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DRAFT FINAL SITE ASSESSMENT REPORT FOR SITE 1 NAS SAUFLEY FIELD FL
03/12/2013
TETRA TECH

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62470-08-D-1001

Rev. 1
March 2013

Draft Final
Site Assessment Report
for
Saufley Field Site 1

Saufley Field
Pensacola, Florida

Contract Task Order JM30

March 2013

NAVFAC
Naval Facilities Engineering Command
NAVFAC SOUTHEAST

NAS Jacksonville
Jacksonville, Florida 32212-0030

TETRA TECH

DRAFT FINAL
SITE ASSESSMENT REPORT
FOR
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

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CONTRACT NO. N62470-08-D-1001
CONTRACT TASK ORDER JM30

March 2013

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PROFESSIONAL CERTIFICATION

Draft Final Site Assessment Report
for
Site 1
Saufley Field
Pensacola, Florida

This Site Assessment Report was prepared under the direct supervision of the undersigned geologist using geologic and hydrogeologic principles standard to the profession at the time the report was prepared in general conformance with the Requirements of Chapters 62-770, Chapter 62-777, and 62-780, Florida Administrative Code. If conditions are determined to exist that differ from those described, the undersigned engineer should be notified to evaluate the effects of additional information on the assessment described in this report. This report was developed specifically for the referenced site and should not be construed to apply to any other site.

Frank Lesesne, P.G.
License Number PG -1020

03/12/13
Date

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ACRONYMS

°C	degrees Celcius
%D	percent difference
AWS	Aleut World Solutions
bls	below land surface
cPAH	chlorinated polycyclic aromatic compound
cVOC	chlorinated volatile organic compound
CLEAN	Comprehensive Long-term Environmental Action Navy
CTL	Cleanup Target Level
CTO	Contract Task Order
DPT	direct-push technology
EM	frequency domain electromagnetic
F.A.C.	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FID	flame ionization detector
FL-PRO	Florida Residual Petroleum Organic Method
FOL	Field Operations Leader
GPR	ground penetrating radar
GPS	global positioning system
ICP	Inductively Coupled Plasma
ID	inside diameter
LCS	laboratory control sample
LLSVOC	low level semivolatile organic compound
LOQ	limit of quantitation
µg/kg	microgram per kilogram
µg/L	microgram per liter
MCL	Maximum Contaminant Level
MDL	method detection limit
mg/kg	milligram per kilogram
mg/L	milligram per liter
MS	matrix spike
NAD	North American Datum
NAS	Naval Air Station
NEESA	Naval Energy and Environmental Support Activity
NETPDTC	Naval Education and Training Professional Development and Technology Center
NGVD	National Geodetic Vertical Datum
nT	nano-Teslas
NTU	Nephelometric Turbidity Unit

ACRONYMS (Continued)

PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PID	photoionization detector
ppm	parts per million
ppt	part per trillion
PVC	polyvinyl chloride
RASO	Radiological Affairs Support Office
RPD	relative percent difference
RRF	relative response factor
SAR	Site Assessment Report
SDG	Sample Delivery Group
SPCS	State Plane Coordinate System SCTL Soil Cleanup Target Level
SIM	selected ion monitor
SVOC	semivolatile organic compound
SOP	Standard Operating Procedure
Tetra Tech	Tetra Tech, Inc.
TDEM	time domain electromagnetic
TRPH	total recoverable petroleum hydrocarbon
USEPA	U.S. Environmental Protection Agency
VOC	volatile organic compound

EXECUTIVE SUMMARY

Tetra Tech, Inc. (Tetra Tech) has completed this Site Assessment Report (SAR) for Site 1 – Burial of Metallic Objects Area located at Saufley Field, in Escambia County, Florida under the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62470-08-D-1001, Contract Task Order (CTO) JM30. This document was prepared in general accordance with the requirements of Chapter 62-780, Florida Administrative Code (F.A.C).

The main purpose of this SAR is to evaluate whether soil and groundwater have been adversely affected by contamination that may have resulted from the potential disposal of "nuclear wash down liquid" containers and solid waste materials in trenches at Site 1. This potential disposal area was identified as Site 1 – Burial of Metallic Objects Area in a Preliminary Assessment conducted by the Navy Energy and Environmental Support Activity in May 1992.

Site Assessment

The following activities were conducted during the March 2011 to January 2013 field event portion of this SAR:

- Professional land survey to lay out a grid for conducting radiological and geophysical surveys.
- Radiological surface survey (no invasive sampling).
- Geophysical survey (no invasive sampling).
- Direct-push technology (DPT) soil and groundwater investigation (field screening for volatile organic compounds [VOCs], and laboratory analysis for VOCs, semivolatile organic compounds [SVOCs], pesticides, polychlorinated biphenyls [PCBs], and inorganics).
- Test pit excavation and soil sampling (field screening for VOCs and laboratory analysis for VOCs, SVOCs, pesticides, PCBs and inorganics).
- Soil analytical results were compared to the State of Florida's Residential, Industrial, and Leachability to Groundwater Soil Cleanup Target Levels (SCTLs) per Chapter 62-777, Florida Administrative Code (F.A.C.).
- Monitoring well installation,
- Groundwater sample collection (field measurements and laboratory analysis for SVOCs, polycyclic aromatic hydrocarbons [PAHs], total recoverable petroleum hydrocarbon [TRPH], and inorganics),

- Groundwater analytical results were compared to Groundwater Cleanup Target Levels (GCTLs) per Chapter 62-777, F.A.C. and Chapter 62-785, F.A.C., and Maximum Contaminant Levels (MCLs) per Chapter 62-550, F.A.C. Hereinafter, the MCLs and GCTLs are referred to as CTLs,
- Groundwater level measurements.
- Aquifer property evaluation.

Findings/Conclusions

A sequential approach was used to determine if disposal activities at Site 1 have had an adverse impact on surface soil, subsurface soil, and groundwater at the site. The following findings are based on the information collected during the field events and laboratory analytical results:

Radiological Survey: Numerous small areas were identified with gamma readings greater than the three standard deviations above background criteria within the survey grid area. A location for the disposal area(s) could not be interpreted from the radiological field screening data.

Geophysical Survey: Two large anomalies and 26 smaller anomalies were identified (NEESA, 1992).

- The largest anomaly appeared to contain metal objects and was similar in dimension to the description of the potential "nuclear wash down liquid" disposal area.
- The other large anomaly was similar to the description of the area where shop equipment was potentially buried.
- The 26 minor anomalies were not associated with any known metallic objects and based the small size and relatively low response of these areas, it is not suspected that the 26 minor anomalies are trench features or other debris pits.

DPT Soil Samples: Analytes detected in the DPT surface and subsurface soil samples include 5 VOCs, 3 SVOCs, 17 PAHs, TRPH, 11 pesticides and 18 inorganics. VOCs did not exceed their SCTLs. One SVOC exceeded its Leachability to Groundwater SCTL in a surface soil sample, but was not detected in subsurface soil samples. Carcinogenic PAHs (cPAHs) exceeded the Industrial Direct Exposure SCTL in surface but not subsurface soil samples. One pesticide exceeded its Leachability to Groundwater SCTL in a surface soil sample but did not in subsurface soil samples. TRPH exceeded its Leachability to Groundwater SCTL in a surface soil sample but not in subsurface soil samples. Arsenic was the only inorganic analyte detected at concentrations that exceeded its Residential and Industrial Direct Exposure SCTLs. One surface soil sample contained arsenic at a concentration that exceeded its Residential Direct Exposure SCTL. Arsenic was also detected in subsurface soil samples at concentrations that exceed Residential and

Industrial Direct Exposure SCTLs, but were at depths that these SCTLs would not be applicable for the exposure scenarios.

DPT Groundwater Samples: SVOCs including low level PAHs, PCBs, and TRPH were not detected in the DPT groundwater samples. One VOC, one pesticide, and 15 inorganics were detected in the DPT groundwater samples. However, only aluminum, chromium, iron and manganese were detected at concentrations that exceed their CTLs. Because the temporary DPT well screens are not as effective as a monitoring well screen in keeping fine grained materials out of a groundwater sample (the turbidity of the DPT groundwater samples ranged from 177 to greater than 1,000 Nephelometric Turbidity Units [NTU]), it is likely that the analytical results for pesticides and metals were affected by the turbidity of the groundwater samples.

Test Pit Soil Samples: Analytes detected in the test pit excavation surface and subsurface soil samples include 3 VOCs, 2 SVOCs, 15 PAHs, TRPH, 4 pesticides and 15 metals. VOCs did not exceed their SCTLs. One SVOC exceeded its Leachability to Groundwater SCTL in a surface soil sample, but was not detected in subsurface soil samples. Three cPAHs exceeded their Leachability to Groundwater SCTLs, and benzo(a)pyrene and cPAHs evaluated as benzo(a)pyrene equivalents exceeded the Industrial Direct Exposure SCTL. These analytes were either not detected or were detected at low concentrations that did not exceed their SCTLs in the subsurface soil samples collected during the test pit excavation activities. One pesticide exceeded its Leachability to Groundwater SCTL in a surface soil sample but did not in the subsurface soil samples. Arsenic was the only inorganic analyte detected in subsurface soil samples at a concentration that exceeded its Residential Direct Exposure SCTL, but was at depths that these SCTLs would not be applicable for the residential exposure scenario.

Groundwater Samples: Groundwater samples were collected from three 2-inch diameter monitoring wells installed at Site 1. One monitoring well was installed at each of the two large geophysical anomalies and one monitoring well was installed hydraulically downgradient from the two anomalies. Four SVOCs and 19 inorganics were detected in the groundwater samples. The SVOCs were detected at low concentrations that did not exceed their CTLs. Aluminum, iron and manganese were the only analytes detected in the Site 1 groundwater samples at concentrations that exceeded their CTLs per Chapter 62-550, F.A.C. Although Saufley Field (including Site 1) is not under the Brownfield rules, Chapter 62-785, F.A.C., the detected concentrations of aluminum, iron and manganese in the groundwater samples did not exceed the human health based criteria that are promulgated per this rule.

Hydrogeology and Aquifer Properties:

Non-aqueous phase liquid was not present. The average groundwater horizontal hydraulic gradient of the

site is approximately 0.0037 foot per foot. The groundwater flow direction is generally toward the north and northwest. The theoretical groundwater seepage (linear) velocity is calculated to range from approximately 31 to 166 feet per year.

Recommendations

Based on a comparison of Florida regulatory criteria outlined in Contaminated Site Cleanup Criteria per Chapter 62-780.680, F.A.C., to the results of the Site 1 subsurface soil, and groundwater sampling events, it is reasonable to conclude that the Burial of Metallic Objects Area has not had an adverse affect to the environment at Site 1 that requires additional assessment or remedial activities; therefore, no further investigation is recommended. However, the surface soil samples indicated the presence of arsenic and cPAHs that exceed residential and industrial regulatory exposure criteria per Chapter 62-777, F.A.C. Because the Site 1 surface soil hits are consistent with the Skeet Range findings and will be addressed under the Skeet Range investigation it is recommended that additional assessment activities for arsenic and cPAHs be conducted per Chapter 62-780.680, F.A.C. for the Skeet Range. A separate investigation is planned by the Navy for the Skeet Range site (Appendix A).

1.0 SITE DESCRIPTION AND BACKGROUND INFORMATION

This Site Assessment Report (SAR) has been prepared by Tetra Tech, Inc. (Tetra Tech) under the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62470-08-D-1001, Contract Task Order (CTO) JM30, for the assessment of Site 1 – Burial of Metallic Objects Area located at Saufley Field in Pensacola, Florida.

1.1 SITE LOCATION AND CONDITIONS

Saufley Field (see Figure 1-1) is located in Escambia County on the Florida panhandle, approximately 5 miles northwest of Pensacola. Currently Saufley Field encompasses approximately 866 acres and includes four airstrips, two of which are active, and a number of buildings that are located south of the airfield. The majority of Saufley Field is covered by paved runways surrounded by mowed, open grassy fields and buildings and structures for tenant support. Approximately 200 of the 866 acres are undeveloped. The majority of the areas surrounding the airstrips and buildings are predominantly wooded and support a wide variety of flora and fauna.

Site 1 is located northwest of the airfield perimeter road between Runways 9 and 13 (Figure 1-2). According to information provided in the Preliminary Assessment conducted in May 1992 by the Naval Energy and Environmental Support Activity (NEESA), in the early 1960s, approximately 30 to 40 steel bottles containing “nuclear wash down liquid” were buried in a trench approximately 9 feet in depth and 60 feet in length. Also in this area, shop equipment from an unknown shop may have been buried in the late 1960s when the base was slated for closure. However, there is no available information regarding the amount or depth at which the shop equipment was buried. The Preliminary Assessment could not determine the exact location(s) of the steel bottles and shop equipment. The general area where Site 1 is purported to be located is in the northwestern portion of Saufley Field and is generally located at or in the immediate vicinity of latitude 30º 28’ 21” North and 87º 20’ 53” West. The site elevation is approximately 75 to 90 feet North American Vertical Datum.

1.2 SITE HISTORY

Saufley Field opened in 1940, was commissioned as a Naval Auxiliary Air Station, and was re-designated a Naval Air Station (NAS) in 1968. It was decommissioned in 1976 and designated as an outlying landing field. In 1979, it was reactivated as a Naval Education and Training Program Development Center and as an outlying landing field for NAS Whiting Field pilot training. In 1996, Saufley Field became the Naval Education and Training Professional Development and Technology Center (NETPDTC), a major shore command.

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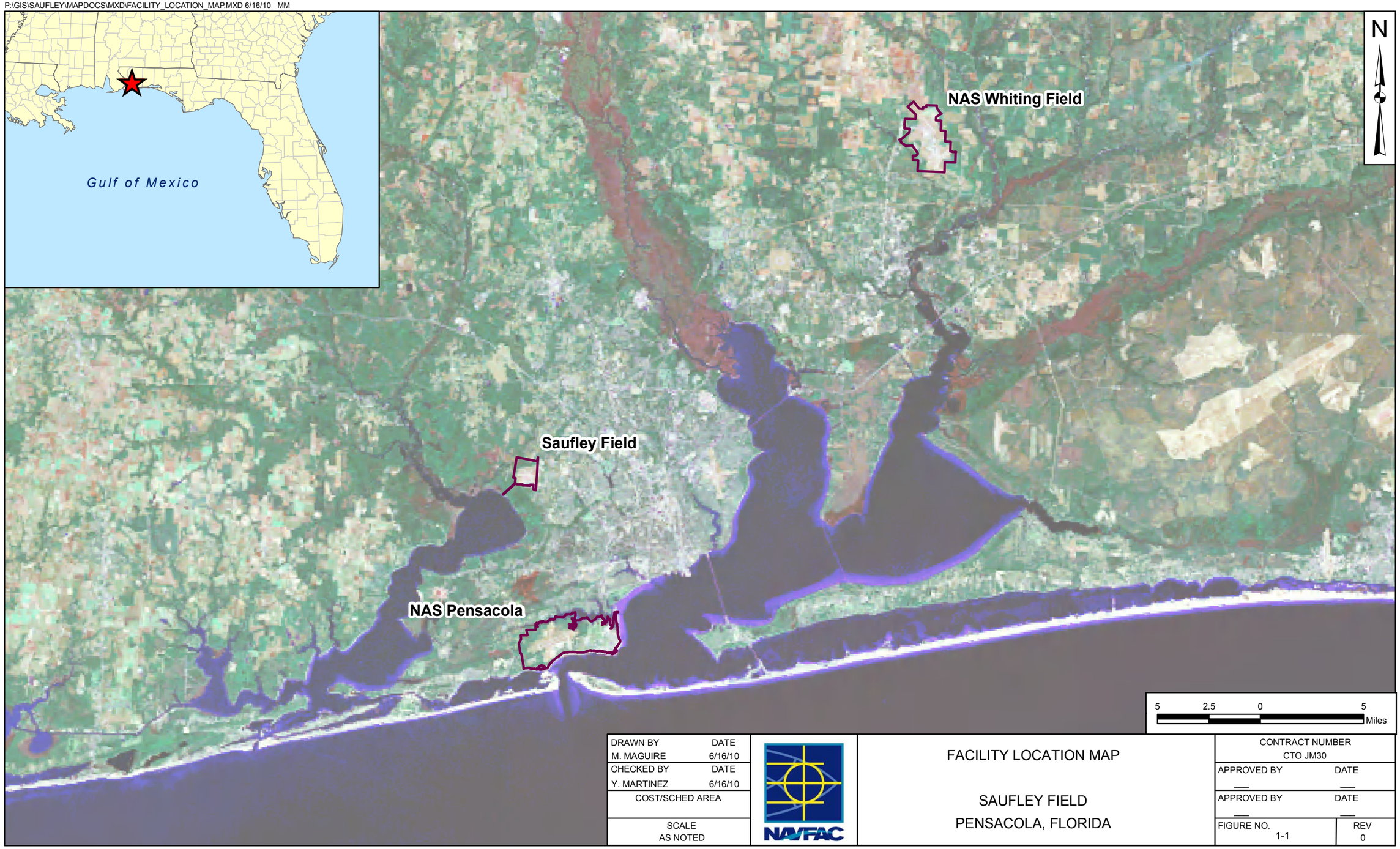

DRAWN BY M. MAGUIRE	DATE 6/16/10	NAVFAC	FACILITY LOCATION MAP	CONTRACT NUMBER CTO JM30
CHECKED BY Y. MARTINEZ	DATE 6/16/10			APPROVED BY ___ DATE ___
COST/SCHED AREA			SAUFLEY FIELD	APPROVED BY ___ DATE ___
SCALE AS NOTED			PENSACOLA, FLORIDA	FIGURE NO. 1-1 / REV 0

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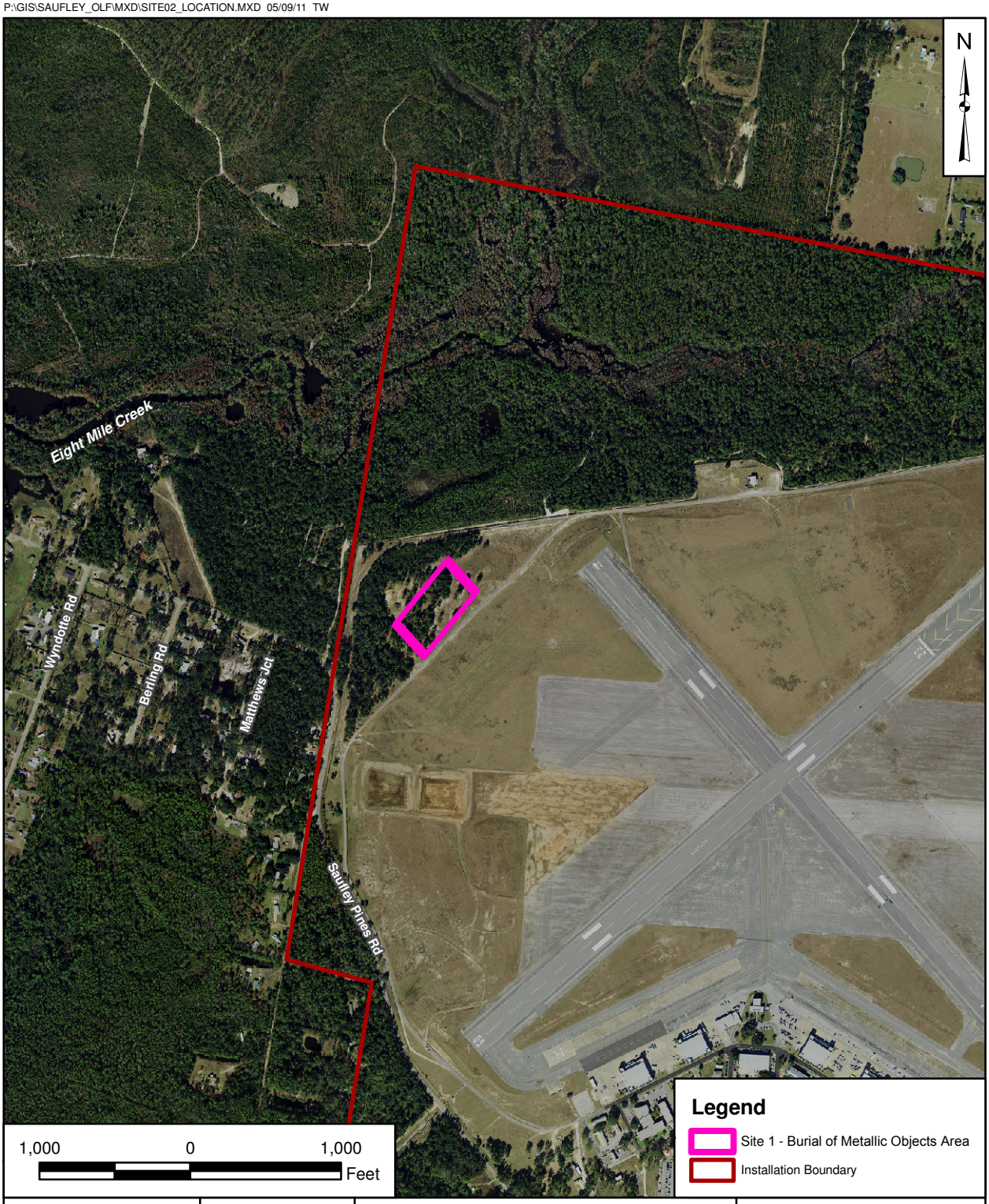

DRAWN BY M. MAGUIRE	DATE 06/16/10	NAVFAC	SITE LOCATION SAUFLEY FIELD PENSACOLA, FLORIDA	CONTRACT NUMBER CTO JM30
CHECKED BY A. IGOE	DATE 05/09/11			APPROVED BY ___ DATE ___
REVISED BY T. WHEATON	DATE 05/09/11			APPROVED BY ___ DATE ___
SCALE AS NOTED				FIGURE NO. FIGURE 1-2 / REV 0

As the host of Saufley Field, NETPDTC supports 10 major Department of Defense (as well as Navy) tenants and has a total base population in excess of 1,000 personnel. Saufley Field operates two active runways and has in excess of 34,425 square feet of hangar space.

In 2008, the Navy entered into negotiations to form an Enhanced Use Lease partnership with private industry. The objective of the Enhanced Use Lease program is to transform 104 acres of the property at Saufley Field into a diversified, multi-use business campus through creative adaptation and reuse. More recently, the Navy has indicated that the Enhanced Use Lease program may not be finalized.

The findings described in NEESA's 1992 Preliminary Assessment Report are as follows:

- Site 1, the Burial of Metallic Objects Area, is reported to consist of 30 to 40 steel bottles that are believed to have been disposed of in the early 1960s.
    - The bottles are reported to contain "nuclear wash down liquid" and are reportedly buried in a trench approximately 9 feet deep and 60 feet in length.
    - The source, size of the steel bottles, and the nature of the material described as "nuclear wash down liquid" is unknown.
- Shop equipment was also reported to have been disposed of in this area in the late 1960s when the base was slated for closure. The source, type, quantity, and location of the shop equipment were not provided in the Preliminary Assessment Report and are unknown.

A former skeet range is also located at the northeastern side of Site 1 (Figure 1-2).

- The former skeet range is an approximate 31.6-acre area located in the northwestern portion of Saufley Field, with the firing stations just 650 feet west of the northwestern end of Runway 14.
- The skeet range consists of a mowed grassy area with a small stand of mature trees from the firing points out to the perimeter fence line. North of the perimeter fence line, a fairly large area was recently completely cleared of all vegetation. At approximately 550 feet from the firing points, the area consists of very thick understory growth with mature trees, where minimal clearing by hand was done to accommodate sample collection.
- Small arms, typically limited to 12-, 16-, and 20-gauge shotgun ammunition, and .410 caliber ammunition, were used to shoot at skeet and trap ranges.
- There is no known historical evidence of explosives use at the site and no evidence of munitions or explosives of concern.
- Fragments of clay targets (skeet) have been observed northwest and northeast of the firing lines, as well as along the western firing line; the highest densities of fragments were observed in the vicinity of the firing lines.
- Site Inspection soil sampling was conducted in January 2010 (Round 1) and May 2012 (Round 2) at the Skeet Range. This work included the collection of surface (0 to 6- and 6 to 24-inches below

ground surface [bgs]) and subsurface (greater than 24-inches bgs) soil samples. Based on current analytical data, further delineation sampling regarding lead and PAH contamination in soil is required at the site.

Site background and history, the results of the Round 1 and 2 sampling events and proposed sampling activities for the Skeet Range are provide in Appendix A for the Skeet Range.

In 1990, NAS Pensacola personnel surveyed Site 1 with a magnetometer and did not locate metallic objects.

1.3 SURFACE FEATURES

The terrain surrounding the facility is generally flat, except in stream valleys, sloping gently toward the south. The land surface elevations on Saufley Field range from 75 to 90 feet above mean sea level. Site 1 lies on a hill, northwest of Runway 13, and includes open grassy areas and densely wooded areas that slope to the north. The land surface at Saufley Field was graded to build the airfield and building area.

1.4 SURFACE WATER HYDROLOGY

Saufley Field is bordered on the southwest by Perdido Bay and to the north by Eleven Mile Creek and Eight Mile Creek. Escambia Bay lies approximately 8 miles to the southeast. Swampy areas exist adjacent to the western portion of Saufley Field. However, sandy surface soil in the majority of the area allows for rapid infiltration of rainfall into the ground, resulting in relatively few streams. The surface topography has little dissection and the natural drainage system is poorly developed. Much of the surface drainage has been constructed or modified to accommodate facility structures. Base run-off makes its way to Perdido Bay via a man-made drainage ditch.

There are two perennial streams located within the bounds of Saufley Field. Eight Mile Creek merges with Eleven Mile Creek in the northwestern portion of the installation. Several small (less than 5 acres) freshwater impoundments associated with the aforementioned stream system exist in the northwestern portion of the installation.

Site 1 is located on a hill within the northwestern portion of the facility, and surface water features are not present at the site.

1.5 REGIONAL GEOLOGY

The parent material of the soils in Escambia County consists mostly of deposits of marine origin. The parent material varies somewhat in mineral and chemical composition and in physical structure because of the environment in which it was deposited (Musgrove et al., 1965). The northern two-thirds of the county, where Saufley field is located, is thought to be the stream-dissected remnant of an extensive

delta plain, known as the Citronelle Formation, that was covered unconformably by sand and clay deposits from high standing seas in the Pleistocene Epoch (2 to 3 million years ago).

These deposits are mostly quartz sand and contain varying amounts of clay, silt, and shell fragments. Clay and silt are more abundant in the soils that formed in the sediment on marine terraces and in lagoons. Clay and silt are virtually absent on shoreline ridges where most of the deposits are eolian sand. Ocean currents transported the parent material. The ocean covered the area a number of times during the Pleistocene age.

1.6 HYDROGOLOGY

Groundwater in Escambia County occurs in three major aquifers: a shallow surficial aquifer, which is artesian and non-artesian (the sand and gravel aquifer), and two deep artisan aquifers (the upper and lower limestones of the Floridan aquifer). Because the shallow surficial aquifer is partly unconfined and recharged principally by direct infiltration of rain, this aquifer is particularly susceptible to contamination from surface sources (Musgrove et al., 1965).

1.6.1 Regional Hydrogeology

In the northern half of Escambia County, the sand and gravel aquifer and the upper limestone of the Floridan aquifer are in contact with one another. In the southern half of Escambia County, where Saufley Field is located, the sand and gravel aquifer and the upper limestone of the Floridan aquifer are separated by a thick section of relatively impermeable clay. The upper limestone of the Floridan aquifer is separated from the lower limestone by a thick clay bed (Musgrove et. al., 1965).

The sand and gravel aquifer is composed of sand but has numerous lenses and layers of clay and gravel. The formation also contains lenses of hardpan where the sand has been cemented by iron oxide minerals. The aquifer recharge is predominantly from local precipitation (Trapp, 1973). The shallow saturated permeable beds in the sand and gravel aquifer contain groundwater under nonartesian conditions, while the deeper permeable beds contain groundwater under artesian pressure where they are confined by lenses of clay and sandy clay (NEESA, 1992). The groundwater flow has historically been toward the Gulf of Mexico and the Escambia and Perdido Rivers; however, groundwater flow can vary locally due to the effect of topography or surface water bodies

Below the sand and gravel aquifer, the limestone layers comprise the regionally extensive Floridan aquifer, which in this area is divided into upper and lower units separated by the Bucatunna clay. The upper Floridan aquifer is an important source of water in areas east of Escambia County; however, in the Pensacola area it is highly mineralized and not used as a water supply. The lower Floridan aquifer is also highly mineralized and is designated for use as an injection zone (Geraghty and Miller, 1986).

1.6.2 Site Specific Hydrogeology

Water levels in the shallow aquifer beneath Saufley Field typically range from 27 feet (near the southeaster perimeter of the facility) to approximately 50 feet below land surface (bls) near the western edge of the hangars and buildings. Based on the land surface topography in the vicinity of Site 1, the groundwater flow direction is estimated to be north and northwest toward Eight Mile Creek (see Figure 1-1 and Figure 1-2).

1.6.3 Potable Well Survey

In 1994, the potable water treatment system at Saufley Field included two active potable water wells. On May 9, 1994, a water sample from potable well PW04 indicated benzene concentrations of 0.032 milligram per liter (mg/L), exceeding the Florida Department of Environmental Protection (FDEP) drinking water standard of 0.001 mg/L. Potable well PW04 was taken off-line and was subsequently placed on quarterly sampling for one year for observation and corrective action to remove the contamination. In April 1996, potable wells PW03 and PW04 were abandoned in-place. Currently the source of potable water for Saufley Field is the well field located at the Naval Technical Training Center Corry Station located approximately 5.5 miles south of Saufley Field.

A potable well survey was conducted using the Florida Department of Health Petroleum Surveillance Program database. The survey identified 12 potable wells within a 1-mile radius (see Figure 1-3).

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Legend

Potable Water Well

DRAWN BY T. WHEATON	DATE 04/15/11	POTIBLE WATER SUPPLY WELL SURVEY SAUFLEY FIELD PENSACOLA, FLORIDA	CONTRACT NUMBER CTO JM30
CHECKED BY A. IGOE	DATE 04/15/11		APPROVED BY ___ DATE ___
COST/SCHED AREA			APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. FIGURE 1-3 / REV 0

2.0 PREVIOUS INVESTIGATIONS

Site 1 – Burial of Metallic Objects Area was initially identified in a preliminary assessment conducted in May 1992 by NEESA. The preliminary assessment was conducted an accordance with United States Environmental Protection Agency (USEPA) guidance for Performing Preliminary Assessments under the Comprehensive Environmental Response, Compensation, and Liability Act.

The Preliminary Assessment conducted in May 1992 by the NEESA identified four areas that have the potential for contaminants to have been released to the environment based on information gathered during the Preliminary Assessment through aerial pictures, records of historical use, and interviews with facility personnel. One of these areas, Site 1, known as Burial of Metallic Objects Area, was identified based on the reported disposal of “nuclear wash down liquid” containers and solid waste materials in trenches. The Preliminary Assessment recommended that the Navy’s Radiological Affairs Support Office (RASO) be contacted because of the possibility of radiological waste buried at the Site. In 1990, NAS Pensacola personnel surveyed Site 1 with a magnetometer and did not locate metallic objects. Prior to this SAR, a radiological survey and the collection of environmental samples for laboratory analysis have not been conducted.

3.0 SITE ASSESSMENT METHODOLOGY

This SAR was completed in accordance with the Contaminated Site Cleanup Criteria per Chapter 62-780, Florida Administrative Code (F.A.C.), under CLEAN 1001 Contract N62470-08-D-1001, CTO JM30. The field investigation at Site 1 utilized a sequential approach to collect, evaluate, and prioritize data collection to evaluate whether soil and groundwater have been adversely affected by contamination that may have resulted from the potential disposal of the 30 to 40 "nuclear wash down liquid" containers and solid waste materials in trenches at Site 1. Potential contaminants released at Site 1 may have leached by infiltrating precipitation from soil and vertically migrated to the groundwater. Having leached into groundwater, the contaminants could then migrate horizontally to downgradient locations at a rate equal to or less than the groundwater seepage velocity.

Most contaminants migrate more slowly than the rate of groundwater flow because they interact chemically or physically with the aquifer matrix and these interactions retard the rate of migration of the contaminants. Heavy metals such as lead tend to migrate very slowly whereas macronutrients such as sodium migrate much more readily. Organic chemicals migration tends to be retarded more when the geologic matrix contains organic material.

To meet the study goals of this SAR at Site 1, radiological, geophysical, physical, and chemical data were needed. The field activities, which included soil screening, soil sampling, monitoring well installation, and groundwater sampling, were conducted in accordance with FDEP Standard Operating Procedures (SOPs) for Field Activities (FDEP, 2008). If the FDEP SOPs did not address a specific task, Tetra Tech deferred to the Tetra Tech Corporate SOPs (Tetra Tech, 2007).

The following data were collected during this investigation:

1. A licensed land surveyor established an initial survey grid for conducting radiological and geophysical surveys.

2. The radiological survey was conducted by a RASO contractor, Aleut World Solutions (AWS) to identify locations of elevated radiation. The RASO contractor conducted this work using a SAP specific to their radiological work (AWS, 2011).

3. The geophysical survey was conducted over the grid area and areas outside of the grid to locate potential buried materials.

4. Soil and groundwater samples were collected using Direct Push Technology (DPT) at locations identified by the radiological and geophysical surveys.

5. Test pits were excavated to confirm the nature of anomalies that were identified by the radiological field screening and geophysical investigation.

6. Soil samples were collected from the DPT borings and test pit excavations. Representative portions of the soil samples were field screened with for elevated radiation by the RASO contractor and for volatile organic compounds (VOCs) by Tetra Tech with a flame ionization detector (FID), a photoionization detector (PID) and Color-Tec® prior to submittal to a fixed-base laboratory for analysis. The soil samples were analyzed by an offsite fixed base laboratory for VOCs, semivolatile organic compounds (SVOCs) including low level polycyclic aromatic hydrocarbons (PAHs), pesticides, polychlorinated biphenyls (PCBs), total recoverable petroleum hydrocarbons (TRPH), and inorganics. The analytical results were compared to the Florida Residential and Industrial Direct Exposure and Leachability to Groundwater Soil Cleanup Target Levels (SCTLs) per Chapter 62-777, F.A.C.

7. Groundwater samples collected from each DPT boring and submitted for fixed-base laboratory analysis. The groundwater samples were analyzed for VOCs, SVOCs including low level PAHs, pesticides, PCBs, TRPH, and inorganics. The groundwater laboratory analytical results were compared to Florida Maximum Contaminant Levels (MCLs) per Chapter 62-550, F.A.C., Florida Groundwater Cleanup Target Levels (GCTLs) per Chapter 62-777, F.A.C. and Florida GCTLs per Chapter 62-785, F.A.C. Hereinafter, the MCLs and GCTLs are referred to as CTLs.

8. A hollow-stem auger rig was used to install monitoring wells. Groundwater samples were collected from the newly installed monitoring wells and submitted to a fixed-base laboratory for analysis of SVOCs including low level PAHs, TRPH, and inorganics. The analyte list was based on the previous soil and groundwater analytical results. The groundwater laboratory analytical results were compared to Florida CTLs per Chapter 62-550 F.A.C., Chapter 62-777, F.A.C. and Chapter 62-785, F.A.C.

The site assessment methodologies used during this investigation are discussed below. The results of the investigation activities are presented in Section 4.0. Conclusions and Recommendations are presented in Section 5.0.

3.1 LAND SURVEY

A horizontal survey of the approximate Site 1 boundary was completed by a professional land surveyor to provide a grid within the site area (approximately 3 acres) that was based on the information provided in the Preliminary Assessment conducted by NEESA and the review of historical aerial photographs (Figure 3-1).

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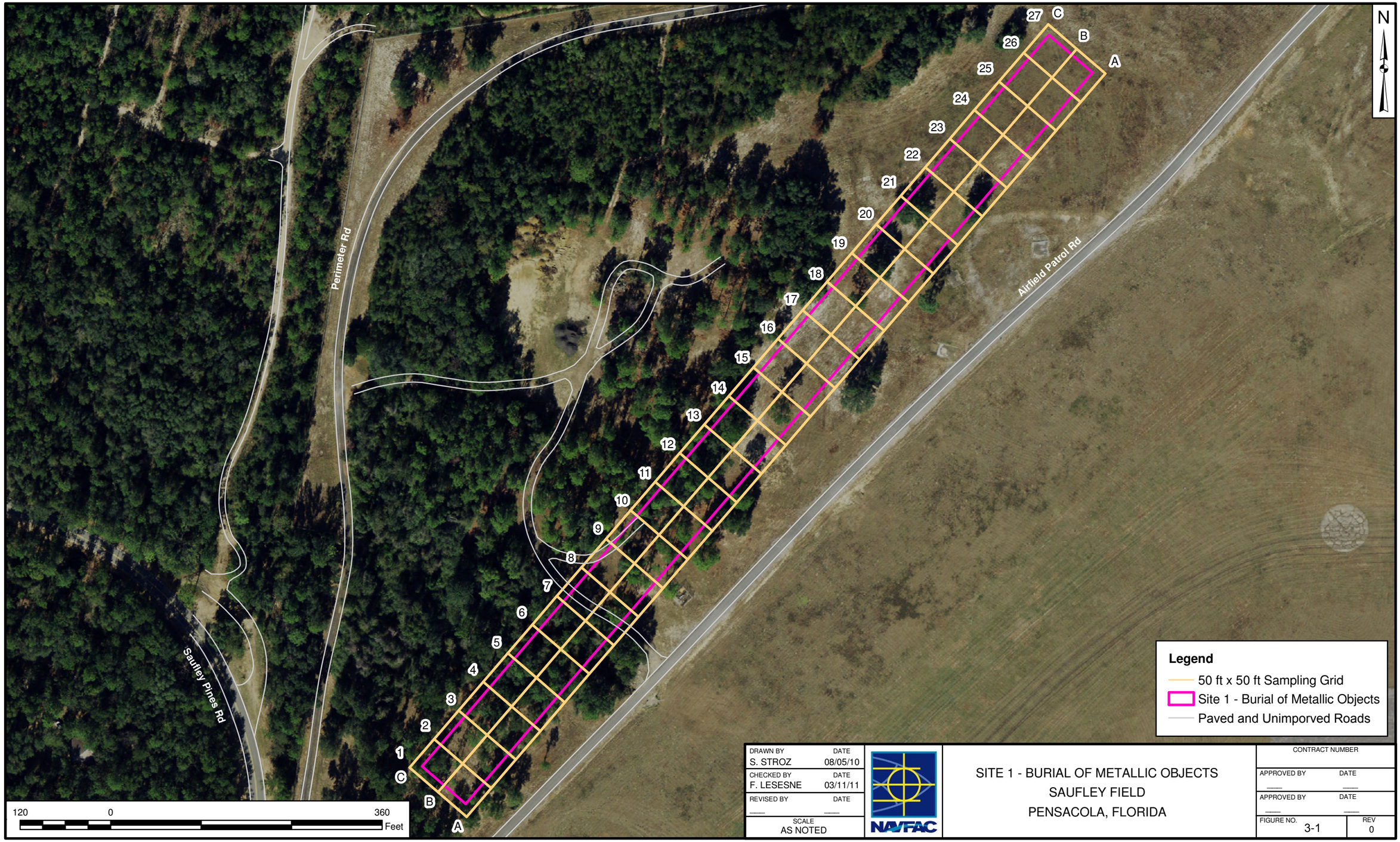

DRAWN BY S. STROZ	DATE 08/05/10	SITE 1 - BURIAL OF METALLIC OBJECTS SAUFLEY FIELD PENSACOLA, FLORIDA	CONTRACT NUMBER
CHECKED BY F. LESESNE	DATE 03/11/11		APPROVED BY ___ DATE ___
REVISED BY ___	DATE ___		APPROVED BY ___ DATE ___
SCALE AS NOTED			FIGURE NO. 3-1 REV 0

The grid system was established to provide the radiological and geophysical survey crews reference coordinates for their data. The surveyor established a 50 by 50 foot horizontal grid with a roughly southwest to northeast axis that was approximately 1,300 feet long and marked each node with the coordinate designation on a 1-inch x 2-inch x 48-inch wood stake. The grid defined fifty two 50 foot by 50 foot cells.

The horizontal locations were referenced by the surveyor to the Florida State Plane Coordinate System (SPCS) North Sheet, North American Datum of 1983, (NAD 83). Elevations were referenced to Mean Sea Level, National Geodetic Vertical Datum, 1988 Adjustment (NGVD 88).

3.2 RADIOLOGICAL SURVEY

The radiological survey was performed by the RASO contractor, AWS to locate the area(s) at Site 1 where the gamma count rate exceeded the background level. Intrusive activities or soil sampling and laboratory analytical activities were not conducted as part of the radiological survey. The surveyed grid system was used to conduct the radiological survey. Dense vegetation in eight of the 52 cells (approximately 0.75 acres) limited or prevented the radiological survey.

To perform the radiological survey, a site background area was chosen that has similar physical, geological, radiological, and biological characteristics as the survey unit being evaluated. Background reference areas are normally selected from non-impacted areas and are not part of the survey unit being evaluated. A minimum of 16 readings were obtained with each instrument used for the survey to establish the gamma background count rate.

The radiological survey was performed at Site 1 using gamma scan surveys with a Ludlum Model-2350-1 Data Logger and a Ludlum Model 44-10 2” by 2” NaI (Thallium doped Sodium Iodide crystal) detector. The Site 1 area underwent a 100 percent gamma scan survey (with the exception of the eight heavily vegetated cells) to identify areas of elevated gamma activity. Elevated activity was defined as any area(s) that exceeded the investigation level (established at 3σ [standard deviations] above the survey specific background levels). Additional measurements were taken to confirm the initial results that exceeded the investigation level, and as appropriate, to quantify the area of elevated radioactivity for further investigation. Numerous small areas that appeared to have elevated radiological activity were staked using pin flags. A figure showing the results from the radiological survey are located in Appendix B. AWS is preparing a separate report on the findings of the radiological survey.

Location control during the radiological survey was provided by the surveyed grid and a global positioning system (GPS). The GPS units had a real time capability to measure horizontal coordinates using the World Geodetic System (1984, last revised in 2004) to 1 to 3 meters.

3.3 GEOPHYSICAL SURVEY

A geophysical survey was conducted by GeoView, Inc. after the radiological survey conducted by AWS to determine the possible presence and location of buried “nuclear wash down liquid” containers and/or solid waste materials within the boundaries of a trench area. Identification of geophysical anomalies in conjunction with the information provided by AWS on radiological anomalies was use to select environmental sample locations that include DPT soil and groundwater boring locations and test pit excavation locations. Intrusive activities or soil sampling and laboratory analytical activities were not conducted as part of the geophysical survey.

Four geophysical techniques were utilized to identify anomalies that would direct the investigation to likely areas of disposal and include: time domain electromagnetic (TDEM), frequency domain electromagnetic (EM), magnetic (MAG), and ground penetrating radar (GPR). The surveyed grid system was used to conduct a series of transects perpendicular and parallel to the grid.

Location control during the geophysical field crews was provided by the surveyed grid and a GPS. The GPS units had a real time capability to measure horizontal coordinates using the World Geodetic System (1984, last revised in 2004) to 1 to 3 meters. Areas with identify anomalies were staked using pin flags. The GeoView, Inc. geophysical report is provided in Appendix C.

3.4 DPT SOIL SAMPLING AND GROUNDWATER SAMPLING

DPT soil samples were collected in accordance with FDEP SOPs FS 3000, Soil Sampling (FDEP, 2008) and the sampling methodology was compliant with Florida’s Risk Assessment Rule in Chapter 62-780.650, F.A.C. Soil sampling equipment was decontaminated prior to commencement of field activities and decontaminated in the field in accordance with FDEP SOP FC1000.

DPT soil samples were collected at 2-foot depth intervals to a depth of 10 feet bls, then in 5-foot intervals to a maximum depth of 40 feet or until groundwater was encountered, whichever was shallower. During DPT operations, soil samples collected from the cores were viewed and described by the on-site geologist. The site geologist recorded the soil properties, including texture, color, and soil moisture for each soil boring and noted staining or odors. Soil sample logs are provided in Appendix D.

Prior to screening the soil samples for VOCs, the RASO contractor, AWS field screened soil samples from each interval for gamma radiation. After the RASO determined the soil sample was safe to handle, each soil sample interval was screened for total VOCs using a FID and PID per the methodology in Chapter 62 770, F.A.C., and chlorinated VOCs (cVOCs) using an AQR Color-Tec® test kit. Eleven soil samples and

two duplicates were collected for off-site laboratory analysis at varying depth intervals from eight locations (Figure 3-2) based on the radiological and chemical field screening results. AWS is preparing a separate report on the findings of the DPT soil samples.

Soil samples that were selected for off-site laboratory analysis for VOCs were collected directly from the DPT core barrel; the remaining soil obtained from the DPT core barrel was either placed in a Mason® jar and covered with aluminum foil for FID and PID screening or placed into a Pyrex® glass bowls for homogenization with a stainless steel spoon prior to sample collection.

A groundwater sample was also collected at each of the DPT boring location and screened for VOCs using an AQR Color-Tec® test kit. The DPT groundwater sampling method involved the advancement of a DPT groundwater sampling screen to a target depth. The screen was exposed to the formation and groundwater was withdrawn through polyethylene tubing to the surface using a peristaltic pump and check valve. The groundwater samples for VOCs were field screened for cVOCs using AQR Color-Tec® screening kits. Field analyses using the AQR Color-Tec® screening kits were conducted in accordance with procedures consistent with the manufacturer's recommendations, as outlined in the SOP for AQR Color-Tec® screening (SOP TT 001).

Based on the groundwater field screening results, five of the DPT groundwater sampling locations that represented the highest levels of contamination in soil and groundwater field screening samples (as selected by the Tetra Tech Field Operations Leader (FOL) in consultation with the Tetra Tech PM) were submitted for off-site laboratory analysis.

The soil and groundwater samples selected for off-site laboratory analysis were sent by overnight delivery under chain of custody protocol to Shealy Laboratory, LLC for analysis of VOCs, SVOCs including low level PAHs, pesticides PCBs, TRPH, and inorganics. The samples, depths and laboratory analytical methods are provided in Table 3-1. Laboratory analytical data are provided in Appendix E.

3.5 TEST PIT SOIL SAMPLING

Test pit soil samples were collected in accordance with FDEP SOPs FS 3000, Soil Sampling (FDEP, 2008) and the sampling methodology was compliant with Florida's Risk Assessment Rule Chapter 62-780.650, FA.C. Soil sampling equipment was decontaminated prior to commencement of field activities and decontaminated in the field in accordance with FDEP SOP FC1000.

VOC screening was conducted at the bottom of each 1-foot soil lift in accordance with procedures described below. The field screening was used to select surface and subsurface soil samples to provide chemical data that was used to confirm whether chemical constituents have been released to the environment.

