	5000	LOQ	ug/Kg	J	RI, Ms

Sample ID: SWMU56-TMW02-SO09 **Collected:** 12/6/2012 11:47:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	1700	J	2200	LOD	4300	LOQ	ug/Kg	J	RI, Ms

Sample ID: SWMU56-TMW09-SO10 **Collected:** 12/6/2012 2:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	2900	J	2300	LOD	4600	LOQ	ug/Kg	J	RI, Ms

Method Category: SVOA

Sample ID: SWMU56-TMW03-GW09 **Collected:** 12/6/2012 9:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
DIESEL RANGE ORGANICS	76	J M	110	LOD	280	LOQ	ug/L	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: SWMU56-TMW01-SO07 **Collected:** 12/6/2012 8:43:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
4,4'-DDE	1.2	J	0.53	LOD	2.0	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW01-SO07 **Collected:** 12/6/2012 8:43:00 **Analysis Type:** Reanalysis-01/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
4,4'-DDD	1.8	J	0.79	LOD	2.0	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW02-SO08 **Collected:** 12/6/2012 11:32:00 **Analysis Type:** Reanalysis-01/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
4,4'-DDD	1.7	J	0.83	LOD	2.0	LOQ	ug/Kg	J	RI

Method Category: SVOA

Sample ID: SMW56-TMW03-SO11 **Collected:** 12/7/2012 8:50:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	28	J	68	LOD	680	LOQ	ug/Kg	U	Mb

Sample ID: SMW56-TMW03-SO12 **Collected:** 12/7/2012 8:05:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	28	J	34	LOD	340	LOQ	ug/Kg	U	Mb

Sample ID: SMW56-TMW04-SO13 **Collected:** 12/7/2012 11:05:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	36	J	34	LOD	340	LOQ	ug/Kg	U	Mb

Sample ID: SMW56-TMW05-SO14 **Collected:** 12/7/2012 12:10:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	47	J	38	LOD	380	LOQ	ug/Kg	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: **SMW56-TMW05-SO15** ***Collected:*** **12/7/2012 12:30:00** ***Analysis Type:*** **Initial/TOT-** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	16	J	36	LOD	360	LOQ	ug/Kg	U	Mb

Sample ID: **SWMU56-TMW01-SO05** ***Collected:*** **12/6/2012 9:00:00** ***Analysis Type:*** **Initial/TOT-** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	41	U	41	LOD	410	LOQ	ug/Kg	UJ	Fd

Sample ID: **SWMU56-TMW01-SO06** ***Collected:*** **12/6/2012 9:10:00** ***Analysis Type:*** **Initial/TOT-** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	26	J	36	LOD	360	LOQ	ug/Kg	J	RI, Fd

Sample ID: **SWMU56-TMW01-SO07** ***Collected:*** **12/6/2012 8:43:00** ***Analysis Type:*** **Initial/TOT-** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZO(B)FLUORANTHENE	44	J K	38	LOD	380	LOQ	ug/Kg	J	RI
CHRYSENE	38	J	38	LOD	380	LOQ	ug/Kg	J	RI
PYRENE	47	J	38	LOD	460	LOQ	ug/Kg	J	RI

Sample ID: **SWMU56-TMW02-SO08** ***Collected:*** **12/6/2012 11:32:00** ***Analysis Type:*** **Initial/TOT-** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	42	J	38	LOD	380	LOQ	ug/Kg	J	RI
PYRENE	20	J	38	LOD	460	LOQ	ug/Kg	J	RI

Sample ID: **SWMU56-TMW02-SO09** ***Collected:*** **12/6/2012 11:47:00** ***Analysis Type:*** **Initial/TOT-** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	39	J	35	LOD	350	LOQ	ug/Kg	J	RI

Sample ID: **SWMU56-TMW09-SO10** ***Collected:*** **12/6/2012 2:30:00** ***Analysis Type:*** **Initial/TOT-** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZYL ALCOHOL	39	J	39	LOD	390	LOQ	ug/Kg	U	Mb

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: SWMU56-TMW04-GW10 **Collected:** 12/6/2012 11:15:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BIS(2-ETHYLHEXYL)PHTHALATE	0.93	J	1.1	LOD	11	LOQ	ug/L	J	RI