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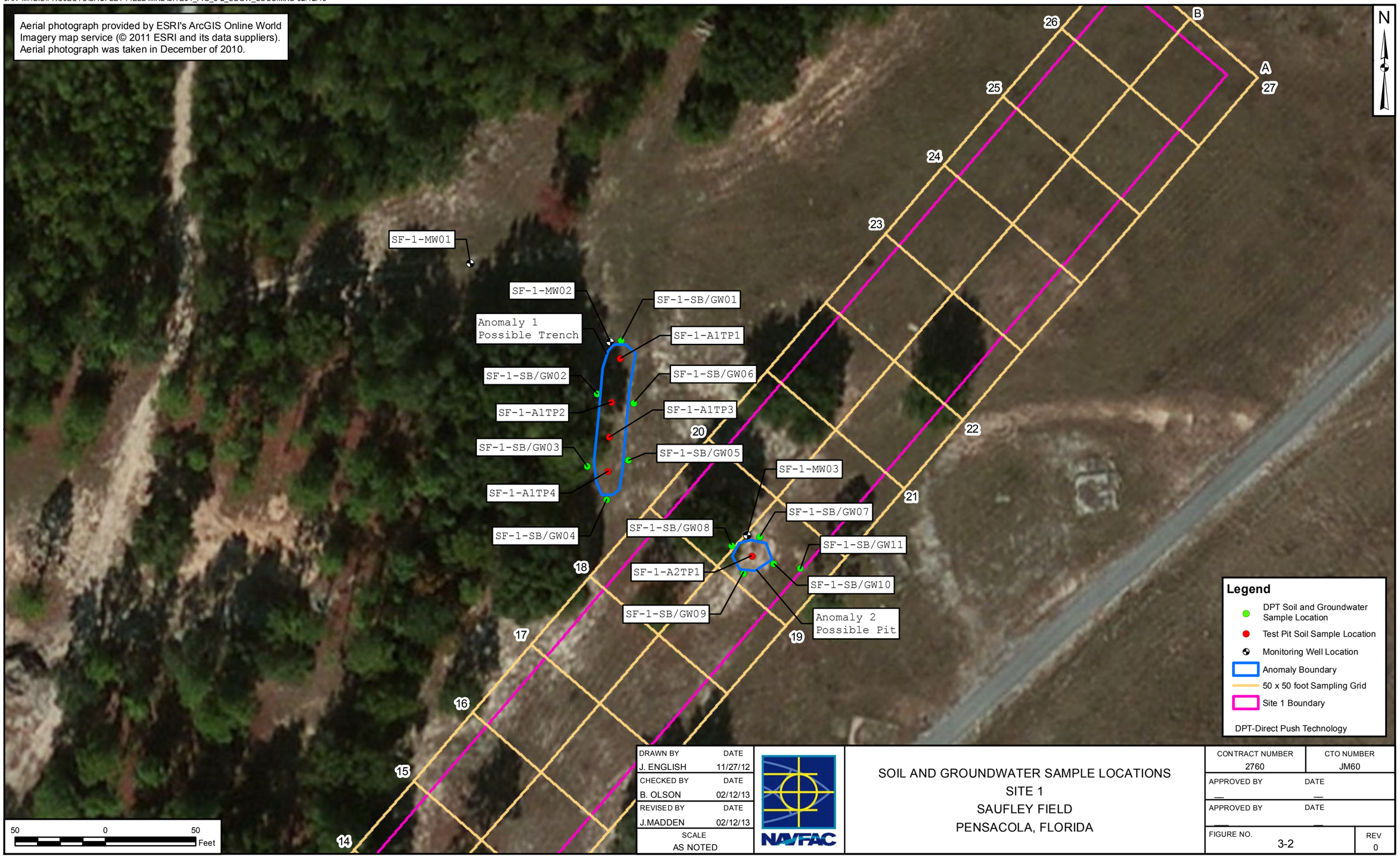

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J. ENGLISH	11/27/12
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REVISED BY	DATE
J.MADDEN	02/12/13
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NAVFAC

SOIL AND GROUNDWATER SAMPLE LOCATIONS
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

CONTRACT NUMBER	CTO NUMBER
2760	JM60
APPROVED BY	DATE
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APPROVED BY	DATE
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FIGURE NO. 3-2	REV 0

TABLE 3-1
DPT SOIL AND GROUNDWATER SAMPLE AND ANALYTICAL METHOD SUMMARY
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

DPT Soil/Groundwater Boring Identification	Sample Identification	Depth Interval (feet bls)	Analyses
Surface Soil			
SF-1-SB10	SF-1-SB10-0-2-01/2012 (SB010)	0-2	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
	SF-1-SB10-0-2-01/2012-D (Duplicate of SB010)	0-2	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-SB11	SF-1-SB11-0-2-01/2012 (SB11)	0-2	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
	SF-1-SB11-0-2-01/2012-D (Duplicate of SB11)	0-2	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
Subsurface Soil			
SF-1-SB02	SF-1-SB02-15-20-01/2012 (SB02)	15-20	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-SB05	SF-1-SB05-20-25-01/2012 (SB05)	20-25	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-SB06	SF-1-SB06-25-30-01/2012 (SB06)	25-30	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-SB07	SF-1-SB07-30-35-01/2012 (SB07)	30-35	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-SB08	SF-1-SB08-20-25-01/2012 (SB08)	20-25	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
	SF-1-SB08-35-40-01/2012 (SB08)	35-40	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-SB09	SF-1-SB09-30-35-01/2012 (SB09)	30-35	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-SB10	SF-1-SB10-10-15-01/2012 (SB10)	10-15	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
	SF-1-SB10-25-30-01/2012	25-30	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D),

TABLE 3-1
DPT SOIL AND GROUNDWATER SAMPLE AND ANALYTICAL METHOD SUMMARY
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

DPT Soil/Groundwater Boring Identification	Sample Identification	Depth Interval (feet bls)	Analyses
	(SB10)		Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
Groundwater			
SF-1-GW01	SF-1-GW01-35-39-01/2012	35-39	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-GW03	SF-1-GW03-35-39-01/2012	35-39	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
	SF-1-GW03-35-39-01/2012-D	35-39	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-GW06	SF-1-GW06-35-39-01/2012	35-39	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-GW08	SF-1-GW08-40-44-01/2012	40-44	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-GW10	SF-1-GW10-40-44-01/2012	40-44	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)

Notes:
DPT = direct-push technology
bls = below land surface
LLSVOC = low level semivolatile organic compound
SVOC = semivolatile organic compound
PCB = polychlorinated biphenyl
TRPH = total recoverable petroleum hydrocarbon
FL-PRO = Florida Residual Petroleum Organic Method
SW = solid waste
SIM = selected ion monitor
Soil Sample Identification:
Surface Soil: Facility Identification; Site Identification and Soil Boring Identification with sample depth interval (bls), month, and year. Example: SF-1-SB1-0-2-1/2012
Subsurface Soil: Facility Identification; Site Identification and Subsurface Soil Identification with sample letter and number, depth interval (bls), month, and year. Example: SF-2-SBA1-0.5-2-10/2010

During test pit excavation, soil samples were collected directly from the backhoe bucket for field screening of radiological and chemical constituents. The radiological survey instruments and measurement methods were selected by AWS per their SAP (AWS, 2011) to detect gamma radiation, which can be used to indicate the presence of a wide array of radionuclear contaminants. The radiological screening occurred at the bottom of each 1-foot soil lift. In addition, AWS collected soil samples from the backhoe bucket at their

discretion for radionuclide-specific analyses in accordance with a SAP specific to the radiological investigation. VOC screening methods were conducted after the radiological field screening and consisted of FID, PID, and AQR Color-Tec® test kit. AWS is preparing a separate report on the findings of the test pit soil samples.

Each soil sample was screened for VOCs using an FID and PID per the methodology in Chapter 62-770, F.A.C., and cVOCs by the AQR Color-Tec® test kit. Based on the radiological and chemical field screening results nine soil samples were collected for off-site laboratory analysis at varying depth intervals from five locations as shown on Figure 3-2 based on the results of the field screening data. The soil samples for VOC analysis were collected directly from the backhoe bucket; the remaining soils were either placed in a Mason® jar and covered with aluminum foil for FID, PID and AQR Color-Tec® screening or placed into a Pyrex® glass bowls for homogenization with a stainless steel spoon prior to sample collection.

The test pit soil samples selected for off-site laboratory analysis were sent by overnight delivery under chain of custody protocol to Shealy Laboratory, LLC for analysis of VOCs, SVOCs including low level PAHs, pesticides PCBs, TRPH, and inorganics. The samples, depths and laboratory analytical methods are specified in Table 3-2. Laboratory analytical data are provided in Appendix E.

TABLE 3-2
TEST PIT SOIL SAMPLE AND ANALYTICAL METHOD SUMMARY
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

Test Pit Identification	Test Pit Soil Sample Identification	Depth Interval (feet bls)	Analysis
Surface Soils			
SF-1-A2TP1 (anomaly A-2)	SF-1-A2TP1-0-1-06/2012	0 - 2	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
Subsurface Soils			
SF-1-A1TP1 (anomaly A-1)	SF-1-A1TP1-4-5-06/2012	4-5	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
	SF-1-A1TP1-8-9-06/2012	8-9	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-A1TP2 (anomaly A-1)	SF-1-A1TP2-4-5-06/2012	4-5	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
	SF-1-A1TP2-9-10-06/2012	9-10	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-A1TP3	SF-1-A1TP3-4-5-	4-5	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and

TABLE 3-2
TEST PIT SOIL SAMPLE AND ANALYTICAL METHOD SUMMARY
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

Test Pit Identification	Test Pit Soil Sample Identification	Depth Interval (feet bls)	Analysis
(anomaly A-1)	06/2012		PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-A1TP4 (anomaly A-1)	SF-1-A1TP4-4-5-06/2012	4-5	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
	SF-1-A1TP4-9-10-06/2012	9-10	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-A2TP1 (Anomaly A-2)	SF-1-A2TP1-4-5-06/2012	4-5	VOCs (SW846 5035/8260B), SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), PCBs (SW846/8082A), TRPH (FL-PRO) metals (SW846/6010C)

Notes:
bls = below land surface
LLSVOC = low level semivolatile organic compound
SVOC = semivolatile organic compound
PCB = polychlorinated biphenyl
TRPH = total recoverable petroleum hydrocarbon
FL-PRO = Florida Residual Petroleum Organic Method
SW = solid waste
SIM = selected ion monitor
Soil Sample Identification:
Surface Soil: Facility Identification; Site Identification and Surface Soil Identification with anomaly and test pit number, depth interval (bls), month, and year. Example: SF-1-A2TP1-0-1-06/2012
Subsurface Soil: Facility Identification; Site Identification, and Surface Soil Identification with anomaly and test pit number, depth interval (bls), month, and year. Example: SF-1-A2TP1-4-5-06/2012

3.6 MONITORING WELL INSTALLATION

Tetra Tech installed three permanent monitoring wells in accordance with Navy and FDEP guidance documents. The locations of these monitoring wells were determined by the Saufley Field Project Team based on DPT and Test Pit soil field screening results, the DPT soil and groundwater sample analytical results and the Test Pit soil sample analytical results (Figure 3-2). Monitoring well SF-1-MW02 was installed at the larger geophysical anomaly and monitoring well SF-1-MW03 was installed at the smaller geophysical anomaly. Monitoring well SF-1-MW01 was installed approximately 90 feet northwest of monitoring well SF-1-MW02. Monitoring well SF-1-MW01 replaced an existing smaller diameter monitoring well, which had been installed for the Munitions Response Program, to allow the use of a submersible pump to collect a groundwater sample because the depth to groundwater was greater than 20 feet.

The monitoring wells were installed using a hollow-stem auger rig and suitable tools. The initial 4 feet of each well boring was advanced with a hand auger of suitable diameter to clear underground utilities that may not have been identified as part the utility clearance activities.

The newly installed monitoring wells were constructed of precleaned, plastic-wrapped well riser and screen materials. Each monitoring well was constructed with 2-inch inside diameter (ID) schedule 40 polyvinyl chloride (PVC) well screen and riser. The monitoring well screens were 15 feet long with factory-machined 0.010-inch slots. The well screen length of 15 feet was chosen based on historical water level fluctuations that have been observed at Saufley Field Site 4 and Site 5. Each monitoring well screen was pre-packed with 30/40-grade silica sand.

Excess riser pipe was cut to fit within a flush mount 8-inch diameter protective manhole cover. Fine sand filter was emplaced above the well screen and the annular space of each boring was grouted from the top of the fine sand filter layer to the land surface. The total depth of SF-1-MW01 was 42 feet bls, the total depth of SF-1-MW02 was 44 feet bls, and the total depth of SF-1-MW03 was 45 feet bls. A summary of the monitoring well construction details is provided in Table 3-3.

TABLE 3-3

SUMMARY OF MONITORING WELL CONSTRUCTION DETAILS
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

Well Designation	Installation Date	Well Diameter	Well Material	Total Depth (feet below top of casing)	Screened Interval (feet bls)	Top of Casing Elevation
SF-1-MW01	10/09/12	2-inch ID	PVC	42	27-42	41.31
SF-1-MW02	10/10/12	2-inch ID	PVC	44	39-54	44.06
SF-1-MW03	10/10/12	2-inch ID	PVC	45	30-45	49.91

Each monitoring well was developed with a submersible pump and new surgical grade Teflon® disposable tubing. Each monitoring well was considered developed once the pH, temperature, and conductivity of the extracted groundwater stabilized and the groundwater was visibly clear (20 NTU or less). Development water from the site was stored in labeled 55-gallon drums for subsequent disposal.

The monitoring wells were surveyed by a professional land surveyor, and the top of casing for each monitoring well was recorded relative to mean sea level (Table 3-4). The horizontal datum was the 1983 North American Datum (NAD) 1983 and the vertical datum was the 1988 NAD.

TABLE 3-4

MONITORING WELL TOP-OF-CASING SURVEY SUMMARY
SITE 2
SAUFLEY FIELD
PENSACOLA, FLORIDA

Well Designation	State Plane Coordinates		Top of Casing	Natural Ground
	Northing	Easting		
SF-1-MW01	547133.290	1071276.510	41.31	41.56
SF-1-MW02	547112.970	1071319.770	44.06	44.41
SF-1-MW03	547037.920	1071409.410	49.91	50.16

Notes:
Horizontal Datum = North American Datum (NAD) 83
Vertical Datum = NAD88

3.7 GROUNDWATER SAMPLING

Monitoring well purging and sampling was conducted on October 13, 2012. The monitoring well purging was conducted in accordance with FDEP SOP FS 2212, Well Purging Techniques (FDEP, 2008). Groundwater samples were collected in accordance with FDEP SOP FS 2220, Groundwater Sampling Techniques (FDEP, 2008).

Prior to groundwater sample collection, static water levels and total well depths were measured for groundwater flow determination. The wells were then purged in accordance with FDEP SOPs using a submersible piston pump and a low-flow, low-stress purge rate achieved by adjusting the pump speed to match the draw-down in the well. Field parameters (including temperature, pH, specific conductance, dissolved oxygen and turbidity) were measured at the initiation of the purging process. The goal of purging water is to provide a representative sample by reducing turbidity and removing the “stagnant” groundwater in the well casing and sand pack area.

When the field parameters stabilized, the groundwater sample was collected. Stabilization was recognized when the pH was constant (within 0.2 Standard Unit), specific conductivity varied no more than 5 percent, dissolved oxygen was less than 20 percent and temperature was constant (within 0.2°C) for at least three consecutive readings.

If parameters had not stabilized or turbidity of less than 10 NTU could not be achieved after a reasonable period of time, continuation of the purging process was left to the discretion of the Tetra Tech FOL.

The representative groundwater samples were collected at a discharge rate of less than 1 liter per minute with a submersible pump. The sample aliquots were collected in the order of inorganics, SVOCs (including low level PAHs), and TRPH, directly from the discharge side of the submersible pump following the

sampling procedure specified in FDEP SOPs. After collection, the samples were placed in a cooler, chilled with ice, and shipped under chain-of-custody protocol for analysis. The RASO contractor was provided groundwater samples for analysis of radionuclides.

The groundwater samples were sent by overnight delivery under chain of custody protocol to Shealy Laboratory, LLC for analysis. The groundwater samples were analyzed for the parameters determined by the Saufley Field Project Team to be appropriate for Site 1 based on the previous soil and groundwater data including: SVOCs, low level PAHs, pesticides, TRPH, and inorganics. Groundwater samples, screen depths and laboratory analytical methods are provided in Table 3-5 and the laboratory analytical data is provided in Appendix E.

TABLE 3-5

GROUNDWATER SAMPLE AND ANALYTICAL MDETHOD SUMMARY
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

Monitoring Well Identification	Groundwater Sample Identification	Screen Interval (feet bls)	Analysis
Surface Soils			
SF-1-MW01	SF-1-MW01-27-42-10/12	27-42	SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), TRPH (FL-PRO) metals (SW846/6010C)
	FD10131201 (Field Duplicate)	27-42	SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-MW02	SF-1-MW02-29-44-10/12	29-44	SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), TRPH (FL-PRO) metals (SW846/6010C)
SF-1-MW03	SF-1-MW03-30-45-10/12	30-45	SVOCs, LLSVOCs and PAHs by SIM (SW846 3545A, 3550C/8270D), Pesticides (SW-846/8081B), TRPH (FL-PRO) metals (SW846/6010C)

Notes:
bls = below land surface
LLSVOC = low level semivolatile organic compound
SVOC – semivolatile organic compound
PCB = polychlorinated biphenyl
TRPH = total recoverable petroleum hydrocarbon
FL-PRO = Florida Residual Petroleum Organic Method
SW = solid waste
SIM = selected ion monitor
Groundwater Sample Identification:
Facility Identification, Site Identification, and Surface Soil Identification with sample sector letter and number, depth interval (bls), month, and year. Example: SF-1-MW01-27-42-10/12

3.8 SAMPLE HANDLING

Sample handling includes the selection of sample containers, preservatives, allowable holding times, sample packaging, shipping and appropriate chain of custody procedures. Samples were packaged and

shipped in general accordance with FDEP SOP 001/01 FS 1000, General Sampling, and applicable sections of FS 2200, Groundwater Sampling and FS 3000, Soil Sampling (FDEP, 2008).

Sampling activities were documented in a site-specific field logbook and samples were transmitted under chain-of-custody protocols to the laboratory. Custody of samples was maintained and documented at all times. Chain-of-custody began with the collection of the samples in the field. FDEP SOP FS 1000 (FS 1009, Sample Documentation and Evidence Custody) and Tetra Tech SOP SA-6.3 describe the chain-of-custody procedures followed during sampling activities. A copy of the chain-of-custody documents and field notes are included in Appendix D.

3.9 QUALITY CONTROL SAMPLES

Soil and groundwater sampling activities were performed in accordance with the procedures prescribed in DEP-SOP-001/01. Equipment rinsate blanks were collected during the soil and groundwater sampling events in accordance to FDEP SOP 001/01 FQ 1000: Field Quality Control Requirements (FDEP, 2008). Soil and groundwater samples were placed in pre-cleaned, pre-preserved sample containers provided by the Shealy Laboratory, LLC. Quality control samples (e.g., matrix spike duplicate, rinsate blanks, and trip blanks) were collected and submitted to the laboratory. The analytical data packages for each sampling event were reviewed in accordance with USEPA Functional Guidelines for Organic Data (1999), USEPA Functional Guidelines for Inorganic Data (2004) and the Department of Defense document quality System Manual for Environmental Laboratories (2010). Laboratory reports and the data review are provided in Appendix E.

3.9.1 Sample Delivery Groups NA13010 and NA13013

Sample Delivery Groups (SDGs) NA13010 and NA13013 contained thirteen soil samples, six groundwater samples, two equipment blanks and a trip blank that were collected on January 11 and 12, 2012. There were also three field duplicate pairs within the SDGs.

Laboratory Performance Issues SDGs NA13010 and NA13013:

SDG NA13010: VOC, SVOC, and pesticides results were qualified for blank contamination. Initial and continuing calibration response factors for 1,4-dioxane, acetone and 2-butanone exceeded quality control limits. Several target compounds had continuing calibration percent difference (%Ds) noncompliances in the VOC and pesticide fraction. Several samples had relative percent differences (RPDs) between columns for positive results exceed quality control limits. Surrogate recovery noncompliances were found in the pesticide fraction. Laboratory control sample (LCS) noncompliances were found in the VOC, SVOC and pesticide fractions. Initial and continuing calibration RRFs for 1,4-dioxane was less than the lower quality control limit.

SDG NA13013: The initial calibration %RSD for caprolactam exceeded quality control limits. LCS noncompliances were found in the SVOC and PEST fractions. Inorganics detected in the laboratory calibration blanks.

Other Factors Affecting Data Quality SDGs NA13010 and NA13013: The field blanks in SDG NA13010 contained VOC, SVOC, and pesticide fractions. The field blank in SDG NA13013 contained contaminants in the SVOC, PAH and VOC fractions. Positive results reported below the LOQ but above the MDL were qualified as estimated.

Matrix spike (MS) noncompliances were found in the VOC, SVOC and pesticide fractions. Field duplicate imprecision was noted for one field surface soil sample duplicate pair for acetone and carbazole and another surface soil sample duplicate pair for 4,4'-DDE and 4,4'-DDT. Positive results reported below the limit of quantitation (LOQ) but above the method detection limit (MDL) were qualified as estimated.

The interfering analytes aluminum and/or iron were present in several samples. The matrix spike and/or matrix spike duplicate percent recoveries for several analytes were outside the 80 to 120 percent quality control limits. Field duplicate imprecision was noted for several analytes for two surface soil and one subsurface soil duplicate pairs. The Inductively Coupled Plasma serial dilution percent differences were less than 10 percent quality control limit for chromium and potassium affecting the aqueous samples. Positive results reported greater than the MDL but below the PQL were qualified as estimated.

3.9.2 Sample Delivery Group NF28058

SDG NF28058 consisted of nine soil samples collected during the test pit excavation activities on June 26 and 27, 2012. The SDG included two equipment blanks and one trip blank.

Laboratory Performance Issues SDG NF28058: VOC, SVOC, and pesticides results were qualified for blank contamination. VOC, 2-butanone, and 1,4-dioxane, results were rejected for relative response factor (RRF) response criterion less than the minimum response. VOC continuing calibration verification %Ds greater than the quality control limit resulted in qualification of analytes. VOC and pesticide results were qualified for surrogate %Recovery non-compliances. Non-detected results for 3,3'-dichlorobenzidine in sample FB06261201 was qualified for a Laboratory Control Sample %Recovery non-compliance.

Other Factors Affecting Data Quality SDG NF28058: The interfering analytes aluminum and iron were present in several samples. The interference check sample percent recoveries for thallium on July 3 and 4, 2012 were < 80 percent quality control limit affecting the soil samples. Positive results reported greater than the MDL but below the PQL were qualified as estimated.

3.9.3 Sample Delivery Group NJ16019

SDG NJ16019 consisted of three groundwater samples, one equipment blank and one duplicate that were collected on October 13, 2012.

Laboratory Performance Issues SDG NJ16019: SVOCs and inorganic results were qualified for blank contamination. The initial calibration %Relative Standard Deviations for 3,3'-dichlorobenzidine was greater than the 15 percent quality control limit. The continuing calibration %D for N-nitroso-di-n-propylamine was greater than the 20 percent quality control limit. The areas of several internal standards were greater than the upper quality control limit in several samples. Several metals had percent differences greater than the 10 percent quality control limit in the serial dilution of sample SF-1-MW01-27-42-10/12.

Other Factors Affecting Data Quality SDG NJ16019: Matrix Spike/Matrix Spike Duplicate noncompliances were found in the SVOC, PAH and inorganics fractions. Positive results less than the reporting limit were qualified estimated, (J), due to uncertainty near the MDL.

3.10 EQUIPMENT CALIBRATION

Field instruments, including the Foxborough FID, YSI 556 MPS Water Quality Meter, and the LaMotte 2020e Turbidimeter, were calibrated daily according to FDEP SOPs Field Testing 1000: General Field Testing and Measurement (FDEP, 2008), and manufacturer's specifications. Equipment calibration was documented with Equipment Calibration Logs. A copy of the completed Equipment Calibration Log is included in Appendix D.

4.0 SITE ASSESSMENT RESULTS

4.1 RADIOLOGICAL SURVEY SUMMARY

The radiological survey was performed in the area of the survey grid at Site 1 by AWS to locate the area(s) where the gamma count rate exceeds the site specific investigation level as determined from comparison to a site specific background location. The site specific background area had similar physical, geological, radiological, and biological characteristics as the Site 1 area being evaluated. Radiological survey measurements were obtained with each instrument to establish a gamma background count rate which was established at 3σ (standard deviations) above the background levels.

The radiological survey was performed using gamma scan surveys with a Ludlum Model-2350-1 Data Logger and a Ludlum Model 44-10 2" by 2" NaI (Thallium doped Sodium Iodide crystal) detector or equivalent instruments. Dense vegetation in eight of the 52 cells (approximately 0.75 acres) in the survey grid limited or prevented the radiological survey. The 44 other cells in the Site 1 survey area had a 100 percent gamma scans conducted to identify areas of elevated gamma activity as defined by any area(s) that exceeded the 3σ background investigation level. Additional measurements were taken to confirm the initial result exceeding the investigation level, and as appropriate, to quantify the area of elevated radioactivity that may require further investigation. Areas with elevated activity were staked using pin flags and the boundary located with the GPS.

Numerous small areas within the survey grid area were identified with gamma readings greater than the 3σ background investigation level. However, a location for the disposal area(s) could not be interpreted from the radiological field screening data. Radiological survey data is included in Appendix B.

4.2 GEOPHYSICAL SURVEY SUMMARY

The geophysical investigation was conducted using surveys by TDEM (EM-61), EM (EM-31), magnetics and GPR. The area of investigation was the approximate 1,300 feet by 100 feet grid that had been surveyed and staked prior to the geophysical investigation. During the geophysical investigation, the survey area was expanded to include the areas north and northwest from the edge of the asphalt road to the tree line to characterize a potential anomalous area. The geophysical transect lines were recorded using a GPS, a Trimble GeoXH.

At the time of the investigation, the site vegetation was predominantly a grass covered field lined on the sides with some trees. Portions of the site were inaccessible due to dense vegetation. A northwest/southeast trending drainage ditch was located within the central portion of the site. Multiple objects of interference which had an effect on the EM, TDEM and magnetometer response were located within the survey area. These objects of interference included reinforced concrete pads, a fenced electrical junction, drainage pipes and a picnic area.

The EM-61 portion of the geophysical investigation was conducted using a Geonics EM61-MK2 Buried Metal Detector. The EM-61 survey was conducted by towing the EM-61 throughout accessible areas of the project site. The EM-61 data was collected on transect lines spaced 10 to 50 feet apart and data readings were collected approximately every 0.6 feet along each transect line. Background response (areas with no metal) was calibrated to be approximately zero millivolts.

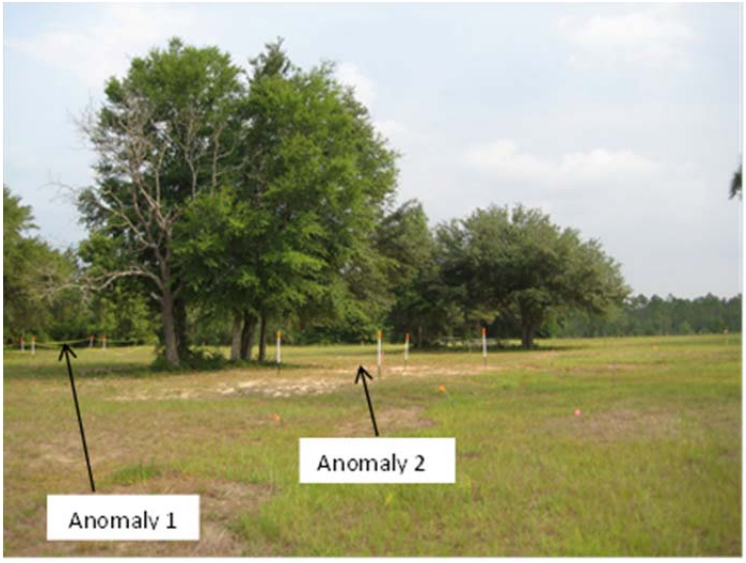
The EM-31 survey was conducted by carrying the EM-31 throughout accessible areas of the project site. The EM-31 data was collected on transect lines spaced 10 to 20 feet apart and data readings were collected every 0.25 seconds along each transect line. The EM-31 data collected both the terrain conductivity response and the in-phase response along the transects (because the target was buried metal, only the in-phase response was conducted). Background response for the in-phase response was calibrated to range from -2 to 1 parts per thousand (ppt).

The magnetics survey was conducted using a Geometrics 859 Cesium Vapor magnetometer. The magnetometer method only responds to the presence of ferrous metals. The magnetometer method is

extremely sensitive and typically will respond to smaller accumulations of metallic debris than the EM method. The magnetometer method also has the ability to detect materials that occur at depths greater than the effective exploration depth of the EM method. Magnetometer readings were collected on 0.2-second intervals. Background magnetometer readings (where buried metallic debris was not present) ranged in general from 48,000 to 48,200 nano-Teslas (nT). In areas where buried metallic debris or surficial metallic objects were present, magnetometer values deviated from this range.

The GPR data was collected using a Mala radar system with a 500-megahertz antenna. A time range setting of 80 nano-seconds was used. This time range setting provided information to an estimated depth of 10 to 12 feet bls.

The geophysical investigation identified two large geophysical anomalies and 26 small geophysical anomalies. Anomaly 1 was located to the west of the original survey area. The anomaly was approximately 85 feet by 15 feet in size. The GPR data indicated that this area is likely associated with a trench or excavated area. The debris/objects within this suspected trench ranged from 2 to 9 feet bls. Based upon the elevated EM and magnetic response within this area, it is suspected that the debris within this anomaly is metallic in nature. It is suspected that Anomaly 1, based on the historic decription by NEESA (1992), has aparent deminsions similar those descried for the trench feature that may contain the approximately 30 to 40 steel bottles containing “nuclear wash down liquid”. The coordinates of the center of Anomaly 1 are 30.473538047°N, 87.348152414°W.



Anomaly 2 was approximately 20 by 10 feet. The GPR data indicated that this area is likely associated with an area of shallow debris. The debris within this suspected trench ranged from 0 to 5 feet bls. Based upon the elevated EM and magnetic response within this area, it is suspected that the debris within this anomaly is metallic in nature. Based on the historic decription by NEESA (1992), this may be the area

where “Shop equipment” was reported to have been disposed of in the late 1960s when the base was slated for closure. The coordinates of the center of Anomaly 2 are 30.473330547°N, 87.347918806°W.

The 26 minor anomalies were not associated with any known metallic objects and based the small size and relatively low response of these areas, it is suspected that these areas are associated with minor, small areas of shallow metallic debris. Based the small size and relatively low response by the geophysical instruments at the 26 minor anomalies it is not suspected that they are trench features or other debris pits. The Final Geophysical Survey Report is included in Appendix C.

4.3 DPT SOIL AND GROUNDWATER SAMPLING RESULTS

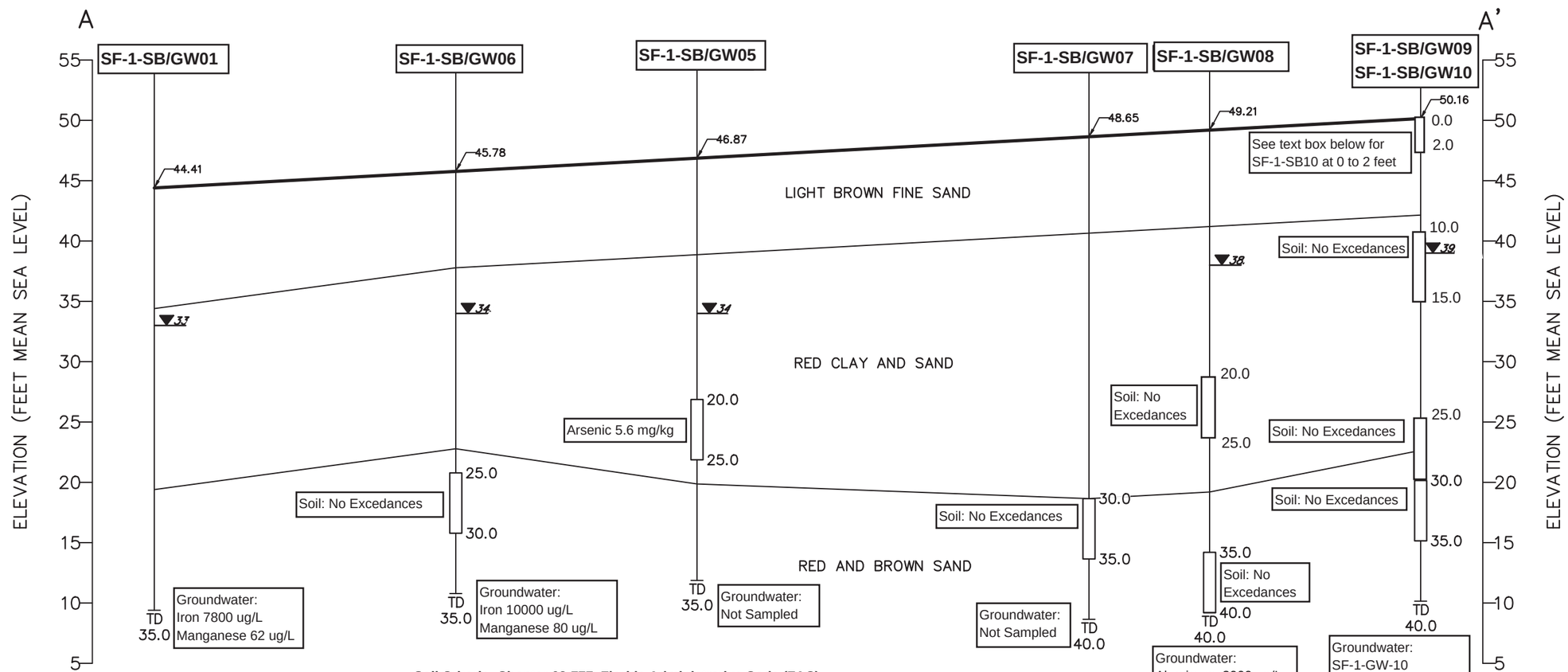
Soil and groundwater samples were collected using DPT at the two large anomalies identified by the geophysical survey. Soil samples were field screened at two foot intervals using the Florida head space method (Florida field screening method for excessively contaminated soil Chapter 62-770.200, F.A.C.) with a FID and PID for VOCs and the AQR Color-Tec® test kit for cVOCs to assess the potential that an environmental release has occurred and to support the selection of surface and subsurface soil samples for fixed-base laboratory analysis. The soil samples selected for laboratory analysis were analyzed for VOCs, SVOCs (including low level PAHs), pesticides, PCBs, TRPH and metals.

The detected analytes were compared to their Florida Residential and Industrial Direct Exposure and Leachability to Groundwater SCTLs per Chapter 62-777, F.A.C. In addition, Carcinogenic PAHs (cPAHs) (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a)anthracene and indeno(1,2,3-cd)pyrene) were evaluated individually for Leachability to Groundwater and as benzo(a)pyrene equivalents for Residential and Industrial Direct Exposure. Also, benzo(a)pyrene was evaluated for Residential and Industrial Direct Exposure and Leachability to Groundwater. The DPT groundwater samples were compared to CTLs per Chapter 62-550, F.A.C. and Chapter 62-777, F.A.C.

The soil lithology encountered at the DPT boring locations typically consisted of: a light brown fine sand from the land surface to approximately 8 to 10 feet bls; a reddish clay or clayey sand layer that had intermittent sand and clayey sand seams from 8 to 10 feet bls to approximately 20 to 25 feet bls; and a brown to light brown sand that occurred to the explored depth of approximately 40 feet bls (Figure 4-1).

4.3.1 DPT Field Screening Results

VOCs were not detected by the AQR Color-Tec® test for the soil samples collected from the DPT soil borings at Anomaly 1. Responses by the soil field screening instrumentation (flame and photo ionization detectors) at the six DPT borings conducted beside Anomaly 1 in general revealed mostly low instrument responses (less than 10 parts per million [ppm]) (Table 4-1). The soil samples collected from DPT



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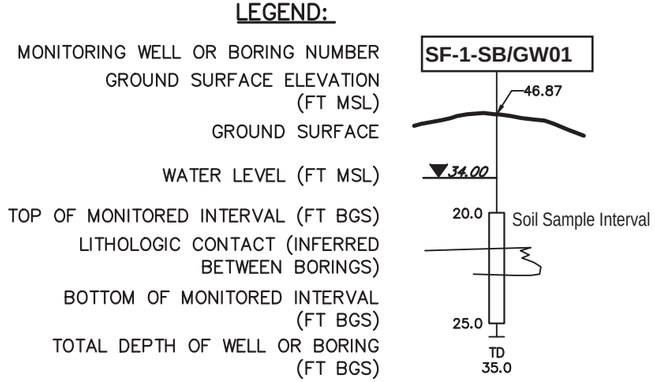

Soil Criteria: Chapter 62-777, Florida Administrative Code (FAC)

Inorganics (milligrams per kilogram)		
Arsenic	Residential	2.1
Organics (micrograms per kilogram)		
Carbazole	LGW	200
Benzo(a)pyrene Equivalent	Residential	100
Benzo(a)anthracene	LGW	800
Benzo(a)pyrene	Residential	100
Benzo(b)fluoranthene	LGW	2400
Dibenzo(a,h)anthracene	LGW	700
Dieldrin	LGW	2
Total Recoverable Petroleum Hydrocrarbons (TRPH) (milligram per kilogram)		
	Residential 460	LGW 340

LGW = leachability to groundwater

Groundwater Criteria: Chapter 62-550, FAC

Inorganics (milligrams per liter)

Aluminum 200
Chromium 100
Iron 300
Manganese 50

SF-1SB10 at 0 to 2 feet	
Carbazole	1100 J ug/kg
Benzo(a)pyrene Equivalent	11798 ug/kg
Benzo(a)anthracene	5800 ug/kg
Benzo(a)pyrene	8300 ug/kg
Benzo(b)fluoranthene	11000 ug/kg
Dibenzo(a,h)anthracene	1200 J ug/kg
Dieldrin	8.7 J ug/kg
TRPH	460 mg/kg

DRAWN BY CK	DATE 1–22–13	GEOLOGIC CROSS SECTION AND ANALYTICAL RESULTS SITE 1 SAUFLEY FIELD PENSACOLA, FLORIDA
CHECKED BY	DATE	
REVISED BY	DATE	
SCALE AS NOTED	NAVFAC	

CONTRACT NO. 2760
OWNER NO.
APPROVED BY DATE
Figure 4-1
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Table 4-1
Summary of Flame Ionization Detector Results – Vadose Zone Soils
Site 1 Burial of Metallic Objects Area
Saufley Field, Pensacola, Florida
1 of 3

Anomaly	Soil Screening Sample	Depth[1] (ft)	FID Unfiltered (ppm)	FID Filtered (ppm)	Corrected Reading[2] (ppm)
1	SF1-SB01 (0)	0	0	0	0
	SF1-SB 01-2	0 to 2	0.25	0.25	0
	SF1-SB0 1-3	2 to 4	0	0	0
	SF1-SB 01-4	4 to 6	0	0	0
	SF1-SB0 1-5	6 to 8	0	0	0
	SF1-SB 01-6	8 to 10	1.48	1.2	0.28
	SF1-SB0 1-7	15 to 18	2.39	2.3	0.9
	SF1-SB 01-8	18 to 20	7.39	2.45	4.94
	SF1-SB 01-9	20 to 25	6.56	4	2.56
	SF1-SB 01-10	25 to 30	10.03	3.84	6.19
1	SF1-SB 02-1	0	2.1	2.09	0.01
	SF1-SB0 2-2	0 to 2	1.78	1.52	0.26
	SF1-SB0 2-3	2 to 4	1.3	1.3	0
	SF1-SB0 2-4	4 to 6	1.74	1.69	0.05
	SF1-SB0 2-5	6 to 8	0	0	0
	SF1-SB0 2-6	8 to 10	1.27	1.23	0.04
	SF1-SB 02-7	15 to 18	40.22	0	**40.22**
	SF1-SB0 2-8	18 to 20	4.59	2.56	2.03
	SF1-SB0 2-9	20 to 25	5.08	3.91	1.17
	SF1-SB 02-10	25 to 30	7.62	3.48	4.14
1	SF1-SB0 3-1	0	1.82	1.66	0.16
	SF1-SB0 3-2	0 to 2	3.23	2.1	1.13
	SF1-SB 03-3	2 to 4	3.2	1.99	1.21
	SF1-SB 03-4	4 to 6	0.8	0.8	0
	SF1-SB0 3-5	6 to 8	1.17	1.15	0.02
	SF1-SB0 3-6	8 to 10	1.56	1.42	0.14
	SF1-SB0 3-7	15 to 18	1.35	1.2	0.15
	SF1-SB0 3-8	18 to 20	5.3	2.38	2.92
	SF1-SB0 3-9	20 to 25	4.7	2.97	1.73
	SF1-SB 03-10	25 to 30	3.89	2.53	1.36
1	SF1-SB0 4-1	0	1.01	0.99	0.02
	SF1-SB0 4-2	0 to 2	3.01	1.97	1.04
	SF1-SB0 4-3	2 to 4	3.78	2.11	1.67
	SF1-SB 04-4	4 to 6	2.27	2.09	0.18
	SF1-SB 04-5	6 to 8	2.13	1.98	0.15
	SF1-SB 04-6	8 to 10	1.63	0.56	1.07
	SF1-SB0 4-7	15 to 18	3.04	0.92	2.12
	SF1-SB 04-8	18 to 20	8.43	1.27	7.16
	SF1-SB0 4-9	20 to 25	4.22	0.43	3.79
	SF1-SB 04-10	25 to 30	11.45	4.13	7.32
	SF1-SB 04-10	25 to 30	11.45	4.13	7.32

Table 4-1
Summary of Flame Ionization Detector Results – Vadose Zone Soils
Site 1 Burial of Metallic Objects Area
Saufley Field, Pensacola, Florida
2 of 3

Anomaly	Soil Screening Sample	Depth[1] (ft)	FID Unfiltered (ppm)	FID Filtered (ppm)	Corrected Reading[2] (ppm)
1	SF1-SB0 5-1	0	2.01	0.72	1.29
	SF1-SB 05-2	0 to 2	1.37	0.6	0.77
	SF1-SB0 5-3	2 to 4	0.6	0.59	0.01
	SF1-SB0 5-4	4 to 6	0.52	0.17	0.35
	SF1-SB0 5-5	6 to 8	9.55	2.13	7.42
	SF1-SB0 5-6	8 to 10	1.23	0.79	0.44
	SF1-SB0 5-7	15 to 18	5.12	1.11	4.01
	SF1-SB 05-8	18 to 20	23.97	1.04	**22.93**
	SF1-SB 05-9	20 to 25	20.01	4.73	**15.28**
	SF1-SB0 5-10	25 to 30	21.81	1.47	**20.34**
1	SF1-SB 06-1	0	10.45	1.35	9.1
	SF1-SB 06-2	0 to 2	12.9	1.12	**11.78**
	SF1-SB 06-3	2 to 4	10.62	1.23	9.39
	SF1-SB 06-4	4 to 6	8.04	1.25	6.79
	SF1-SB0 6-5	6 to 8	10.7	0.66	**10.04**
	SF1-SB0 6-6	8 to 10	5.91	0.72	5.19
	SF1-SB 06-7	15 to 18	15.78	1.27	**14.51**
	SF1-SB 06-8	18 to 20	18.35	1.51	**16.84**
	SF1-SB0 6-9	20 to 25	19.57	1.39	**18.18**
	SF1-SB0 6-10	25 to 30	19.54	1.37	**18.17**
2	SF1-SB 07-1	0	10.6	0.36	**10.24**
	SF1-SB0 7-2	0 to 2	13.3	0.48	**12.82**
	SF1-SB0 7-3	2 to 4	4.36	0.57	3.79
	SF1-SB0 7-4	4 to 6	3.59	0.22	3.37
	SF1-SB 07-5	6 to 8	3.18	0.1	3.08
	SF1-SB 07-6	8 to 10	3.03	0.17	2.86
	SF1-SB0 7-7	15 to 18	3.54	0.99	2.55
	SF1-SB0 7-8	18 to 20	13.8	2.14	**11.66**
	SF1-SB 07-9	20 to 25	5.32	0.29	5.03
	SF1-SB0 7-10	25 to 30	16.75	0.7	**16.05**
	SF1-SB 07-11	30 to 35	7.21	0.53	6.68
2	SF1-SB 08-1	0	8.01	0.8	7.21
	SF1-SB0 8-2	0 to 2	7.31	0.93	6.38
	SF1-SB0 8-3	2 to 4	2.93	0.1	2.83
	SF1-SB0 8-4	4 to 6	6.26	0.33	5.93
	SF1-SB0 8-5	6 to 8	3.43	1.01	2.42
	SF1-SB 08-6	8 to 10	6.59	1.92	4.67
	SF1-SB0 8-7	15 to 18	11.18	1.25	9.93
	SF1-SB0 8-8	18 to 20	17.93	1.73	**16.2**
	SF1-SB 08-9	20 to 25	3.36	0.6	2.76
	SF1-SB 08-10	25 to 30	11.5	0.41	**11.09**
	SF1-SB0 8-11	30 to 35	14.01	0.53	**13.48**

Table 4-1
Summary of Flame Ionization Detector Results – Vadose Zone Soils
Site 1 Burial of Metallic Objects Area
Saufley Field, Pensacola, Florida
3 of 3

Anomaly	Soil Screening Sample	Depth[1] (ft)	FID Unfiltered (ppm)	FID Filtered (ppm)	Corrected Reading[2] (ppm)
2	SF1-SB0 9-1	0	7.8	0.97	6.83
	SF1-SB0 9-2	0 to 2	5.2	0.86	4.34
	SF1-SB0 9-3	2 to 4	2.59	0.23	2.36
	SF1-SB0 9-4	4 to 6	7.05	0.99	6.06
	SF1-SB0 9-5	6 to 8	13.3	3.71	9.59
	SF1-SB0 9-6	8 to 10	0.78	0.1	0.68
	SF1-SB0 9-7	15 to 18	11.53	1.46	**10.07**
	SF1-SB0 9-8	18 to 20	8.4	0.93	7.47
	SF1-SB0 9-9	20 to 25	13.5	3.34	**10.16**
	SF1-SB0 9-10	25 to 30	13.76	1.82	**11.94**
	SF1-SB0 9-11	30 to 35	7.25	0.74	6.51
2	SF1-SB 10-1	0	10.52	0.6	9.92
	SF1-SB 10-2	0 to 2	1.6	0.22	1.38
	SF1-SB 10-3	2 to 4	5	0.59	4.41
	SF1-SB 10-4	4 to 6	1.04	0.6	0.44
	SF1-SB 10-5	6 to 8	0.96	0.17	0.79
	SF1-SB 10-6	8 to 10	1.18	0.98	0.2
	SF1-SB 10-7	15 to 18	1.04	0.96	0.08
	SF1-SB 10-8	18 to 20	5.63	1.15	4.48
	SF1-SB 10-9	20 to 25	19.63	1.6	**18.03**
	SF1-SB 10-10	25 to 30	3.33	0.98	2.35
	SF1-SB 10-11	30 to 35	14.79	1.33	**13.46**
2	SF1-SB 11-1	0	24.93	0.61	**24.32**
	SF1-SB 11-2	0 to 2	6.1	0.21	5.89
	SF1-SB 11-3	2 to 4	9.86	0.33	9.53

Notes:
1. Depth = Distance below land surface
2. Corrected Reading = FID Unfiltered measurement minus the FID Filtered measurement

FID = flame ionization detector
ft = feet
ppm = parts per million

Bold Values = FID reading above 10 ppm
Shading = Soil sample collected and submitted for off-site laboratory analysis

borings SF-1-SB01, SF-1-SB03 and SF-1-SB04 had corrected readings less than 10 ppm which did not indicate the presence of VOCs at concentrations that would suggest they would exceed regulatory criteria. Three of the DPT boings at Anomaly 1 had soil samples with responses that are potentially indicative of detectable concentrations of VOCs in the site soils. DPT soil boring SF-1-SB02 had a 40.22 ppm response for the sample collected at 15 to 20 feet bls. DPT soil boring SF-1-SB05 had responses ranging from 15.28 to 22.93 ppm in samples three samples collected at 5 foot intervals from 20 to 33 feet bls. DPT soil boring SF-1-SB05 had responses of 11.78 ppm at 2 to 4 feet bls, 10.04 ppm at 10 to 15 feet bls and from 14.51 to 18.18 ppm from four samples collected at 5 foot intervals from 15 to 33 feet bls. Based on these measurements, soil samples for laboratory analysis were collected from the samples with the highest corrected reading response at DPT soil borings SF-1-SB02 at 15 to 20 feet bls, SF-1-SB05 at 20 to 25 feet bls and SF-1-SB06 at 25 to 30 feet bls.

VOCs were not detected by the AQR Color-Tec® test for the soil samples collected from the DPT soil borings at Anomaly 2. Although most of the responses by the soil field screening instrumentation (flame and photo ionization detectors) at the five DPT borings conducted beside Anomaly 2 in general revealed mostly low instrument responses less than 10 ppm, each boring had sample intervals with readings greater than 10 ppm (Table 4-1). DPT soil boring SF-1-SB07 had responses of 10.24 and 12.82 ppm at 0 to 4 feet bls, 11.66 ppm at 18 to 20 feet bls and 16.05 ppm at 25 to 30 feet bls. DPT soil boring SF-1-SB08 had responses of 16.20 ppm at 20 to 25 feet bls, 11.09 ppm at 30 to 35 feet bls and 13.48 ppm at 35 to 40 feet bls. DPT soil boring SF-1-SB09 had responses of 10.07 ppm at 15 to 20 feet bls, 10.16 ppm at 20 to 25 feet bls and 11.94 ppm at 25 to 30 feet bls. DPT soil boring SF-1-SB10 had responses of 18.03 ppm at 25 to 30 feet bls and 13.46 ppm at 35 to 40 feet bls. DPT soil boring SF-1-SB11 had a response of 24.32 ppm at 0 to 2 feet bls. Based on these measurements, soil samples for laboratory analysis were collected from the samples with the highest corrected reading response at DPT soil borings SF-1-SB07 at 30 to 35 feet bls, SF-1-SB08 at 20 to 25 feet bls and 30 to 35 feet bls, SF-1-SB09 at 25 to 30 feet bls, SF-1-SB10 at 0 to 2 feet bls and 20 to 25 feet bls, and SF-1-SB11 at 0 to 2 feet bls.

4.3.2 DPT Soil Sample Analytical Results

Analytes detected in the DPT surface and subsurface soil samples include 5 VOCs, 3 SVOCs, 17 PAHs, TRPH, 11 pesticides and 18 metals. A summary of the analytes detected in DPT surface and subsurface soil samples and those that exceeded their Florida SCTLs are listed in Table 4-2.

Analytes that exceeded their Florida SCTLs are presented graphically on Figures 4-1, 4-2, 4-3 and 4-4. Laboratory analytical data is provided in Appendix E.

Table 4-2
Summary of DPT Soil Sample Analytical Results
Saufley Field Site 1
Pensacola Fl
Page 1 of 4

LOCATION	FL SCTL 62-777 Residential Soil-Direct	FL SCTL 62-777 Industrial Soil-Direct	FL SCTL 62-777 Leachability to Groundwater	SF-1-SB02	SF-1-SB05	SF-1-SB06
SAMPLE ID				SF-1-SB02-15-20-01/2012	SF-1-SB05-20-25-01/2012	SF-1-SB06-25-30-01/2012
SAMPLE DATE				1/12/2012	1/12/2012	1/12/2012
SAMPLE DEPTH				15 to 20	20 to 25	25 to 30
METALS (MG/KG)						
ALUMINUM	80000	*	***	18000	5400	1800
ANTIMONY	27	370	5.4	0.39 J	0.19 UJ	0.18 J
ARSENIC	2.1	12	***	**14**	**5.6**	2.1
BARIUM	120	130000	1600	14	10	2
BERYLLIUM	120	1400	63	0.1 J	0.043 J	0.029 U
CADMIUM	82	1700	7.5	0.87 J	0.49 J	0.24 J
CHROMIUM	210	470	38	28	12	3.7
COBALT	1700	42000	***	0.13 J	0.1 U	0.095 U
COPPER	150**	89000	***	9.4	6.4	1.7
IRON	53000	*	***	25000	9500	2300
LEAD	400	1400	***	3.5 J	6.2 J	1.6 J
MANGANESE	3500	43000	***	4.3	3.5	1.6
MERCURY	3	17	2.1	0.0063 U	0.0056 U	0.0062 U
NICKEL	340	35000	130	0.94 J	0.67 J	0.43 J
SELENIUM	440	11000	5.2	0.2 U	1	0.49 J
SILVER	410	8200	17	0.51	0.046 U	0.043 U
VANADIUM	67	10000	980	49	22	6.8
ZINC	26000	630000	***	2.6 J	1.4 J	0.74 J
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	NC	NC	NC	87.5	91.4	94.6
SEMIVOLATILES (UG/KG)						
BIS(2-ETHYLHEXYL)PHTHALATE	72000	390000	3600000	14 U	13 U	13 U
CARBAZOLE	49000	240000	200	16 U	15 U	15 U
DIBENZOFURAN	320000	63000000	15000	11 U	11 U	11 U
VOLATILES (UG/KG)						
2-HEXANONE	24000	130000	1400	1.4 UJ	1.5 U	1.6 U
ACETONE	11000000	68000000	25000	5.8 U	3.3 U	3.4 U
METHYLENE CHLORIDE	17000	26000	20	0.22 U	0.81 J	0.81 J
TOLUENE	7500000	60000000	500	0.32 U	0.36 U	0.38 U
TOTAL XYLENES	130	700	0.2	0.19 UJ	0.21 U	0.23 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
1-METHYLNAPHTHALENE	200000	1800000	3100	1.1 U	1.1 U	1 U
2-METHYLNAPHTHALENE	210000	2100000	8500	1.1 U	1.1 U	1 U
ACENAPHTHENE	2400000	20000000	2100	0.92 U	0.9 U	0.85 U
ANTHRACENE	21000000	300000000	2500000	0.56 U	0.55 U	0.52 U
BAP EQUIVALENT	100	700	8000	0.063	0.72 U	0.68 U
BENZO(A)ANTHRACENE	#	#	800	0.65 U	0.64 U	0.61 U
BENZO(A)PYRENE	100	700	8000	0.73 U	0.72 U	0.68 U
BENZO(B)FLUORANTHENE	#	#	2400	0.63 J	0.54 U	0.51 U
BENZO(G,H,I)PERYLENE	2500000	52000000	32000000	0.72 U	0.71 U	0.67 U
BENZO(K)FLUORANTHENE	#	#	24000	0.53 U	0.52 U	0.49 U
CHRYSENE	#	#	77000	0.5 U	0.49 U	0.46 U
DIBENZO(A,H)ANTHRACENE	#	#	700	0.56 U	0.55 U	0.52 U
FLUORANTHENE	3200000	59000000	1200000	0.46 U	0.46 U	0.43 U
FLUORENE	2600000	33000000	160000	0.63 U	0.62 U	0.58 U
INDENO(1,2,3-CD)PYRENE	#	#	6600	1.1 U	1.1 U	1 U
NAPHTHALENE	55000	300000	1200	1.1 U	1.1 U	1 U
PHENANTHRENE	2200000	36000000	250000	0.8 U	0.78 U	0.74 U
PYRENE	2400000	45000000	880000	0.55 U	0.54 U	0.51 U
PESTICIDES (UG/KG)						
4,4'-DDD	4200	22000	5800	0.041 UJ	0.039 U	0.037 U
4,4'-DDE	2900	15000	18000	0.025 UJ	0.024 U	0.023 U
4,4'-DDT	2900	15000	11000	0.08 UJ	0.075 U	0.072 U
ALPHA-CHLORDANE	NC	NC	NC	0.032 UJ	0.13 U	0.029 U
DIELDRIN	60	300	2	0.032 UJ	0.03 U	0.029 U
ENDRIN	25000	510000	1000	0.025 UJ	0.024 U	0.023 U
ENDRIN ALDEHYDE	NC	NC	NC	0.041 UJ	0.039 U	0.037 U
GAMMA-BHC (LINDANE)	700	2500	9	0.085 UJ	0.08 U	0.12 J
GAMMA-CHLORDANE	NC	NC	NC	0.2 U	0.34 U	0.2 U
HEPTACHLOR	200	1000	23000	0.17 U	0.38 U	0.18 U
METHOXYCHLOR	420000	8800000	160000	0.076 UJ	0.072 U	0.069 U
PETROLEUM HYDROCARBONS (MG/KG)						
TRPH (C08-C40)	460	2700	340	2.4 U	2.3 J	2.2 U

Footnotes:
mg/kg = milligram per kilogram
ug/kg = microgram per kilogram
TRPH = Total Recoverable Petroleum Hydrocrbons
FL SCTL = Florida Soil Cleanup Target Level per Chapter 62-777, Florida Administrative Code
* = Contaminant is not a health concern for this exposure scenario
** = Direct Exposure value based on acute toxicity considerations. This criteriion is applicable in scenarios where children might be expose to soils (e.g. residences, schools, playgrounds
*** = Leachability values may be dericed using the SPLP Test to calcualte site specific SCTLs or may be determined using TCLP in the event oil wastes are present
#=Site concentrations for carcinogenic polycyclic aromatic hydrocarbons must be converted to Benzo(a)pyrene equivalents before comparison with the appropriate direct exposure Soil Cleanup Target Level for Benzo(a)pyrene using the appraoch described in the February 2005 'Final Technical Report: Development of Cleanup Target Leevels for Chapter 62-777 F.A.C.
J = The chemical was detected but the concentration reported is an estimated value.
U = The chemical was not detected.
bold = exceedance of Residential or Industrial Exposure criteria
shaded = exceedance of leachability to groundwater critera

Table 4-2
Summary of DPT Soil Sample Analytical Results
Saufley Field Site 1
Pensacola Fl
Page 2 of 4

LOCATION SAMPLE ID SAMPLE DATE SAMPLE DEPTH	FL SCTL 62-777 Residential Soil-Direct	FL SCTL 62-777 Industrial Soil-Direct	FL SCTL 62-777 Leachability to Groundwater	SF-1-SB07 SF-1-SB07-30-35-01/2012 1/12/2012 30 to 35	SF-1-SB08 SF-1-SB08-20-25-01/2012 1/12/2012 20 to 25	SF-1-SB08 SF-1-SB08-35-40-01/2012 1/12/2012 35 to 40
METALS (MG/KG)						
ALUMINUM	80000	*	***	2600	11000	2600
ANTIMONY	27	370	5.4	0.17 UJ	0.4 J	0.18 UJ
ARSENIC	2.1	12	***	**2.8**	**4.7**	1.1 U
BARIUM	120	130000	1600	3.8	17	3.2
BERYLLIUM	120	1400	63	0.027 U	0.08 J	0.028 U
CADMIUM	82	1700	7.5	0.28 J	0.34 J	0.22 J
CHROMIUM	210	470	38	5.4	16	3.1
COBALT	1700	42000	***	0.089 U	0.11 U	0.093 U
COPPER	150**	89000	***	1.1	5.8	1.1
IRON	53000	*	***	2300	7500	2100
LEAD	400	1400	***	2 J	6.6 J	2.8 J
MANGANESE	3500	43000	***	2.5	4.9	2.2
MERCURY	3	17	2.1	0.0059 U	0.016 J	0.0056 U
NICKEL	340	35000	130	0.67 J	1.1 J	1.4 J
SELENIUM	440	11000	5.2	0.17 U	0.2 U	0.18 U
SILVER	410	8200	17	0.04 U	0.048 U	0.042 U
VANADIUM	67	10000	980	17	33	15
ZINC	26000	630000	***	0.73 J	2.2 J	0.94 J
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	NC	NC	NC	96.1	85.1	91.5
SEMIVOLATILES (UG/KG)						
BIS(2-ETHYLHEXYL)PHTHALATE	72000	390000	3600000	12 U	14 U	13 U
CARBAZOLE	49000	240000	200	15 U	16 U	15 U
DIBENZOFURAN	320000	63000000	15000	10 U	12 U	11 U
VOLATILES (UG/KG)						
2-HEXANONE	24000	130000	1400	1.6 U	1.4 U	1.6 U
ACETONE	11000000	68000000	25000	5 U	3.7 U	3.1 U
METHYLENE CHLORIDE	17000	26000	20	0.74 J	0.5 J	0.83 J
TOLUENE	7500000	60000000	500	0.36 U	0.32 U	0.36 U
TOTAL XYLENES	130	700	0.2	0.22 U	0.19 U	0.22 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
1-METHYLNAPHTHALENE	200000	1800000	3100	1 U	1.1 U	1.1 U
2-METHYLNAPHTHALENE	210000	2100000	8500	1 U	1.1 U	1.1 U
ACENAPHTHENE	2400000	20000000	2100	0.86 U	0.95 U	0.9 U
ANTHRACENE	21000000	300000000	2500000	0.53 U	0.58 U	0.56 U
BAP EQUIVALENT	100	700	8000	0.68 U	0.75 U	0.72 U
BENZO(A)ANTHRACENE	#	#	800	0.61 U	0.67 U	0.64 U
BENZO(A)PYRENE	100	700	8000	0.68 U	0.75 U	0.72 U
BENZO(B)FLUORANTHENE	#	#	2400	0.52 U	0.57 U	0.54 U
BENZO(G,H,I)PERYLENE	2500000	52000000	32000000	0.67 U	0.74 U	0.71 U
BENZO(K)FLUORANTHENE	#	#	24000	0.5 U	0.55 U	0.52 U
CHRYSENE	#	#	77000	0.46 U	0.51 U	0.49 U
DIBENZO(A,H)ANTHRACENE	#	#	700	0.53 U	0.58 U	0.56 U
FLUORANTHENE	3200000	59000000	1200000	0.43 U	0.48 U	0.46 U
FLUORENE	2600000	33000000	160000	0.59 U	0.65 U	0.62 U
INDENO(1,2,3-CD)PYRENE	#	#	6600	1 U	1.1 U	1.1 U
NAPHTHALENE	55000	300000	1200	1 U	1.1 U	1.1 U
PHENANTHRENE	2200000	36000000	250000	0.74 U	0.82 U	0.78 U
PYRENE	2400000	45000000	880000	0.52 U	0.57 U	0.54 U
PESTICIDES (UG/KG)						
4,4'-DDD	4200	22000	5800	0.037 UJ	0.042 U	0.038 UJ
4,4'-DDE	2900	15000	18000	0.023 UJ	0.026 U	0.023 UJ
4,4'-DDT	2900	15000	11000	0.18 J	0.12 J	0.074 UJ
ALPHA-CHLORDANE	NC	NC	NC	0.029 UJ	0.033 U	1.7 J
DIELDRIN	60	300	2	0.029 UJ	0.033 U	0.029 UJ
ENDRIN	25000	510000	1000	0.023 UJ	0.026 U	0.023 UJ
ENDRIN ALDEHYDE	NC	NC	NC	0.037 UJ	0.042 U	0.038 UJ
GAMMA-BHC (LINDANE)	700	2500	9	0.077 UJ	0.088 U	0.47 J
GAMMA-CHLORDANE	NC	NC	NC	0.12 U	0.49 U	4.5 J
HEPTACHLOR	200	1000	23000	0.15 U	0.19 U	4.5 J
METHOXYCHLOR	420000	8800000	160000	0.069 UJ	0.078 U	0.07 UJ
PETROLEUM HYDROCARBONS (MG/KG)						
TRPH (C08-C40)	460	2700	340	2.2 U	2.4 U	2.2 U

Footnotes:
mg/kg = milligram per kilogram
ug/kg = microgram per kilogram
TRPH = Total Recoverable Petroleum Hydrocrbons
FL SCTL = Florida Soil Cleanup Target Level per Chapter 62-777, Florida Administrative Code
* = Contaminant is not a health concern for this exposure scenario
** = Direct Exposure value based on acute toxicity considerations. This criteriion is applicable in scenarios where children might be expose to soils (e.g. residences, schools, playgrounds
*** = Leachability values may be dericed using the SPLP Test to calcualte site specific SCTLs or may be determined using TCLP in the event oil wastes are present
#=Site concentrations for carcinogenic polycyclic aromatic hydrocarbons must be converted to Benzo(a)pyrene equivalents before comparison with the appropriate direct exposure Soil Cleanup Target Level for Benzo(a)pyrene using the appraoch described in the February 2005 'Final Technical Report: Development of Cleanup Target Leevels for Chapter 62-777 F.A.C.
J = The chemical was detected but the concentration reported is an estimated value.
U = The chemical was not detected.
bold = exceedance of Residential or Industrial Exposure criteria
shaded = exceedance of leachability to groundwater critera

Table 4-2
Summary of DPT Soil Sample Analytical Results
Saufley Field Site 1
Pensacola Fl
Page 3 of 4

LOCATION	FL SCTL 62-777 Residential Soil-Direct	FL SCTL 62-777 Industrial Soil-Direct	FL SCTL 62-777 Leachability to Groundwater	SF-1-SB09	SF-1-SB10	SF-1-SB10
SAMPLE ID				SF-1-SB09-30-35-01/2012	SF-1-SB10-0-2-01/2012	SF-1-SB10-0-2-01/2012-D
SAMPLE DATE				1/12/2012	1/12/2012	1/12/2012
SAMPLE DEPTH				30 to 35	0 to 2	0 to 2
METALS (MG/KG)						
ALUMINUM	80000	*	***	1300	12000 J	6300 J
ANTIMONY	27	370	5.4	0.24 J	0.38 J	0.41 J
ARSENIC	2.1	12	***	**2.2**	**2.4**	1.8
BARIUM	120	130000	1600	1.3	18 J	9.7 J
BERYLLIUM	120	1400	63	0.034 J	0.097 J	0.03 J
CADMIUM	82	1700	7.5	0.011 U	0.44 J	0.21 J
CHROMIUM	210	470	38	6.2	8.7 J	4.8 J
COBALT	1700	42000	***	0.093 U	0.37 J	0.27 J
COPPER	150**	89000	***	0.99	5.9	3.9
IRON	53000	*	***	5400	5700 J	3200 J
LEAD	400	1400	***	0.57 J	34 J	16 J
MANGANESE	3500	43000	***	1.9	90 J	50 J
MERCURY	3	17	2.1	0.0059 U	0.042 J	0.056 J
NICKEL	340	35000	130	0.25 J	2.5	1.7 J
SELENIUM	440	11000	5.2	0.18 U	0.3 J	0.5 J
SILVER	410	8200	17	0.043 U	0.044 U	0.044 U
VANADIUM	67	10000	980	12	16	8.7
ZINC	26000	630000	***	0.98 J	16	8
MISCELLANEOUS PARAMETERS						
PERCENT SOLIDS (%)	NC	NC	NC	95.2	89.9	91.5
SEMIVOLATILES (UG/KG)						
BIS(2-ETHYLHEXYL)PHTHALATE	72000	390000	3600000	12 U	63 U	65 U
CARBAZOLE	49000	240000	200	15 U	610 J	1100 J
DIBENZOFURAN	320000	63000000	15000	10 U	110 J	220
VOLATILES (UG/KG)						
2-HEXANONE	24000	130000	1400	1.5 U	1.8 J	1.6 U
ACETONE	11000000	68000000	25000	4.6 U	120 J	2.9 U
METHYLENE CHLORIDE	17000	26000	20	0.64 J	0.27 U	1.4 U
TOLUENE	7500000	60000000	500	0.36 U	0.39 U	1.1 J
TOTAL XYLENES	130	700	0.2	0.22 U	0.24 UJ	1.1 J
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
1-METHYLNAPHTHALENE	200000	1800000	3100	1 U	44 J	27 J
2-METHYLNAPHTHALENE	210000	2100000	8500	1 U	58	31 J
ACENAPHTHENE	2400000	20000000	2100	0.86 U	280	190
ANTHRACENE	21000000	300000000	2500000	0.53 U	720	470
BAP EQUIVALENT	100	700	8000	0.68 U	**11798**	**10458**
BENZO(A)ANTHRACENE	#	#	800	0.61 U	5800	5000
BENZO(A)PYRENE	100	700	8000	0.68 U	**8300**	**7500**
BENZO(B)FLUORANTHENE	#	#	2400	0.52 U	11000	10000
BENZO(G,H,I)PERYLENE	2500000	52000000	32000000	0.67 U	6500	5800
BENZO(K)FLUORANTHENE	#	#	24000	0.5 U	5000	4100
CHRYSENE	#	#	77000	0.47 U	7500	6600
DIBENZO(A,H)ANTHRACENE	#	#	700	0.53 U	1200 J	910
FLUORANTHENE	3200000	59000000	1200000	0.44 U	9000	7500
FLUORENE	2600000	33000000	160000	0.59 U	130	75
INDENO(1,2,3-CD)PYRENE	#	#	6600	1 U	5600	5000
NAPHTHALENE	55000	300000	1200	1 U	190	96
PHENANTHRENE	2200000	36000000	250000	0.75 U	2800	2300
PYRENE	2400000	45000000	880000	0.52 U	7700	6900
PESTICIDES (UG/KG)						
4,4'-DDD	4200	22000	5800	0.28 J	0.39 U	0.38 U
4,4'-DDE	2900	15000	18000	0.022 U	3 J	4.1 J
4,4'-DDT	2900	15000	11000	0.1 J	4.1 J	5.1 J
ALPHA-CHLORDANE	NC	NC	NC	13	0.31 UJ	0.3 U
DIELDRIN	60	300	2	0.029 U	8.7 J	0.3 U
ENDRIN	25000	510000	1000	0.022 U	0.24 U	0.23 U
ENDRIN ALDEHYDE	NC	NC	NC	0.037 U	0.39 UJ	2.4 J
GAMMA-BHC (LINDANE)	700	2500	9	0.47 J	3.9 J	0.79 U
GAMMA-CHLORDANE	NC	NC	NC	32	0.27 UJ	1.6 U
HEPTACHLOR	200	1000	23000	37	0.62 U	0.6 U
METHOXYCHLOR	420000	8800000	160000	0.068 U	0.73 UJ	0.71 U
PETROLEUM HYDROCARBONS (MG/KG)						
TRPH (C08-C40)	460	2700	340	5.5 J	330	460

Footnotes:
mg/kg = milligram per kilogram
ug/kg = microgram per kilogram
TRPH = Total Recoverable Petroleum Hydrocrbons
FL SCTL = Florida Soil Cleanup Target Level per Chapter 62-777, Florida Administrative Code
* = Contaminant is not a health concern for this exposure scenario
** = Direct Exposure value based on acute toxicity considerations. This criteriion is applicable in scenarios where children might be expose to soils (e.g. residences, schools, playgrounds
*** = Leachability values may be dericed using the SPLP Test to calcualte site specific SCTLs or may be determined using TCLP in the event oil wastes are present
#=Site concentrations for carcinogenic polycyclic aromatic hydrocarbons must be converted to Benzo(a)pyrene equivalents before comparison with the appropriate direct exposure Soil Cleanup Target Level for Benzo(a)pyrene using the appraoch described in the February 2005 'Final Technical Report: Development of Cleanup Target Leevels for Chapter 62-777 F.A.C.
J = The chemical was detected but the concentration reported is an estimated value.
U = The chemical was not detected.
bold = exceedance of Residential or Industrial Exposure criteria
shaded = exceedance of leachability to groundwater critera

Table 4-2
Summary of DPT Soil Sample Analytical Results
Saufley Field Site 1
Pensacola Fl
Page 4 of 4

LOCATION	FL SCTL 62-777 Residential Soil-Direct	FL SCTL 62-777 Industrial Soil-Direct	FL SCTL 62-777 Leachability to Groundwater	SF-1-SB10	SF-1-SB10	SF-1-SB11	SF-1-SB11
SAMPLE ID				SF-1-SB10-10-15-01/2012	SF-1-SB10-25-30-01/2012	SF-1-SB11-0-2-01/2012	SF-1-SB11-0-2-01/2012-D
SAMPLE DATE				1/12/2012	1/12/2012	1/12/2012	1/12/2012
SAMPLE DEPTH				10 to 15	25 to 30	0 to 2	0 to 2
METALS (MG/KG)							
ALUMINUM	80000	*	***	16000	7900	3600	4400
ANTIMONY	27	370	5.4	0.18 UJ	0.2 UJ	0.21 UJ	0.19 UJ
ARSENIC	2.1	12	***	**2.8**	1.7	0.88 U	0.94 U
BARIUM	120	130000	1600	6.2	11	4.7	6.4
BERYLLIUM	120	1400	63	0.044 J	0.058 J	0.033 U	0.029 U
CADMIUM	82	1700	7.5	0.26 J	0.25 J	0.32 J	0.29 J
CHROMIUM	210	470	38	11	6.2	3	4.3
COBALT	1700	42000	***	0.095 U	0.1 U	0.15 J	0.22 J
COPPER	150**	89000	***	4.3	2.7	1.5	1.9
IRON	53000	*	***	7200	3300	1800	2300
LEAD	400	1400	***	4.8 J	3.7 J	2.4 J	5.3 J
MANGANESE	3500	43000	***	7.2	4.4	36	43
MERCURY	3	17	2.1	0.0063 U	0.011 J	0.0082 J	0.0072 J
NICKEL	340	35000	130	1.9 J	0.77 J	1.3 J	1.4 J
SELENIUM	440	11000	5.2	0.18 U	0.28 J	0.47 J	0.39 J
SILVER	410	8200	17	0.2 U	0.047 U	0.05 U	0.044 U
VANADIUM	67	10000	980	19	14	5.1	6.3
ZINC	26000	630000	***	3 J	1.8 J	4	5.8
MISCELLANEOUS PARAMETERS							
PERCENT SOLIDS (%)	NC	NC	NC	90.3	87	81.7	94.2
SEMIVOLATILES (UG/KG)							
BIS(2-ETHYLHEXYL)PHTHALATE	72000	390000	3600000	13 U	14 U	20 J	66
CARBAZOLE	49000	240000	200	15 U	16 U	17 U	14 U
DIBENZOFURAN	320000	63000000	15000	11 U	11 U	12 U	10 U
VOLATILES (UG/KG)							
2-HEXANONE	24000	130000	1400	1.3 U	1.6 U	1.7 U	1.6 U
ACETONE	11000000	68000000	25000	3.9 U	29 U	77 J	47 J
METHYLENE CHLORIDE	17000	26000	20	0.21 U	0.92 U	0.6 J	0.61 J
TOLUENE	7500000	60000000	500	0.31 U	0.38 U	0.4 U	0.36 U
TOTAL XYLENES	130	700	0.2	0.18 U	0.23 U	0.24 U	0.22 U
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)							
1-METHYLNAPHTHALENE	200000	1800000	3100	1.1 U	1.1 U	1.2 U	5.2 U
2-METHYLNAPHTHALENE	210000	2100000	8500	1.1 U	1.1 U	1.2 U	5.3 U
ACENAPHTHENE	2400000	20000000	2100	0.91 U	0.93 U	1 U	4.4 U
ANTHRACENE	21000000	300000000	2500000	0.56 U	0.57 U	2.4 J	11 J
BAP EQUIVALENT	100	700	8000	0.73 U	1.9	66	**234**
BENZO(A)ANTHRACENE	#	#	800	0.65 U	0.66 U	29	100
BENZO(A)PYRENE	100	700	8000	0.73 U	1.5 J	45	**160**
BENZO(B)FLUORANTHENE	#	#	2400	0.55 U	1.6 J	64	230
BENZO(G,H,I)PERYLENE	2500000	52000000	32000000	0.71 U	3.3 J	41	150
BENZO(K)FLUORANTHENE	#	#	24000	0.53 U	0.91 J	24	79
CHRYSENE	#	#	77000	0.49 U	0.81 J	39	130
DIBENZO(A,H)ANTHRACENE	#	#	700	0.56 U	0.57 U	7.7	28
FLUORANTHENE	3200000	59000000	1200000	0.46 U	0.47 U	41	170
FLUORENE	2600000	33000000	160000	0.63 U	0.64 U	0.69 U	3 U
INDENO(1,2,3-CD)PYRENE	#	#	6600	1.1 U	2.2 J	34	120
NAPHTHALENE	55000	300000	1200	1.1 U	1.1 U	1.2 U	5.1 U
PHENANTHRENE	2200000	36000000	250000	0.79 U	0.81 U	11	48
PYRENE	2400000	45000000	880000	0.55 U	0.56 U	38	140
PESTICIDES (UG/KG)							
4,4'-DDD	4200	22000	5800	0.039 U	0.04 U	0.042 U	0.35 J
4,4'-DDE	2900	15000	18000	0.024 U	0.025 U	4.2 J	8.3 J
4,4'-DDT	2900	15000	11000	0.076 U	0.078 U	3.3 J	7.6 J
ALPHA-CHLORDANE	NC	NC	NC	0.03 U	0.031 U	0.033 U	0.42 U
DIELDRIN	60	300	2	0.03 U	0.031 U	0.033 U	0.46 J
ENDRIN	25000	510000	1000	0.024 U	0.025 U	1 J	0.023 UJ
ENDRIN ALDEHYDE	NC	NC	NC	0.039 U	0.04 U	0.22 J	1.4 J
GAMMA-BHC (LINDANE)	700	2500	9	0.31 J	0.27 J	0.5 J	0.41 J
GAMMA-CHLORDANE	NC	NC	NC	0.18 U	0.27 U	0.23 U	0.25 U
HEPTACHLOR	200	1000	23000	0.14 U	0.2 U	0.18 U	0.17 U
METHOXYCHLOR	420000	8800000	160000	0.073 U	0.075 U	1.2 J	1.9 J
PETROLEUM HYDROCARBONS (MG/KG)							
TRPH (C08-C40)	460	2700	340	2.7 J	2.3 U	2.5 U	6.1 J

Footnotes:
mg/kg = milligram per kilogram
ug/kg = microgram per kilogram
TRPH = Total Recoverable Petroleum Hydrocrbons
FL SCTL = Florida Soil Cleanup Target Level per Chapter 62-777, Florida Administrative Code
* = Contaminant is not a health concern for this exposure scenario
** = Direct Exposure value based on acute toxicity considerations. This criteriion is applicable in scenarios where children might be expose to soils (e.g. residences, schools, playgrounds
*** = Leachability values may be dericed using the SPLP Test to calcualte site specific SCTLs or may be determined using TCLP in the event oil wastes are present
#=Site concentrations for carcinogenic polycyclic aromatic hydrocarbons must be converted to Benzo(a)pyrene equivalents before comparison with the appropriate direct exposure Soil Cleanup Target Level for Benzo(a)pyrene using the appraoch described in the February 2005 'Final Technical Report: Development of Cleanup Target Leevels for Chapter 62-777 F.A.C.
J = The chemical was detected but the concentration reported is an estimated value.
U = The chemical was not detected.
bold = exceedance of Residential or Industrial Exposure criteria
shaded = exceedance of leachability to groundwater critera

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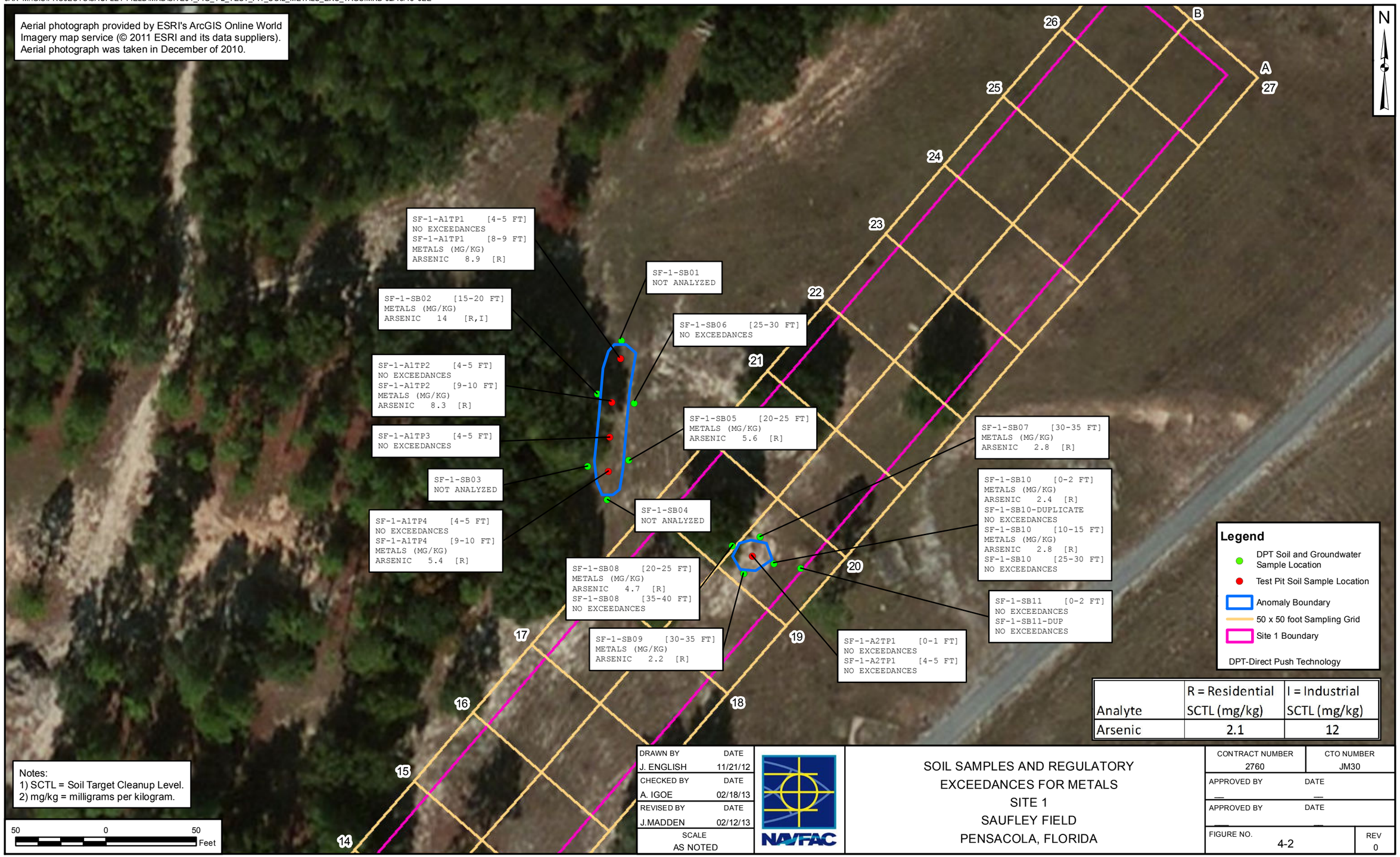

Analyte	R = Residential SCTL (mg/kg)	I = Industrial SCTL (mg/kg)
Arsenic	2.1	12

DRAWN BY	DATE
J. ENGLISH	11/21/12
CHECKED BY	DATE
A. IGOE	02/18/13
REVISED BY	DATE
J.MADDEN	02/12/13
SCALE	
AS NOTED	

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SOIL SAMPLES AND REGULATORY EXCEEDANCES FOR METALS
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

CONTRACT NUMBER	CTO NUMBER
2760	JM30
APPROVED BY	DATE
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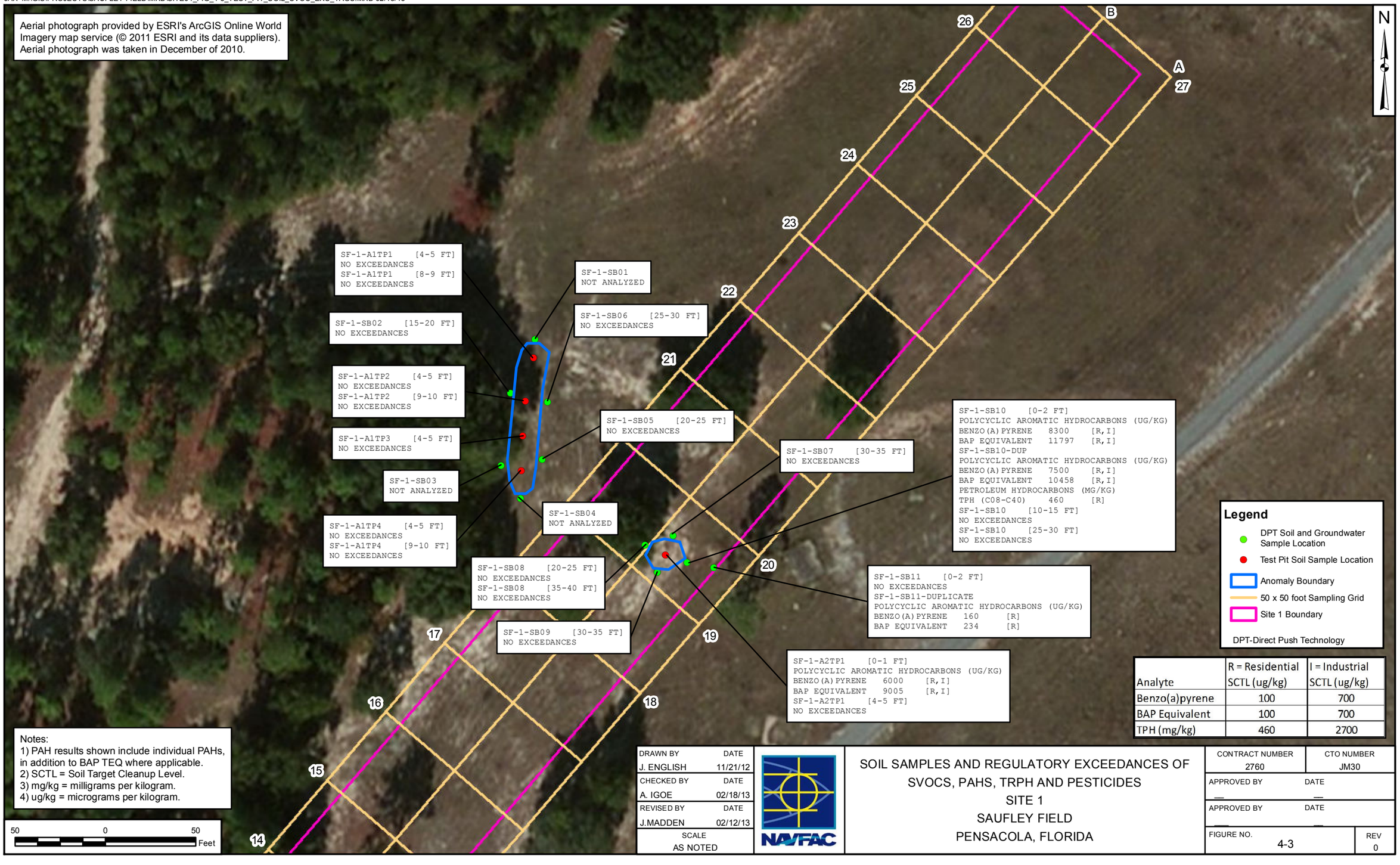
APPROVED BY	DATE
—	—
FIGURE NO. 4-2	REV 0

JAX M:\GIS\PROJECTS\SAUFLEY FIELD\MXD\SITE01_FIG_4-3_TEST_PIT_SOIL_SVOC_EXC_TAGS.MXD 02/18/13



Analyte	R = Residential SCTL (ug/kg)	I = Industrial SCTL (ug/kg)
Benzo(a)pyrene	100	700
BAP Equivalent	100	700
TPH (mg/kg)	460	2700

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REVISED BY	DATE
J.MADDEN	02/12/13
SCALE	
AS NOTED	

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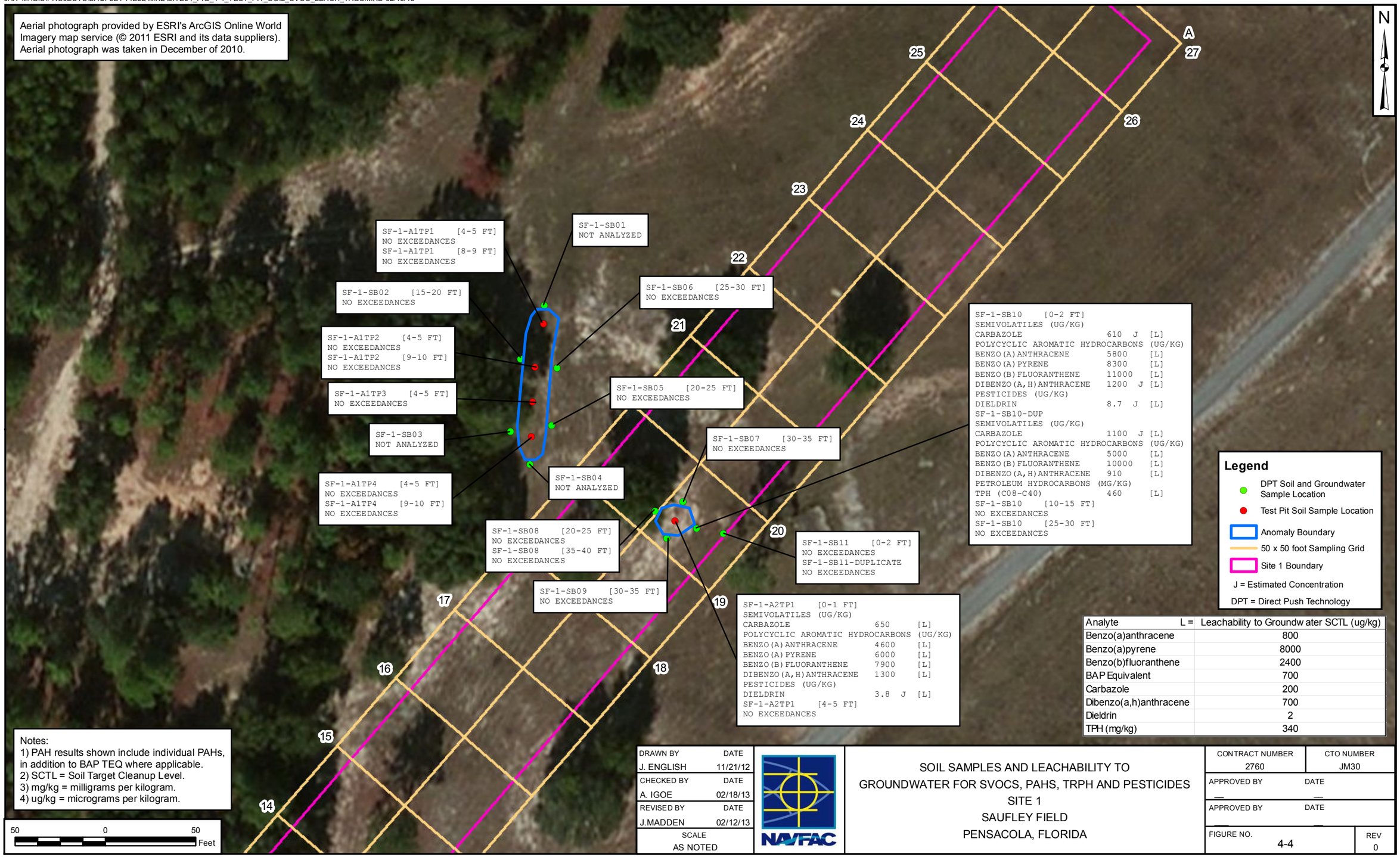
SOIL SAMPLES AND REGULATORY EXCEEDANCES OF SVOCS, PAHS, TRPH AND PESTICIDES
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

CONTRACT NUMBER	CTO NUMBER
2760	JM30
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO. 4-3	REV 0

JAX M:\GIS\PROJECTS\SAUFLEY FIELD\MXD\SITE01_FIG_4-4_TEST_PIT_SOIL_SVOC_LEACH_TAGS.MXD 02/18/13



Analyte L =	Leachability to Groundw ater SCTL (ug/kg)
Benzo(a)anthracene	800
Benzo(a)pyrene	8000
Benzo(b)fluoranthene	2400
BAP Equivalent	700
Carbazole	200
Dibenzo(a,h)anthracene	700
Dieldrin	2
TPH (mg/kg)	340

DRAWN BY J. ENGLISH	DATE 11/21/12	
CHECKED BY A. IGOE	DATE 02/18/13	
REVISED BY J.MADDEN	DATE 02/12/13	
SCALE AS NOTED		

NAVFAC

SOIL SAMPLES AND LEACHABILITY TO GROUNDWATER FOR SVOCS, PAHS, TRPH AND PESTICIDES
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

CONTRACT NUMBER 2760	CTO NUMBER JM30
APPROVED BY —	DATE —
APPROVED BY —	DATE —
FIGURE NO. 4-4	REV 0

The VOCs detected in the DPT surface and subsurface soil samples include: 2-hexanone, acetone, methylene chloride, toluene and xylenes (total). None of the VOCs were detected at concentrations that exceed their respective SCTLs per Chapter 62-777, F.A.C.

The SVOCs detected in the DPT surface and subsurface soil samples include: bis(2-ethylhexyl)phthalate, carbazole and dibenzofuran. Only carbazole was detected at DPT surface soil (0 to 2 foot bls) sample location SF-1-SB10 at 610 J microgram per kilogram (µg/kg) and its duplicate at 1100 µg/kg at concentrations that exceed its Leachability to Groundwater SCTL of 200 µg/kg. Carbazole was not detected in the subsurface soil samples from sample location SF-1-SB10 or any subsurface soil sample from the other DPT sample locations.

The PAHs detected in the DPT surface and subsurface soil samples include: 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorine, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene and pyrene. However, only benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene) and dibenzo(a,h)anthracene exceeded their Leachability to Groundwater SCTLs, and benzo(a)pyrene and cPAHs evaluated as benzo(a)pyrene equivalents exceeded the Industrial Direct Exposure SCTL of 700 µg/kg. The exceedances were at DPT surface soil (0 to 2 foot bls) sample locations SF-1-SB10 and SF-1-SB11. These analytes were either not detected or were detected at low concentrations that did not exceed their SCTLs in the subsurface soil samples from sample location SF-1-SB10 or any subsurface soil sample from the other DPT sample locations.

The pesticides detected in the DPT surface and subsurface soil samples include: 4,4`DDD, 4,4`DDE, 4,4`DDT, alpha-chlordane, dieldrin, endrin, endrin aldehyde, gamma-BHC (Lindane), Gamma Chlordane, heptachlor and methoxychlor. Only dieldrin was detected at DPT surface soil (0 to 2 foot bls) sample location SF-1-SB10 at 8.7 J µg/kg at a concentration that exceeds its Leachability to Groundwater SCTL of 2 µg/kg. Dieldrin was not detected in the subsurface soil samples from sample location SF-1-SB10 or any subsurface soil sample from the other DPT sample locations.

TRPH was detected in 6 of the DPT surface and subsurface soil samples, but only one sample contained TRPH at a concentration that exceeded its SCTL for Leachability to Groundwater. The surface soil sample duplicate (0 to 2 foot bls) from sample location SF-1-SB10 contained TRPH at 460 milligram per kilogram (mg/kg) which exceeds the Leachability to Groundwater SCTL of 340 mg/kg.

The surface soil sample (0 to 2 foot bls) from location SF-1-SB10 contained TRPH at 330 which is less than the Leachability to Groundwater SCTL. TRPH was either not detected or was detected at low

concentrations that did not exceed its Leachability to Groundwater SCTL in the subsurface soil samples from sample location SF-1-SB10 or any subsurface soil sample from the other DPT sample locations.

Metals detected in the DPT surface and subsurface soil samples include: aluminum, antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, silver, vanadium and zinc. However, only arsenic was detected at concentrations that exceeded its Residential and Industrial Direct Exposure SCTL. One of the two surface (0 to 2 foot bls) soil samples, SF-1-SB10, contained arsenic 2.4 mg/kg at concentrations that exceeded its Residential Direct Exposure SCTL of 2.1 mg/kg. Arsenic was also detected in subsurface soil samples at concentrations that exceed Residential and Industrial Direct Exposure SCTLs, but were at depths that these SCTLs would not be applicable for the exposure scenarios. Four subsurface soil samples contained arsenic at concentrations that exceed its Residential Direct Exposure SCTL:

- SF-1-SB10 10 to 15 feet bls at 2.4 mg/kg
- SF-1-SB05 20 to 25 feet bls at 5.6 mg/kg
- SF-1-SB08 20 to 25 feet bls at 4.7 mg/kg
- SF-1-SB10 30 to 35 feet bls at 2.8 mg/kg

One subsurface soil sample contained arsenic at a concentration that exceeds its Industrial Direct Exposure SCTL (12 mg/kg):

- SF-1-SB02 15 to 20 feet bls at 14 mg/kg

4.3.3 DPT Groundwater Sample Analytical Results

Groundwater samples were collected at each DPT sample location by advancing a DPT groundwater sampling screen to the target depth which was approximately 5 feet below the water level encountered at the time of the field activities. The screen was exposed to the formation and groundwater was withdrawn through polyethylene tubing to the surface using a peristaltic pump and check valve. The groundwater samples for VOCs were field screened for cVOCs using AQR Color-Tec® screening kits. In addition, groundwater samples were collected for off-site laboratory analysis of VOCs, SVOCs (including low level PAHs), pesticides, PCBs, TRPH and metals.

A summary of the analytes detected in DPT groundwater samples and those that exceeded their Florida CTLs are listed in Table 4-3. Analytes that exceeded their Florida CTLs are also presented graphically on Figure 4-5. Laboratory analytical data is provided in Appendix E.

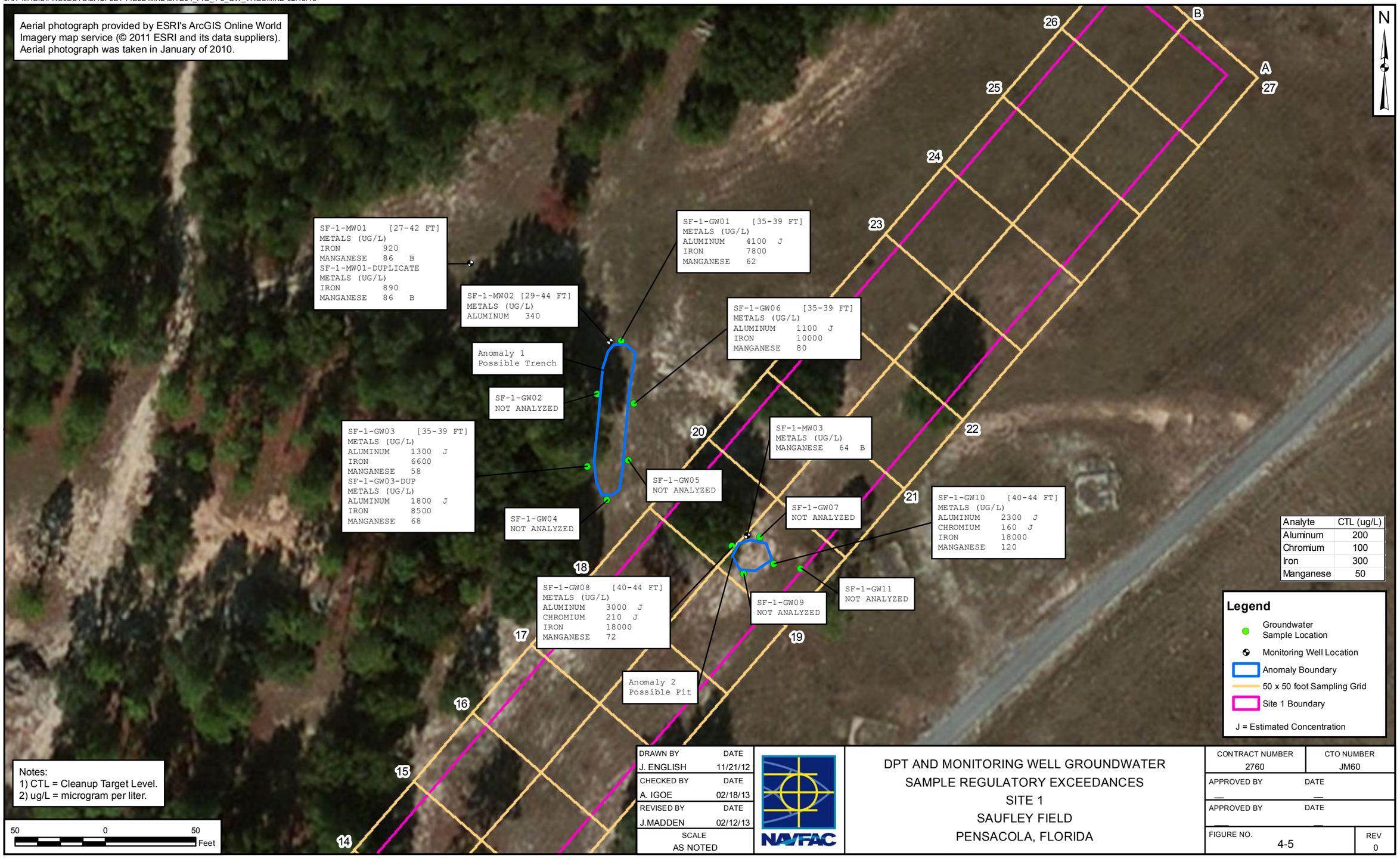
Because the temporary DPT well screen is not as effective as a monitoring well screen in keeping fine grained materials out of a groundwater sample, the turbidity of the DPT groundwater samples ranged from 177 to greater than 1,000 NTU. It is likely that the analytical results for pesticides and metals were adversely affected by the turbidity of the groundwater samples which resulted in concentrations that are not

Table 4-3
Summary of DPT Groundwater Sample Analytical Results
Saufley Field Site 1
Pensacola Floria
Page 1 of 1

LOCATION SAMPLE ID SAMPLE DATE DEPTH	CTLs PER CHAPTERS 62-550, F.A.C. & 62-777, F.A.C.	CTLs PER CHAPTER 62-785, F.A.C.	SF-1-GW01 SF-1-GW01-35-39-01/2012 1/12/2012 35 to 39	SF-1-GW03 SF-1-GW03-35-39-01/2012 1/12/2012 35 to 39	SF-1-GW03 SF-1-GW03-35-39-01/2012-D 1/12/2012 35 to 39	SF-1-GW06 SF-1-GW06-35-39-01/2012 1/11/2012 35 to 39	SF-1-GW08 SF-1-GW08-40-44-01/2012 1/11/2012 40 to 44	SF-1-GW10 SF-1-GW10-40-44-01/2012 1/11/2012 40 to 44
FIELD (NTU)								
TURBIDITY	NA	NA	>1000	177	177	>1000	>1000	>1000
METALS (UG/L)								
ALUMINUM	200	7000	4100 J	1300 J	1800 J	1100 J	3000 J	2300 J
ARSENIC	10	NA	0.94 J	0.5 J	0.44 J	0.58 J	0.45 J	0.54 J
BARIUM	2000	NA	53	110	110	150	120	76
CADMIUM	5	NA	0.059 U	0.059 U	0.059 U	0.081 J	0.072 J	0.059 U
CHROMIUM	100	NA	45 J	44 J	58 J	78 J	210 J	160 J
COBALT	140	NA	1.3 J	1.6 J	1.6 J	2.3 J	2.9 J	2.6 J
COPPER	1000	280	40	16	20	19	29	56
IRON	300	4200	**7800**	**6600**	**8500**	**10000**	**18000**	**18000**
LEAD	15	NA	4.5	1.9	2.4	2.6	3.2	5.7
MANGANESE	50	330	62	58	68	80	72	120
MERCURY	0.002	NA	0.00021	0.00005 J	0.00005 U	0.00005 U	0.00053	0.00009 J
NICKEL	100	NA	29	13	16	27	69	44
SODIUM	160000	NA	3000	4400	4300	5900	3800	3000
VANADIUM	49	NA	8.1	2 U	3.3 U	2.3 U	17	3.2 U
ZINC	5000	2100	240	11	7.3 J	8.1 J	7.9 J	15
VOLATILES (UG/L)								
ACETONE	6300	NA	3.3 U	4.7 J	3.3 U	3.3 U	4.5 J	3.3 U
PESTICIDES (UG/L)								
GAMMA-BHC (LINDANE)	0.2	NA	0.0058 J	0.0061 J	0.007 J	0.0011 U	0.0011 UJ	0.0062 J

Footnotes:
[1]CTL = Groundwater Cleanup Criteria as provided in Chapter 62-550, and 62-777, Florida Administrative Code (F.A.C.)
> = greater than
NTU = Nephlometric Turbidity Units
UG/L = microgram per liter
J = The chemical was detected but the concentration reported is an estimated value.
U = The chemical was not detected.
Shaded values = analyte exceeds cleanup target level per Chapters 62-550, F.A.C. or 62-777, F.A.C.
Bold values = analyte exceeds cleanup target level per Chapter 62-785, F.A.C.
NA = No Regulatory Value Avaliable

JAX M:\GIS\PROJECTS\SAUFLEY FIELD\MXD\SITE01_FIG_4-5_GW_TAGS.MXD 02/18/13



DRAWN BY	DATE
J. ENGLISH	11/21/12
CHECKED BY	DATE
A. IGOE	02/18/13
REVISED BY	DATE
J.MADDEN	02/12/13
SCALE	
AS NOTED	

NAVFAC

DPT AND MONITORING WELL GROUNDWATER SAMPLE REGULATORY EXCEEDANCES
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

CONTRACT NUMBER	CTO NUMBER
2760	JM60
APPROVED BY	DATE
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APPROVED BY	DATE
—	—
FIGURE NO. 4-5	REV 0

considered representative of the aquifer condition. SVOCs including low level PAHs), PCBs, TRPH were not detected in the DPT groundwater samples. One VOC, acetone was detected in two of the groundwater samples. One pesticide, gamma-BHC (Lindane) was detected in three groundwater samples and a duplicate. Metals detected in the DPT groundwater samples include: aluminum, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, sodium, vanadium and zinc. Aluminum, chromium, iron and manganese were the only analytes detected in the DPT groundwater samples at concentrations that exceeded their CTLs.