Method Category: SVOA

Sample ID: SMW56-TMW05-SO14 **Collected:** 12/7/2012 12:10:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
NAPHTHALENE	0.66	J	0.77	LOD	5.8	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW01-SO07 **Collected:** 12/6/2012 8:43:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACENAPHTHENE	2.2	J	0.30	LOD	5.5	LOQ	ug/Kg	J	RI
DIBENZO(A,H)ANTHRACENE	3.9	J	2.8	LOD	5.5	LOQ	ug/Kg	J	RI
FLUORENE	5.4	J	0.74	LOD	5.5	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW02-SO08 **Collected:** 12/6/2012 11:32:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACENAPHTHYLENE	4.0	J	0.76	LOD	5.7	LOQ	ug/Kg	J	RI
ANTHRACENE	3.7	J	2.9	LOD	5.7	LOQ	ug/Kg	J	RI
DIBENZO(A,H)ANTHRACENE	3.4	J	2.9	LOD	5.7	LOQ	ug/Kg	J	RI
FLUORENE	4.0	J	0.76	LOD	5.7	LOQ	ug/Kg	J	RI

Method Category: SVOA

Sample ID: SWMU56-TMW03-GW09 **Collected:** 12/6/2012 9:50:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
BENZO(B)FLUORANTHENE	0.0050	J Q	0.011	LOD	0.11	LOQ	ug/L	UJ	Mb, Surr
FLUORANTHENE	0.092	J	0.011	LOD	0.11	LOQ	ug/L	J	RI, Surr
FLUORENE	0.14		0.022	LOD	0.11	LOQ	ug/L	J	Surr
NAPHTHALENE	0.039	J	0.011	LOD	0.11	LOQ	ug/L	J	RI, Surr

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: SVOA

Sample ID: SWMU56-TMW03-GW09 **Collected:** 12/6/2012 9:50:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
PHENANTHRENE	0.23		0.013	LOD	0.11	LOQ	ug/L	J	Surr

Sample ID: SWMU56-TMW04-GW10 **Collected:** 12/6/2012 11:15:00 **Analysis Type:** Initial/TOT- **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
FLUORANTHENE	0.0059	J	0.011	LOD	0.11	LOQ	ug/L	U	Mb
FLUORENE	0.067	J	0.021	LOD	0.11	LOQ	ug/L	J	RI

Method Category: VOA

Sample ID: SMW56-TMW05-SO14 **Collected:** 12/7/2012 12:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	340	J	570	LOD	1300	LOQ	ug/Kg	J	RI

Sample ID: SMW56-TMW05-SO15 **Collected:** 12/7/2012 12:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	270	J	420	LOD	940	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW01-SO05 **Collected:** 12/6/2012 9:00:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	290	J	460	LOD	1000	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW01-SO06 **Collected:** 12/6/2012 9:10:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	260	J	410	LOD	920	LOQ	ug/Kg	J	RI

Sample ID: SWMU56-TMW02-SO08 **Collected:** 12/6/2012 11:32:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	350	J	540	LOD	1200	LOQ	ug/Kg	J	RI

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: VOA

Sample ID: SWMU56-TMW09-SO10 **Collected:** 12/6/2012 2:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	330	J	500	LOD	1100	LOQ	ug/Kg	J	RI

Method Category: VOA

Sample ID: SWMU56-TMW03-GW09 **Collected:** 12/6/2012 9:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	20	U Q	20	LOD	25	LOQ	ug/L	UJ	Lcs

Sample ID: SWMU56-TMW04-GW10 **Collected:** 12/6/2012 11:15:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
GASOLINE RANGE ORGANICS	83	Q	20	LOD	25	LOQ	ug/L	J	Lcs

Method Category: VOA

Sample ID: SMW56-TMW03-SO11 **Collected:** 12/7/2012 8:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	4.4	J	7.5	LOD	15	LOQ	ug/Kg	U	Mb

Sample ID: SMW56-TMW03-SO12 **Collected:** 12/7/2012 8:05:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	6.1	J	7.8	LOD	16	LOQ	ug/Kg	U	Mb

Sample ID: SMW56-TMW04-SO13 **Collected:** 12/7/2012 11:05:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	6.1	J	6.9	LOD	14	LOQ	ug/Kg	U	Mb

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: VOA

Sample ID: **SMW56-TMW05-SO14** ***Collected:*** **12/7/2012 12:10:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	21		10	LOD	20	LOQ	ug/Kg	U	Mb