Each of the groundwater samples and duplicate contained aluminum at concentrations (ranging from 1,300 J to 4,100 J micrograms per liter [µg/L]) exceeding its CTL of 200 µg/L). However, aluminum did not exceed its health based MCL of 7,000 µg/L per Chapter 62-785, F.A.C. Chromium was detected in two DPT groundwater samples SF-1-GW08 (210 J µg/L) and SF-1GW-10 (160 J µg/L). Each of the groundwater samples and duplicate contained iron at concentrations (ranging from 6,600 to 18,000 µg/L) exceeding its CTL of 300 µg/L. Iron also exceeded its health based MCL of 4,200 µg/L per Chapter 62-785, F.A.C. Each of the groundwater samples and duplicate contained manganese at concentrations (ranging from 58 to 120 µg/L) exceeding its CTL of 50 µg/L. However, manganese did not exceed its health based MCL of 330 µg/L per Chapter 62-785, F.A.C.

4.4 TEST PIT EXCAVATION AND SOIL SAMPLE RESULTS

Test pits were excavated at each of the two large anomalies to confirm the nature of anomalies that were identified by the geophysical investigation. Excavation was conducted starting at the northwest side of each test pit and moved to the northeast side in 1-foot lifts. Anomaly 1 (Test Pit 1) was excavated to a depth of 9 feet bls and Anomaly 2 (Test Pit 2) was excavated to a depth of 5 feet bls. Debris encountered within the test pits were screened for radiological constituents and then placed into a roll-off. The debris encountered in Test Pit 1 consisted of crushed drums, metal and concrete debris, broken glass and glass bottles. The debris encountered in Test Pit 2 consisted of metal and concrete debris.

Both anomalies were fully excavated. Containers that could be identified by the radiological field screening or interpreted as “nuclear wash down fluid” containers were not discovered during the test pit excavation activities. The scrap metal and concrete rubble removed from the excavation areas was disposed of at a metals recycling facility.

Soil samples were also collected to screen for VOCs during test pit excavation activities at the two large geophysical anomalies identified by the geophysical survey. Soil samples were field screened using the Florida head space method (Florida field screening method for excessively contaminated soil Chapter 62-770.200, F.A.C.) with a FID/PID and AQR Color-Tec® test kit to assess the potential that an environmental release has occurred and to support the selection of surface and subsurface soil samples for fixed-base laboratory analysis. The soil samples selected for laboratory analysis were analyzed for VOCs, SVOCs (including low level PAHs), pesticides, PCBs, TRPH and metals.

The detected analytes were compared to their Florida Residential and Industrial Direct Exposure and Leachability to Groundwater SCTLs per Chapter 62-777, F.A.C. In addition, cPAHs (benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a)anthracene and indeno(1,2,3-cd)pyrene) were evaluated individually for Leachability to Groundwater and as benzo(a)pyrene equivalents for Residential and Industrial Direct Exposure. Also, benzo(a)pyrene was evaluated for Residential and Industrial Direct Exposure and Leachability to Groundwater.

VOCs were not detected by the AQR Color-Tec® test for the soil samples collected from the DPT soil borings at Anomalies 1 and 2. Responses by the soil field screening instrumentation (flame and photo ionization detectors) at the at the test pits in general revealed mostly low instrument responses, less than 10 ppm.

Analytes detected in the test pit excavation surface and subsurface soil samples include 3 VOCs, 2 SVOCs, 15 PAHs, TRPH, 4 pesticides and 15 metals. A summary of the analytes detected in test pit excavation surface and subsurface soil samples and those that exceeded their Florida SCTLs are listed in Table 4-4. Analytes that exceeded their Florida SCTLs are also presented graphically on Figures 4-1, 4-2 4-3 and 4-4. Laboratory analytical data is provided in Appendix E.

The VOCs detected in the test pit excavation surface and subsurface soil samples include: carbon disulfide, methyl acetate and toluene. None of the VOCs were detected at concentrations that exceed their respective SCTLs per Chapter 62-777, F.A.C.

Table 4-4
Summary of Test Pit Soil Sample Analytical Results
Saufley Field Site 1
Pensacola Florida
Page 1 of 3

LOCATION SAMPLE ID SAMPLE DATE SAMPLE DEPTH (feet)	FL SCTL 62-777 Residential Soil-Direct	FL SCTL 62-777 Industrial Soil-Direct	FL SCTL 62-777 Leachability Based GW	SF-1-A1TP1 SF-1-A1TP1-4-5-201206 6/25/2012 4 to 5	SF-1-A1TP1 SF-1-A1TP1-8-9-201206 6/25/2012 8 to 9	SF-1-A1TP2 SF-1-A1TP2-4-5-201206 6/26/2012 4 to 5
METALS (MG/KG)						
ALUMINUM	80000	*	***	3500	29000	1600
ARSENIC	2.1	12	***	0.76 U	**8.9**	0.33 U
BARIUM	120	130000	1600	6.1	8.1	2.4
CADMIUM	82	1700	7.5	0.11 U	0.4	0.063 U
CHROMIUM	210	470	38	2.8	25	1.9
COBALT	1700	42000	***	0.25 J	0.21 J	0.13 J
COPPER	150**	89000	***	1.3	6.4	0.71
IRON	53000	*	***	2100	21000	1100
LEAD	400	1400	***	3.3	4 J	1.2
MANGANESE	3500	43000	***	19	9.3	8.4
MERCURY	3	17	2.1	0.0063 U	0.0058 U	0.0056 U
NICKEL	340	35000	130	1.5 J	2.1	0.61 J
THALLIUM	6.1	150	2.8	0.28 J	0.54 UJ	0.26 J
VANADIUM	67	10000	980	4.8	44	2.6
ZINC	26000	630000	***	4	5.3 J	1.5 J
SEMIVOLATILES (UG/KG)						
CARBAZOLE	49000	240000	200	14 U	16 U	14 U
DIBENZOFURAN	320000	63000000	15000	10 U	11 U	9.9 U
VOLATILES (UG/KG)						
CARBON DISULFIDE	270000	1500000	5600	0.64 U	0.59 J	0.6 U
METHYL ACETATE	6800000	38000000	16000	1.1 U	4 J	1 U
TOLUENE	7500000	60000000	500	0.38 U	0.54 J	0.54 J
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
1-METHYLNAPHTHALENE	200000	1800000	3100	1 U	1.1 U	0.98 U
2-METHYLNAPHTHALENE	210000	2100000	8500	1 U	1.1 U	0.99 U
ANTHRACENE	21000000	300000000	2500000	0.53 U	0.57 U	0.51 U
BAP EQUIVALENT	100	700	8000	8	0.74 U	0.66 U
BENZO(A)ANTHRACENE	#	#	800	4	0.66 U	0.59 U
BENZO(A)PYRENE	100	700	8000	5.6	0.74 U	0.66 U
BENZO(B)FLUORANTHENE	#	#	2400	7.4	0.56 U	0.5 U
BENZO(G,H,I)PERYLENE	2500000	52000000	32000000	5.6	0.72 U	0.65 U
BENZO(K)FLUORANTHENE	#	#	24000	3.6	0.54 U	0.48 U
CHRYSENE	#	#	77000	5	0.5 U	0.45 U
DIBENZO(A,H)ANTHRACENE	#	#	700	0.84 J	0.57 U	0.51 U
FLUORANTHENE	3200000	59000000	1200000	5.5	0.47 U	0.42 U
INDENO(1,2,3-CD)PYRENE	#	#	6600	4.5	1.1 U	1 U
NAPHTHALENE	55000	300000	1200	1 U	1.1 U	0.97 U
PHENANTHRENE	2200000	36000000	250000	1.6 J	0.8 U	0.72 U
PYRENE	2400000	45000000	880000	5.1	0.56 U	0.5 U
PESTICIDES (UG/KG)						
4,4'-DDD	4200	22000	5800	0.11 J	0.04 U	0.037 U
4,4'-DDT	2900	15000	11000	0.68 J	0.077 U	0.072 U
DIELDRIN	60	300	2	0.19 J	0.031 U	0.029 U
HEPTACHLOR	200	1000	23000	0.074 J	0.15 J	0.058 U
PETROLEUM HYDROCARBONS (MG/KG)						
TRPH (C08-C40)	460	2700	340	6 J	4.3 U	2.2 J

Footnotes:
mg/kg = milligram per kilogram
ug/kg = microgram per kilogram
TRPH = Total Recoverable Petroleum Hydrocrbons
FL SCTL = Florida Soil Cleanup Target Level per Chapter 62-777, Florida Administrative Code

*=Contaminant is not a health concern for this exposure scenario

**=Direct exposure value based on acute toxicity considerations. This criterion is applicable in scenarios where children might be exposed to soils (e.g. reisdences, schools, playgrounds)

***=Leachability values may be derived using the SPLP Test to calcualte site specific SCTLs or may be determined using TCLP in the event oil wastes are present

#=Site concentrations for carcinogenic polycyclic aromatic hydrocarbons must be converted to Benzo(a)pyrene equivalents before comparison with the appropriate direct exposure Soil Cleanup Target Level for Benzo(a)pyrene using the appraoch described in teh February 2005 'Final Technical Report: Development of Cleanup Target Leevels for Chapter 62-777 F.A.C.

J = The chemical was detected but the concentration reported is an estimated value.

U = The chemical was not detected.

bold=exceedance of Residential or Industrial Exposure criteria
shaded=exceedance of leachability to groundwater critera

Table 4-4
Summary of Test Pit Soil Sample Analytical Results
Saufley Field Site 1
Pensacola Florida
Page 2 of 3

LOCATION SAMPLE ID SAMPLE DATE SAMPLE DEPTH (feet)	FL SCTL 62-777 Residential Soil-Direct	FL SCTL 62-777 Industrial Soil-Direct	FL SCTL 62-777 Leachability Based GW	SF-1-A1TP2 SF-1-A1TP2-9-10-201206 6/26/2012 9 to 10	SF-1-A1TP3 SF-1-A1TP3-4-5-201206 6/26/2012 4 to 5	SF-1-A1TP4 SF-1-A1TP4-4-5-201206 6/27/2012 4 to 5
METALS (MG/KG)						
ALUMINUM	80000	*	***	27000	2400	1800
ARSENIC	2.1	12	***	**8.3**	0.53 U	0.27 U
BARIUM	120	130000	1600	9.7	4.3	4.5
CADMIUM	82	1700	7.5	0.45	0.065 U	0.11 U
CHROMIUM	210	470	38	32	2.2	1.9
COBALT	1700	42000	***	0.17 J	0.21 J	0.088 U
COPPER	150**	89000	***	7.1	0.97	0.77
IRON	53000	*	***	21000	1500	1200
LEAD	400	1400	***	8.2	1.2	1.4
MANGANESE	3500	43000	***	6.8	11	8
MERCURY	3	17	2.1	0.0063 U	0.0058 U	0.0054 U
NICKEL	340	35000	130	1.8 J	1 J	0.74 J
THALLIUM	6.1	150	2.8	0.29 UJ	0.26 UJ	0.24 UJ
VANADIUM	67	10000	980	44	3.7	3.1
ZINC	26000	630000	***	3.9 J	2.4 J	1.9 J
SEMIVOLATILES (UG/KG)						
CARBAZOLE	49000	240000	200	16 U	14 U	14 U
DIBENZOFURAN	320000	63000000	15000	11 U	9.7 U	10 U
VOLATILES (UG/KG)						
CARBON DISULFIDE	270000	1500000	5600	0.68 U	0.61 U	0.62 U
METHYL ACETATE	6800000	38000000	16000	1.1 U	1 U	1 U
TOLUENE	7500000	60000000	500	0.4 U	0.36 U	0.45 J
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
1-METHYLNAPHTHALENE	200000	1800000	3100	1.1 U	1 U	0.98 U
2-METHYLNAPHTHALENE	210000	2100000	8500	1.1 U	1 U	0.99 U
ANTHRACENE	21000000	300000000	2500000	0.59 U	0.53 U	0.51 U
BAP EQUIVALENT	100	700	8000	0.76 U	0.68 U	0.66 U
BENZO(A)ANTHRACENE	#	#	800	0.68 U	0.61 U	0.59 U
BENZO(A)PYRENE	100	700	8000	0.76 U	0.68 U	0.66 U
BENZO(B)FLUORANTHENE	#	#	2400	0.57 U	0.52 U	0.5 U
BENZO(G,H,I)PERYLENE	2500000	52000000	32000000	0.75 U	0.67 U	0.65 U
BENZO(K)FLUORANTHENE	#	#	24000	0.55 U	0.49 U	0.48 U
CHRYSENE	#	#	77000	0.52 U	0.46 U	0.45 U
DIBENZO(A,H)ANTHRACENE	#	#	700	0.59 U	0.53 U	0.51 U
FLUORANTHENE	3200000	59000000	1200000	0.48 U	0.43 U	0.42 U
INDENO(1,2,3-CD)PYRENE	#	#	6600	1.1 U	1 U	1 U
NAPHTHALENE	55000	300000	1200	1.1 U	1 U	0.97 U
PHENANTHRENE	2200000	36000000	250000	0.83 U	0.74 U	0.72 U
PYRENE	2400000	45000000	880000	0.57 U	0.52 U	0.5 U
PESTICIDES (UG/KG)						
4,4'-DDD	4200	22000	5800	0.042 UJ	0.035 U	0.036 U
4,4'-DDT	2900	15000	11000	0.081 UJ	0.068 U	0.07 U
DIELDRIN	60	300	2	0.032 UJ	0.027 U	0.028 U
HEPTACHLOR	200	1000	23000	0.13 J	0.12 J	0.057 U
PETROLEUM HYDROCARBONS (MG/KG)						
TRPH (C08-C40)	460	2700	340	3.2 J	2.5 U	3.1 J

Footnotes:
mg/kg = milligram per kilogram
ug/kg = microgram per kilogram
TRPH = Total Recoverable Petroleum Hydrocrbons
FL SCTL = Florida Soil Cleanup Target Level per Chapter 62-777, Florida Administrative Code

*=Contaminant is not a health concern for this exposure scenario

**=Direct exposure value based on acute toxicity considerations. This criterion is applicable in scenarios where children might be exposed to soils (e.g. reisdences, schools, playgrounds)

***=Leachability values may be derived using the SPLP Test to calcualte site specific SCTLs or may be determined using TCLP in the event oil wastes are present

#=Site concentrations for carcinogenic polycyclic aromatic hydrocarbons must be converted to Benzo(a)pyrene equivalents before comparison with the appropriate direct exposure Soil Cleanup Target Level for Benzo(a)pyrene using the appraoch described in teh February 2005 'Final Technical Report: Development of Cleanup Target Leevels for Chapter 62-777 F.A.C.

J = The chemical was detected but the concentration reported is an estimated value.

U = The chemical was not detected.

bold=exceedance of Residential or Industrial Exposure criteria
shaded=exceedance of leachability to groundwater critera

Table 4-4
Summary of Test Pit Soil Sample Analytical Results
Saufley Field Site 1
Pensacola Florida
Page 3 of 3

LOCATION SAMPLE ID SAMPLE DATE SAMPLE DEPTH (feet)	FL SCTL 62-777 Residential Soil-Direct	FL SCTL 62-777 Industrial Soil-Direct	FL SCTL 62-777 Leachability Based GW	SF-1-A1TP4 SF-1-A1TP4-9-10-201206 6/27/2012 9 to 10	SF-1-A2TP1 SF-1-A2TP1-0-1-201206 6/25/2012 0 to 1	SF-1-A2TP1 SF-1-A2TP1-4-5-201206 6/25/2012 4 to 5
METALS (MG/KG)						
ALUMINUM	80000	*	***	26000	9500	2500
ARSENIC	2.1	12	***	**5.4**	1.9 U	0.54 U
BARIUM	120	130000	1600	8.7	12	3.5
CADMIUM	82	1700	7.5	0.28	0.29	0.088 U
CHROMIUM	210	470	38	23	7.4	2.3
COBALT	1700	42000	***	0.21 J	0.19 J	0.15 J
COPPER	150**	89000	***	6.2	3.8	1
IRON	53000	*	***	15000	4600	1500
LEAD	400	1400	***	5.6	25	1.4
MANGANESE	3500	43000	***	14	61	11
MERCURY	3	17	2.1	0.0065 U	0.029 J	0.0062 U
NICKEL	340	35000	130	2.2	2.1 J	1 J
THALLIUM	6.1	150	2.8	0.28 UJ	0.28 UJ	0.26 UJ
VANADIUM	67	10000	980	33	12	3.7
ZINC	26000	630000	***	7.5 J	7.9	2.4 J
SEMIVOLATILES (UG/KG)						
CARBAZOLE	49000	240000	200	15 U	650	15 U
DIBENZOFURAN	320000	63000000	15000	11 U	120 J	10 U
VOLATILES (UG/KG)						
CARBON DISULFIDE	270000	1500000	5600	0.67 U	0.56 UJ	0.64 U
METHYL ACETATE	6800000	38000000	16000	1.1 U	0.94 UJ	1.1 U
TOLUENE	7500000	60000000	500	0.5 J	0.58 J	0.47 J
POLYCYCLIC AROMATIC HYDROCARBONS (UG/KG)						
1-METHYLNAPHTHALENE	200000	1800000	3100	4.6	210 U	1 U
2-METHYLNAPHTHALENE	210000	2100000	8500	7.5	210 U	1 U
ANTHRACENE	21000000	300000000	2500000	0.55 U	550 J	0.54 U
BAP EQUIVALENT	100	700	8000	0.71 U	**9005**	6
BENZO(A)ANTHRACENE	#	#	800	0.63 U	4600	3.9
BENZO(A)PYRENE	100	700	8000	0.71 U	**6000**	4.3
BENZO(B)FLUORANTHENE	#	#	2400	0.54 U	7900	6.5
BENZO(G,H,I)PERYLENE	2500000	52000000	32000000	0.7 U	4800	4
BENZO(K)FLUORANTHENE	#	#	24000	0.52 U	3000	2.6 J
CHRYSENE	#	#	77000	0.48 U	5300	4.9
DIBENZO(A,H)ANTHRACENE	#	#	700	0.55 U	1300	0.63 J
FLUORANTHENE	3200000	59000000	1200000	0.45 U	5800	6.5
INDENO(1,2,3-CD)PYRENE	#	#	6600	1.1 U	4200	3.5
NAPHTHALENE	55000	300000	1200	4	210 U	1 U
PHENANTHRENE	2200000	36000000	250000	0.77 U	2000	2.3 J
PYRENE	2400000	45000000	880000	0.54 U	4900	5.5
PESTICIDES (UG/KG)						
4,4'-DDD	4200	22000	5800	0.041 U	0.38 U	0.038 UJ
4,4'-DDT	2900	15000	11000	0.079 U	1.4 J	0.075 UJ
DIELDRIN	60	300	2	0.032 U	3.8 J	0.03 UJ
HEPTACHLOR	200	1000	23000	0.064 U	0.6 U	0.061 UJ
PETROLEUM HYDROCARBONS (MG/KG)						
TRPH (C08-C40)	460	2700	340	2.4 U	160	3.8 J

Footnotes:
mg/kg = milligram per kilogram
ug/kg = microgram per kilogram
TRPH = Total Recoverable Petroleum Hydrocrbons
FL SCTL = Florida Soil Cleanup Target Level per Chapter 62-777, Florida Administrative Code

*=Contaminant is not a health concern for this exposure scenario

**=Direct exposure value based on acute toxicity considerations. This criterion is applicable in scenarios where children might be exposed to soils (e.g. reisdences, schools, playgrounds)

***=Leachability values may be derived using the SPLP Test to calcualte site specific SCTLs or may be determined using TCLP in the event oil wastes are present

#=Site concentrations for carcinogenic polycyclic aromatic hydrocarbons must be converted to Benzo(a)pyrene equivalents before comparison with the appropriate direct exposure Soil Cleanup Target Level for Benzo(a)pyrene using the appraoch described in teh February 2005 'Final Technical Report: Development of Cleanup Target Leevels for Chapter 62-777 F.A.C.

J = The chemical was detected but the concentration reported is an estimated value.

U = The chemical was not detected.

bold=exceedance of Residential or Industrial Exposure criteria
shaded=exceedance of leachability to groundwater critera

The SVOCs detected in the test pit excavation surface and subsurface soil samples include: carbazole and dibenzofuran. Only carbazole was detected at DPT surface soil (0 to 1 foot bls) sample location SF-1-A2TP1 at 650 µg/kg at a concentration that exceeds its Leachability to Groundwater SCTL of 200 µg/kg. Carbazole was not detected in any of the test pit excavation subsurface soil samples.

The PAHs detected in the test pit excavation surface and subsurface soil samples include: 1-methylnaphthalene, 2-methylnaphthalene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene and pyrene. However, only benzo(a)anthracene, benzo(b)fluoranthene) and dibenzo(a,h)anthracene exceeded their Leachability to Groundwater SCTLs, and benzo(a)pyrene and cPAHs evaluated as benzo(a)pyrene equivalents exceeded the Industrial Direct Exposure SCTL of 700 µg/kg. The exceedances were at DPT surface soil (0 to 1 foot bls) sample location SF-1-A2TP1. These analytes were either not detected or were detected at low concentrations that did not exceed their SCTLs in the subsurface soil samples collected during the test pit excavation activities.

The pesticides detected in the test pit excavation surface and subsurface soil samples include: 4,4`DDD, 4,4`DDT, dieldrin and heptachlor. Only dieldrin was detected at DPT surface soil (0 to 1 foot bls) sample location SF-1-A2TP1 at 3.8 J µg/kg at a concentration that exceeds its Leachability to Groundwater SCTL of 2 µg/kg. Dieldrin was either not detected or was detected at low concentrations in subsurface soil samples collected during the test pit excavation activities.

Metals detected in the test pit excavation surface and subsurface soil samples include: aluminum, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, thallium, vanadium and zinc. However, only arsenic was detected in subsurface soil samples at concentrations that exceeded its Residential Direct Exposure SCTL of 2.1 mg/kg. Arsenic was detected in the subsurface soil samples at depths that these SCTLs would not be applicable for the residential exposure scenario. Three subsurface soil samples contained arsenic at concentrations that exceed its Residential Direct Exposure SCTL:

- SF-1-A1TP1 8 to 9 feet bls at 8.9 mg/kg
- SF-1-A1TP2 9 to 10 feet bls at 8.3 mg/kg
- SF-1-A1TP4 9 to 10 feet bls at 5.4 mg/kg

4.5 GROUNDWATER SAMPLING RESULTS

Based on the analytical results of the soil samples the Saufley Field project team decide to have a monitoring well installed at each of the geophysical anomalies and to replace a hydraulic downgradient

well that was one-inch diameter with a two-inch diameter monitoring well to allow the use of a downhole pump to collect the groundwater sample. The monitoring well (SF-1-MW01) installed at the small anomaly was completed to a depth of 45 feet bls and screened from 30 to 45 feet bls (Figure 3-2). The monitoring well (SF-1-MW02) installed at the larger anomaly was completed to a depth of 44 feet bls and screened from 29 to 44 feet bls. The replacement monitoring well (SF-1-MW03) was completed to a depth of 42 feet bls and screened from 27 to 42 feet bls.

The groundwater samples were collected using a downhole pump and low-flow/low stress purging and sampling techniques. Also the Saufley Field project team selected the analytes for groundwater based on the analytes that were detected in the surface and subsurface soils and DPT groundwater samples. The groundwater analyte list included: SVOCs (including low level PAHs), TRPH and metals. The groundwater samples were compared to CTLs per Chapter 62-550, F.A.C. and Chapter 62-777, F.A.C.

The turbidity of the groundwater samples ranged from 4.74 to 16.3 NTU, which is lower than the literature value 20 NTU (Puls, R.W. and Barcelona, M.J., 1996; and Puls, R.W. and R.M. Powell, 1992) that suggest turbidity may adversely affect the analytical results. Low level PAHs and TRPH were not detected in the groundwater samples. Four SVOCs and 19 metals were detected in the groundwater samples. A summary of the analytes detected in groundwater samples collected from the permanent monitoring wells and those that exceeded their Florida CTLs are listed in Table 4-5. Analytes that exceeded their Florida CTLs are also presented graphically on Figure 4-5. Laboratory analytical data is provided in Appendix E.

The four SVOCs, bis(2-ethylhexyl)phthalate, di-n-butyl phthalate, di-n-octyl phthalate and phenol were detected in the three groundwater samples and a duplicate. The SVOCs were detected at low concentrations that did not exceed their CTLs.

The 19 metals detected in the Site 1 groundwater samples include: aluminum, antimony, arsenic, barium, beryllium, calcium, cadmium, cobalt, copper, iron, lead, magnesium, manganese, nickel, potassium, selenium, silver, sodium, vanadium and zinc. Aluminum, iron and manganese were the only analytes detected in the Site 1 groundwater samples at concentrations that exceeded their CTLs. The groundwater sample from monitoring well SF-1MW02 contained aluminum at 340 µg/L which exceeds its secondary CTL per Chapter 62-550, F.A.C. (200 µg/L), but not the health based criteria per Chapter 62-785, F.A.C. (7,000 µg/L). The groundwater sample and duplicate from monitoring well SF-1MW01 contained iron at 920 and 890 µg/L, respectively which exceeds its secondary CTL per Chapter 62-550, F.A.C. (300 µg/L), but not the health based criteria per Chapter 62-785, F.A.C. (4,200 µg/L). Manganese was detected in the groundwater sample and duplicate from monitoring well SF-1MW01 at 86 B µg/L and the groundwater sample from monitoring well SF-1-MW03 at 64 B µg/L, which exceeds its secondary CTL per Chapter 62-550, F.A.C. (50 µg/L), but not the health based criteria per Chapter 62-785, F.A.C. (330 µg/L). It should be noted that manganese was detected in the laboratory method blank and therefore may not be attributed to the Site.

Table 4-5
Summary of Groundwater Sample Analytical Results
Saufley Field Site 1
Pensacola Floria
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MONITORING WELL ID			**SF-1-MW01**		**SF-1-MW02**	**SF-1-MW03**
SAMPLE ID	**CLEANUP TARGET LEVELS PER CHAPTERS 62-550, F.A.C. & 62-777,**	**CLEANUP TARGET LEVELS PER CHAPTER 62-785, F.A.C.**	**SF-1-MW01-27-42-10/13/2012**	**FD10131201 10/13/2012**	**SF-1-MW02-29-44-10/13/2012**	**SF-1-MW03-30-45-10/13/2012**
SAMPLE DATE			**42**	**42**	**44**	**45**
Well Depth (feet)			**27 to 42**	**27 to 42**	**29 to 44**	**30 to 45**
Well Screen Depth Interval (feet)						
FIELD (NTU)						
TURBIDITY	NA	NA	16.3	16.3	14.3	4.74
METALS (UG/L)						
ALUMINUM	200	7000	190	180	340	88
ANTIMONY	6	NA	0.42 J	0.097 U	0.097 U	0.097 U
ARSENIC	10	NA	0.28 J	0.26 U	0.26 U	0.26 U
BARIUM	2000	NA	140 B	150 B	22 B	28 B
BERYLLIUM	4	NA	0.06 J	0.12 J	0.064 J	0.028 U
CALCIUM	NA	NA	7400 B	7600 B	9200 B	11000 B
COBALT	140	NA	8.6	8.9	0.42 J	1.4 J
COPPER	1000	280	1	1.1	2.3	0.87 J
IRON	300	4200	920	890	290	120
LEAD	15	NA	0.12 J	0.096 J	0.67 J	0.047 U
MAGNESIUM	NA	NA	7000	7100	1700	3300
MANGANESE	50	330	86 B	86 B	24 B	64 B
NICKEL	100	NA	3.7 J	4 J	1.4 J	1.5 J
POTASSIUM	NA	NA	1400 B	1400 B	680 B	1400 B
SELENIUM	50	NA	0.25 U	0.25 U	0.53 J	0.25 U
SILVER	100	35	0.028 J	0.011 U	0.011 U	0.011 U
SODIUM	160000	NA	6300 B	6500 B	3700 B	3200 B
VANADIUM	49	NA	1.5 U	1.5 U	1.5 U	1.9 J
ZINC	5000	2100	8.9 BJ	9.3 BJ	9.5 BJ	4.3 BJ
SEMIVOLATILES (UG/L)						
BIS(2-ETHYLHEXYL)PHTHALATE	6	NA	1.1 J	1.2 J	1.2 J	1.1 J
DI-N-BUTYL PHTHALATE	700	NA	0.52 J	0.61 J	0.52 J	0.26 J
DI-N-OCTYL PHTHALATE	140	NA	0.094 U	0.87 J	0.093 U	0.094 U
PHENOL	10	2100	0.23 U	0.23 U	0.23 U	1.1

Notes
F.A.C. = Florida Administgrative Code
NTU = Nephlometric Turbidity Units
UG/L = microgram per liter
J = The chemical was detected but the concentration reported is an estimated value.
U = The chemical was not detected.
B = analyte detected in laboratory method blank
Shaded values = analyte exceeds cleanup target level per Chapters 62-550, F.A.C. or 62-777, F.A.C.
Bold values = analyte exceeds cleanup target level per Chapter 62-785, F.A.C.
NA = No Regulatory Value Avaliable

4.6 SITE SPECIFIC HYDROGEOLOGY

4.6.1 Static Water Levels and Groundwater Elevations

The monitoring wells were installed at Site 1 in a parallel line with one monitoring well at each of the anomalies and one hydraulically downgradient, therefore, due the placement of the monitoring wells a three point solution to mathematically construct a potentiometric surface was not performed. Water level measurements made at the Site 1 monitoring well locations in October 2012 and January 2013 are provided in Table 4-6. The groundwater flow direction at Site 2, which is located hydraulically upgradient of Site 1, is generally towards the north and/or northwest (Tetra Tech, 2012). Based on the groundwater flow direction at Site 2, the groundwater flow direction at Site 1 is also expected to be generally towards the north and/or northwest. Water level measurement data are provided in Appendix D.

TABLE 4-6

GROUNDWATER ELEVATIONS, OCTOBER 2012 AND JANUARY 2013
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

Well Number	Total Depth (feet below top of casing)	Top of Casing (Feet NAD88)	Depth to Groundwater (from top of casing) 10/16/12	Groundwater Elevation 10/16/12	Depth to Groundwater (from top of casing) 1/10/13	Groundwater Elevation 1/10/13
SF-1-MW01	45	41.31	27.06	14.25	28.94	12.37
SF-1-MW02	44	44.06	29.65	14.41	31.54	12.52
SF-1-MW03	42	49.91	34.80	15.11	36.80	13.11

The horizontal groundwater gradient across Site 1 was calculated from the groundwater elevations measured in shallow monitoring wells SF-1-MW-01 and SF-1-MW-03 in October 2012 and January 2013 (Table 4-7). The groundwater flow gradient was determined using the following equation:

$$l = \frac{h_1 - h_2}{d}$$

where:
l = the hydraulic gradient
h_1 = the water elevation at point 1, the highest value
h_2 = the water elevation at point 2, the lowest value
d = the horizontal distance between point 1 and point 2 parallel to the direction of groundwater flow

TABLE 4-7

AVERAGE HYDRAULIC GRADIENT FOR SITE 2
SITE 1
SAUFLEY FIELD
PENSACOLA, FLORIDA

Well Pair	Groundwater Elevation (feet) (H_1-H_2)	Horizontal Distance (feet) (d)	Hydraulic Gradient (feet per foot)
SF-2-MW01 / SF-2-MW03	0.86	215	0.004
SF-2-MW01 / SF-2-MW03	0.74	215	0.003
Average Hydraulic Gradient (feet per foot)			0.0037

4.6.2 Hydraulic Conductivity and Groundwater Flow Velocity

Slug tests to determine hydraulic conductivity values were not conducted as part of the Site 1 investigation. However, hydraulic conductivity values from slug test in monitoring wells at UST Site 2406 (Tetra Tech, 2003), located approximately 2,000 feet south of Site 1, were used because of the similarity in lithologic materials. The slug test results are summarized in Table 4-8 for UST Site 2406 monitoring wells that are screened from 74.5 to 79.5 feet. The average of the hydraulic conductivity values for the shallow wells at Site 2406 is approximately 0.017 feet per minute for monitoring well OLFS-2406-DMW30 and 0.0032 feet per minute for monitoring well OLFS-2406-DMW31.

TABLE 4-8

SLUG TEST RESULTS FOR UST SITE 2406
SITE 2
SAUFLEY FIELD
PENSACOLA, FLORIDA

Well Designation	Screen Length (feet)	Screened Interval (feet)	Water Column (feet)	Calculated Hydraulic Conductivities (feet per minute)		
OLFS-2406-DMW30	5	74.5-79.5	41.92	0.018	0.016	0.017
OLFS-2406-DMW31	5	74.5-79.5	50.93	0.0032	0.0033	0.0030

Note:
Source: Site Assessment Report Addendum for UST Site 2406

Potential movement of groundwater by natural flow (theoretical groundwater seepage [linear] velocity) in the saturated zone for Site 2 can be estimated by Darcy's Law, which may be expressed as follows:

$$V = \frac{K \times I}{\eta}$$

where:

V = average velocity

K = hydraulic conductivity

η = effective porosity

I = average hydraulic gradient

Data from soil borings advanced during this investigation indicated that fine grained sand and silty or clayey sand is the typical lithologies at Saufley Field. Review of field data suggests that a representative effective porosity for this lithology is approximately 20 percent. The estimated average groundwater velocity for the water table zone at Site 1 was calculated using:

- average hydraulic conductivities for the similar lithologies at Site 2406 of 0.0032 feet per minute, as represented by monitoring well OLFS-2406-DMW31 and 0.017 feet per minute, as represented by monitoring well OLFS-2406-DMW30;
- an average hydraulic gradient of 0.0037 foot per foot for Site 1; and
- an effective porosity value of 20 percent.

Based on the above assumptions, the estimated average groundwater velocity (theoretical groundwater seepage velocity) for the water table zone at Site 1 was calculated to range from 5.9×10^{-5} to 3.2×10^{-4} feet per minute or about 31 to 165 feet per year.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

A sequential approach was used to determine if disposal activities have had an impact on the surface soil, subsurface soil, and groundwater at the site. The following findings are based on the information collected during field events between March 2011 and October 2012 and laboratory analytical results.

5.1.1 Radiological Survey

Numerous small areas were identified with gamma readings greater than the 3 sigma above background criteria within the survey grid area.

5.1.2 Geophysical Survey

Two large anomalies and 26 smaller anomalies were identified. The largest of the anomalies appeared to contained metal objects and was similar in dimension (a trench approximately 9 feet deep and 60 feet in length) to the description (NEESA, 1992) of the “nuclear wash down liquid” disposal area. The debris/objects within this suspected trench appear to range from 2 to 9 feet bls.

The other large anomaly was similar to the description (NEESA, 1992) of the area where shop equipment was buried. Based upon the elevated EM and magnetic response within this area, it is suspected that the debris within this anomaly is metallic in nature.The debris within this suspected trench ranged from 0 to 5 feet bls. Based upon the elevated EM and magnetic response within this area, it is suspected that the debris within this anomaly is metallic in nature.

The 26 minor anomalies were not associated with any known metallic objects and based the small size and relatively low response of these areas, it is suspected that these areas are associated with minor, small areas of shallow metallic debris. It is not suspected that the 26 minor anomalies are trench features or other debris pits.

5.1.3 DPT Soil Samples

Analytes detected in the DPT surface and subsurface soil samples include 5 VOCs, 3 SVOCs, 17 PAHs, TRPH, 11 pesticides and 18 metals. None of the VOCs were detected at concentrations that exceed their respective SCTLs per Chapter 62-777, F.A.C.

Carbazole was the only SVOC detected in a DPT surface soil sample and it's duplicate at concentrations that exceed its Leachability to Groundwater SCTL; carbazole was not detected in the subsurface soil samples.

The PAHs benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene) and dibenzo(a,h)anthracene exceeded their Leachability to Groundwater SCTLs, and benzo(a)pyrene and cPAHs evaluated as benzo(a)pyrene equivalents exceeded the Industrial Direct Exposure SCTL. The PAHs were either not detected or were detected at low concentrations that did not exceed their SCTLs in the subsurface soil samples.

Dieldrin was the only pesticide detected in a surface soil sample at a concentration that exceeds its Leachability to Groundwater SCTL of 2 µg/kg. Dieldrin was not detected in the subsurface soil samples. TRPH was detected in a surface soil sample duplicate at a concentration that exceeds the Leachability to Groundwater SCTL of 340 mg/kg.

The surface soil sample from this location did not contain TRPH at a concentration that exceeded its Leachability to Groundwater SCTL. In addition, TRPH was either not detected or was detected at low concentrations that did not exceed its Leachability to Groundwater SCTL in the subsurface soil samples.

Arsenic was the only inorganic analyte detected at concentrations that exceeded its Residential and Industrial Direct Exposure SCTLs. Four subsurface soil samples contained arsenic at concentrations that exceed its Residential Direct Exposure SCTL and one subsurface soil samples contained arsenic at a concentration that exceed its Industrial Direct Exposure SCTL (12 mg/kg).

5.1.4 DPT Groundwater Samples

Because the temporary DPT well screens are not as effective as a monitoring well screen in keeping fine grained materials out of a groundwater sample, the turbidity of the DPT groundwater samples ranged from 177 to greater than 1,000 NTU. It is likely that the analytical results for pesticides and metals were adversely affected by the turbidity of the groundwater samples and the data is of limited use.

SVOCs including low level PAHs, PCBs, and TRPH were not detected in the DPT groundwater samples. One VOC, acetone was detected in two of the groundwater samples. One pesticide, gamma-BHC (Lindane) was detected in three groundwater samples and a duplicate. Metals detected in the DPT groundwater samples include: aluminum, arsenic, barium, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, nickel, sodium, vanadium and zinc. Aluminum, chromium, iron and manganese were

the only analytes detected in the DPT groundwater samples at concentrations that exceeded their CTLs.

5.1.5 Test Pit Soil Samples

Analytes detected in the test pit excavation surface and subsurface soil samples include 3 VOCs, 2 SVOCs, 15 PAHs, TRPH, 4 pesticides and 15 metals. None of the VOCs were detected at concentrations that exceed their respective SCTLs per Chapter 62-777, F.A.C.

Carbazole was the only SVOC detected in a test pit surface soil sample at a concentration that exceeds its Leachability to Groundwater SCTL. Carbazole was not detected in any of the test pit excavation subsurface soil samples.

The PAHs benzo(a)anthracene, benzo(b)fluoranthene) and dibenzo(a,h)anthracene exceeded their Leachability to Groundwater SCTLs, and benzo(a)pyrene and cPAHs evaluated as benzo(a)pyrene equivalents exceeded the Industrial Direct Exposure SCTL. These analytes were either not detected or were detected at low concentrations that did not exceed their SCTLs in the subsurface soil samples collected during the test pit excavation activities.

Dieldrin was the only pesticide detected at a test pit surface soil sample location at a concentration that exceeds its Leachability to Groundwater SCTL. Dieldrin was either not detected or was detected at low concentrations below its Leachability to Groundwater SCTL in subsurface soil samples.

Arsenic was the only inorganic detected in three subsurface soil samples at concentrations that exceeded its Residential Direct Exposure SCTL. Arsenic was detected in the subsurface soil samples at depths that these SCTLs would not be applicable for the residential exposure scenario.

5.1.6 Monitoring Well Groundwater Samples

Based on the analytical results of the soil samples, the Saufley Field project team decided to have a monitoring well installed at each of the geophysical anomalies and one hydraulically downgradient. The Saufley Field project team selected the analytes for groundwater based on the analytes that were detected in the surface and subsurface soils and DPT groundwater samples. The groundwater analyte list included: SVOCs (including low level PAHs), TRPH and metals. Four SVOCs and nineteen metals were detected in the groundwater samples and a duplicate. The SVOCs were detected at low concentrations that did not exceed their CTLs. Aluminum, iron and manganese were the only inorganic analytes detected in the Site 1 groundwater samples at concentrations that exceeded their CTLs.

The groundwater sample from monitoring well SF-1MW02 contained aluminum at a concentration that exceeded its secondary CTL per Chapter 62-550, F.A.C., but not the health based criteria per Chapter 62-785, F.A.C.

The groundwater sample and duplicate from monitoring well SF-1MW01 contained iron at concentrations that exceeded its secondary CTL per Chapter 62-550, F.A.C., but not the health based criteria per Chapter 62-785, F.A.C.

Manganese was detected in the groundwater sample and duplicate from monitoring well SF-1MW01 and the groundwater sample from monitoring well SF-1-MW03 at concentrations that exceeded its secondary CTL per Chapter 62-550, F.A.C., but not the health based criteria per Chapter 62-785, F.A.C. (330 µg/L).

5.1.7 Hydrogoelogy

Non-aqueous phase liquid was not present. The average groundwater horizontal hydraulic gradient of the site is approximately 0.0037 foot per foot. The groundwater flow direction is generally toward the north and northwest. The theoretical groundwater seepage (linear) velocity is calculated to range from approximately 31 to 165 feet per year.

5.2 RECOMMENDATIONS

Based on a comparison of Florida regulatory criteria outlined in Contaminated Site Cleanup Criteria per Chapter 62-780.680, F.A.C., to the results of the Site 1 subsurface soil, and groundwater sampling events, it is reasonable to conclude that the Burial of Metallic Objects Area has not had an adverse affect to the environment at Site 1 that requires additional assessment or remedial activities and no further investigation is recommended. However, the surface soil samples indicated the presence of arsenic and cPAHs that exceed residential and industrial regulatory exposure criteria per Chapter 62-777, F.A.C. Because the Site 1 surface soil hits are consistent with the Skeet Range findings and will be addressed under the Skeet Range investigation it is recommended that additional assessment activities for arsenic and cPAHs be conducted per Chapter 62-780.680, F.A.C. in conjunction with the Skeet Range. A separate investigation is planned by the Navy for the Skeet Range site (Appendix A).

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APPENDIX A

SKEET RANGE INFORMATION

SAUFLEY FIELD SKEET RANGE

SITE BACKGROUND

Saufley Field is located approximately 10 miles north of NAS Pensacola. It was acquired by the United States Navy in 1940 and was used primarily for naval aviation training throughout its history, and has been commissioned as a Naval Auxiliary Air Station (NAAS), NAS, and OLF. Presently, the 866-acre field serves as an OLF, and contains two active 4,000-foot runways and three aircraft hangars; 209 acres of the field are undeveloped land and wetlands. The current mission of Saufley Field is to support Training Wings 5 and 6, and to serve as home for several DoD and other U.S. Government organizations as a joint use facility.

The Saufley Field Skeet Range, which is not listed in the Navy Range Inventory Database, was identified during reviews of documents, maps, and still photographs obtained from the National Archives during the 2007 PA of NAS Pensacola (Malcolm Pirnie, Inc., 2007). The former skeet range was a 31.6-acre area located in the northwestern portion of Saufley Field, with the firing stations just 650 feet west of the northwestern end of Runway 14.

The area encompassing the skeet range consists of a mowed grassy area with a small stand of mature trees from the firing points out to the perimeter fence line. North of the perimeter fence line, a fairly large area was recently completely cleared of all vegetation. At approximately 550 feet from the firing points, the area consists of very thick understory growth with mature trees, where minimal clearing by hand was done to accommodate sample collection.

Historical Munitions Usage Information

Although there is no documented evidence of specific munitions usage at the Site, small arms use at skeet and trap ranges of this era was typically limited to 12-, 16-, and 20-gauge shotgun ammunition, and .410-caliber ammunition. The former Saufley Field Skeet Range was used only for small arms training. There is no known historical evidence of explosives use at the site and no evidence of MEC. Therefore, MEC was not suspected to be present. No MEC or MPPEH were observed during either the PA or SI visual surveys.

A visual survey of the area around the Saufley Field Skeet Range site was conducted on November 29, 2007 as part of the Preliminary Assessment (Malcolm Pirnie, Inc., 2007). During the visual survey, fragments of clay targets (skeet) were observed northwest and northeast of the firing lines, as well as along the western firing line; the highest densities of fragments were observed in the vicinity of the firing

lines. On March 27, 2009, Tetra Tech conducted a site walk as part of the SI and confirmed the observations from the PA.

Saufley Field

Saufley Field is located approximately 10 miles north of NAS Pensacola. It was acquired by the United States Navy in 1940 and was used primarily for naval aviation training throughout its history and has been commissioned as a Naval Auxiliary Air Station (NAAS), NAS, and OLF. Presently, the 866-acre field serves as an OLF, and contains two active 4,000-foot runways and three aircraft hangars; 209 acres of the field are undeveloped land and wetlands. The current mission of Saufley Field is to support Training Wings 5 and 6 and to serve as home for several DoD and other U.S. Government organizations as a joint use facility. The MRP site at Saufley Field included in this MC UFP-SAP is the Saufley Field Skeet Range. The Saufley Field Bombing Targets are also located in this area, but the investigation to be conducted there is described in the MEC UFP-SAP.

Saufley Field Skeet Range

The Saufley Field Skeet Range is a 31.6-acre site located in the northwestern portion of Saufley Field with the firing stations just 650-feet west of the northwest tip of Runway 14. The Saufley Field Skeet Range, which is not listed in the Navy Range Inventory Database, was identified during reviews of documents, maps, and still photographs obtained from the National Archives during the 2007 PA of NAS Pensacola (Malcolm Pirnie, Inc., 2007). The airfield fence line crosses the center of the site.

The area north of the site is characterized by undeveloped forest and wetlands; south of the fence is vegetated; thick wooded areas are to the west; regularly mowed turf grass is to the east where the former firing area was located. The southwest portion of the site overlaps the northern portion of the Saufley Field Small Arms Range.

The Skeet Range site is primarily undeveloped and unused. Three concrete building foundations, including the foundation of the former Skeet Range House, and concrete firing pads remain visible at the site. The Skeet Range is shown on maps dated 1943 and 1946 through 1949. It is also visible on aerial photographs dated 1943 and 1945. A 1945 information booklet describes the Skeet Range as “two 100-foot by 100-foot areas with five stations each” (U.S. Navy, 1945). The exact time period in which the range was operational is unknown.

Munitions use may have included 12-gauge, 16-gauge, 20-gauge, and .410-caliber shotgun ammunition, which was typical of skeet range usage. The OLF Saufley Skeet Range was used only for small arms

training; there is no known historical evidence of explosives use at the site and no evidence of MEC. Therefore, MEC are not suspected to be present.

The Saufley Field Skeet Range is located in a relatively flat area with drainage flowing north towards the wetlands associated with Eight Mile Creek and Eleven Mile Creek, which flow southwest towards Perdido Bay. No surface water features are located at the Saufley Field Skeet Range. Wetlands associated with the floodplains of Eight Mile Creek and Eleven Mile Creek are located north of the site boundary. No monitoring wells or groundwater information exists for the site.