Sample ID: **SMW56-TMW05-SO15** ***Collected:*** **12/7/2012 12:30:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	5.7	J	8.1	LOD	16	LOQ	ug/Kg	U	Mb
CARBON DISULFIDE	0.53	J	0.81	LOD	4.1	LOQ	ug/Kg	J	RI

Sample ID: **SWMU56-TMW01-SO05** ***Collected:*** **12/6/2012 9:00:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	9.6	J	11	LOD	22	LOQ	ug/Kg	J	RI

Sample ID: **SWMU56-TMW01-SO06** ***Collected:*** **12/6/2012 9:10:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	7.7	J	7.8	LOD	16	LOQ	ug/Kg	U	Mb

Sample ID: **SWMU56-TMW01-SO07** ***Collected:*** **12/6/2012 8:43:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
1,3,5-TRIMETHYLBENZENE	0.61	J Q	0.76	LOD	3.8	LOQ	ug/Kg	J	RI, Surr
2-BUTANONE	13	J	4.9	LOD	15	LOQ	ug/Kg	J	RI, Surr
ACETONE	96		7.6	LOD	15	LOQ	ug/Kg	J	Surr
CARBON DISULFIDE	0.44	J	0.76	LOD	3.8	LOQ	ug/Kg	J	RI, Surr
NAPHTHALENE	1.3	J Q	0.76	LOD	3.8	LOQ	ug/Kg	J	RI, Surr

Sample ID: **SWMU56-TMW02-SO08** ***Collected:*** **12/6/2012 11:32:00** ***Analysis Type:*** **Initial/TOT** ***Dilution:*** **1**

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
2-BUTANONE	20	J	7.1	LOD	22	LOQ	ug/Kg	J	RI, Surr
ACETONE	97		11	LOD	22	LOQ	ug/Kg	J	Surr
CARBON DISULFIDE	0.87	J	1.1	LOD	5.6	LOQ	ug/Kg	J	RI, Surr
CIS-1,2-DICHLOROETHENE	120		1.1	LOD	5.6	LOQ	ug/Kg	J	Surr
TOLUENE	1.2	J	1.1	LOD	5.6	LOQ	ug/Kg	J	RI, Surr

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: VOA

Sample ID: SWMU56-TMW02-SO08 **Collected:** 12/6/2012 11:32:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
TRANS-1,2-DICHLOROETHENE	9.6		1.1	LOD	5.6	LOQ	ug/Kg	J	Surr

Sample ID: SWMU56-TMW02-SO09 **Collected:** 12/6/2012 11:47:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	6.4	J	8.0	LOD	16	LOQ	ug/Kg	U	Mb

Sample ID: SWMU56-TMW09-SO10 **Collected:** 12/6/2012 2:30:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
ACETONE	7.5	J	9.8	LOD	20	LOQ	ug/Kg	U	Mb

Method Category: VOA

Sample ID: SMWU56-AQTB03 **Collected:** 12/6/2012 9:00:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
CIS-1,2-DICHLOROETHENE	0.60	J	0.20	LOD	1.0	LOQ	ug/L	J	RI
METHYLENE CHLORIDE	0.54	J	0.40	LOD	5.0	LOQ	ug/L	U	Mb
TRICHLOROFLUOROMETHANE	1.3	J	0.80	LOD	2.0	LOQ	ug/L	J	RI

Sample ID: SMWU56-AQTBQ04 **Collected:** 12/7/2012 8:05:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
METHYLENE CHLORIDE	0.52	J	0.40	LOD	5.0	LOQ	ug/L	U	Mb

Sample ID: SWMU56-TMW03-GW09 **Collected:** 12/6/2012 9:50:00 **Analysis Type:** Initial/TOT **Dilution:** 1

Analyte	Lab Result	Lab Qual	DL	DL Type	RL	RL Type	Units	Data Review Qual	Reason Code
METHYLENE CHLORIDE	0.44	J	0.40	LOD	5.0	LOQ	ug/L	U	Mb, Tb

* denotes a non-reportable result

Project Name and Number: Joint Andrews AFB - Joint Andrews AFB

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Method Category: **VOA**

Sample ID: **SWMU56-TMW04-GW10** ***Collected:*** **12/6/2012 11:15:00** ***Analysis Type:*** **Initial/TOT/TOT** ***Dilution:*** **1**