A visual survey of the area around the Saufley Field Skeet Range was conducted on November 29, 2007 as part of the PA. The former firing area is located in an open, grassy area which is bordered by thick brush and mature trees. A portion of an asphalt jogging trail is located within the southeast range boundary. Three concrete building foundations were observed south of the firing arcs, along the jogging trail. The foundations are likely the remnants of the Skeet Range House, Well House, and Pump House. Four firing pads were easily discernible along the western firing line in the shape of an arc. No structures are located in the vicinity of the range, and the area remains undeveloped and vegetated. Fragments of clay targets were observed northwest and northeast of the firing lines, as well as along the western firing line. The highest densities of fragments were observed in the vicinity of the firing lines. Multiple metal bases to 12-gauge shotgun shells and one casing from an expended .38-caliber bullet were observed inside a wooded area approximately 250 feet northwest of the firing arc. Tetra Tech conducted a site walk on March 27, 2009 as part of the Skeet Range Site Investigation and confirmed the observations from the PA. It was determined that the range orientation may be incorrect. Based on locations of one firing circle and the skeet range house foundation, actual orientation may have been parallel to the road. GPS data from the firing points will be used to locate one firing circle, and then a second parallel circle will be placed based on the locations of the skeet houses.

Tetra Tech, Inc.
FIELD TASK MODIFICATION REQUEST FORM

Project/Installation Name NAS Pensacola, Saufley Field Skeet Range	**CTO & Project Number** CTO JM57; 112G03440	**Task Modification Number** 001
Modification to: Sampling and Analysis Plan (SAP) for Munitions Response Program Site Inspections at 13 Sites, December 2009; and associated SAP Addendum, January 2012	**Site Location** NAS Pensacola	**Date of Request** February 26, 2013

Background:

Tetra Tech performed Site Inspection (SI) soil sampling in January 2010 (Round 1) and May 2012 (Round 2) at the former Naval Air Station (NAS) Pensacola Saufley Field Skeet Range. This work included the collection of surface [0 to 6- and 6 to 24-inches below ground surface (bgs)] and subsurface (greater than 24-inches bgs) soil samples.

All soil samples collected during the Round 1 sampling event were initially screened in the field for lead utilizing X-ray fluorescence (XRF) with a subset of those samples subsequently shipped to the fixed-base laboratory (FBL) for select metals (As, Cu, Pb, Sb, Sn, Zn) analysis. Soil samples collected within the projected clay target fall out area were also shipped to the FBL for polynuclear aromatic hydrocarbon (PAH) analysis. Additionally, two samples were analyzed for Synthetic Precipitation Leaching Procedure (SPLP) for select metals and PAHs to determine whether contaminants left in situ, would leach into the local groundwater at the site. For the PAHs, a benzo(a)pyrene (BaP) equivalent concentration was calculated and utilized for screening purposes. During the Round 2 sampling event, additional lead and PAH samples were collected in an attempt to bound the contamination at the site.

Based on current analytical data, further delineation sampling regarding lead and PAH contamination in soil is required at the site.

During the course of the fieldwork, pitcher-plants that are State listed as threatened were observed at the site. Favorable habitats were observed to exist at the site for plant and animal species currently “listed” as threatened or endangered by the U.S. Fish and Wildlife Service (Federal), the Florida Fish and Wildlife Conservation Commission (State), and the Florida

Department of Agriculture and Consumer Services (State). Upon review of the NAS Pensacola Integrated Natural Resources Management Plan (INRMP) and other available natural resource information on existing habitats within the Range boundary, the following seven species have either been previously identified as occurring or have the potential to occur within the Range boundary:

Vertebrates

- Gopher tortoise *(Gopherus polyphemus)* – state listed as Threatened

Plants

- Spoon-leaf sundew *(Drosera intermedia)* – state listed as Threatened
- Chapman's butterwort *(Pinguicula primuliflora)* – state listed as Threatened
- Primrose-flowered butterwort *(Pinguicula primuliflora)* – state listed as Endangered
- White-topped pitcher-plant *(Sarracenia leucophylla)* – state listed as Endangered
- Parrot pitcher-plant *(Sarracenia psittacina)* – state listed as Threatened
- Purple pitcher-plant *(Sarracenia purpurea)* – state listed as Threatened

Decisions regarding potential future remediation of the lead and PAH contamination may have an impact on the suitable habitat of the "listed" species at the site.

Lead shot is visible on the ground surface within specific areas of the Saufley Field Skeet Range. It was particularly visible in an area of the Skeet Range were trees had been clear cut in preparation for expanded flight operations. Ingested as grit, lead shot can have adverse impacts to birds through ingestion of the lead shot pellets into the gizzard during their digestive process.

Based on the above information the objectives of this Field Task Modification Request (FTMR) are to:

1) Address data gaps to better define the limits of lead and PAH contamination at the site;

2) Determine the vertical and lateral extent and density of lead shot at the site;

3) Determine the lateral extent of the skeet clay target remnants at the site;

4) Determine the location and extent of suitable habitat for the aforementioned "listed" plant and animal species within the boundaries of the site;

5) Determine the density of the "listed" plant and animal species having the potential to exist within the boundaries of the site: and

6) Obtain data necessary to complete the Remedial Investigation and to develop a Feasibility Study.

Field Task Modifications:

The approach in determining the extent of suitable habitat for the protected species and the density of the protected species will be conducted in two phases. The objective of the first phase will be to identify areas within the site that contain suitable habitat for the protected plant and animal species. The objective of the second phase will be to determine presence or absence and estimate the densities of target plant and animal species within the identified suitable habitats.

The information presented below provides a more detailed discussion on how the above aspects of this FTMR will be conducted.

Lead in Soil:

Lead contamination exists at the site as a result of lead shot utilized at the former skeet range. Initial soil sampling at the Saufley Field Skeet Range indicated lead concentrations greater than the Florida Department of Environmental Protection (FDEP) soil cleanup target level (SCTL).

Additional soil sampling at the site will be performed to define the extent of lead contamination vertically in the soil at previous sample locations and to refine the boundaries of lead contamination at the site by collecting samples from additional locations. All soil samples will be collected in accordance with **SOP-05** of the SAP (Tetra Tech, 2009). Samples are proposed for collection vertically at two previous locations (D5-SB043 and E8-SB045) where lead contamination at depth is not currently bound vertically. For the newly planned 74 locations, samples will initially be collected at 0-6 and 6-24 inches bgs. All soil samples will be screened for lead in the field via XRF.

As during previous rounds of sampling, if a soil sample presents an XRF lead concentration greater than the selected field action level of 200 ppm, which is one-half of the FDEP SCTL for lead, additional step-out and/or step-down soil samples will be collected until all lead concentrations are below 200 ppm. A minimum of 20 percent of the collected samples will be shipped to the FBL for lead analysis so a correlation factor can be calculated between the field and FBL lead analysis

Table 1 provides a list of planned lead samples and the rationale for collection of that particular sample. **Figure 1** presents all former select metals sample locations as well as all planned lead sample locations. Former sample locations exceeding the FDEP SCTL for lead are highlighted in red while the newly planned sample locations (SB079 - SB133) are presented in blue.

PAHs in Soil:

Initial soil sampling at the Saufley Field Skeet Range indicated BaP equivalent concentrations greater than the FDEP SCTL. Additional soil samples will be collected to define the extent of PAH contamination vertically in the soil at 15 previous sample locations. Soil samples will also be collected to refine the current boundary of PAH contamination around 23 previous sample locations at the site. All soil samples collected will be shipped to the FBL for PAH analysis.

Table 1 provides a list of planned PAH samples and the rationale for collection of that particular sample. **Figure 2** presents all former PAH sample locations as well as all newly planned PAH sample locations. Former sample locations exceeding the FDEP SCTL BaP equivalent are highlighted in red while the planned sample locations (SB153 – SB184) are presented in blue.

Extent of Lead Shot at the Site:

To determine the extent and density of the lead shot observed at the site during previous field investigations, soil samples (1-foot by 1-foot by 1-inch deep) will be collected at various locations throughout the site. The soil will be visually observed for lead shot and subsequently sieved to determine the amount of lead shot present within the sample. In locations where lead shot exists, additional depths in 2-inch increments will be collected until the depth of the lead shot is determined. **SOP-18** provides the necessary steps for determining the vertical and lateral extent of lead shot at the site.

Extent of Clay Target Remnants at the Site:

During previous field investigations at the Saufley Field Skeet Range, clay target remnants were observed on the ground surface within specific areas of the site. A thorough visual surface survey of those areas will be completed to identify the lateral boundary of clay target remnants at the site.

Rare, Threatened, and Endangered Species and Habitat Survey:

This portion of the FTMR describes the procedures for conducting a threatened and endangered plant and animal survey, which includes a suitable habitat survey and species identification/confirmation survey. The planned habitat survey will include rare plant and animal

species that are "listed" as threatened and endangered by the U.S. Fish and Wildlife Service (federal) or the Florida Fish and Wildlife Conservation Commission and The Florida Department of Agriculture and Consumer Services (state) for which suitable habitat exists within the boundaries of the Survey Area. This survey will be further limited to those "listed" species known to occur at the former Saufley Field Skeet Range, as documented in the NAS Pensacola INRMP dated November 2006. Boundaries of the Survey Area have been determined to encompass a portion of the former Skeet Range at Saufley Field, as depicted on **Figure 3**, from the fence and tree line at the north end of the airfield to the northern boundary of the former skeet range as depicted by the purple line on **Figure 3**.

Maps showing the known location of rare, threatened, and endangered species at the Saufley Field Skeet Range are located at the NAS Pensacola Natural Resources Office in the Environmental Division. These maps will be reviewed prior to conducting field surveys.

The confirmed presence of some or all of these seven threatened and endangered species within the Survey Area could influence future remedial decision making by requiring additional measures to protect or relocate individual animals and plants, as well as to restore or otherwise mitigate impacts to their suitable habitats. Depending on what species are found and if their habitats will be impacted, specific Navy policies and State of Florida regulations pertaining to these species will be reviewed and appropriate agency consultations made prior to determining specific additional measures to implement.

The gopher tortoise has been regulated in Florida since 1972 and has been fully protected since 1988, first as a species of special concern and currently as a threatened species. Gopher tortoise populations in Florida were determined to be in decline due mainly to conversion of their preferred dry, sandy upland habitats from natural conditions to agricultural, urban, and suburban land uses. This species is currently regulated by the Florida Fish and Wildlife Conservation Commission, which is implementing a 10-year management plan with the goal to restore and maintain secure, viable populations of gopher tortoises throughout Florida.

All six of the threatened and endangered plant species previously identified for the Survey Area are listed because of their limited range in Florida, loss/degradation of wetland habitat where they grow, and potential for commercial exploitation. These species are carnivorous plants that occur within several types of wetland habitats including bogs, seepage slopes, seepage streams, baygalls, wet prairies, depression marshes, blackwater stream edges, and pine plantations.

SOP-19 provides the necessary steps for performing the rare, threatened, and endangered species and habitat survey at the site.

Habitat Survey:

The first phase of the threatened and endangered species survey is to identify areas within the Survey Area (see **Figure 3**) that contain suitable habitat for threatened and endangered species, as described above. The habitat survey will be conducted as described in **SOP-19**. Because the habitat survey is not restricted by season, it will be conducted in the winter/early spring while the vegetation is less dense than it is in the summer. This habitat survey will guide the more intensive species specific surveys (described below) to be conducted on those areas where the target species are most likely to occur.

Areas will be considered to have suitable habitat if they have the following attributes based on the species:

Gopher Tortoise

- Upland vegetative communities with well drained soils
- Vegetated berms or spoil areas within or near uplands

Pitcher-plants, Sundew, and Butterworts

- Wetlands or wetland/upland ecotones without an enclosed tree canopy
- Seepage flow from shallow surficial aquifer or surface waters
- Areas that otherwise meet the description of bogs, seepage slopes, seepage streams, baygalls, wet prairies, depression marshes, and blackwater stream edges
- Certain pine plantation areas that display any of the above attributes

Aerial photography, soil maps, National Wetlands Inventory maps, and other available information will be reviewed to determine the most likely areas of suitable habitat within the Survey Area. Pedestrian transects will be established in a south to north direction across the Survey Area at between 50 to 100 foot intervals, based on habitat variability (homogeneous or patchy mosaic). These transects will be subject to adjustment per the density of vegetation encountered in the field. The areas of suitable habitat encountered along each transect will be recorded on a site map in the field and suitable habitat boundary points along each transect will be GPS located and marked in the field with fluorescent color surveyor's flagging tape tied to

available vegetation. Representative photographs will also be taken of each suitable habitat encountered within the Survey Area. Upon completion of the survey, field maps, field notes and suitable habitat boundary point GPS coordinates will be used to compile a GIS map with the approximate location and extent of each area of suitable habitat within the Survey Area. Additionally if threatened and endangered species are observed during the habitat survey, then their approximate locations will be recorded on a field map, GPS coordinates collected, and they will be photographed.

Species Survey:

The second phase of the threatened and endangered species survey will be to determine presence/absence of target plant and animal species and estimate their densities within the identified suitable habitats. The threatened and endangered species survey will be conducted in the areas considered to have suitable habitat for seven target species as described in **SOP-19**. Suitable habitats will be surveyed by walking pedestrian transects across them at 15 to 25 foot intervals (depending upon vegetation density and target plant detectability), as necessary to achieve 100 percent coverage for determination of presence or absence of the target species. The remainder of the Survey Area outside of suitable habitat identified by the Habitat Survey will also be visually checked along meandering pedestrian transects for the target species.

Surveys for gopher tortoises can be conducted throughout the year, as their burrows and burrow aprons are readily detectable. Surveys for pitcher-plants, sundews and butterworts should be conducted during their species specific flowering periods, which generally occur in the winter (late December-early March) and/or spring (March-May). Chapman's and Primrose-flowered butterworts are reported to flower in the winter and spring, while spoon-leaf sundews and pitcher-plants are reported to flower in the spring. Therefore, a Species Survey for gopher tortoises and Chapman's and Primrose-flowered butterworts will be conducted if they are detected during the Habitat Survey in February. Species Surveys will be conducted for all target species encountered during the Species Survey event in the Spring (March-May).

Species surveys will be conducted to identify target species presence and to qualitatively estimate population density. Suitable habitats will be surveyed by walking pedestrian transects across them at intervals necessary to achieve 100 percent coverage for identification to determine presence/absence of the target species. High, medium and low density areas of

target species will be visually estimated, GPS located, photographed, and recorded on field maps.

Results of the Habitat and Species Surveys will be reported in tabular, GIS graphic, and photographic format for incorporation into remedial action planning and approval documentation.

Approval:

_____

Ralph Basinski, Tetra Tech Project Manager / Date

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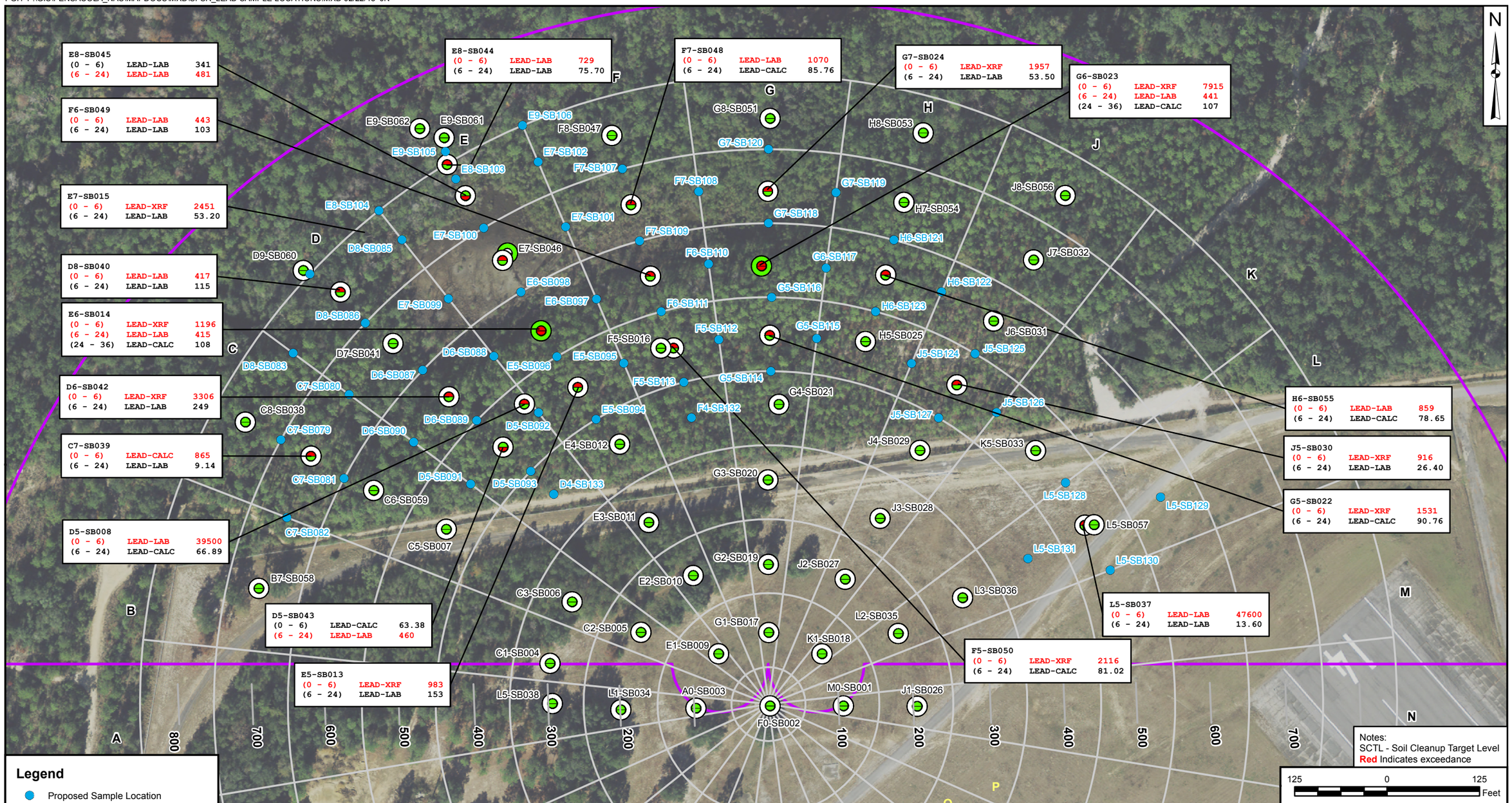


Notes:
SCTL - Soil Cleanup Target Level
Red Indicates exceedance

125 0 125 Feet

Legend

- Proposed Sample Location
- Sample from 0-6 inch depth bgs
- Sample from 6-24 inch depth bgs
- Sample from 24-36 inch depth bgs
- Sampling Grid
- SFSR_10FT_BUFFER
- Range Boundary

Symbol	Lead SCTL (mg/kg)
	≤ 400
	> 400
	No Sample Collected

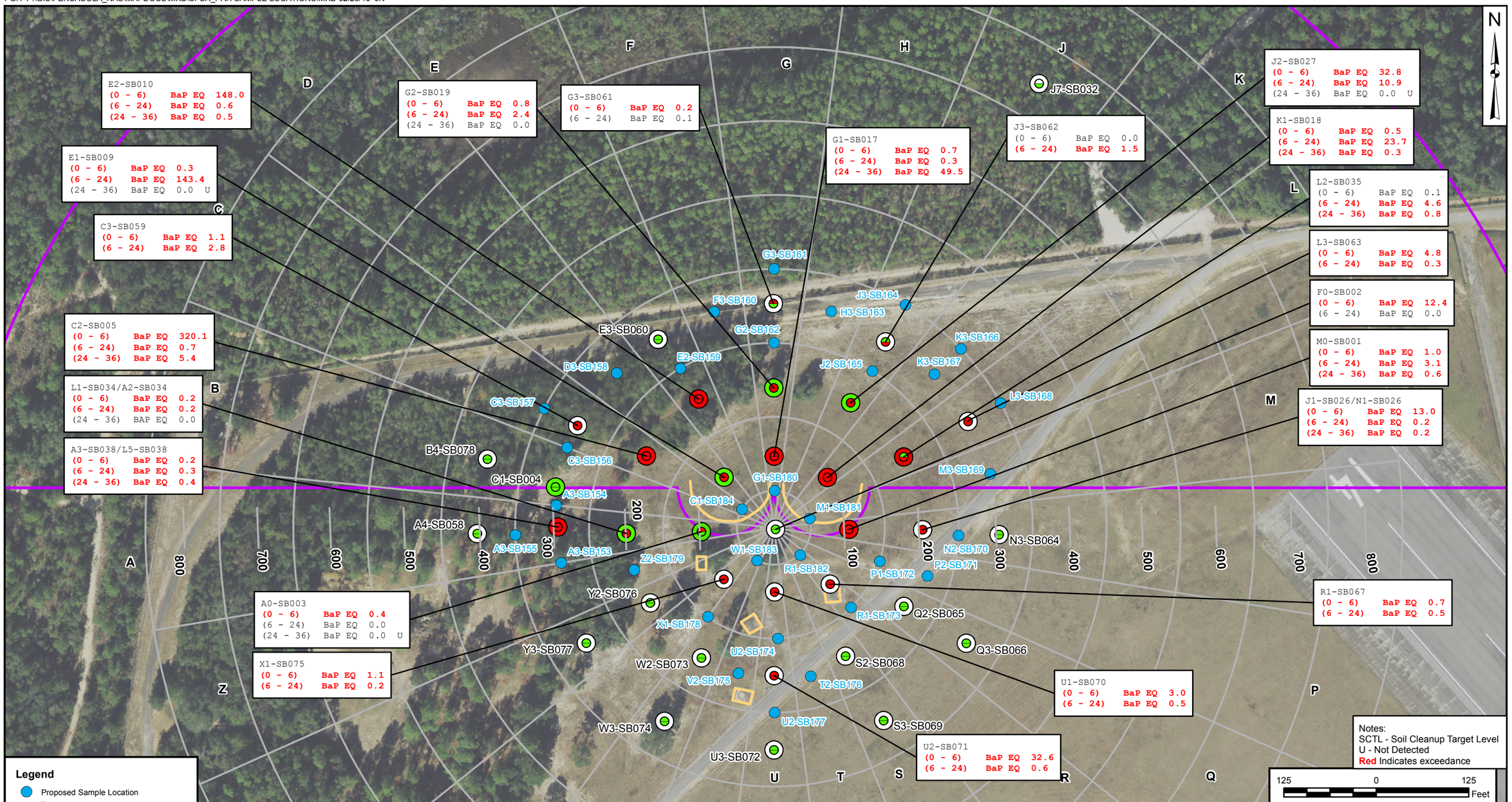
DRAWN BY J. ENGLISH	DATE 12/20/11
CHECKED BY J. GOERDT	DATE 02/22/13
REVISED BY J. NOVAK	DATE 02/22/13
SCALE AS NOTED	

NAVFAC

FORMER AND PROPOSED LEAD SAMPLE LOCATIONS
SAUFLEY FIELD SKEET RANGE
NAS PENSACOLA
PENSACOLA, FLORIDA

CONTRACT NUMBER	CTO NUMBER 148
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. 1	REV 0

PGH P:\GIS\PENSACOLA_NAS\MAPDOCS\MXD\SFSR_PAH SAMPLE LOCATIONS.MXD 02/26/13 JN



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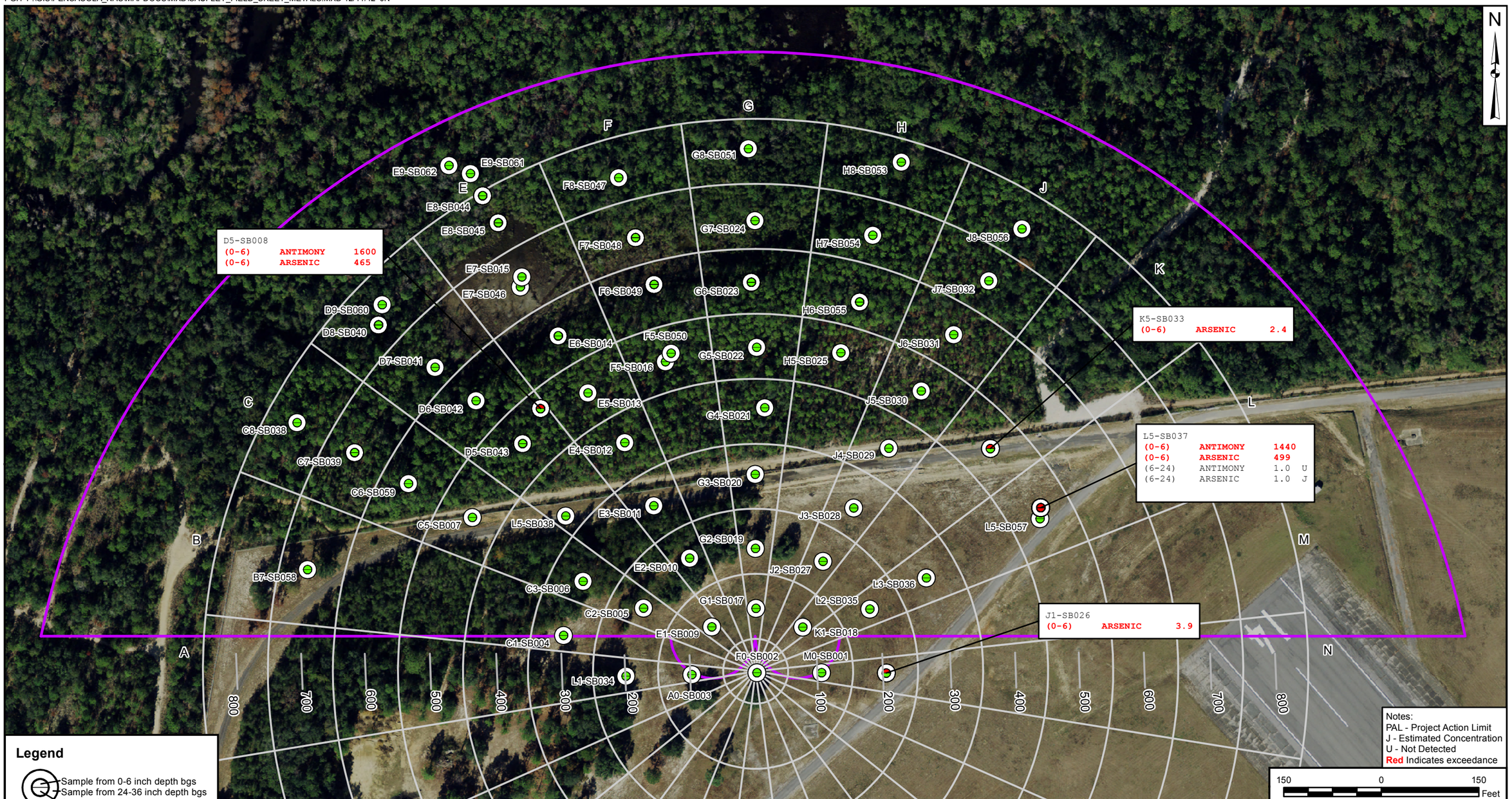


Legend

Sample from 0-6 inch depth bgs
Sample from 24-36 inch depth bgs
Sample from 6-24 inch depth bgs

Sampling Grid

(0-6) Sample depth in inches below ground surface

Concentration in mg/kg

Select metals includes antimony arsenic, copper, tin and zinc

Symbol	Arsenic PAL (mg/kg)	Antimony PAL (mg/kg)
	≤ 2.1	≤ 27
	> 2.1	> 27
	No Sample Collected	No Sample Collected

Notes:
PAL - Project Action Limit
J - Estimated Concentration
U - Not Detected
Red Indicates exceedance

150 0 150 Feet

DRAWN BY	DATE
T. WHEATON	05/05/10
CHECKED BY	DATE
J. DUCAR	12/11/12
REVISED BY	DATE
J. NOVAK	12/11/12
SCALE	
AS NOTED	

NAVFAC

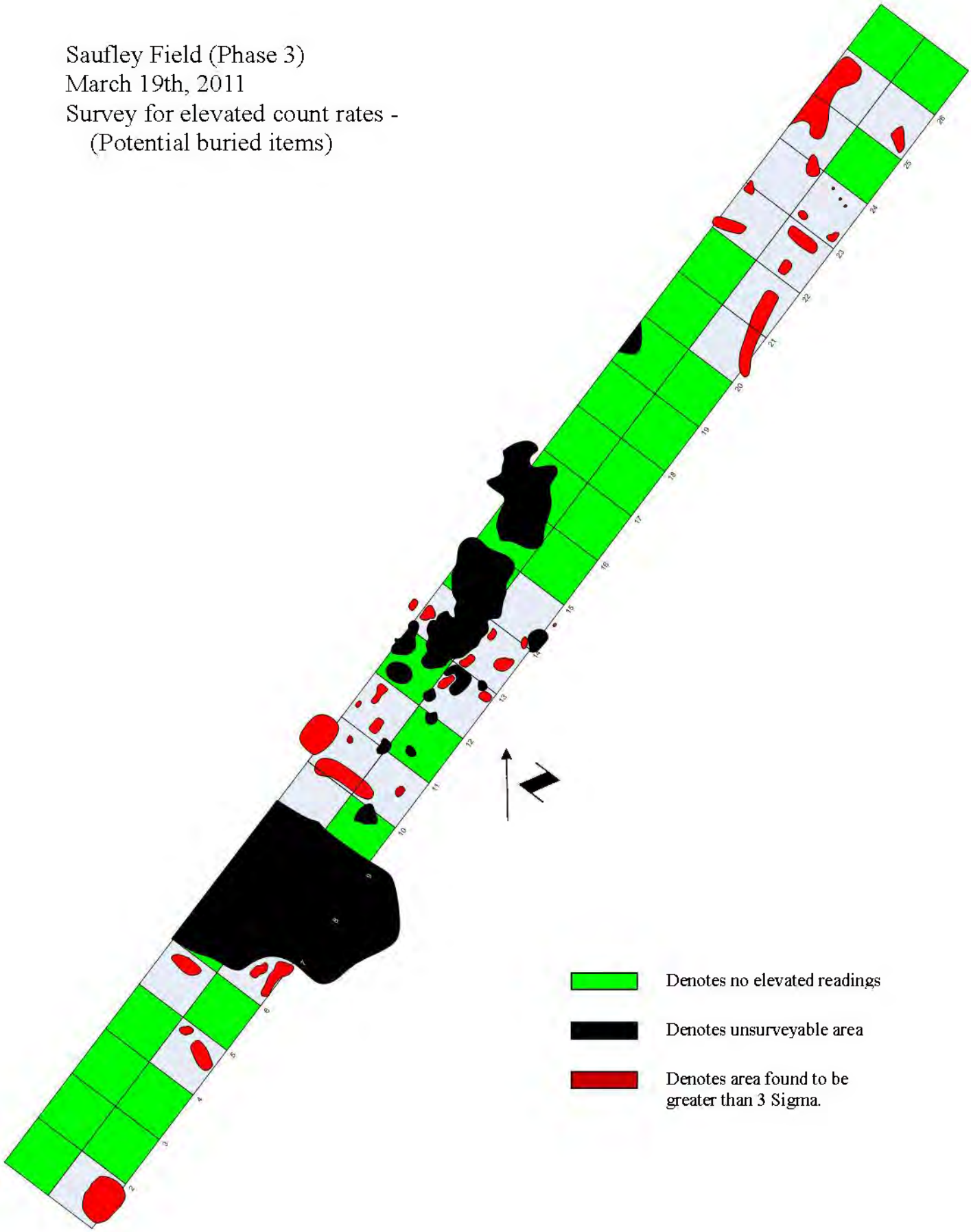
SELECT METALS EXCEEDANCES IN SOIL
SAUFLEY FIELD SKEET RANGE
NAS PENSACOLA
PENSACOLA, FLORIDA

CONTRACT NUMBER	CTO NUMBER
—	JU57
APPROVED BY	DATE
—	—
APPROVED BY	DATE
—	—
FIGURE NO. 14-3	REV 0

APPENDIX B

RADIOLOGICAL SURVEY DATA

Saufley Field (Phase 3)
March 19th, 2011
Survey for elevated count rates -
(Potential buried items)



Grid	Area Name	Point #	Gross Counts	Above 3σ	Instrument #	3σ Value
A1	A1-1	1	5362	308	117651	5054
		2	5855	801		
		3	5468	414		
		4	5275	221		
		5	6191	1137		
		6	5380	326		
		7	5644	590		
A4	A4-1	1	5417	363	117651	5054
	A4-2	1	5885	831		
		2	5113	59		
		3	6084	1030		
		4	5241	187		
B5	B5-1	1	4391	256	183983	4135
		2	4347	212		
		3	4710	575		
		4	4538	403		
		5	4243	108		
A6	A6-1	1	6103	1049	117651	5054
		2	5953	899		
		3	5803	749		
		4	5444	390		
		5	5232	178		
		6	5095	41		
	A6-2	1	5140	86	117651	5054
		2	5112	58		
		3	5093	39		
B9	B9-1	1	4156	21	183983	4135
A10	A10-1	1	4700	565	183983	4135
		2	4893	758		
	A10-2	1	4499	364		
		2	4736	601		
B10	B10-1	1	4315	180	183983	4135
		2	4456	321		
	B10-2	1	4973	838		
		2	5740	1605		
		3	7009	2874		
		4	6006	1871		
		5	5083	948		
	B10-3	1	5030	895		

B11	B11-1	1	5633	1498	183983	4135
		2	4783	648		
	B11-2	1	5693	1558		
	B11-3	1	4883	748		
		2	4305	170		
A12	A12-1	1	4613	478	183983	4135
		2	4712	577		
		3	4470	335		
	A12-2	1	4765	630		
		2	4864	729		
		3	4721	586		
A13	A13-1	1	4356	221	183983	4135
		2	4522	387		
		3	4430	295		
	A13-2	1	4230	95		
		2	4152	17		
	A13-3	1	4569	434		
		2	5006	871		
		3	4790	655		
B13	B13-1	1	4333	198	183983	4135
		2	4706	571		
		3	4923	788		
		4	5011	876		
		5	4625	490		
		6	4200	65		
	B13-2	1	5202	1067		
		2	4412	277		
		3	5337	1202		
		4	5082	947		
A14	A14-1	1	4443	308	183983	4135
	A14-2	1	4284	149		
A20	A20-1	1	7304	3169	183983	4135
		2	5610	1475		
		3	4714	579		
		4	5695	1560		
		5	4479	344		
		6	6287	2152		
		7	5148	1013		
		8	5696	1561		

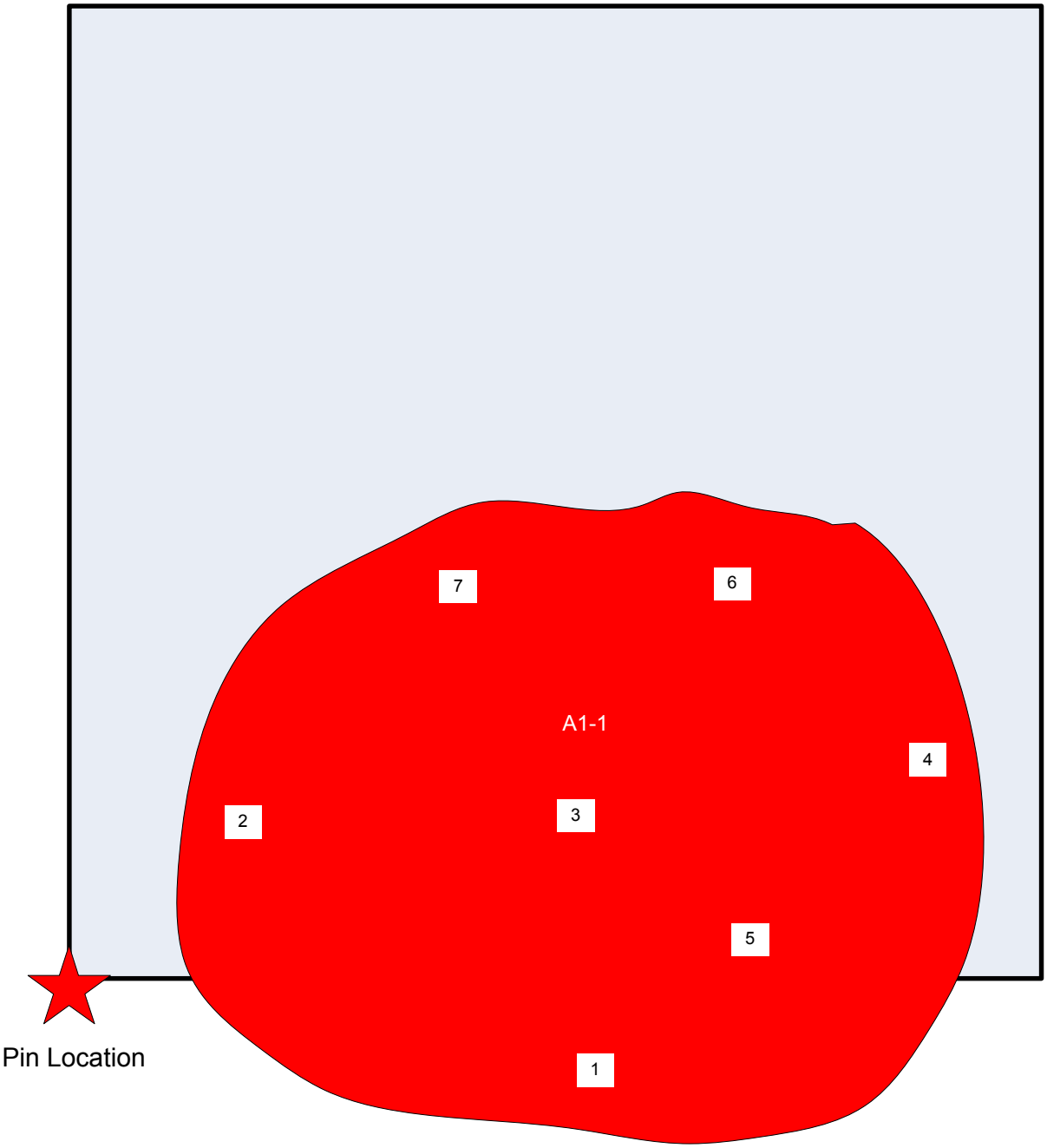
A21	A21-1	1	5847	793	117651	5054
		2	7891	2837		
		3	6880	1826		
		4	6611	1557		
A22	A22-1	1	5856	802	117651	5054
		2	6208	1154		
		3	5702	648		
		4	7236	2182		
	A22-2	1	5630	576		
		2	5503	449		
		3	5761	707		
		4	6001	947		
B22	B22-1	1	5869	815	117651	5054
		2	5434	380		
		3	5075	21		
		4	5432	378		
	B22-2	1	5918	864		
		2	5450	396		
		3	5450	396		
		4	5474	420		
A23	A23-1	1	5698	644	117651	5054
		2	5610	556		
		3	6334	1280		
	A23-2	1	6110	1056		
		2	5336	282		
	A23-3	1	5282	228		
	A23-4	1	5864	810		
	A23-5	1	5747	693		
B23	B23-1	1	5624	570	117651	5054
		2	5283	229		
		3	5064	10		
		4	5148	94		
		5	5238	184		
B24	B24-1	1	5398	344	117651	5054
		2	5562	508		
		3	5211	157		
		4	5444	390		
		5	5360	306		
		6	5402	348		
		7	5618	564		
		8	5326	272		

A25	A25-1	1	5203	149	117651	5054
		2	5297	243		
		3	5427	373		
		4	5385	331		
B25	B25-1	1	5720	666	117651	5054
		2	5493	439		
		3	5589	535		
		4	5395	341		
		5	5613	559		
		6	5684	630		
		7	5384	330		

Denotes <100 ncpm above the investigation level

Denotes >100 and <500 ncpm above the investigation level

Denotes >500 ncpm above the investigation level



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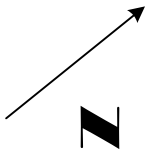
3/19/2011



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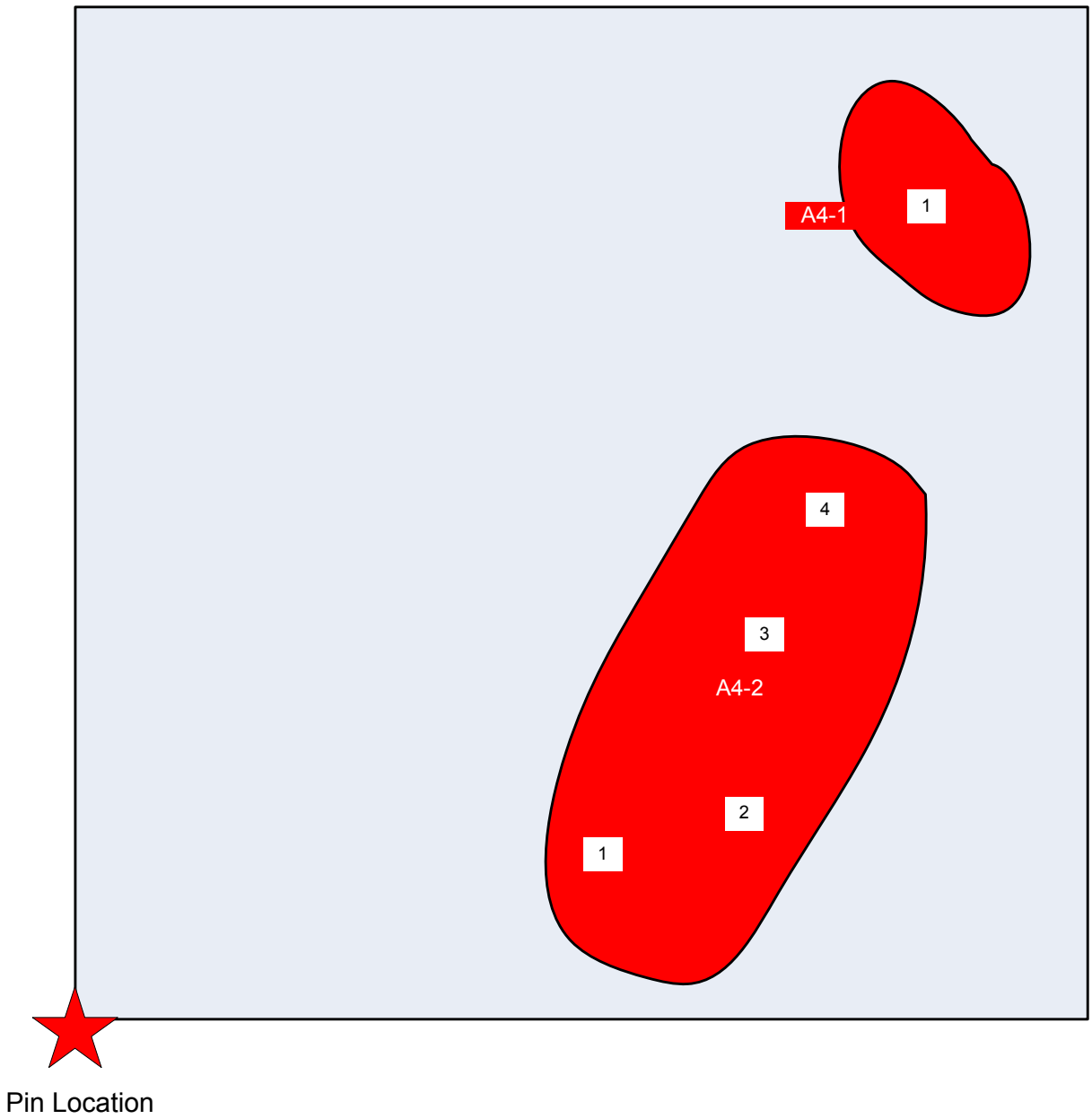

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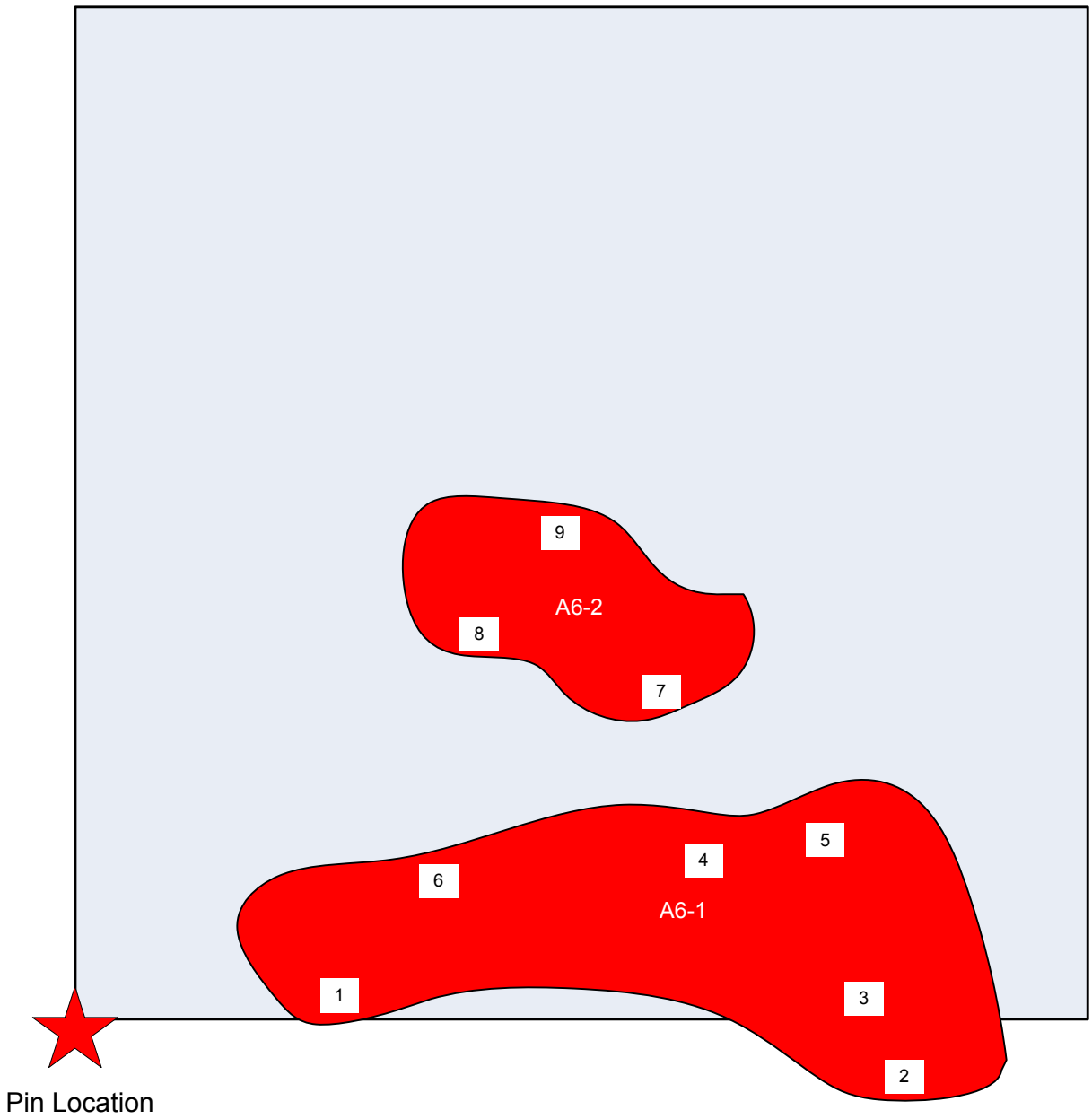

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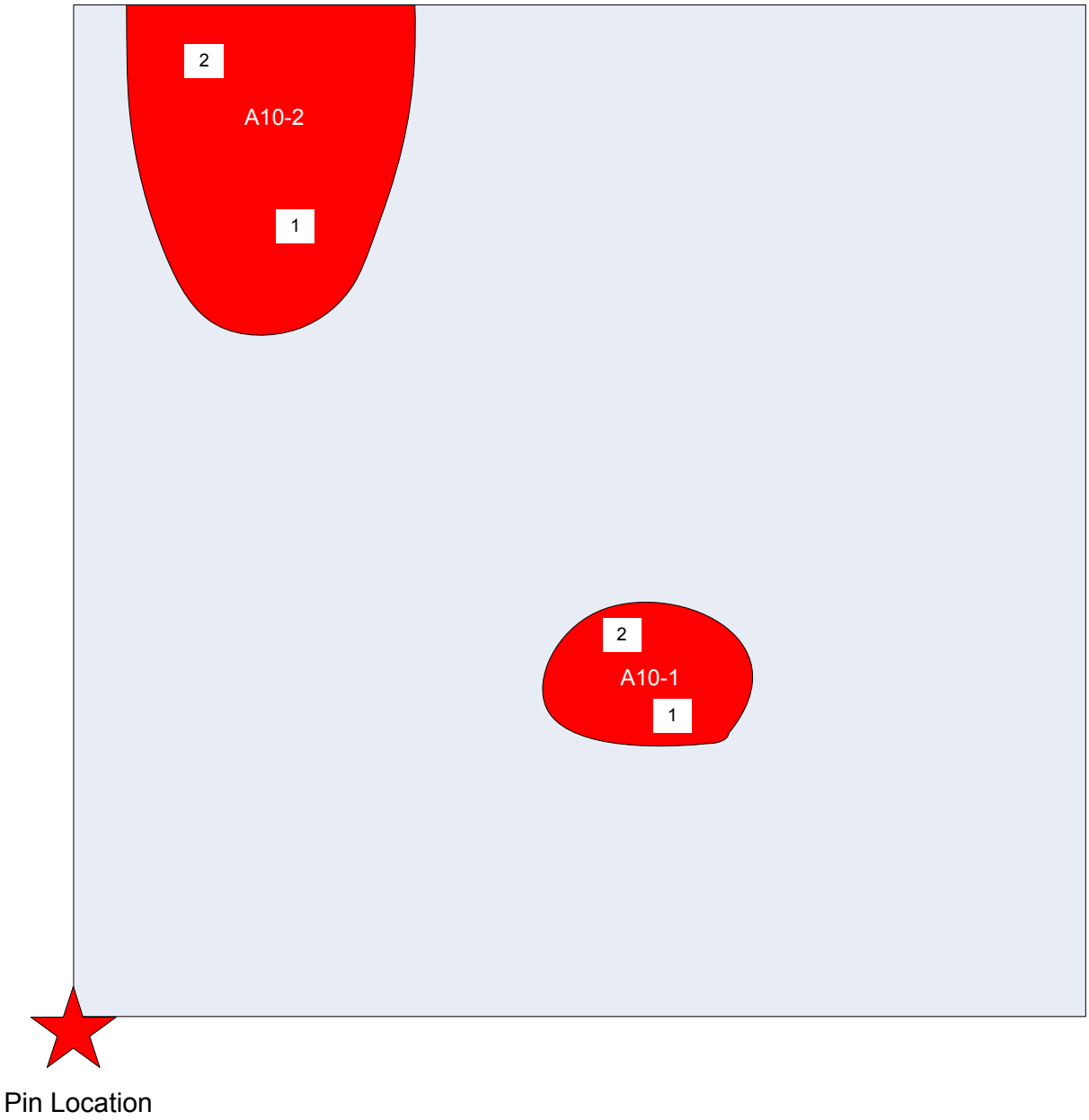