Analyte	*Lab Result*	*Lab Qual*	*DL*	*DL Type*	*RL*	*RL Type*	*Units*	*Data Review Qual*	*Reason Code*
1,1-DICHLOROETHENE	0.17	J	0.20	LOD	1.0	LOQ	ug/L	J	Rl
CIS-1,2-DICHLOROETHENE	0.49	J	0.20	LOD	1.0	LOQ	ug/L	U	Tb
METHYLENE CHLORIDE	0.53	J	0.40	LOD	5.0	LOQ	ug/L	U	Mb, Tb
NAPHTHALENE	0.28	J	0.80	LOD	1.0	LOQ	ug/L	U	Mb
TRICHLOROETHENE	4.2		0.20	LOD	1.0	LOQ	ug/L	U	Tb
TRICHLOROFLUOROMETHANE	0.93	J	0.80	LOD	2.0	LOQ	ug/L	U	Tb

* denotes a non-reportable result

Data Qualifier Summary

Lab Reporting Batch ID: 280-36819-1 **Laboratory: TAL DEN**

EDD Filename: 280-36819-1_BayWest **eQAPP Name: Bay West-Joint Base Andrews_20130129**

Reason Code Legend

Reason Code	*Description*
Fd	Field Duplicate Precision
Lcs	Laboratory Control Precision
Lcs	Laboratory Control Spike Upper Estimation
Mb	Method Blank Contamination
Ms	Matrix Spike Lower Estimation
Ms	Matrix Spike Precision
Ms	Matrix Spike Upper Estimation
Rl	Reporting Limit Trace Value
Surr	Surrogate/Tracer Recovery Upper Estimation
Tb	Trip Blank Contamination

* denotes a non-reportable result

Appendix E

Laboratory Analytical Packages

(on attached DVD)

Appendix F

Regulatory Comment Form

Response to Comments for the
SWMU 56 Draft Final Phase I Remedial Investigation
Performance-Based Restoration
Joint Base Andrews, Camp Springs, Maryland
September 2013

Comment #	Page	Section/ Paragraph/ Line No.	Comment	A, D, E, FD or X[1]	Response	A or D[2]
PGCHD (Ken Clare) – Comments Received: 17 October 2013						
1		Executive Summary	In reference to the statement: "groundwater at Bldg. 3459 AOI was not investigated because … possible herbicide and pesticide contamination would be limited to surface soils." I don't understand how herbicides and pesticides couldn't potentially contaminate the groundwater.	E	The Phase I RI objective is to determine whether hazardous substances were released to the environment and/or whether hazardous substances have impacted the environment exceeding human health or environmental exposure criteria in accordance with the SWMU 56 Uniform Federal Policy for Quality Assurance Project Plan (UFP-QAPP; Bay West, 2012). Groundwater samples at the Building 3459 AOI were not included in the scope of the Phase I RI.	
2		Acronyms and Abbreviations	MCPP = meta-chlorophenylpiperazine. In the Executive Summary: Groundwater samples at the Civil Engineering Storage Yard AOI detected MCPP, identified as a herbicide. I looked into this and found out that meta-chlorophenylpiperazine is a recreational drug and stimulant. Methyl chlorophenoxypropionic acid (Mecoprop) is a herbicide	A	The definition of MCPP was revised to 2-4-chloro-2-methylphenoxypropanoic acid in the acronym list and throughout the report.	
3		Section 1.3	Site Location and Description: 3rd paragraph, 1st sentence: North Carolina Street should be NC Avenue	A	Page 1-3, Section 1.3 Site Location and Description, Paragraph 3, North Caroline Street was changed to North Carolina Avenue.	
4	28	Section 4.3.2.1.1	delta BHC is not described in the Acronyms and Abbreviations. I believe it is delta benzene hexachloride. 4,4'-DDD and 4,4'-DDE are mentioned in the A & A, but their first use in context, the spelling is omitted.	A	Delta BHC - delta-hexachlorocyclohexane was added to the acronym list and was defined on its first use in context on Page 4-8. 4,4'-DDD is defined on its first use in context on Page 4-4. 4,4'-DDE is defined on its first use in context on Page 4-4	
End of comments						

[1]A = agree D = disagree E = explanation FD = needs further discussion X = take exception to