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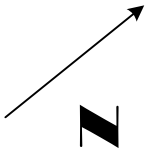

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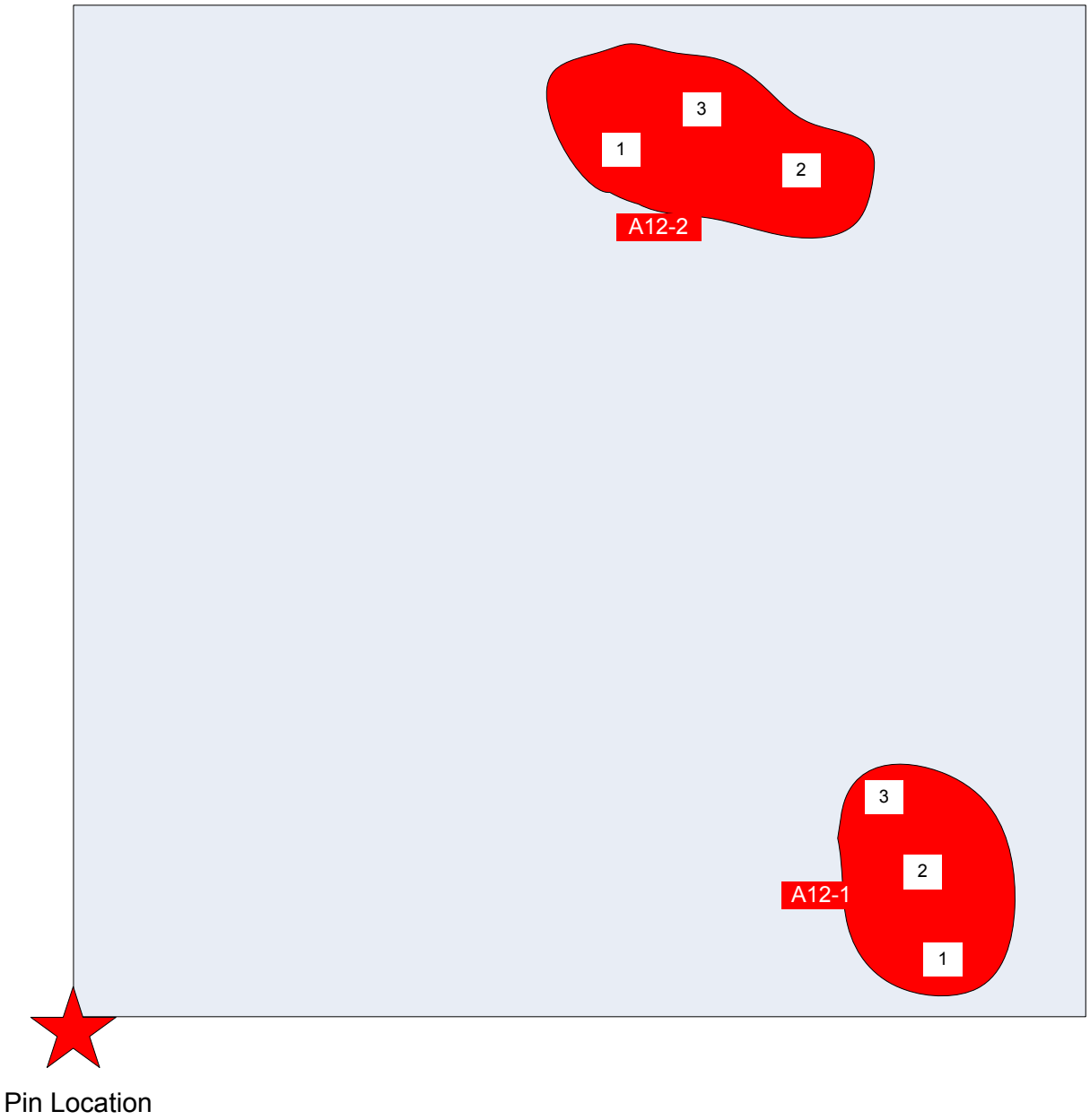

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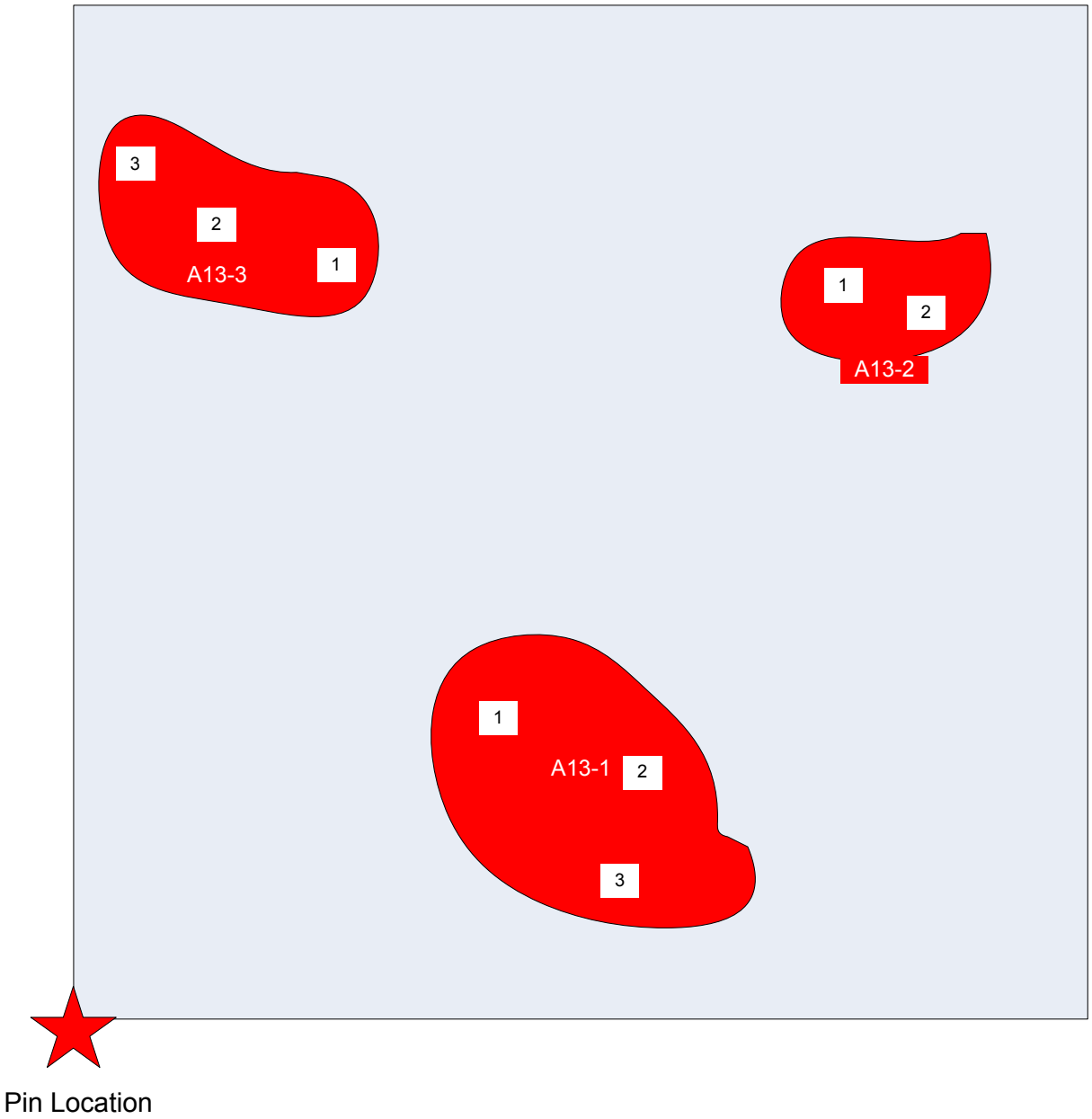

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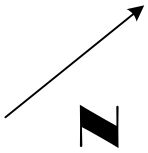

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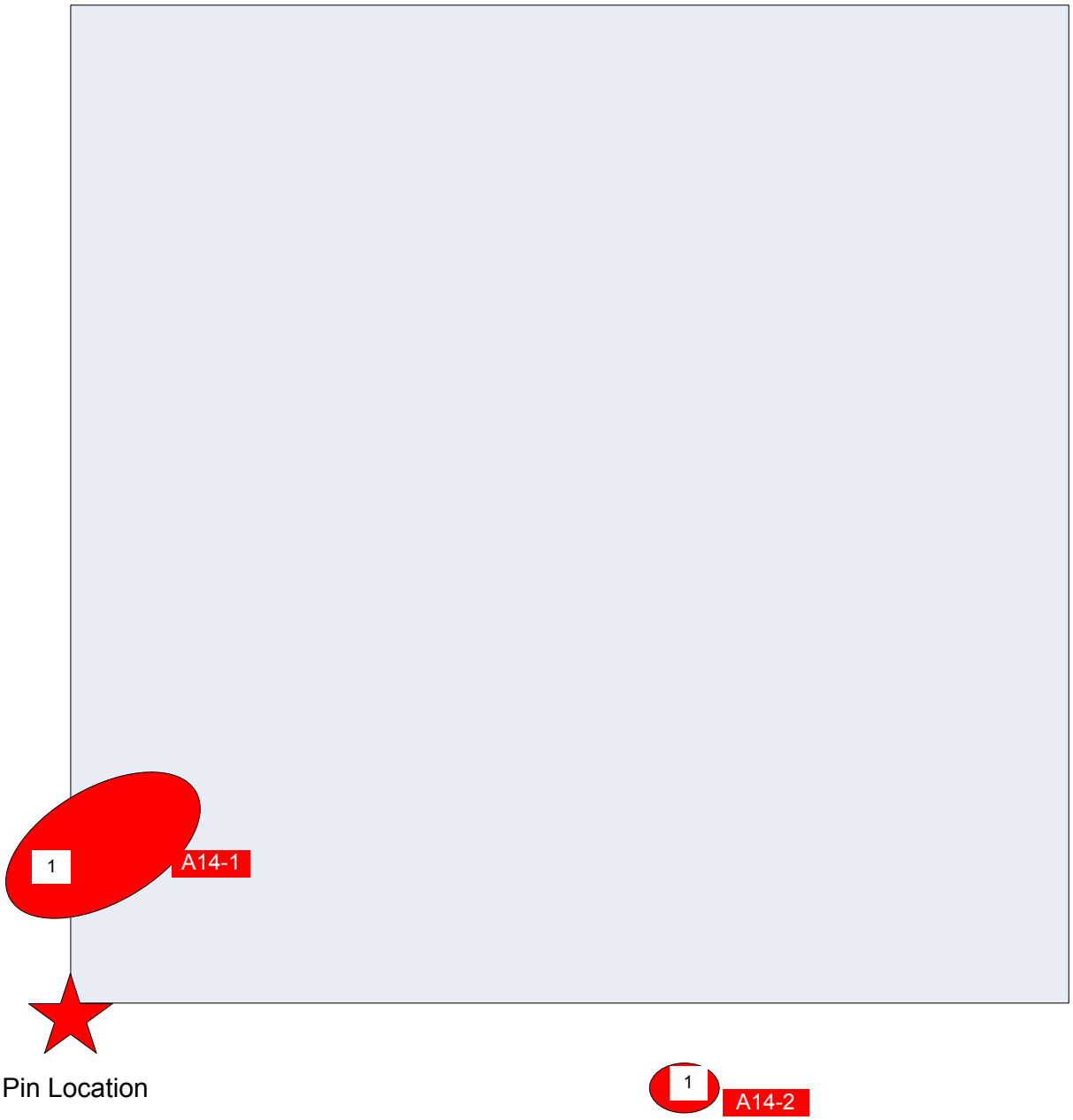

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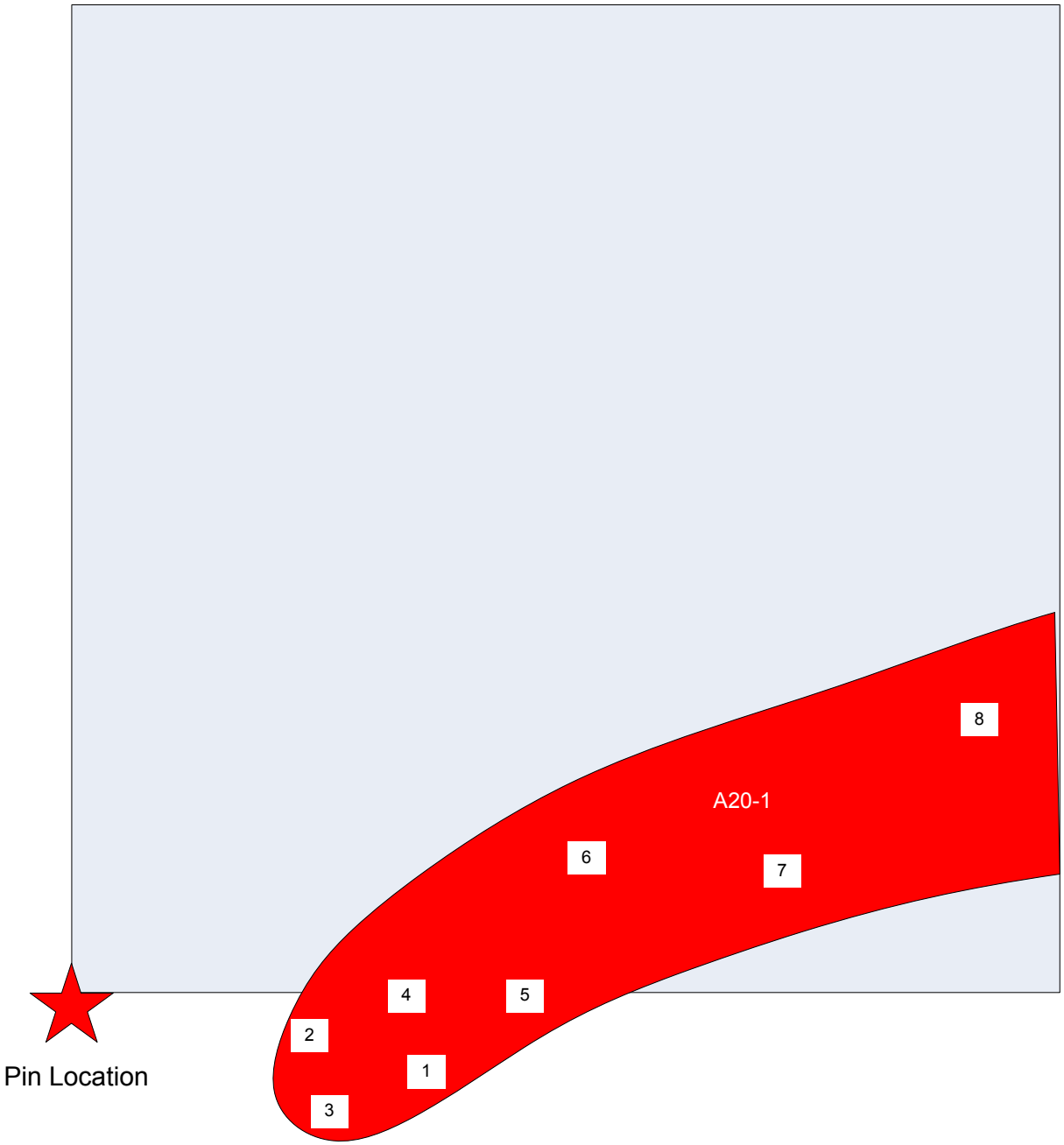

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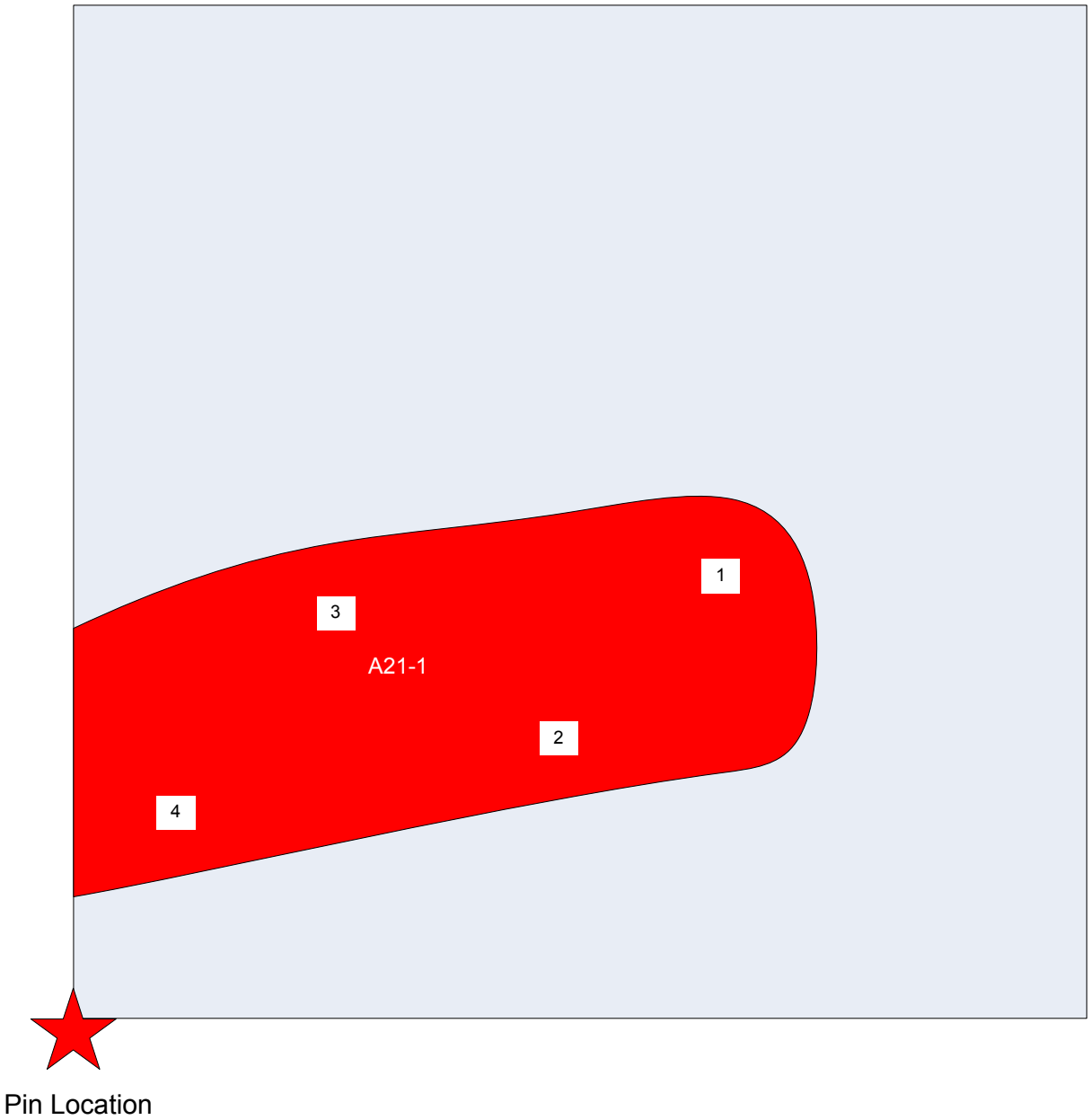

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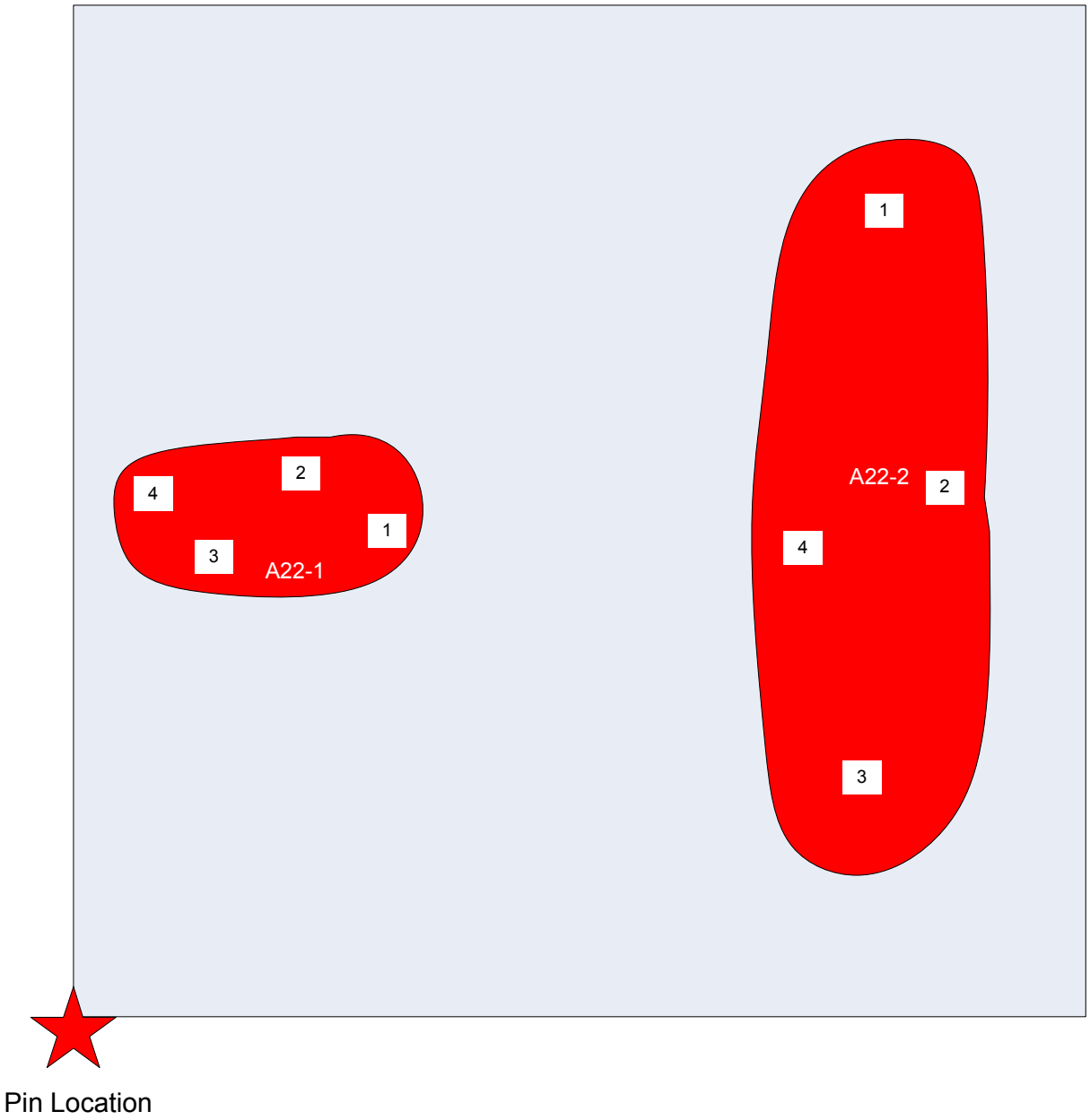

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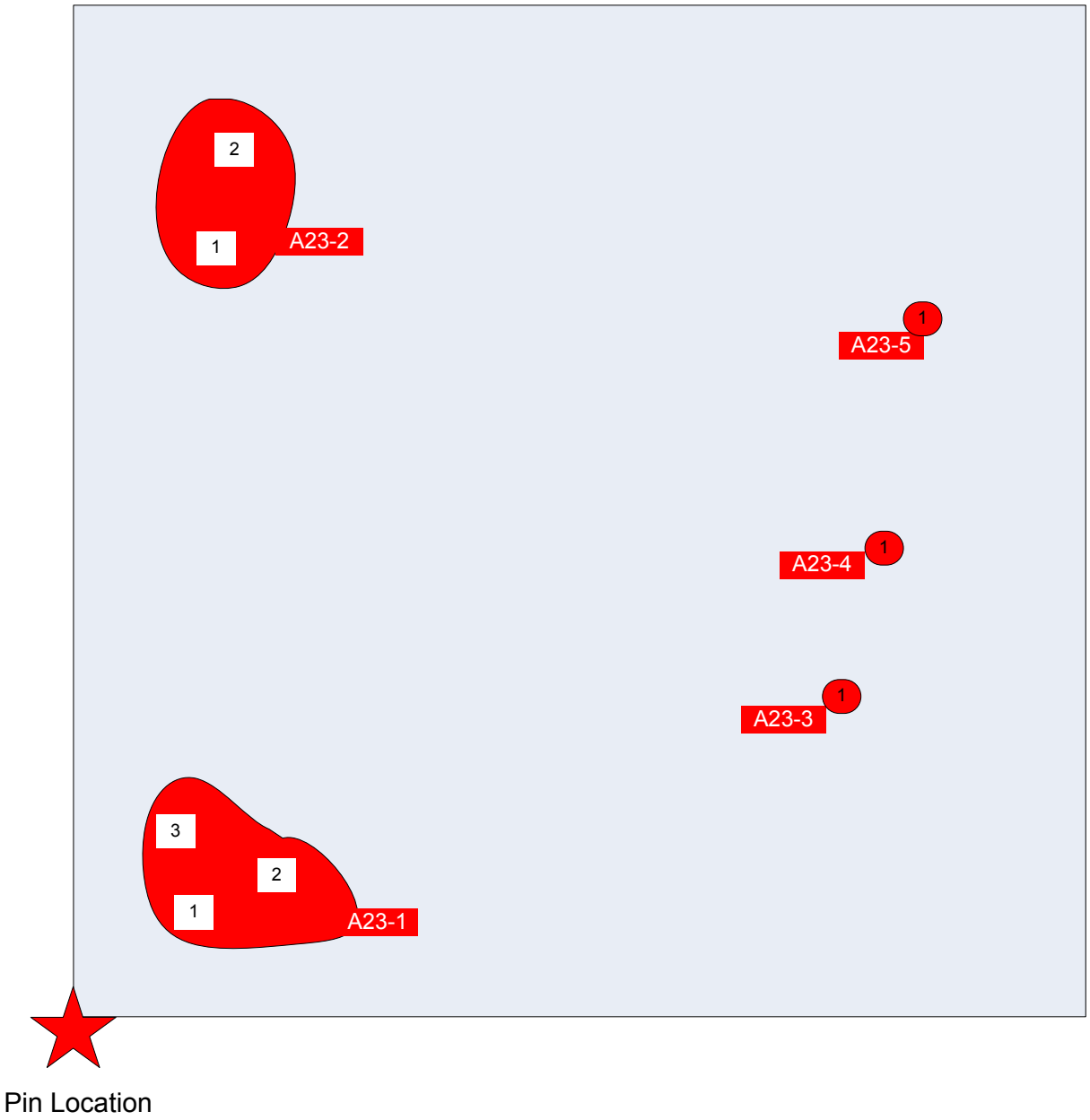

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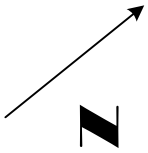

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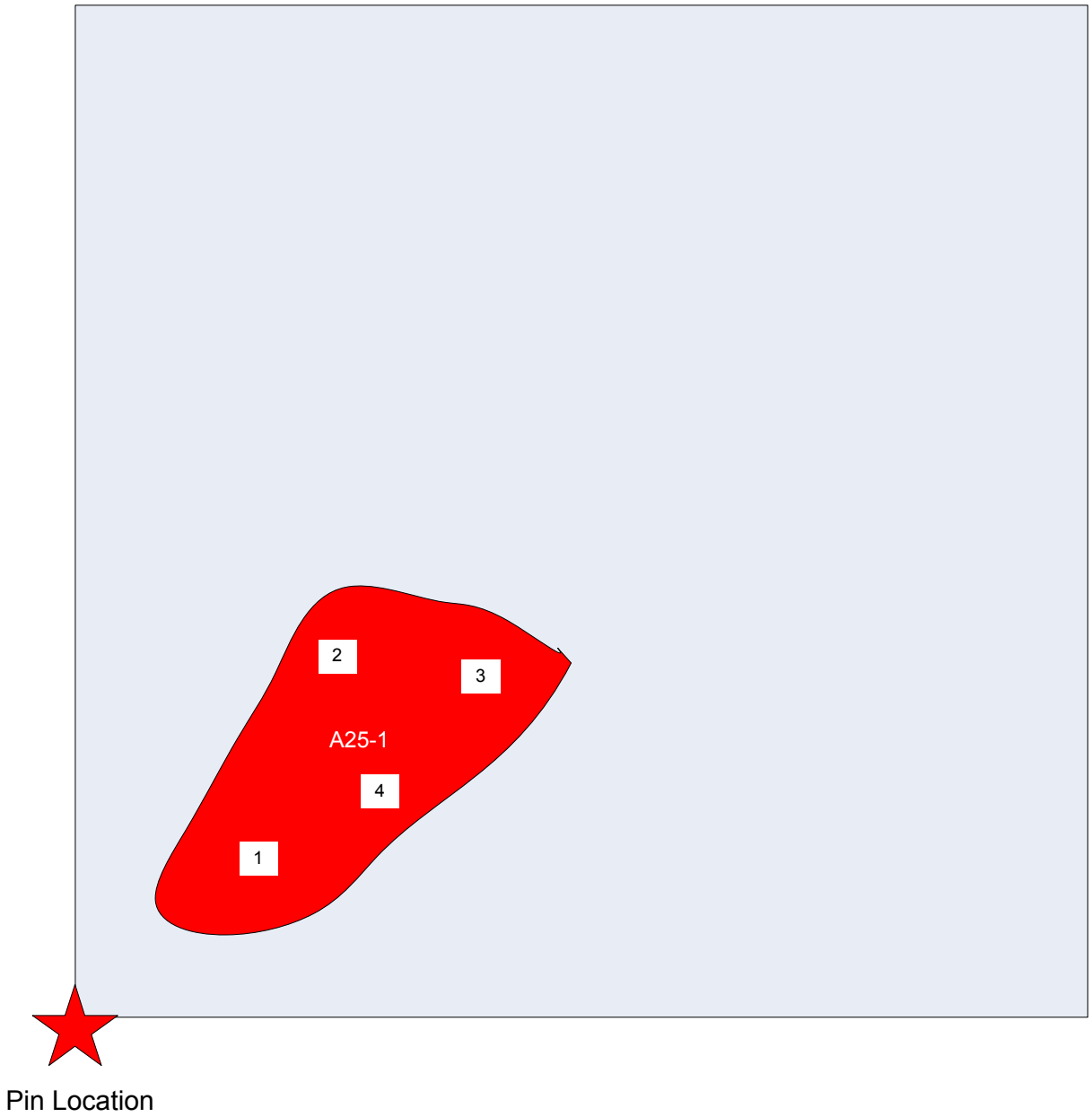

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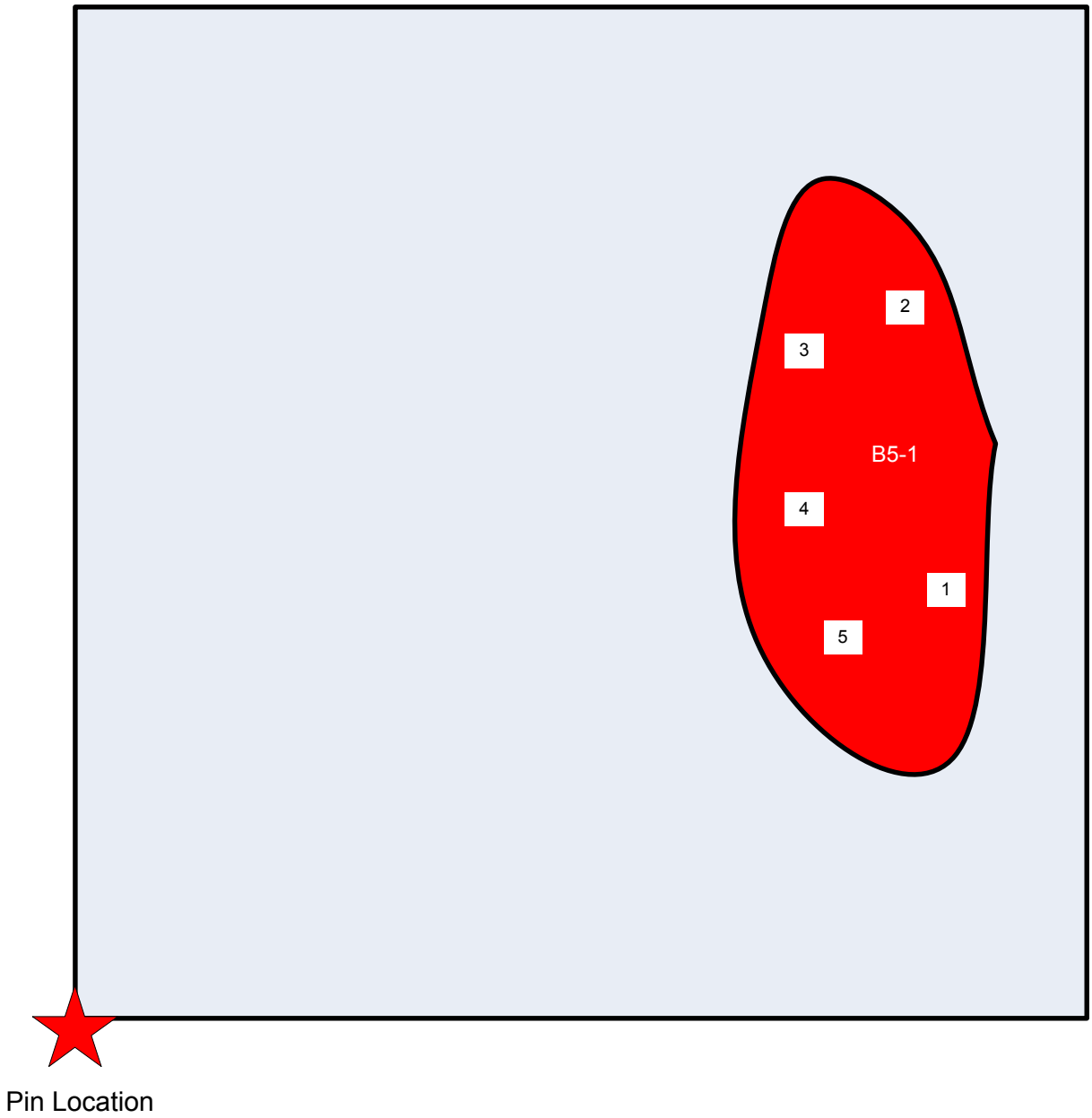

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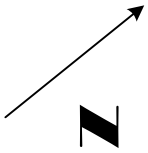
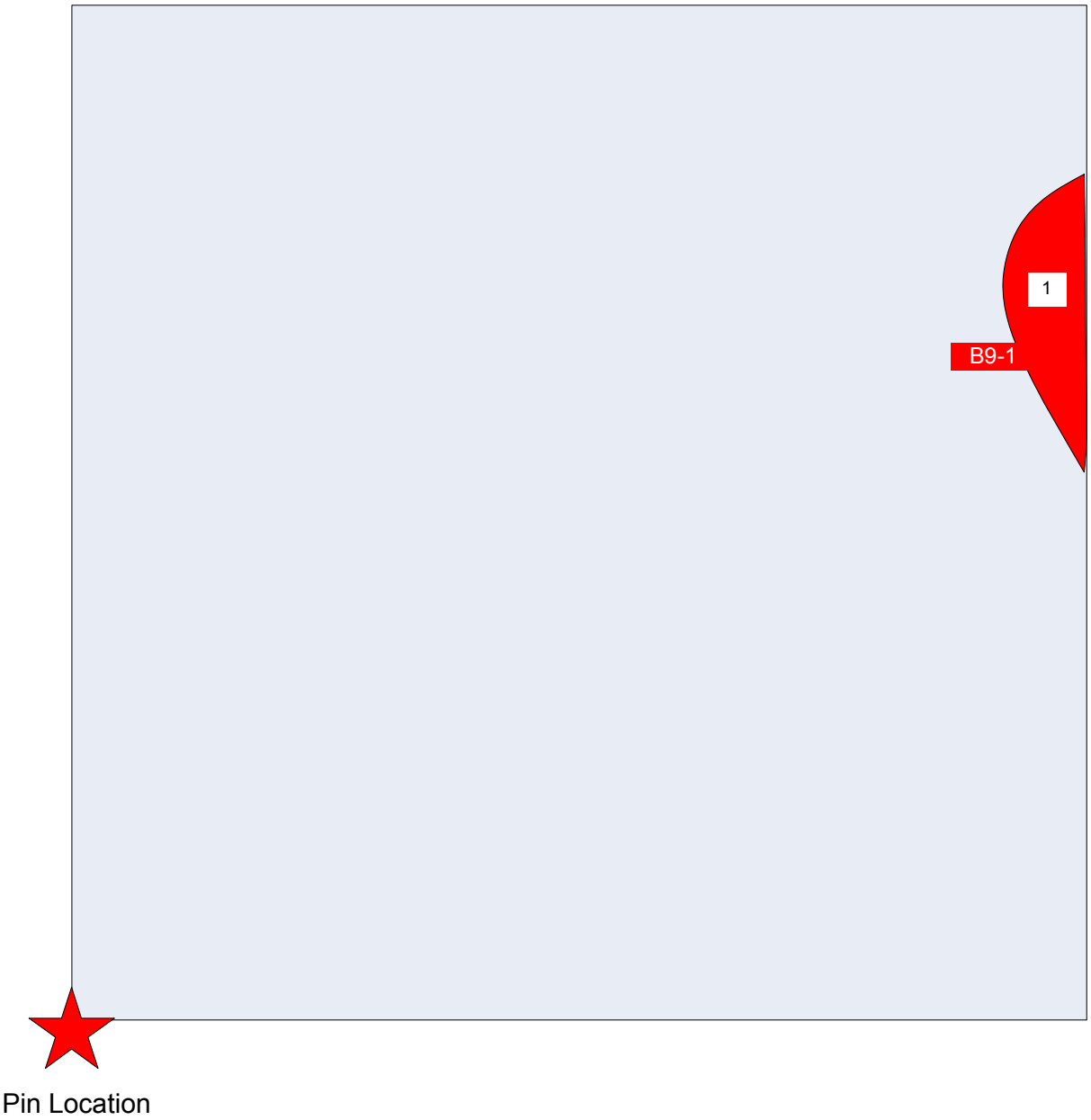
Saufley Field
3/19/2011

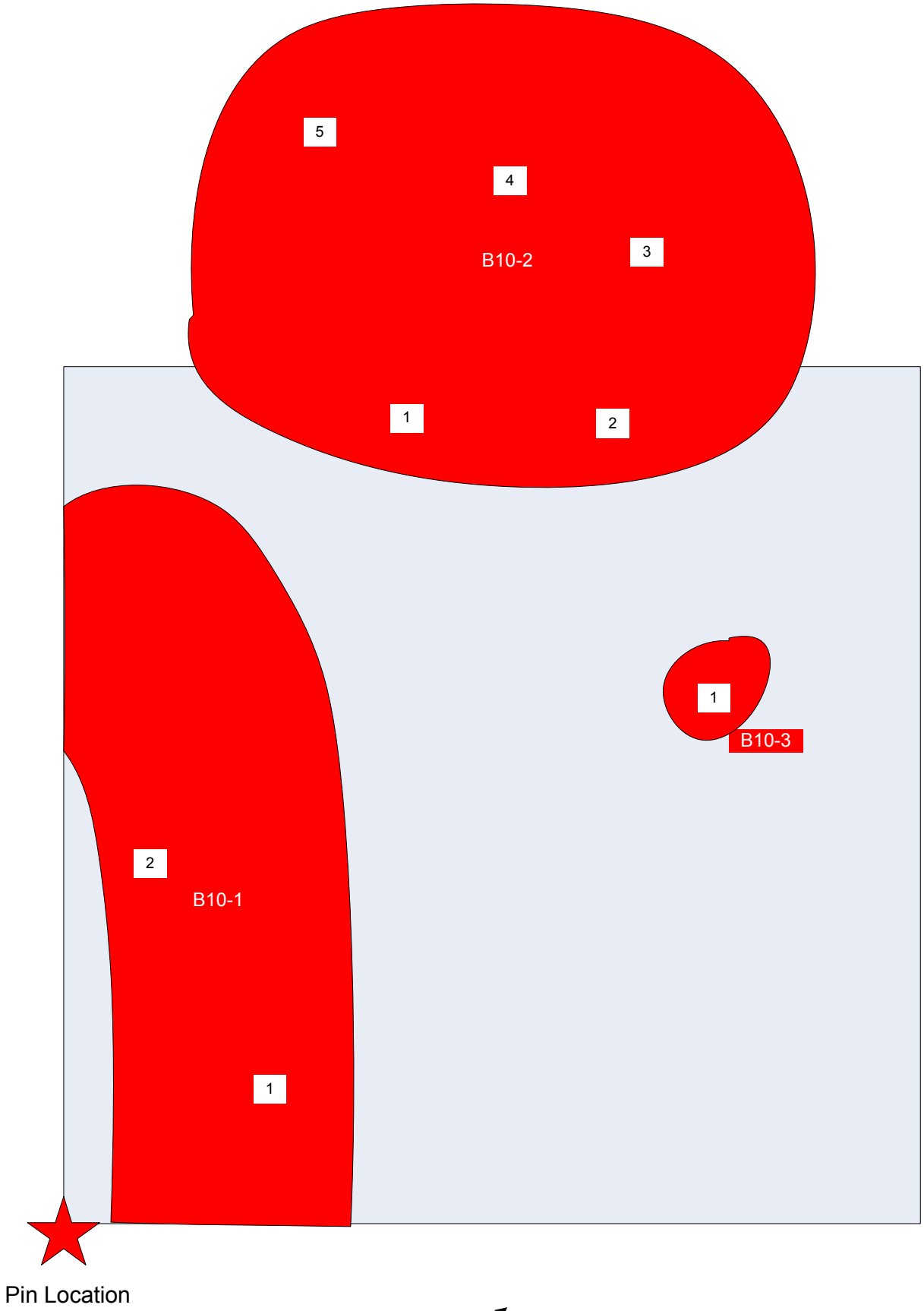


Grid size =
50ft by 50ft



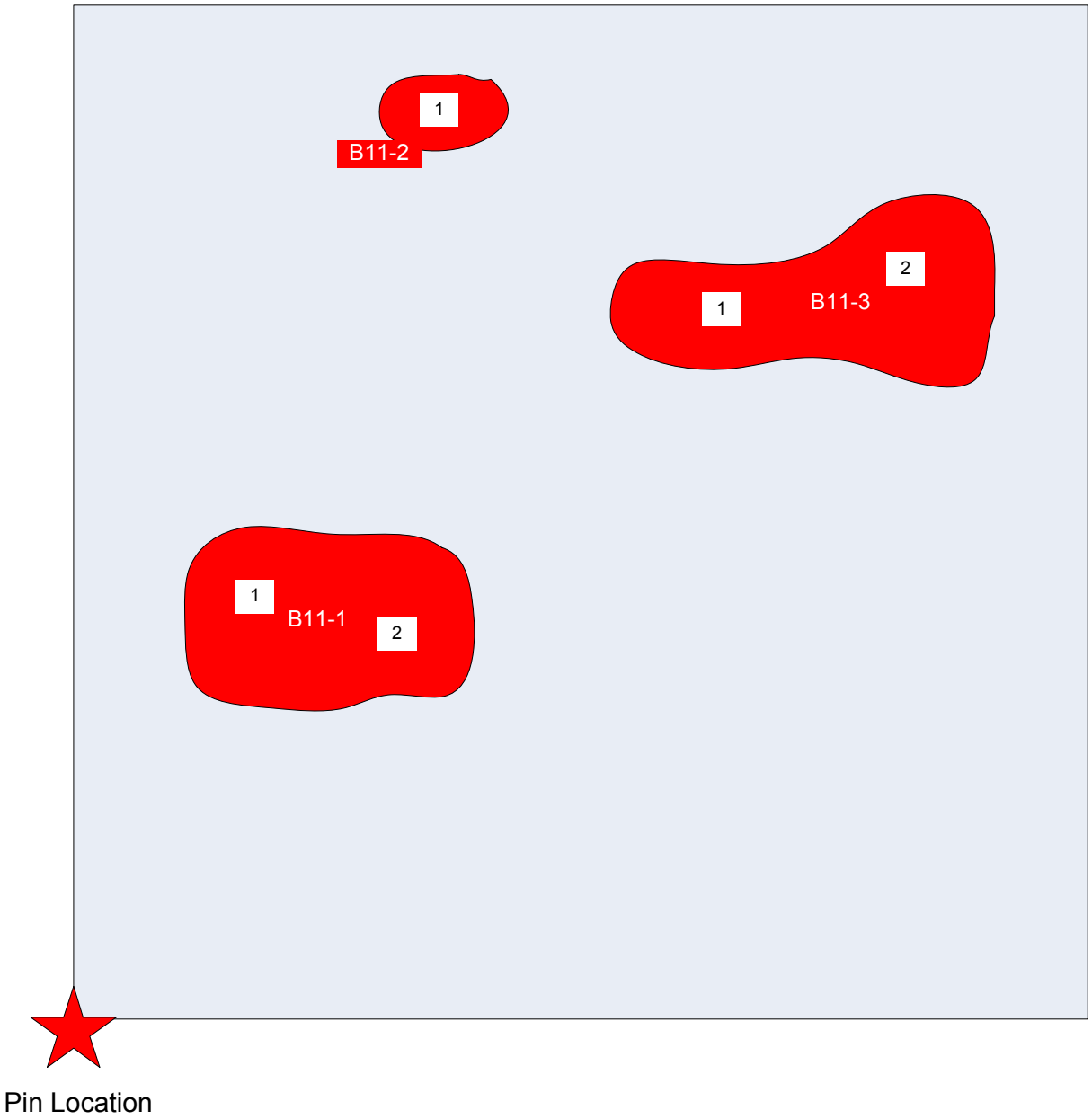
Grid B9
Saufley Field
3/19/2011

Grid size =
50ft by 50ft

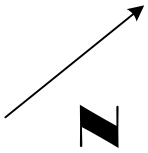


Grid B10
Saufley Field
3/19/2011

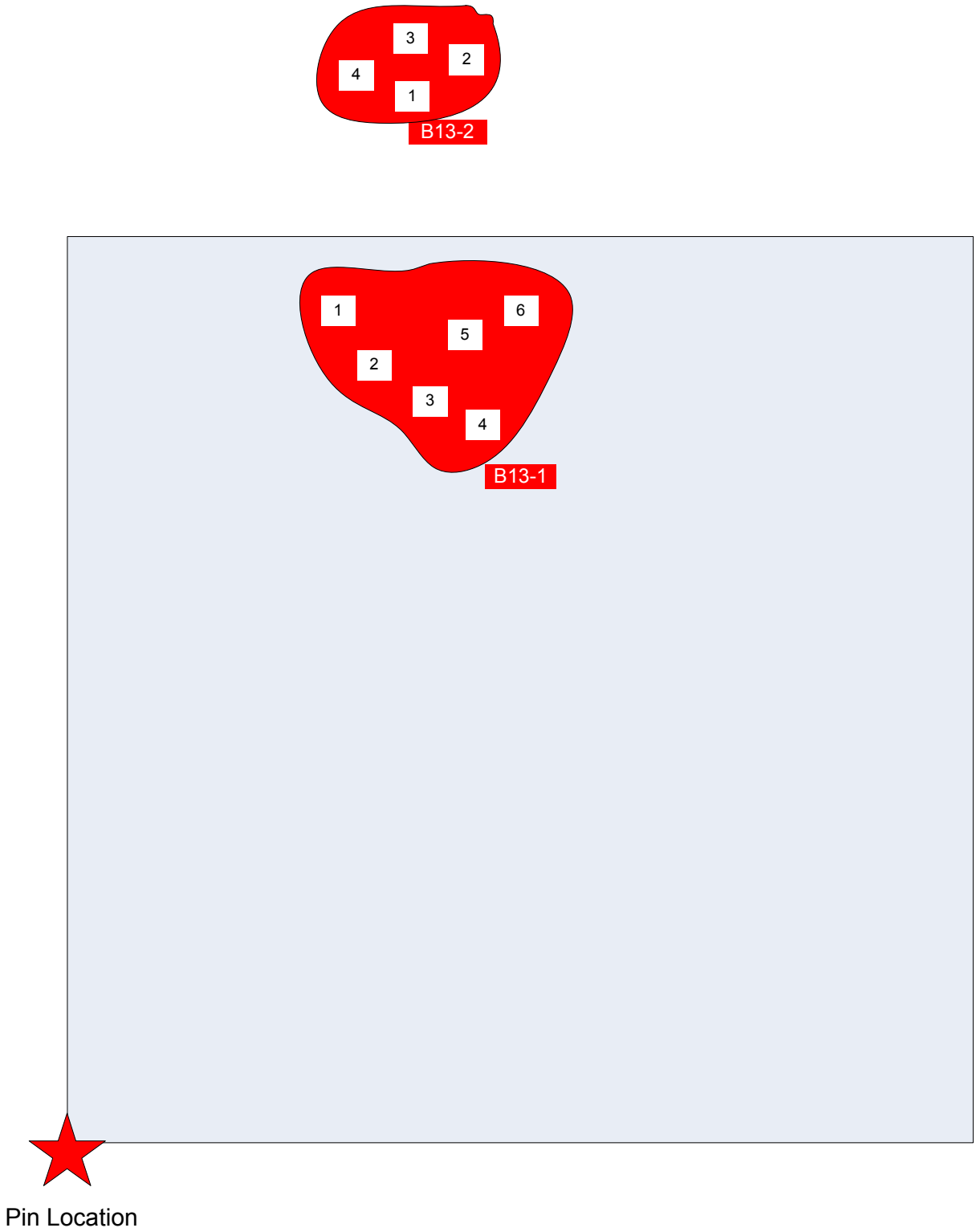
Grid size =
50ft by 50ft



Grid B11
Saufley Field
3/19/2011

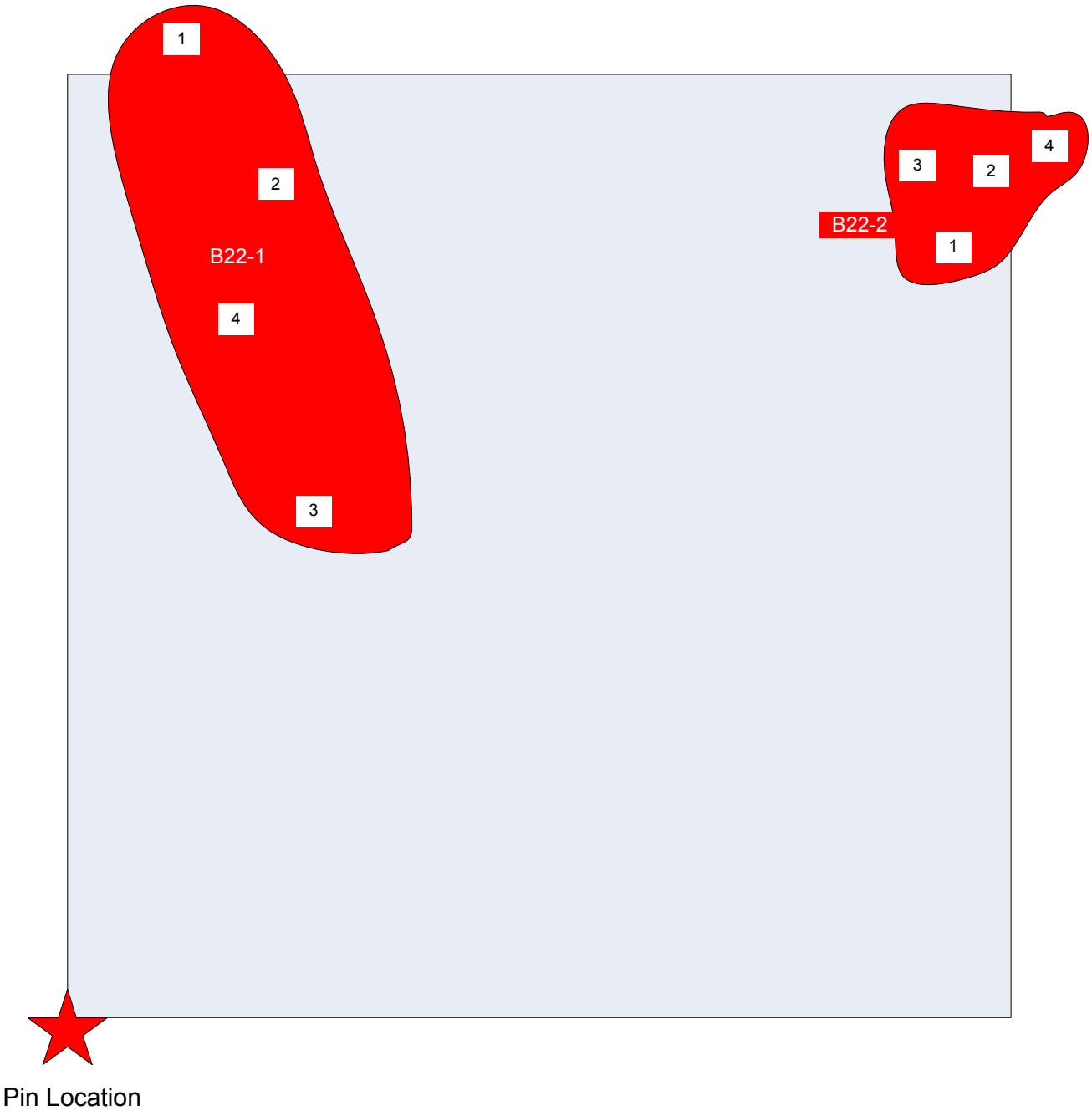


Grid size =
50ft by 50ft



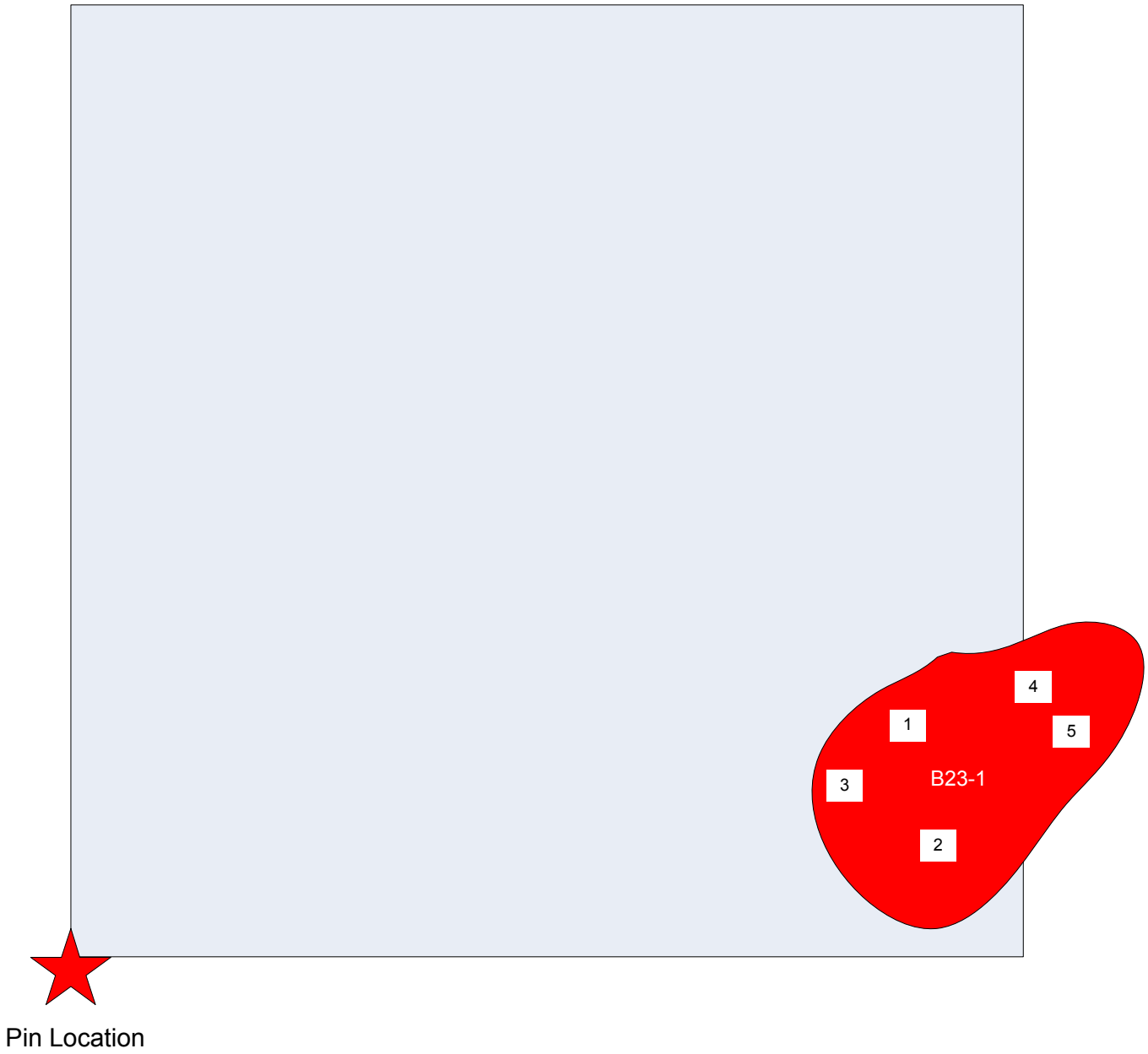
Grid B13
Saufley Field
3/19/2011

Grid size =
50ft by 50ft



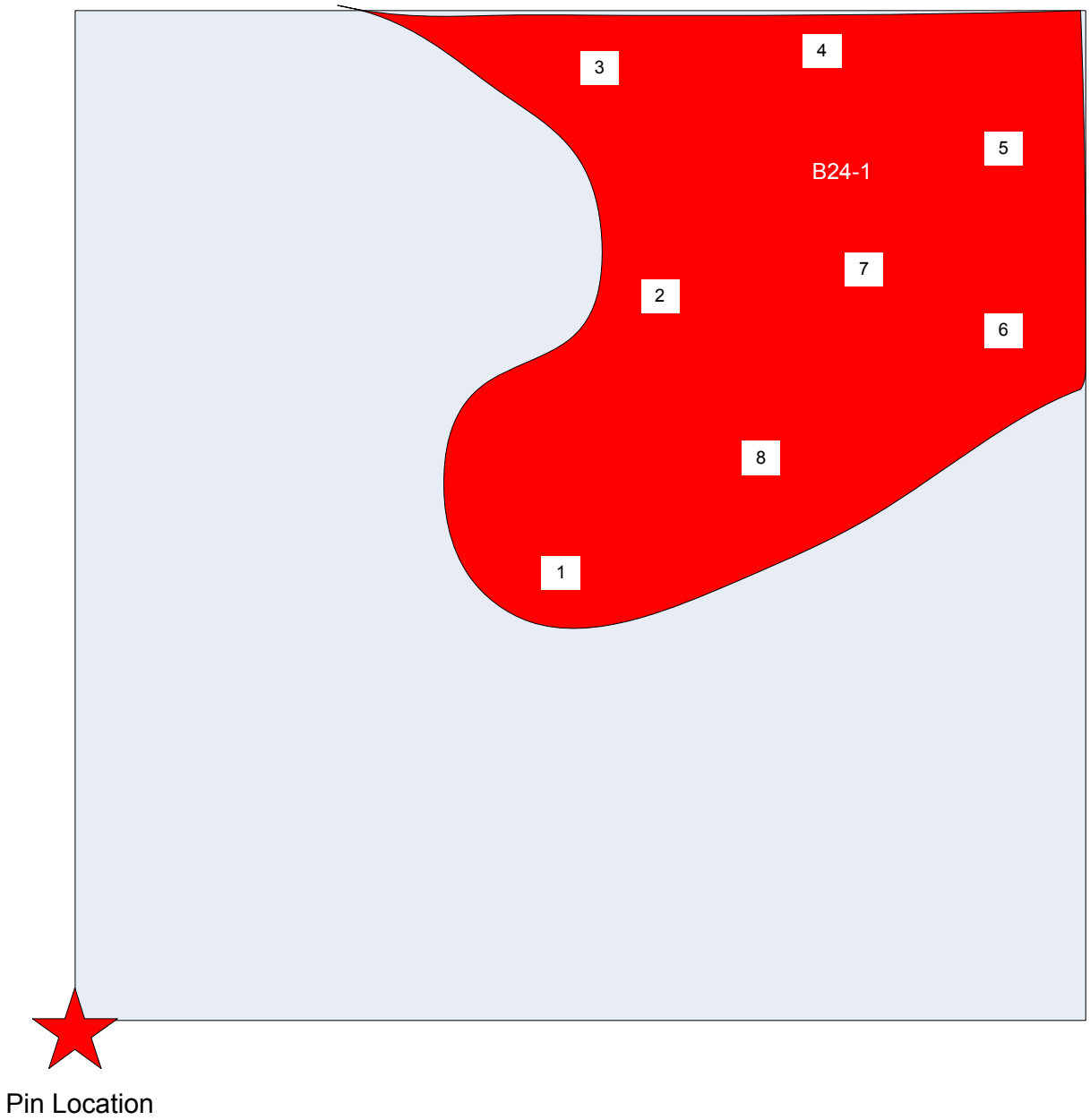
Grid B22
Saufley Field
3/19/2011

Grid size =
50ft by 50ft



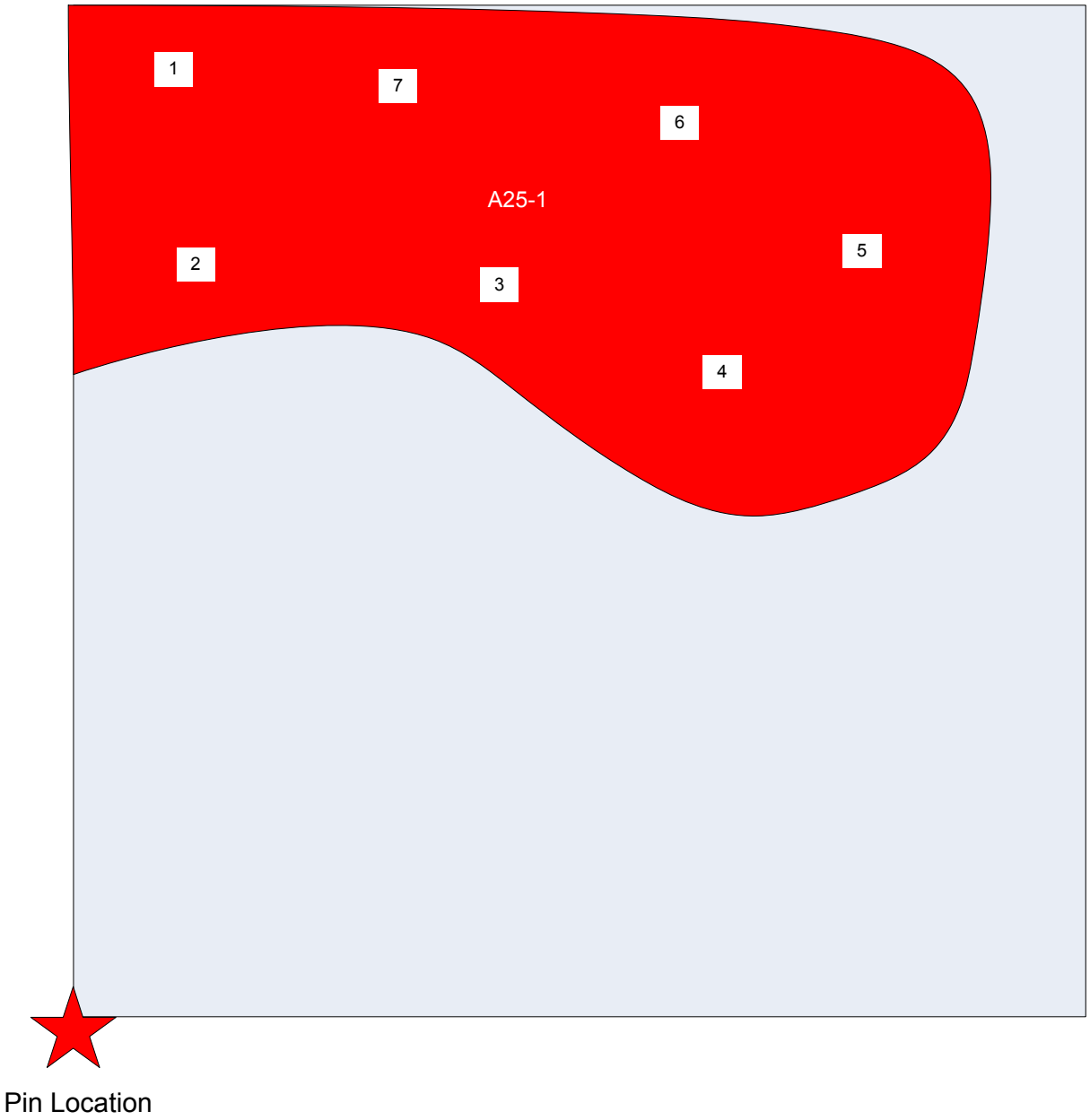
Grid B23
Saufley Field
3/19/2011

Grid size =
50ft by 50ft



Grid B24
Saufley Field
3/19/2011

Grid size =
50ft by 50ft



Grid B25
Saufley Field
3/19/2011

Grid size =
50ft by 50ft

Aleut World Solutions
Background Determination Data Sheet

Project/Location:	Saufley Field Phase III				
Instrument Model:	2221		Instrument Serial No.	117651	
Last Calibration Date:	3/8/2011				
Detector Model:	44-10		Detector Serial No.:	0533	
Today's Date:	3/14/2011		Data Collected by:	Dymaris McFarlin	

	Alpha		Beta-Gamma	x	Gamma	

Remarks: Instrument Ambient Background

Type of Surface:	Ambient		Count Time:	1	Minutes
Count Number		$(x - \bar{x})$		$(x - \bar{x})^2$	
1	4203	-262.73		69028.80	
2	4394	-71.73		5145.67	
3	4345	-120.73		14576.54	
4	4259	-206.73		42738.67	
5	4256	-209.73		43988.07	
6	4318	-147.73		21825.14	
7	4301	-164.73		27137.07	
8	4401	-64.73		4190.40	
9	4357	-108.73		11822.94	
10	4497	31.27		977.60	
11	4425	-40.73		1659.20	
12	4180	-285.73		81643.54	
13	4273	-192.73		37146.14	
14	4228	-237.73		56517.14	
15	4399	-66.73		4453.34	
16	4376	-89.73		8052.07	
17	4408	-57.73		3333.14	
18	4409	-56.73		3218.67	
19	4430	-35.73		1276.87	
20	4389	-76.73		5888.00	
21	4764	298.27		88963.00	
22	4609	143.27		20525.34	
23	4694	228.27		52105.67	
24	4845	379.27		143843.20	
25	4660	194.27		37739.54	
26	4654	188.27		35444.34	
27	4832	366.27		134151.27	
28	4733	267.27		71431.47	
29	4715	249.27		62133.87	
30	4618	152.27		23185.14	
Mean Count: $\bar{x}$	4465.73		SUM	1114141.87	
Standard Deviation (σ)	196.01		Variance:	38418.69	
Background Count Rate:		4465.73	CPM + -	588.02	CPM

CPM Low	CPM High
3877.71	5053.75

Calculations Completed by:	Ken Bradley	Date:	3/14/2011
Reviewed by:		Date:	

Aleut World Solutions
Background Determination Data Sheet

Project/Location:	Saufley Field Phase III				
Instrument Model:	2221		Instrument Serial No.	183983	
Last Calibration Date:	3/8/2011				
Detector Model:	44-10		Detector Serial No.:	081879	
Today's Date:	3/14/2011		Data Collected by:	Dymaris McFarlin	
	Alpha		Beta-Gamma	x	Gamma
Remarks:	Instrument Ambient Background				
Type of Surface:	Ambient		Count Time:	1	Minutes

Count Number		$(x - \bar{x})$		$(x - \bar{x})^2$
1	3580	-184.20		33929.64
2	3616	-148.20		21963.24
3	3638	-126.20		15926.44
4	3546	-218.20		47611.24
5	3559	-205.20		42107.04
6	3521	-243.20		59146.24
7	3636	-128.20		16435.24
8	3721	-43.20		1866.24
9	3765	0.80		0.64
10	3758	-6.20		38.44
11	3855	90.80		8244.64
12	3777	12.80		163.84
13	4021	256.80		65946.24
14	3848	83.80		7022.44
15	3865	100.80		10160.64
16	3919	154.80		23963.04
17	3875	110.80		12276.64
18	3840	75.80		5745.64
19	3890	125.80		15825.64
20	3879	114.80		13179.04
21	3803	38.80		1505.44
22	3740	-24.20		585.64
23	3709	-55.20		3047.04
24	3804	39.80		1584.04
25	3845	80.80		6528.64
26	3839	74.80		5595.04
27	3691	-73.20		5358.24
28	3810	45.80		2097.64
29	3700	-64.20		4121.64
30	3876	111.80		12499.24
Mean Count: $\bar{x}$	3764.20		SUM	444474.80
Standard Deviation (σ)	123.80		Variance:	15326.72
Background Count Rate:		3764.20	CPM + -	371.40

CPM Low	CPM High
3392.80	4135.60

Calculations Completed by:	Ken Bradley	Date:	3/14/2011
Reviewed by:		Date:	

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		Saufley Field (Phase 3)					
Instrument Model:		2221			Instrument Serial No.	117651	
Last Calibration Date:		3/8/2011			Background Count Rate:	4466	C_B
Detector Model:		44-10			Detector Serial No.:	0533	
Today's Date:		3/14/2011			Data Collected by:	Dymaris McFarlin	
Source ID:	1296118	Activity	7,368,846	dpm	Efficiency:	0.6 %	
Radionuclide:	Cs-137	CPM	CPM				
Count Number		(Gross) C_G	(Net) C_I		$(C_I - \bar{c})$	$(C_I - \bar{c})^2$	
1		**51408**	46942		373.10	139203.61	
2		**51185**	46719		150.10	22530.01	
3		**51043**	46577		8.10	65.61	
4		**51366**	46900		331.10	109627.21	
5		**50859**	46393		-175.90	30940.81	
6		**51351**	46885		316.10	99919.21	
7		**51081**	46615		46.10	2125.21	
8		**50799**	46333		-235.90	55648.81	
9		**51272**	46806		237.10	56216.41	
10		**51435**	46969		400.10	160080.01	
11		**51076**	46610		41.10	1689.21	
12		**51163**	46697		128.10	16409.61	
13		**51027**	46561		-7.90	62.41	
14		**50438**	45972		-596.90	356289.61	
15		**50816**	46350		-218.90	47917.21	
16		**51060**	46594		25.10	630.01	
17		**50736**	46270		-298.90	89341.21	
18		**50722**	46256		-312.90	97906.41	
19		**51122**	46656		87.10	7586.41	
20		**50739**	46273		-295.90	87556.81	
Total		1020698	931378		SUM	1381745.8	$\Sigma(C_I - c)^2$
Mean Count: $\bar{c}$			46569				
Chi Squared Value (C^2):		29.67	10.11 - 30.14	Standard Deviation:	270		
+ 20% Value:	55883	- 20% Value:	37255				
Calculations Completed by:			Ken Bradley			Date:	3/14/2011
Reviewed by:						Date:	

Aleut World Solutions
Chi-Squared Test of Reliability Data Sheet

Project/Location:		Saufley Field (Phase 3)					
Instrument Model:		2221			Instrument Serial No.	183983	
Last Calibration Date:		3/8/2011			Background Count Rate:	3764	C_B
Detector Model:		44-10			Detector Serial No.:	081879	
Today's Date:		3/14/2011			Data Collected by:	Dymaris McFarlin	
Source ID:	1296118	Activity	7,368,846	dpm	Efficiency:	0.6 %	
Radionuclide:	Cs-137	CPM	CPM				
Count Number		(Gross) C_G	(Net) C_I		$(C_I - \bar{c})$	$(C_I - \bar{c})^2$	
1		**44168**	40404		-318.45	101410.40	
2		**44667**	40903		180.55	32598.30	
3		**44656**	40892		169.55	28747.20	
4		**44537**	40773		50.55	2555.30	
5		**44686**	40922		199.55	39820.20	
6		**44194**	40430		-292.45	85527.00	
7		**44575**	40811		88.55	7841.10	
8		**44425**	40661		-61.45	3776.10	
9		**44585**	40821		98.55	9712.10	
10		**44873**	41109		386.55	149420.90	
11		**44284**	40520		-202.45	40986.00	
12		**44656**	40892		169.55	28747.20	
13		**44354**	40590		-132.45	17543.00	
14		**44538**	40774		51.55	2657.40	
15		**44784**	41020		297.55	88536.00	
16		**44459**	40695		-27.45	753.50	
17		**44107**	40343		-379.45	143982.30	
18		**44511**	40747		24.55	602.70	
19		**44074**	40310		-412.45	170115.00	
20		**44596**	40832		109.55	12001.20	
Total		889729	814449		SUM	967332.95	$\Sigma(C_I - c)^2$
Mean Count: $\bar{c}$			40722				
Chi Squared Value (C^2):		23.75	10.11 - 30.14	Standard Deviation:	226		
+ 20% Value:	48867	- 20% Value:	32578				
Calculations Completed by:			Ken Bradley			Date:	3/14/2011
Reviewed by:						Date:	

Saufley Field Phase III **AWS** **Daily Report**

Project Number		Date		Report #
DO 0041		3/14/2011		001

USN 2010-036

JMC POC:	Navy Cont POC:	Navy POC:	RASO POC	AWS POC:
Bill Metcalf 309-782-2248	Frank Lesesne 703-767-7620	Bill Gates	Pat Owens	Bill Haney

Safety: No accidents

Personnel on Site:

Name	Title		Company	Task
Ken Bradley	HP Supervisor		AWS	Rad Survey
Dymaris McFarlin	Sr. HP Tech		AWS	Rad Survey

Production:

Area	Materials, Equipment, Activities	Details:
	Reported to site and met TetraTech contact. Walked down job site. Performed instrument setup. 2 - 2221's w/44-10 probes, 1 model 19, and 1 Trimble GPS unit on site. Surveyed 4 grids. Several large contaminated areas found.	Continuing
	Approximately 11 grids are inaccessible due to heavy vegetation and undergrowth.	
Percent Complete (Project)		**10% Complete**

Daily Safety Meeting Topics:

7:00 am safety meeting General Safety

4:00 pm planning meeting

Comments:

We found several areas with elevated counts (500-2000 counts above the 3 Sigma investigational level).

Submitted By: Ken Bradley

Saufley Field Phase III **AWS** **Daily Report**

Project Number		Date		Report #
DO 0041		3/15/2011		002

USN 2010-036

JMC POC:	Navy Cont POC:	Navy POC:	RASO POC	AWS POC:
Bill Metcalf 309-782-2248	Frank Lesesne 703-767-7620	Bill Gates	Pat Owens	Bill Haney

Safety: No accidents

Personnel on Site:

Name	Title		Company	Task
Ken Bradley	HP Supervisor		AWS	Rad Survey
Dymaris McFarlin	Sr. HP Tech		AWS	Rad Survey

Production:

Area	Materials, Equipment, Activities	Details:
	Area survey continues. Another 10 grids surveyed. Again today, several areas were identified that clearly exceed the 3 sigma action level. Areas were flagged and GPS locations documented.	Continuing
	Two Ludlum 2221s/44-10 probes, one Ludlum Model 19 and one Trimble GPS pack are on site.	
Percent Complete (Project)		**30% Complete**

Daily Safety Meeting Topics:

7:00 am safety meeting General Safety

4:00 pm planning meeting

Comments:

We continue to find areas with elevated counts (500-2000 counts above the 3 Sigma investigational level) rather than individual spots. Elevated counts found outside the target area. The gridded area does not appear to be consistent with the contamination. Either the "trench" was part of the original contour of the land and doesn't conform to the gridded area or there is subterranean leaching and runoff of radioactive material.

Submitted By: Ken Bradley

Saufley Field Phase III **AWS** **Daily Report**

Project Number		Date		Report #
DO 0041		3/16/2011		003

USN 2010-036

JMC POC:	Navy Cont POC:	Navy POC:	RASO POC	AWS POC:
Bill Metcalf 309-782-2248	Frank Lesesne 703-767-7620	Bill Gates	Pat Owens	Bill Haney

Safety: No accidents

Personnel on Site:

Name	Title		Company	Task
Ken Bradley	HP Supervisor		AWS	Rad Survey
Dymaris McFarlin	Sr. HP Tech		AWS	Rad Survey

Production:

Area	Materials, Equipment, Activities	Details:
	Area survey continues. Another 10 grids surveyed. Again today, several areas were identified that clearly exceed the 3 sigma action level. Areas were flagged and GPS locations documented.	Continuing
	Two Ludlum 2221s/44-10 probes, one Ludlum Model 19 and one Trimble GPS pack are on site.	
Percent Complete (Project)		**50% Complete**

Daily Safety Meeting Topics:

7:00 am safety meeting General Safety

4:00 pm planning meeting

Comments:

Approximately 11 grids are severely impacted or impassible due to heavy brush/growth. Surveys at the edges of several of these areas indicate that the contamination continues into these areas. More elevated readings found outside the gridded area. Due to the amount and size of contaminated areas found, I am unsure we can finish the accessible areas of this phase by Fri. MAR 18, 2011.

Submitted By: Ken Bradley

Saufley Field Phase IV **AWS** **Daily Report**

Project Number		Date		Report #
USN 2010-036/DO: 041		1/6/2012		002

JMC POC:	Navy Cont POC:	Navy POC:	RASO POC	AWS POC:
Bill Metcalf 309-782-2248	Frank Lesesne 703-767-7620	John Schoolfield 904-542-6418	Pat Owens 757-887-4692	Daniel Spicuzza 412 848-7022

Safety: No accidents

Personnel on Site:

Name	Title	# of Hours	Company	Task
Daniel Spicuzza	Project Manager	8	AWS	Site Mobilization

Production:

Area	Materials, Equipment, Activities	Details:
	Mobilized on site. Received instruments, supplies, and sample coolers and containers.	Completed with exception of 55-gallon drums.
	Completed initial instrument QA/QC checks. All results SAT.	Completed
	1 Ludlum 2221/44-10 probe, 1 Ludlum Model 19, 1 Model 2929 Dual Channel Scaler, 1 Model 2360 with 43-93 probe, 1 Model 3 with 44-9 probe are on site.	
Percent Complete (Project)		**10% Complete**

Daily Safety Meeting Topics:

N/A

Comments:

Completed initial instrument QA/QC checks. All results were SAT. Completed background reference area readings with NaI 2" by 2" detector. The 55-gallon drums were delayed in shipping, will arrive on Monday of next week. Tried using a DC power inverter to operate the Model 2929. Will not work properly with the inverter. Found a live electrical outlet in Hangar 807 that we can use for the Model-2929.

Submitted By: Daniel Spicuzza

Saufley Field Phase IV **AWS** **Daily Report**

Project Number		Date		Report #
USN 2010-036/DO: 041		1/5/2012		001

JMC POC:	Navy Cont POC:	Navy POC:	RASO POC	AWS POC:
Bill Metcalf 309-782-2248	Frank Lesesne 703-767-7620	John Schoolfield 904-542-6418	Pat Owens 757-887-4692	Daniel Spicuzza 412 848-7022

Safety: No accidents

Personnel on Site:

Name	Title	# of Hours	Company	Task
Daniel Spicuzza	Project Manager	8	AWS	Site Mobilization

Production:

Area	Materials, Equipment, Activities	Details:
	Mobilized on site. Received instruments, supplies, and sample coolers and containers.	Continuing
	Perform initial instrument QA/QC checks.	Continuing
	1 Ludlum 2221/44-10 probe, 1 Ludlum Model 19, 1 Model 2929 Dual Channel Scaler, 1 Model 2360 with 43-93 probe, 1 Model 3 with 44-9 probe are on site.	
Percent Complete (Project)		**0% Complete**

Daily Safety Meeting Topics:

N/A

Comments:

Mobilized on site. Took instruments and supplies to the brick building near Hangar 807. Began initial instrument QA/QC checks. Contacted Tetra Tech personnel informing on what I was doing. Met with Greg Campbell.

Submitted By: Daniel Spicuzza

APPENDIX C

GEOPHYSICAL SURVEY DATA

FINAL REPORT
GEOPHYSICAL INVESTIGATION
SAUFLEY FIELD SITE 1
BURIAL OF METALLIC OBJECTS AREA
PENSACOLA, FLORIDA

Prepared for Tetra Tech NUS, Inc.
Tallahassee, FL

Prepared by GeoView, Inc.
St. Petersburg, FL

May 22, 2011

Mr. Frank Lesesne, P.G.
Tetra Tech NUS, Inc.
1558 Village Square Boulevard
Tallahassee, FL 32309

Subject: Transmittal of Final Report for Geophysical Investigation
Saufley Field Site 1 - Burial of Metallic Objects Area
Pensacola, Florida
GeoView Project Number 12617 (rev.1)

Dear Mr. Lesesne,

GeoView, Inc. (GeoView) is pleased to submit the final report that summarizes and presents the results of the geophysical investigation performed at the above referenced site. Electromagnetics, magnetics and ground penetrating radar were used to help determine the presence of buried underground metallic debris within the accessible areas of the project site. GeoView appreciates the opportunity to have assisted you on this project. If you have any questions or comments about the report, please contact us.

Sincerely,
GEOVIEW, INC.

Michael J. Wightman, P.G.
President
Florida Professional Geologist
Number 1423

Stephen Scruggs, P.G.
Geophysicist
Florida Professional Geologist
Number 2470

A Geophysical Services Company

4610 Central Avenue
St. Petersburg, FL 33711

Tel.: (727) 209-2334
Fax: (727) 328-2477

1.0 Introduction

A geophysical investigation was conducted at the Saufley Field Site 1 - Burial of Metallic Objects Area located northwest of Pensacola, Florida. The site was located northwest of the airfield perimeter road. In early 1960, it was reported that 30 to 40 steel bottles containing nuclear wash-down water were buried in a trench 9 feet (ft) in depth and 60 ft in length. The size of the bottles is unknown. Also, there are reports that shop equipment may have been buried within this area in late 1960 when the base was planned to be closed. Of concern was the possible presence and location of the debris trench. The geophysical investigation was conducted using time domain electromagnetics (EM-61), frequency domain electromagnetics (EM-31), total field magnetics (magnetics) and ground penetrating radar (GPR).

2.0 Site Description

The original area of investigation was approximately 1,300 ft by 100 ft in size. During the survey, the survey area was expanded to the east to the edge of the asphalt road and to the northwest to characterize a potential anomalous area. At the time of the investigation, the site vegetation was predominantly a grass covered field lined on the sides with some trees. Portions of the site were inaccessible due to dense vegetation. A northwest/southeast trending drainage ditch was located within the central portion of the site. Multiple objects of interference which had an effect on the EM, TDEM and magnetometer response were located within the survey area. These objects included reinforced concrete pads, a fenced electrical junction, drainage pipes and a picnic area.

3.0 Description of Geophysical Investigation

The original survey grid for the geophysical investigation was established by others prior to the investigation. Wooden stakes were placed on a 50-foot grid across the survey area. The positions of the survey grid and geophysical transect lines were recorded using a sub-meter accuracy GPS system. A discussion of the limitations of the survey grid is provided in Appendix A2.1.

<u>EM-61</u>

The EM-61 portion of the geophysical investigation was conducted using a Geonics EM61-MK2 Buried Metal Detector (EM-61). The EM-61 survey was conducted by towing the EM-61 throughout accessible areas of the project site. The EM-61 data was collected on transect lines spaced 10 to 50 ft apart and data readings were collected every 0.6 ft along each transect line. Background response (areas with no metal) was calibrated to be approximately zero millivolts. The

positions of the geophysical transect lines were recorded using a Trimble GeoXH. The EM-61 data was then contoured using Surfer^{tm} contouring software. The location of the EM-61 transect lines are shown on Figure 2. A description of the EM-61 technique and the methods employed for buried debris studies is provided in Appendix A2.2.

EM-31

The EM-31 portion of the geophysical investigation was conducted using a Geonics EM31-MK2 (EM-31). The EM method will respond to the presence of metals that are both iron-bearing (ferrous) and non-ferrous (e.g., aluminum or brass). For this study EM-31 measurements were taken using a vertical dipole orientation. This orientation provided bulk conductivity readings for soils to an approximate depth of 15 to 17 ft bls.

The EM-31 survey was conducted by carrying the EM-31 throughout accessible areas of the project site. The EM-31 data was collected on transect lines spaced 10 to 20 ft apart and data readings were collected every 0.25 seconds along each transect line. The EM-31 data collected both the terrain conductivity response and the in-phase response along the transects. Because the target was buried metal, only the in-phase response is presented in this report. Background response for the in-phase response was calibrated to range from -2 to 1 parts per thousand (ppt). The positions of the geophysical transect lines were recorded using a Trimble GeoXH. The EM data was then contoured using Surfer^{tm} contouring software. The location of the EM-31 transects are shown on Figure 3. A description of the EM-31 technique and the methods employed for buried debris studies is provided in Appendix A2.32.

Magnetics

The magnetics survey was conducted using a Geometrics 859 Cesium Vapor magnetometer. The magnetometer method only responds to the presence of ferrous metals. The magnetometer method is extremely sensitive and typically will respond to smaller accumulations of metallic debris than the EM method. The magnetometer method also has the ability to detect materials that occur at depths greater than the effective exploration depth of the EM method. Magnetometer readings were collected on 0.2-second intervals. Background magnetometer readings (where buried metallic debris was not present) ranged in general from 48,000 to 48,200 nano-Teslas (nT). In areas where buried metallic debris or surficial metallic objects were present, magnetometer values deviated from this range. The positions of the magnetometer readings were recorded using a Novatel Smart V1 Global Positioning System (GPS). The location of the magnetics survey

is shown on Figure 2. The magnetometer data was processed using MagMap[tm] 2000 software and contoured using Surfer[tm] contouring software. A description of the magnetometer technique and the methods employed for buried debris studies is provided in Appendix A2.4.

Ground Penetrating Radar

The GPR data was collected using a Mala radar system with a 500-megahertz antenna. A time range setting of 80 nano-seconds was used. This time range setting provided information to an estimated depth of 10 to 12 ft below land surface (bls). The positions of the GPR transects were recorded using a Trimble GeoXH. The GPR data was collected on a 50 ft grid across the survey area. A description of the GPR technique and the methods employed for buried debris studies is provided in Appendix A2.5.

4.0 Survey Results

The combined results of the geophysical investigation are presented in Figure 1. The results of a previous radiation survey (performed by others) are also shown on Figure 1. In addition, the color contoured responses for each geophysical methods are presented in Figures 2 through 4. The geophysical investigation identified multiple areas of elevated response. The majority of these areas were due to known metallic surface features or underground pipes. However, two large anomalous areas were identified within the survey area. These areas are shown as Anomalies 1 and 2 on the figures.

Anomaly 1 was located to the west of the original survey area. The anomaly was approximately 85 ft by 15 ft in size. The GPR data indicated that this area is likely associated with a trench or excavated area. The debris/objects within this suspected trench ranged from 2 to 9 ft bls. Based upon the elevated EM and magnetic response within this area, it is suspected that the debris within this anomaly is metallic in nature. It is suspected that Anomaly 1 is likely the historic trench feature containing the steel bottles. The coordinates of the center of Anomaly 1 are 30.473538047°N, 87.348152414°W .

Anomaly 2 was approximately 20 ft by 10 ft in size. The GPR data indicated that this area is likely associated with an area of shallow debris. The debris within this suspected trench ranged from 0 to 5 ft bls. Based upon the elevated EM and magnetic response within this area, it is suspected that the debris within this anomaly is metallic in nature. The coordinates of the center of Anomaly 2 are 30.473330547°N, 87.347918806°W.

The data indicated 26 additional minor areas of elevated response that were not associated with any known metallic objects. Based upon the small size and relatively low response of these areas, it is suspected that these areas are associated with minor, small areas of shallow metallic debris. It is not suspected that these additional 26 additional areas are trench features or other debris pits. The locations of these anomalies and anomalies 1 and 2 are shown on Figures 1-4 and are provided in Table 1.

Examples of the GPR data collected at the project site are provided in Appendix 1. A discussion of the limitations of the geophysical methods used in this investigation is provided in Appendix 2.6.

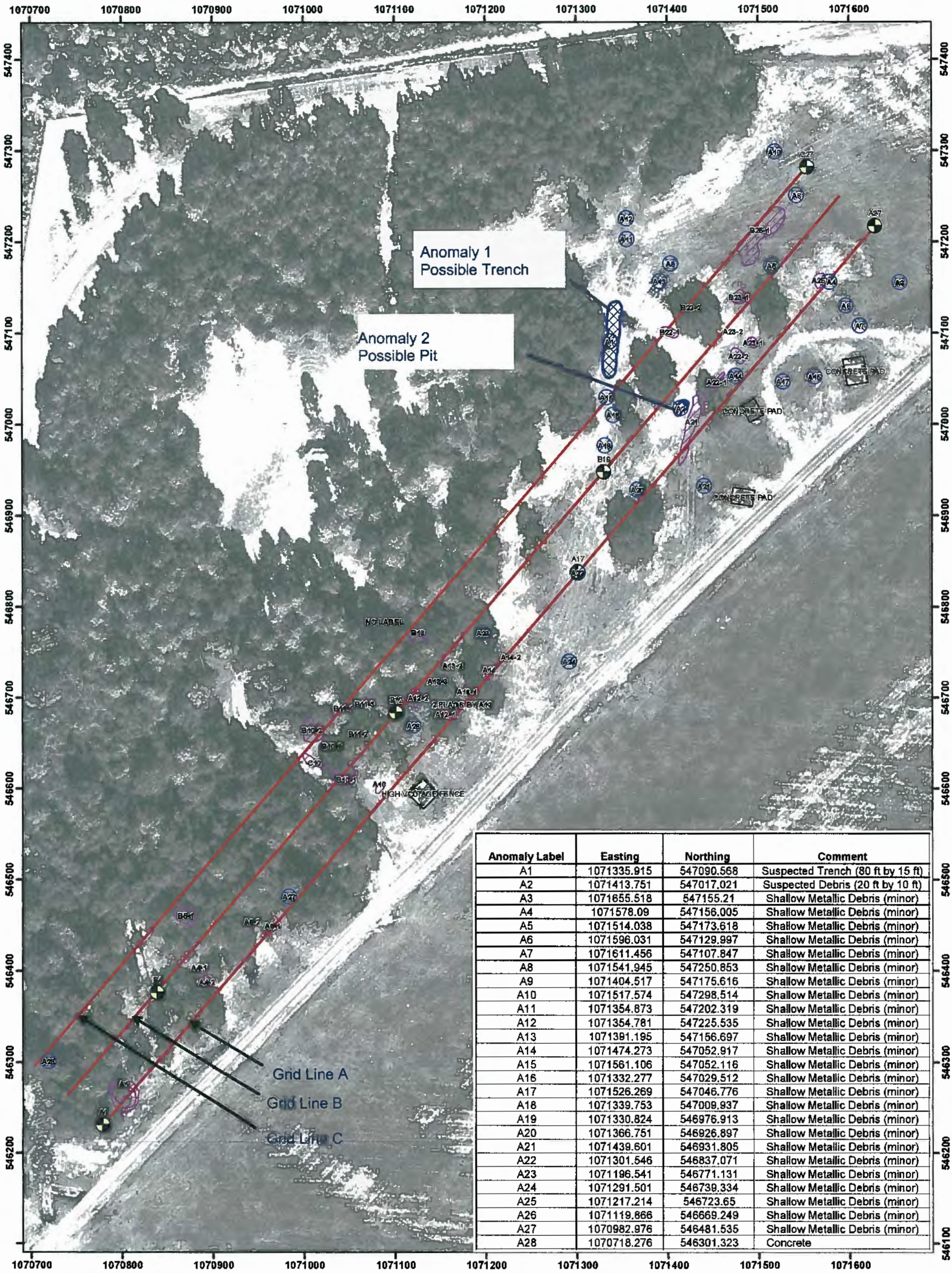
TABLE 1

GPS coordinates for the estimated centers of each of the areas of suspected buried metallic debris

Anomaly Label	Easting	Northing	Comment
A1	1071336	547091	Suspected Trench (80 ft by 15 ft)
A2	1071414	547017	Suspected Debris (20 ft by 10 ft)
A3	1071656	547155	Shallow Metallic Debris (minor)
A4	1071578	547156	Shallow Metallic Debris (minor)
A5	1071514	547174	Shallow Metallic Debris (minor)
A6	1071596	547130	Shallow Metallic Debris (minor)
A7	1071611	547108	Shallow Metallic Debris (minor)
A8	1071542	547251	Shallow Metallic Debris (minor)
A9	1071405	547176	Shallow Metallic Debris (minor)
A10	1071518	547299	Shallow Metallic Debris (minor)
A11	1071355	547202	Shallow Metallic Debris (minor)
A12	1071355	547226	Shallow Metallic Debris (minor)
A13	1071391	547157	Shallow Metallic Debris (minor)
A14	1071474	547053	Shallow Metallic Debris (minor)
A15	1071561	547052	Shallow Metallic Debris (minor)
A16	1071332	547030	Shallow Metallic Debris (minor)
A17	1071526	547047	Shallow Metallic Debris (minor)
A18	1071340	547010	Shallow Metallic Debris (minor)
A19	1071331	546977	Shallow Metallic Debris (minor)
A20	1071367	546927	Shallow Metallic Debris (minor)
A21	1071440	546932	Shallow Metallic Debris (minor)
A22	1071302	546837	Shallow Metallic Debris (minor)
A23	1071197	546771	Shallow Metallic Debris (minor)
A24	1071292	546739	Shallow Metallic Debris (minor)
A25	1071217	546724	Shallow Metallic Debris (minor)
A26	1071120	546669	Shallow Metallic Debris (minor)
A27	1070983	546482	Shallow Metallic Debris (minor)
A28	1070718	546301	Surface Concrete

** Coordinates in State Plane, Florida West, NAD83, Conus, Ft*

APPENDIX 1
FIGURES AND EXAMPLES OF GPR DATA COLLECTED AT THE PROJECT SITE



Anomaly Label	Easting	Northing	Comment
A1	1071335.915	547090.568	Suspected Trench (80 ft by 15 ft)
A2	1071413.751	547017.021	Suspected Debris (20 ft by 10 ft)
A3	1071655.518	547155.21	Shallow Metallic Debris (minor)
A4	1071578.09	547156.005	Shallow Metallic Debris (minor)
A5	1071514.038	547173.618	Shallow Metallic Debris (minor)
A6	1071596.031	547129.997	Shallow Metallic Debris (minor)
A7	1071611.456	547107.847	Shallow Metallic Debris (minor)
A8	1071541.945	547250.853	Shallow Metallic Debris (minor)
A9	1071404.517	547175.616	Shallow Metallic Debris (minor)
A10	1071517.574	547298.514	Shallow Metallic Debris (minor)
A11	1071354.873	547202.319	Shallow Metallic Debris (minor)
A12	1071354.781	547225.535	Shallow Metallic Debris (minor)
A13	1071391.195	547156.697	Shallow Metallic Debris (minor)
A14	1071474.273	547052.917	Shallow Metallic Debris (minor)
A15	1071561.106	547052.116	Shallow Metallic Debris (minor)
A16	1071332.277	547029.512	Shallow Metallic Debris (minor)
A17	1071526.269	547046.776	Shallow Metallic Debris (minor)
A18	1071339.753	547009.937	Shallow Metallic Debris (minor)
A19	1071330.824	546976.913	Shallow Metallic Debris (minor)
A20	1071366.751	546926.897	Shallow Metallic Debris (minor)
A21	1071439.601	546931.805	Shallow Metallic Debris (minor)
A22	1071301.546	546837.071	Shallow Metallic Debris (minor)
A23	1071196.541	546771.131	Shallow Metallic Debris (minor)
A24	1071291.501	546739.334	Shallow Metallic Debris (minor)
A25	1071217.214	546723.65	Shallow Metallic Debris (minor)
A26	1071119.866	546669.249	Shallow Metallic Debris (minor)
A27	1070982.976	546481.535	Shallow Metallic Debris (minor)
A28	1070718.276	546301.323	Concrete

EXPLAINATION

- MINOR GEOPHYSICAL ANOMALY
- SURVEY GRID STAKE
- RADIATION SURVEY ANOMALY
- GEOPHYSICAL ANOMALY
- CONCRETE PAD
- FENCE

DATUM: NAD 83, STATE PLANE, FLORIDA NORTH
PROJECTION: TRANSVERSE MERCATOR
UNITS: FEET
IMAGERY: DOQQ - FLORIDA DEP LABINS

N

SCALE: 1" = 100'

100 50 0 100 Feet

30 15 0 30 Meters

GeoView

FIGURE 1

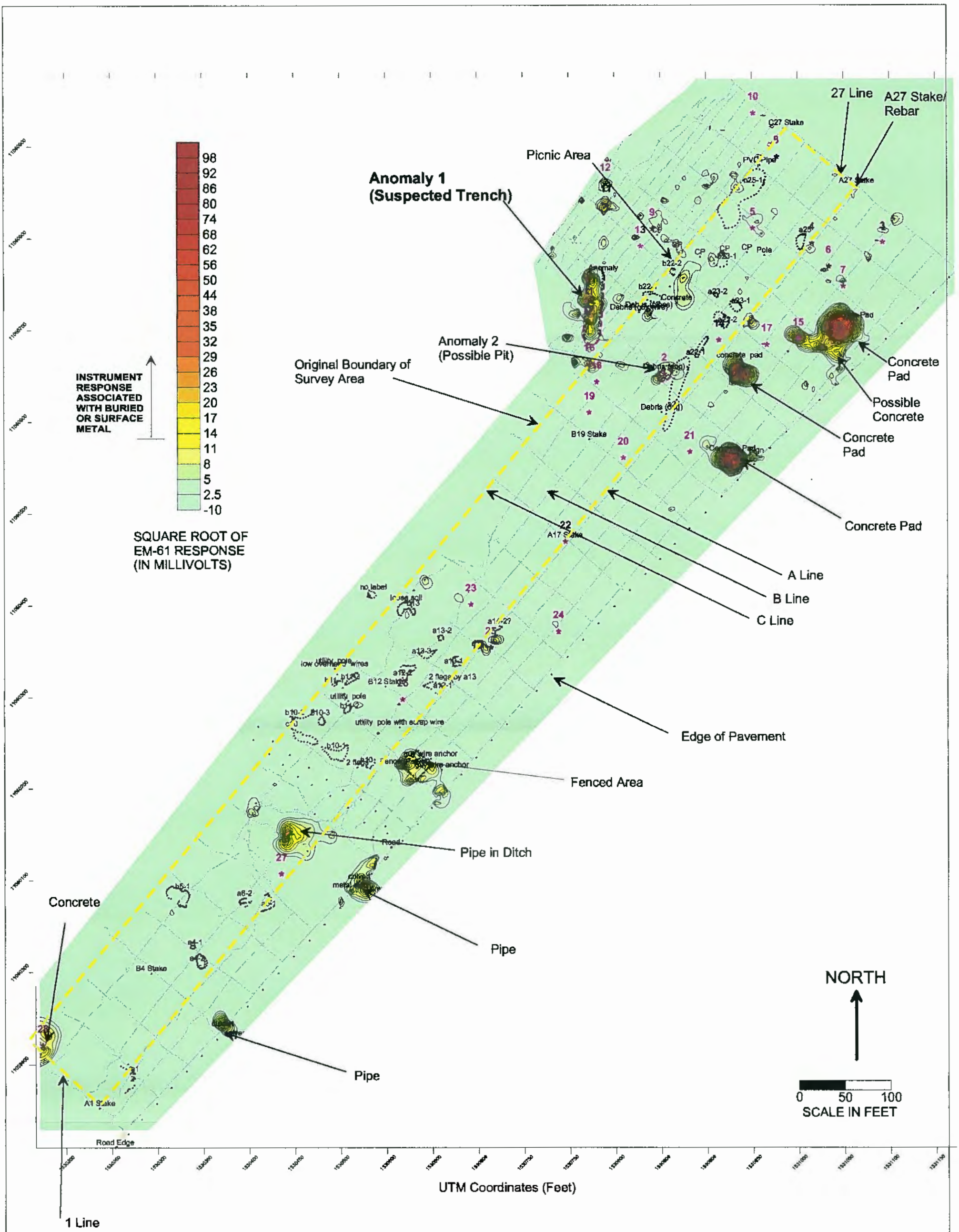
SITE MAP SHOWING RESULTS OF GEOPHYSICAL SURVEY

SAUFLEY FIELD SITE 1
BURIAL OF METALLIC OBJECTS AREA
PENSACOLA, FLORIDA

TETRA TECH NUS, INC.
TALLAHASSEE, FLORIDA

PROJECT: 12617

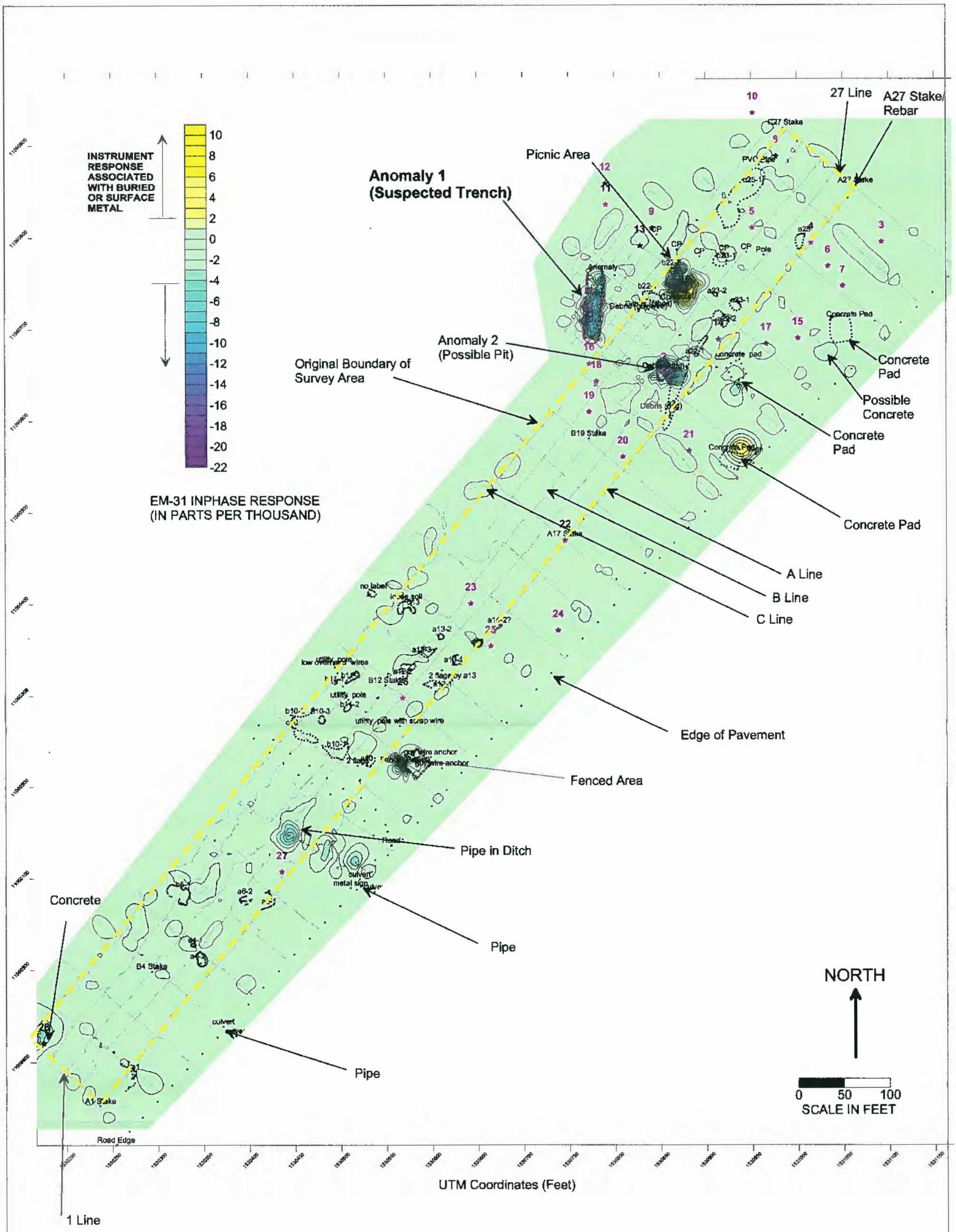
DATE: 05/18/11



EXPLANATION

- 20 — CONTOUR OF EM RESPONSE (IN MILLIVOLTS)
- EM-61 DATA TRANSECT
- 1 ★ — GEOPYSICAL ANOMALY WITH DESIGNATION
- SUSPECTED TRENCH/PIT
- a12-2 — RADIATION SURVEY ANOMALIES (MARKED BY OTHERS)

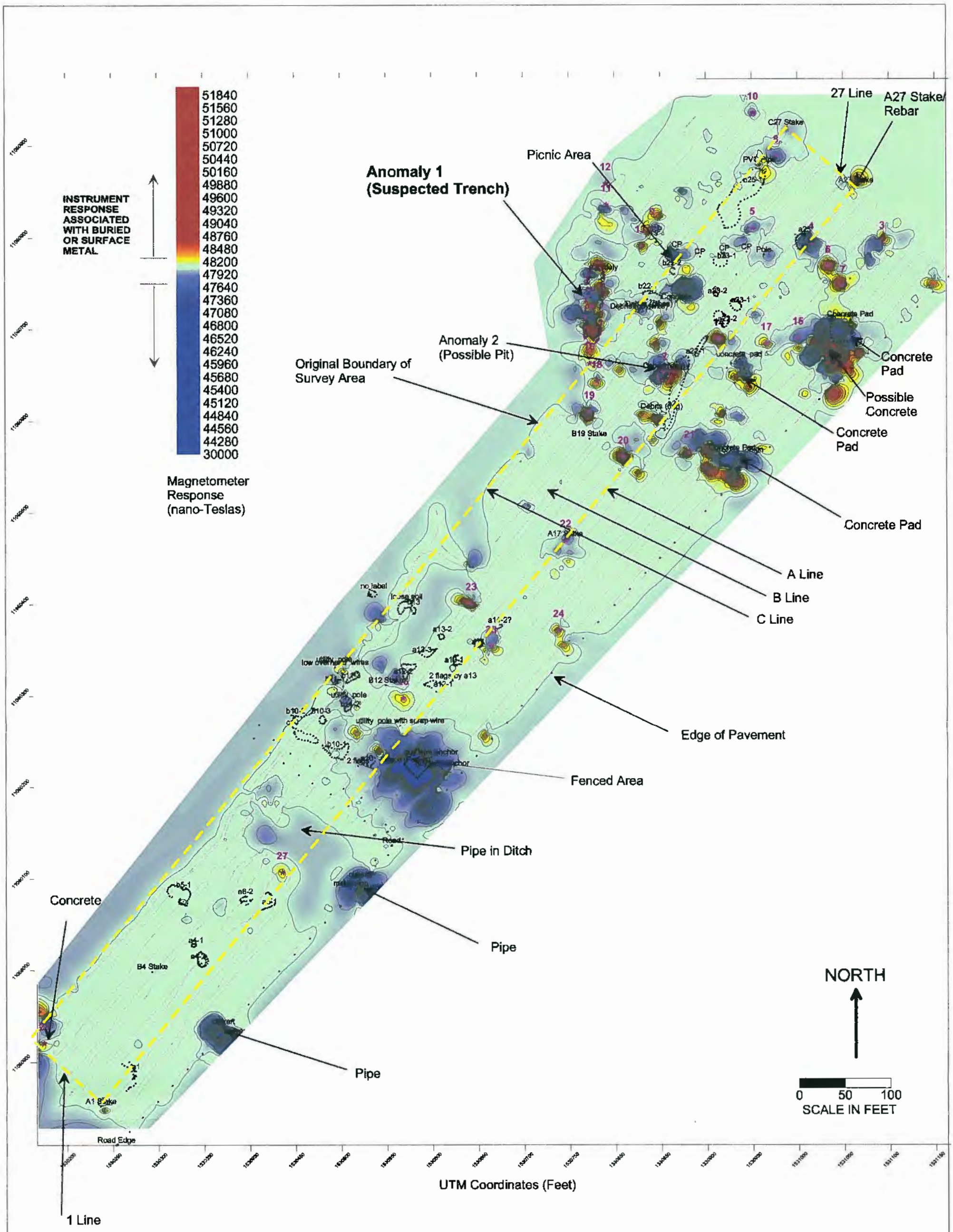
GeoView A geophysical services company	FIGURE 2	SAUFLEY FIELD SITE 1 BURIAL OF METALLIC OBJECTS AREA PENSACOLA, FLORIDA	
	COLOR CONTOUR MAP OF EM-61 RESPONSE	TETRA TECH NUS, INC. TALLAHASSEE, FLORIDA	PROJECT: 12617 DATE: 05/18/11



EXPLANATION

- 20 CONTOUR OF EM RESPONSE (IN PARTS PER THOUSAND)
- EM-31 DATA TRANSECT
- 1 * GEOPYSICAL ANOMALY WITH DESIGNATION
- SUSPECTED TRENCH/PIT
- a12-2 RADIATION SURVEY ANOMALIES (MARKED BY OTHERS)

GeoView A geophysical services company	FIGURE 3	SAUFLEY FIELD SITE 1 BURIAL OF METALLIC OBJECTS AREA PENSACOLA, FLORIDA
	COLOR CONTOUR MAP OF EM-31 INPHASE RESPONSE	TETRA TECH NUS, INC. TALLAHASSEE, FLORIDA PROJECT: 12617 DATE: 05/18/11



EXPLANATION

20 CONTOUR OF MAGNETOMETER RESPONSE (IN NANO-TESLAS)

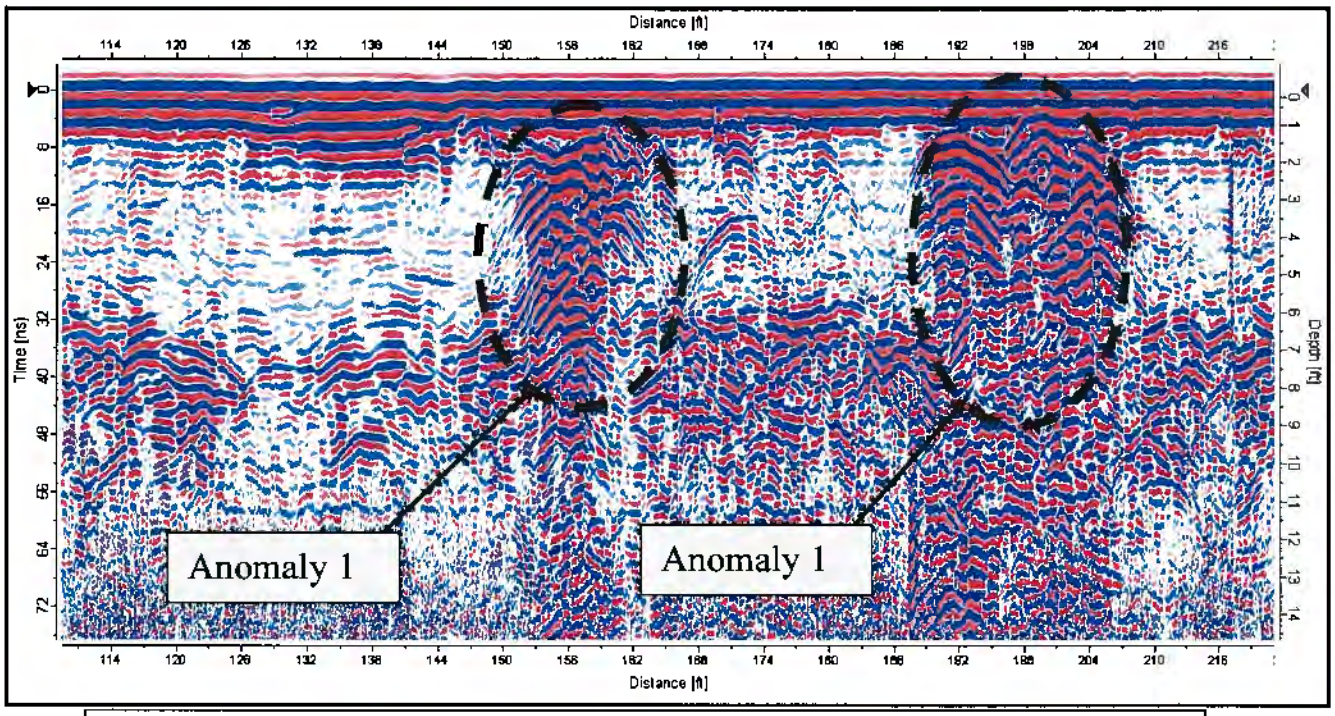
MAGNETOMETER TRANSECT

1 ★ GEOPYSICAL ANOMALY WITH DESIGNATION

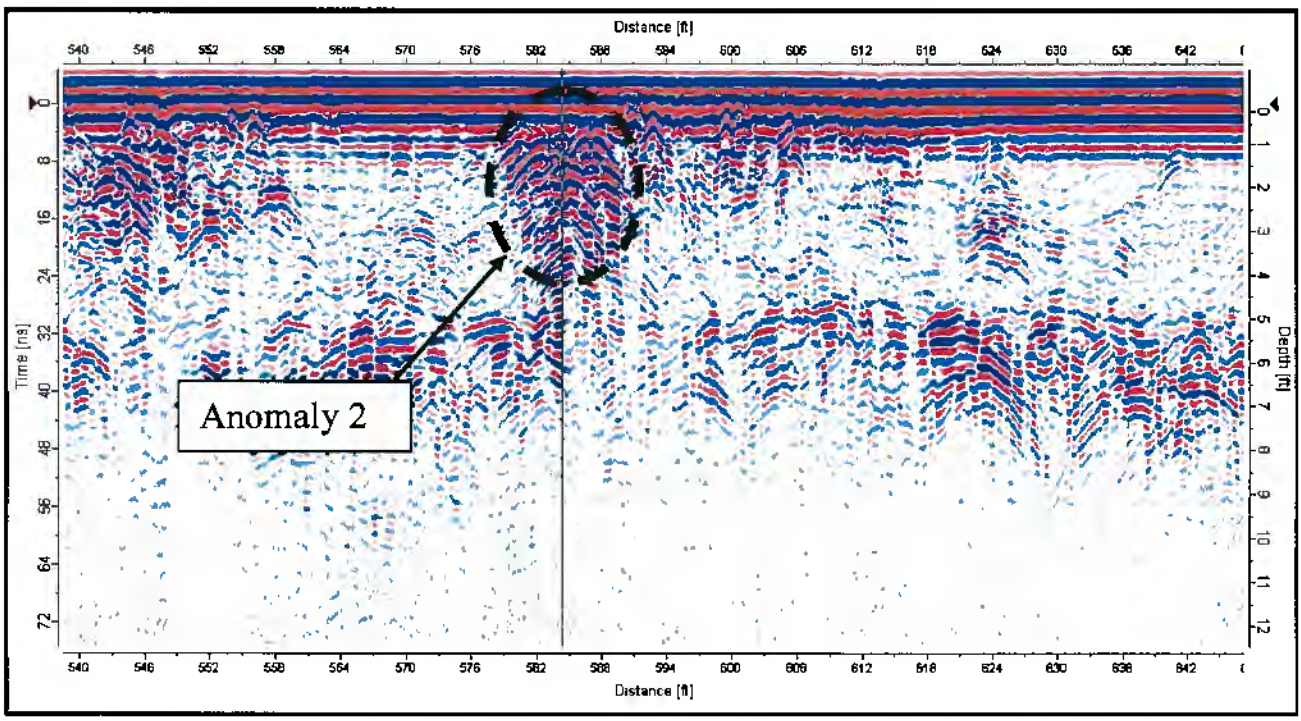
SUSPECTED TRENCH/PIT

a12-2 RADIATION SURVEY ANOMALIES (MARKED BY OTHERS)

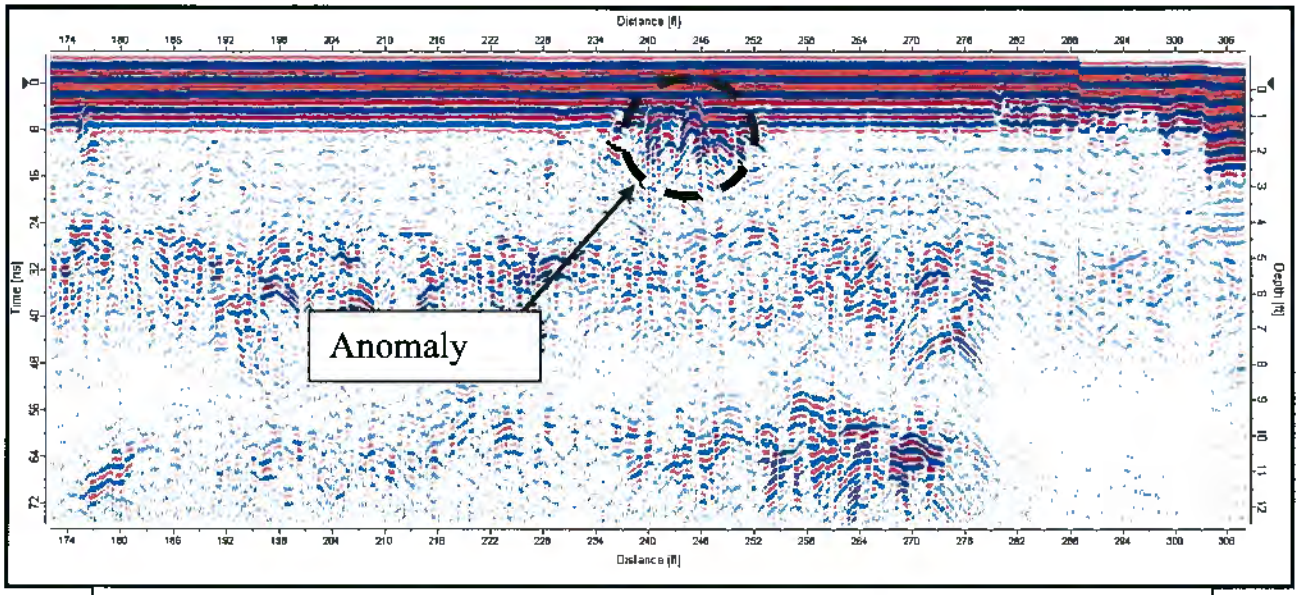
GeoView A geophysical services company	FIGURE 4 COLOR CONTOUR MAP OF MAGNETOMETER RESPONSE	SAUFLEY FIELD SITE 1 BURIAL OF METALLIC OBJECTS AREA PENSACOLA, FLORIDA TETRA TECH NUS, INC. TALLAHASSEE, FLORIDA PROJECT: 12617 DATE: 05/18/11



GPR Transect Across Geophysical Anomaly 1 (the Suspected Trench)
(Two Passes Across the Suspected Trench)



GPR Transect Across Geophysical Anomaly 2 (Possible Debris Pit)



GPR Transect Across a Typical Minor Geophysical Anomaly
(Suspected Minor Amount of Shallow Metallic Debris)

APPENDIX 2
DESCRIPTION OF GEOPHYSICAL METHODS, SURVEY METHODOLOGIES AND LIMITATIONS

A2.1 On Site Measurements

The positions of the transects and anomalies were recorded using a Trimble GeoXH with an external antenna and a Novatel Smart V1 antenna. These GPS systems typically have an accuracy of 1 to 3 ft.

A2.2 Time Domain Electromagnetics

The TDEM (EM-61) method evaluates the magnitude of an induced (secondary) electromagnetic (EM) field caused by a primary EM field after that primary field is suddenly shut off.

During a TDEM (EM-61) sounding, an electrical current is caused to flow in a horizontal transmitter coil located near the ground. The current is maintained until a static magnetic field is established. The current in that coil is then rapidly terminated. This produces a strong electromotive force that induces eddy (secondary) currents in the ground. The eddy currents are caused by the presence of subsurface conductors. With increasing time, the strength of the eddy currents diminishes. The eddy currents, when they are still present induce a voltage in the receiver coil that is proportional to eddy current strength. The eddy current strength also depends on the amount of metal in the subsurface. The more metal present, the longer the eddy currents persist. Field measurement consists of reading the output voltage from the receiver coil registered at a particular time after field shut-off. If no metal is present near the coil, then there are no eddy currents at a late time and the reading is near zero. If metal is present near the coil, then the eddy currents persist for a longer time, and the reading is some positive number. By sensing only the response from the buried metal, the method is capable of detecting targets in highly conductive environments. For TDEM surveys the Geonics Ltd. Model EM-61 metal detection (EM-61) system is used. The EM-61 instrument response is recorded on field-portable computerized data logger (Polycorder Digital Data Recorder) for subsequent data processing and contouring.

The EM-61 survey is performed along predetermined transect lines. The transect lines are typically uni-directional and oriented parallel to the long axis of the site. The spacing between transects ranges from 2 to 5 ft, depending upon the desired size of the target to be identified. Approach is typically +/-5% for both lengths and angles in degrees.

A2.3 EM-31

The EM method is a non-destructive geophysical technique that measures the electrical conductivity of subsurface materials. The conductivity is determined by inducing (from a transmitter) a time-varying magnetic field and measuring (with a receiver) the amplitude and phase shift of an induced secondary magnetic field. The EM survey was conducted using a Geonics EM31-MK2 (EM-31). For soil conditions typical to Florida, the EM unit provides a measurement of ground conductivity to a depth of 15 to 20 ft below land surface.

Variations in subsurface conductivity may be caused by the presence of buried metallic objects or by geological changes such as changes in soil type (clay vs. sand) or variations in pore fluid conductivity. Typical applications for the EM method include:

- Location of buried metallic objects
- Mapping conductive contaminant ground water plumes
- Mapping of non-conductive (hydrocarbon) contaminant ground water plumes
- Delineating abandoned trenches or lagoons with fill material different from native soils
- Determining relative concentrations of near-surface conductive soils (clays)
- Delineating bedrock fracture zones
- Identifying large voids or cavities

There are two components of the induced magnetic field measured by the EM-31 equipment. The first is the quadrature-phase (out-of-phase) component that measures the bulk conductivity of soil and groundwater. This is referred to as the terrain conductivity response with units that are expressed in milli-siemens per meter (mS/m). The second component is the in-phase response that is relatively more sensitive to large metallic objects such as pipes, drums, large items of buried metallic debris and underground storage tanks. This portion of the instrument response is expressed in parts per thousand (ppt). In areas where no metals are present the in-phase response is zero. By using the in-phase and quadrature-phase components, it is possible to determine whether a change in bulk conductivity is due to the presence of buried metallic objects or due to changes in either subsurface soil conditions or pore fluid conductivity.

The EM-31 survey is performed by walking the instrumentation across the project site along a system of parallel transect lines. The separation distance between transect sites is dictated by the survey requirements. For surveys designed

to identify relatively large areas of buried debris (e.g., landfills), a transect spacing of 50 to 100 ft is typical. For surveys designed to identify discrete areas of buried debris, a transect spacing of 10 to 50 ft is used. The EM-31 data is electronically recorded and then downloaded to a computer for processing. EM data is usually presented as either profiles (for an individual transect) or as contour maps. Contour maps are developed using Surfer^{tm}, a computer contouring program.

A2.4 Magnetics

GeoView uses a Geometrics 859 Cesium Vapor magnetometer for total field magnetic investigations. A magnetometer measures the intensity of the total magnetic field in the area around the sensor. The 859 magnetometer measures the magnitude of the total magnetic field independent of instrument orientation.

In environmental and engineering applications, the primary use of a magnetometer is to evaluate perturbations in the magnetic field of the earth that are caused by subsurface anomalies. Perturbations in the total magnetic field caused by subsurface anomalies are the result of a complex relationship between the object and the magnetic field of the earth. The relationship is complex because the total field registered by the instrument is a vectorial representation of three factors which affect the magnitude of the response; (1) The ambient magnetic field of the earth, (2) The inductive contribution from the object, and (3) Any contributions to the total field by remnant or permanent magnetization. Accordingly, the observed intensity of the total field is dependent upon the position of the measuring device within the source field caused by the anomaly. The magnitude of the magnetic field of the earth is typically measured in nano-Telslas (nT).

The localized occurrence of magnetized minerals, iron objects, or cultural features of interest cause spatial variations in the earth's magnetic field. Such variations cause two types of magnetism; induced and remnant (or permanent). Induced magnetization refers to the action of the material in enhancing the earth's magnetic field as the material itself acts as a magnet. The magnitude of the induced field is directly proportional to the strength of the ambient field and the ability of the material to act as a magnet (magnetic susceptibility). Remnant (with rocks) or permanent (with metals) magnetization is the magnetic field caused by the object or material independent of the ambient earth's magnetic field. The magnetic field variations caused by metal objects are a combination of both induced and permanent magnetization.

A2.5 Ground Penetrating Radar

Ground Penetrating Radar (GPR) consists of a set of integrated electronic components which transmits high frequency (200 to 1500 megahertz [MHz]) electromagnetic waves into the ground and records the energy reflected back to the ground surface. The GPR system consists of an antenna, which serves as both a transmitter and receiver, and a profiling recorder that both processes the incoming signal and provides a graphic display of the data. The GPR data can be reviewed as both printed hard copy output or recorded on the profiling recorder's hard drive for later review. GeoView uses a Mala GPR system.

A GPR survey provides a graphic cross-sectional view of subsurface conditions. This cross-sectional view is created from the reflections of repetitive short-duration electromagnetic (EM) waves that are generated as the antenna is pulled across the ground surface. The reflections occur at the subsurface contacts between materials with differing electrical properties. The electrical property contrast that causes the reflections is the dielectric permittivity that is directly related to conductivity of a material. The GPR method is commonly used to identify such targets as underground utilities, underground storage tanks or drums, buried debris, voids, rebar or geological features.

The greater the electrical contrast between the surrounding materials (earth or concrete) and target of interest, the greater the amplitude of the reflected return signal. Unless the buried object is metal, only part of the signal energy will be reflected back to the antenna with the remaining portion of the signal continuing to propagate downward to be reflected by deeper features. If there is little or no electrical contrast between the target interest and surrounding earth materials it will be very difficult if not impossible to identify the object using GPR.

A GPR survey is conducted along survey lines (transects) which are measured paths along which the GPR antenna is moved. Electronic marks are placed in the data by the operator at designated points along the GPR transects. These marks allow for a correlation between the GPR data and the position of the GPR antenna on the ground.

For debris surveys, the GPR survey is conducted along a set of perpendicularly orientated transects. The survey is conducted in two directions. This is because the most definitive GPR signal response indicating the presence of a buried object is obtained when the GPR antenna is passed perpendicular to the long axis of the buried object.

Depth estimates to the top of the debris is determined by dividing the time of

travel of the GPR signal from the land surface to the top of the GPR signal reflection associated with the debris by the velocity of the GPR signal. The velocity of the GPR signal is usually obtained from published tables of the GPR signal traveling through unsaturated soils (4 to 6 nano-seconds per foot two-way travel time). The accuracy of GPR-derived depths typically ranges from 20 to 40 percent of the total depth.

A2.6 Limitations

GeoView can make no warranties or representations of the conditions that may be present beyond the depth of investigation or resolving capability of the EM, TDEM, magnetics or GPR methods or in areas that were either not accessible to the geophysical investigation or where areas of cultural interference were present.

APPENDIX D

FIELD NOTES

Appendix C

January 2012 - Direct Push Soil and Groundwater Sampling

Tetra Tech

PROJECT: Sunflower Field S & I
LOCATION: Pensacola FL
PROJECT MANAGER: Frank Kosse

JOB #: 112G02760
DATE: 1/9/12
FOL: Amber Fox

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (Tetra Tech and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 PID/FID			
2 YSI			
3 turbidity meter			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place	✓		
(OSHA poster, hospital route, key phone numbers, etc.)			

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped	✓		
COCs faxed to appropriate in-house personnel			✓
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis

Tetra Tech

PROJECT: Sunfly Field Site 1 **JOB #:** 112-02760
LOCATION: Pensacola FL **DATE:** 1/16/12
PROJECT MANAGER: Frank Kwong **FOL:** Amber Tyre

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (Tetra Tech and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 PID/FID			
2 YSI			
3 turbidity meter			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place	✓		
(OSHA poster, hospital route, key phone numbers, etc.)			

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped	✓		
COCs faxed to appropriate in-house personnel			✓
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis.

Tetra Tech

PROJECT: Sunflower Field SAI
LOCATION: Pensacola FL
PROJECT MANAGER: Frank Moore
JOB #: 112G02766
DATE: 1/11/12
FOL: Amber Tyre

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (Tetra Tech and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 PID/FID			
2 YSI			
3 turbidity meter			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place (OSHA poster, hospital route, key phone numbers, etc.)	✓		

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped	✓		
COCs faxed to appropriate in-house personnel			✓
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis.

Tetra Tech

PROJECT: Sanford Field S & I
LOCATION: Pensacola FL
PROJECT MANAGER: Frank Keane

JOB #: 112G02760
DATE: 1/12/12
FOL: Amber Tyre

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (Tetra Tech and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 PID/FID			
2 VSI			
3 hydrolab meter			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place	✓		
(OSHA poster, hospital route, key phone numbers, etc.)			

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped	✓		
COCs faxed to appropriate in-house personnel			✓
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis

Tetra Tech

PROJECT: Smithfield Site 1 **JOB #:** 112G02760
LOCATION: Pennsauken PA **DATE:** 11/3/12
PROJECT MANAGER: Frank Moore **FOL:** Amber Tyre

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (Tetra Tech and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 PID/FID			
2 YSI			
3 [illegible] meter			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place (OSHA poster, hospital route, key phone numbers, etc.)	✓		

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped	✓		
COCs faxed to appropriate in-house personnel			✓
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis.

Tetra Tech NUS, Inc.

DAILY ACTIVITIES RECORD

PROJECT NAME: Sandy Field Site 1 **PROJECT NUMBER:** 112-0766

CLIENT: Navy **LOCATION:** Sandy Field

DATE: 1/11/12 **ARRIVAL TIME:** 0700

Tt NUS PERSONNEL: Amber Tyler, Kevin Weingart, Alex Murray **DEPARTURE TIME:** 1800

CONTRACTOR: PREFERRED DRILLING **DRILLER:** Chris Burger

ITEM	QUANTITY ESTIMATE	QUANTITY TODAY	PREVIOUS TOTAL QUANTITY	CUMULATIVE QUANTITY TO DATE
(1) DPT GW SCREEN	10	7	3	10
(2) DPT GW SAMPLING	5	3	–	3

COMMENTS:
(1) 4 BORINGS TO 44' BGS
3 BORINGS TO 39' BGS
(2) 2 BORINGS TO 44' BGS
1 BORING TO 39' BGS

APPROVED BY:

Tt NUS REPRESENTATIVE

DRILLER

DATE: 1/11/12

Tetra Tech NUS, Inc.

DAILY ACTIVITIES RECORD

PROJECT NAME: Sawfly Creek Site 1 **PROJECT NUMBER:** 112G02760

CLIENT: Navy **LOCATION:** Sawfly Creek

DATE: 1/12/12 + 1/13/12 **ARRIVAL TIME:** 0700

Tt NUS PERSONNEL: Amber Tagg, Kevin Weeks + Alex Murphy **DEPARTURE TIME:** 1030

CONTRACTOR: Pickard Drilling **DRILLER:** Chris Burgess

ITEM	QUANTITY ESTIMATE	QUANTITY TODAY	PREVIOUS TOTAL QUANTITY	CUMULATIVE QUANTITY TO DATE
(1) DPT GW Sampling	2	2	–	2
(2) DPT Soil Screen	8	8	–	8
– 15-20' (2-7)				
-20-25' (5-6)				
25-30 (6-9)				
30-35 (8-8)				
35-40 (8-11)				
(30-35) (9-10)				
10-15' (10-6'9)				
25-30 (10-9)				
(3) Bkg GW sampling	1	1	–	1
(4) Bkg GW sampling - screen + pack		55		55
(5) BackFill				
sands	27			27
grout	5			5

COMMENTS: (1) 2 DPT GW collections @ 39' BLS
(2) Soil samples were collected from multiple depths @ multiple locations
(3) Screen materials for bkg GW sample to 69' bls
(4) Screen material for temp GW sample feet PVC 55 feet screen

APPROVED BY:

Tt NUS REPRESENTATIVE

DRILLER

DATE:

(8) Bags of sand back fill

Tetra Tech NUS, Inc.

DAILY ACTIVITIES RECORD

PROJECT NAME: Sandy Field Site 1 **PROJECT NUMBER:** 112G02460
CLIENT: Navy **LOCATION:** Sandy Field
DATE: 1-9-12 **ARRIVAL TIME:** 0700
Tt NUS PERSONNEL: Amber Tyler, Kevin Weichert, Alex Murphy **DEPARTURE TIME:** @ 1800
CONTRACTOR: PREFERRED DRILLING **DRILLER:** Chris Burgess

ITEM	QUANTITY ESTIMATE	QUANTITY TODAY	PREVIOUS TOTAL QUANTITY	CUMULATIVE QUANTITY TO DATE
① DPT SOIL SCREEN	15	3.5	—	3.5

COMMENTS: ① TO BORINGS 6-35 BLS, 5' MACRO CORES 5'-35'

APPROVED BY:

Tt NUS REPRESENTATIVE

DRILLER

DATE: 1/9/12

Tetra Tech NUS, Inc

DAILY ACTIVITIES RECORD

PROJECT NAME: Saufley Field Site 1 **PROJECT NUMBER:** 112G0166

CLIENT: Navy **LOCATION:** Saufley Field

DATE: 1-10-12 **ARRIVAL TIME:** 0700

Tt NUS PERSONNEL: Amber Tyler, Kevin Weichert, Alex Mills **DEPARTURE TIME:** 1800

CONTRACTOR: PREFERRED DRILLING **DRILLER:** Chris Burgess

ITEM	QUANTITY ESTIMATE	QUANTITY TODAY	PREVIOUS TOTAL QUANTITY	CUMULATIVE QUANTITY TO DATE
(1) DPT SOIL SCREEN	15	8.5	2.5	11
(2) DPT GW SCREEN	10	3	—	3

COMMENTS:

(1) 2.5 BORINGS TO 35' WITH MACROCORES 5' → 35'

(2) 3 DPT GW COLLECTIONS AT 39' BGS

4 BORINGS TO 40' WITH MACROCORES 5' - 40'

1 TO 6

APPROVED BY:

Tt NUS REPRESENTATIVE

DRILLER C.B.

DATE: 1/10/12

FIGURE 8-1
SITE-SPECIFIC TRAINING DOCUMENTATION

My signature below indicates that I am aware of the potential hazardous nature of performing field investigation activities at NAS Pensacola, Florida and that I have received site-specific training which included the elements presented below:

- Names of designated personnel and alternates responsible for site sefety and health
- Safety, health, and other hazards present on site
- Use of personal protective equipment
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Emergency response procedures (evacuation and assembly points)
- Incipient response procedures
- Review of the contents of relevant Material Safety Data Sheets
- Review of the use of AHAs
- Review Tetra Tech SOP Excavation
- Stop work authority

I have been given the opportunity to ask questions and my questions have been answered to my satisfaction. The dates of my training and my medical surveillance requirements indicated below are accurate to the best of my knowledge.

Name (Printed and Signature)	Site-Specific Training Date	40-Hour Training (Date)	8-Hour Refresher Training (Date)	8-Hour Supervisory Training (Date)	Medical Exam
Amber Igoe	1/1/11	6/05	1/2011	1/2011	9/2011
Christopher Burger	1/9/11	5/2000	7/2011		1/2011
Patrick Burger	1-9-11	5/2000	7/2011		1/2011
[illegible]	1-9-11	3/98	4/2011	4/2011	9/2011
JAMES Youngs	1-9-1	2/92			10-2011

Instructor(s):_____

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Optional Items: High visibility vests are recommended for these activities in high traffic areas.		control measures for diesel fuel and grout. Supervisory personnel: 8-Hour General Site Worker Supervisory Training [OSHA 29 CFR 1910.120 (e)(4)] Documentation attesting to applicable training and medical clearance will be collected by the FOL and maintained on site.

All persons working within the operational will sign this AHA indicating that they have reviewed the document and are aware of their responsibilities as stated in the AHA. All persons in the operational zone during this activity will have signed off this AHA. It is preferred that the sign off take place once any additional site specific information has been incorporated immediately prior during the review

Name (Printed)	Signature	Occupation	Date Reviewed/Training
Amber Iyer		Env Scientist	1/6/12
KEVIN WEICHERT		ENV. SCIENTIST	1/6/12
K. ALEX Murphy		ENVIRONMENTAL ENG.	1/6/12
Christopher Burger	C. B	Env. driller	1/9/12
C B			
[illegible]	Dan [illegible]	AWS, LLC	1/9/12
JAMES Yount	James Yount	AWS, LLC	1-9-12

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
	handle, etc.) will require removal from service. FOL and SSO to perform regular (e.g., daily) inspections for housekeeping issues. The results of these efforts will be documented in the Field Logbook	Supervisory personnel: 8-Hour General Site Worker Supervisory Training [OSHA 29 CFR 1910 120 (e)(4)] • Documentation attesting to applicable training and medical clearance will be collected by the FOL and/or the SSO. DPT Equipment Inspection – As it is necessary to ensure certain categories are addressed when inspecting this equipment an Equipment Inspection Checklist for Drill Rigs have been provided to assist you. See Attachment IV • Obtain Drillers License or Certification
Personal Protective Equipment: Minimum: Heavy work boots, hardhats when required by the location or when overhead hazards exist, safety glasses, flashlights. **Optional items:** High visibility vest, snake chaps, works gloves. **HTRW**: None anticipated for this task.	Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities. The SSO will be responsible for the implementation of the following Site Specific Health and Safety Programs: • Hazard Communication • Hearing Conservation

All persons working within the operational will sign this AHA indicating that they have reviewed the document and are aware of their responsibilities as stated in the AHA. All persons in the operational zone during this activity will have signed off this AHA. It is preferred that the sign off take place once any additional site specific information has been incorporated immediately prior during the review

Name (Printed)	Signature	Occupation	Date Reviewed/Training
Amber Tyre		Env Scientist	1/6/12
KEVIN WEICHERT	K. WLT	ENV SCIENTIST	1/6/12
Christopher Burger	C. B	Env driller	1/9/12
Patrick Burger	Patrick Burger	Env. Driller	1-9-12
Don Spurczek	Don Spur	AWS, LLC	1-9-12
JAMES YOUNG	James Young	AWS, LLC	1-9-12

Equipment	Inspection	Training
nitrile gloves. If contact with overspray cannot be avoided, rain suit or moisture-repellant disposable coveralls may be specified by the SSO.		initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.

I have read and understand this AHA:

Name (Printed)	Signature	Date
Amber Igoe		1/6/12
KEVIN WEICHERT		1/6/12
K ALEX Murphy		1/6/12
Christopher Burger	CB	1/9/12
Patrick Burger	Patrick S. Burger	1-9-12
Dan Spaulding	Dan Spa	1-9-12
JAMES Yount	James Yount	1-9-12

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Minimum: Safety Glasses; footwear with adequate Lug and ankle support/steel toes; leather/canvas work gloves for site set up. Nitrile surgeons or nitrile outer gloves will be utilized when handling contaminated tubing or sampling. **Optional items**: High visibility vests are recommended for these activities in high traffic areas.		• 40-Hour General Site Worker Training [OSHA 29 CFR 1910.120 (e)] • 8-Hour General Site Worker Refresher Training [OSHA 29 CFR 1910 120 (e)(8)] • Site Specific Training – All personnel shall be instructed and attest to the review and understanding of this HASP prior to the commencement of on-site activity. • Periodically, Tailgate Training Sessions will be conducted to review activities in progress, results of site surveys, and upcoming tasks. It is recommended that AHAs be reviewed prior to conducting the identified task. • Participate in a Medical Clearance/Surveillance Program as described in OSHA 29 CFR 1910.120 (f). • Complete a Medical Data Sheet • Review applicable MSDSs if you are unaware of the hazards and recommended control measures for diesel fuel and grout. Supervisory personnel: 8-Hour General Site Worker Supervisory Training [OSHA 29 CFR 1910.120 (e)(4)] Documentation attesting to applicable training and medical clearance will be collected by the FOL and/or the SSO and maintained on site.

All persons working within the operational will sign this AHA indicating that they have reviewed the document and are aware of their responsibilities as stated in the AHA. All persons in the operational zone during this activity will have signed off this AHA. It is preferred that the sign off take place once any additional site specific information has been incorporated immediately prior during the review

Name (Printed)	Signature	Occupation	Date Reviewed/Training
Amir Iqbal	[illegible]	Env Scientist	1/6/12
KEVIN WEICHERT	[illegible]	ENVIRON. SCIENTIST	1/10/12
K. Alex Murphy	[illegible]	Environmental Engineer	1/6/12
Christopher Burger	C. B	Env driller	1/9/12
Patrick Burger	[illegible]	Env driler	1-9-12
Dan Spicer	[illegible]	AWS, LLC	1-9-12
James Young	James Young	AWS, LLC	1-9-12

EQUIPMENT	INSPECTION	TRAINING
Hand tools (drum dollies, wrenches, etc.)	1. Visual inspection prior to use by user. Check wooden handles for cracks or splinters.	1. All personnel participating in this activity must be current with HAZWOPER training requirements.
Personal Protective Equipment: Minimum: Safety toe boots, safety glasses Optional items: Hardhat, cotton or leather work gloves. HTRW: If contact with IDW is likely, wear chemical-resistant coveralls (e.g., Tyvek) or aprons and surgeon's nitrile gloves under leather/cotton work gloves.	1. Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	1. PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.

I have read and understand this AHA:

Name (Printed)	Signature	Date
Amber Tyler		1/6/12
KEVIN WEICHERT		1/6/12
K. ALEX Murphy		1/6/12
Christopher Burger		1/9/12
Patrick Burger		1-9-12
Dan Spencer		1-9-12
JAMES Young		1-9-12

1-9-12

1100 - 2-1 - 00-02' - FINE LT BROWN SAND
1105 - 2-2 - 02-04' - FINE LT BROWN SAND
1113 2-3 4'-6' - FINE LT BROWN SAND
1125 2-4 6'-8' - FINE LT BROWN SAND
1126 2-5 8'-10' - CLAY W/ SANDS
1137 2-6 10'-15' - CLAY W/ SANDS
1145 2-7 15-20' - CLAY W/ SANDS
1152 2-8 20'-25' - FINE LT BROWN SANDS
1159 2-9 25'-30' - FINE LT BROWN SAND
1205 2-10 30'-33' - FINE LT BROWN SANDS

W @ 33'

1-9-12

0845- ALEX PHONES PID/FID COMPANY FOR TROUBLESHOOTING
23747

0920 CREW SETS UP ON LOCATION (1)

0930- 1-1 COLLECTED 0-2'
- FINE LT BRN SAND

0931- 1-2 COLLECTED - 2'-4'
- FINE LT BRWN SAND

0935 1-3 Collected 4'-6'
- FINE LT BROWN SAND

* 0940 1-4 Collected - 6'-8'
FINE LT BROWN SAND

* 1000 1-5 COLLECTED 8'-10'

1010 1-6 COLLECTED 10' - 15'
FINE SAND w/ CLAY

1018 1-7 COLLECTED 15-20'
FINE SAND w/ CLAY

1028 1-8 COLLECTED 20' - 25'
CLAY LAYER w/ SANDS

1036 1-9 Collected 25' - 30'
RED SANDS

1042 1-10 Collected 30'-33' Hit GW
RED SANDS

1-9-12

1351	3-1	0'-2' FINE LT BROWN SAND
1355	3-2	2'-4' FINE LT BROWN SAND
1357	3-3	4'-6' FINE LT BROWN SAND
1408	3-4	6'-8' FINE LT BROWN SAND
1412	3-5	8'-10' FINE LT BROWN SAND
1415	3-6	10'-15' CLAY
1418	3-7	15'-20' CLAY
1423	3-8	20'-25' FINE SANDS w/ CLAY
1428	3-9	25'-30' FINE SANDS w/ CLAY
1431	3-10	30'-33' FINE SANDS Hit ΔW @ 33'

1-9-12

1440	~~0'-2'~~ 4-1	0'-2'	Dark Brown Sands
1445	4-2	2'-4'	Brown Sands
1450	4-3	4'-6'	LT Brown Sands
1508	4-4	6'-8'	LT Brown Sands
1512	4-5	8'-10'	Clay

0745- 4-6 - RED CLAY | SAND MIX - 10-15'

0750 - 4-7 - RED CLAY 15'-16', YELLOW CLAY 16'-18'-
RED CLAY 18'-20'

0755 - 4-8 - RED CLAY 20' → 23.5', WHITE ~~CLAY~~ SAND 23.5'-25.0'

0802 4-9 - RED CLAY 25-26' LT BROWN SAND ~~CLAY~~ 26-27'
27'-30' RED SAND

0807 - 4-10 - H_2O @ 33' BGS - RED SAND/CLAY MIX - 30-33'

0815- 5-1 - 0-2' - BROWN SAND | ORGANICS

0820 - 5-2 - 2-4' - LT BROWN SAND

0825 - 5-3 - 4-6' - LT BROWN SAND

0835 - 5-4 - 6-8' - LT BROWN SAND

0840 - 5-5 - 8-10' - RED CLAY | SAND MIX

0845 - 5-6 - 10'-15' - RED CLAY / SAND MIX

0900 - 5-7 - 15-19' - RED CLAY - 19'-20' WHITE SAND

0903 - 5-8 - 20-21' - RED CLAY, 21'-24' - LT RED CLAY, 24-25 - WHITE FINE SAND

0905 - 5-9 - 25-27' - RED CLAY/SAND, 27-29 - LT BRN SAND, 29'-30 - LT BRN CLAY

0908 - 5-10 - H_2O @ 34' - LT BROWN SAND CLAY MIX

0910 6-1 - 0-2' - BROWN SAND

0912 - 6-2 - 2-4' - LT BROWN SAND

0914 - 6-3 - 4-6' - LT BROWN SAND

0918 - 6-4 - 6-8 - LT BROWN SAND

0921 - 6-5 - 8-10' - RED SAND | CLAY MIX

0925 - 6-6 - 10-12.5 - RED CLAY / BROWN SAND MIX. 12.5-15' - RED CLAY

0930 - 6-7 - 15'-20 - RED CLAY

0934 - BEGIN DRILLING @ 7

pH: 6.32 ORP: -121.1 44' BGS

COND: 113 DO: 1.01

TEMP: 21.36 TURB: ERROR

0952 - 7 COLLECTED

1010 - BEGIN DRILLING @ 8

pH: 6.42 ORP: -104.8 44' BGS

COND: 102 DO: 0.70

TEMP: 22.95 TURB: ERROR

- 8 COLLECTED

1032

1045 - BEGIN DRILLING @ 9

pH: 6.55 ORP: -108.0

COND: 133 DO: 0.77 44' BGS

TEMP: 23.63 TURB: ERROR

1100 - 9 COLLECTED

1115 - BEGIN DRILLING @ 10

pH: 5.84 ORP: -33.5

COND: 87 DO: 3.23 44' BGS

TEMP: 21.04 TURB: ERROR

1142 - 10 COLLECTED

0933 - 6-8 - 20-23' - RED CLAY, 23'-25', WHITE SAND + BRN CLAY MIX

0936 - 6-9 - 25'-30' - WHITE/LT BROWN SAND - TINY AMNT RED CLA

0942 - 6-10 - 30'-34' - RED CLAY, LT BROWN SAND MIX
- GW @ 34' BGS

1005 - 7-1 - 0-2' - LT BROWN FINE SAND

1009 - 7-2 - 2-4' - LT BROWN FINE SAND

1011 - 7-3 - 4-6' - LT BROWN FINE SAND

1016 - 7-4 - 6-8' - LT BROWN SAND

1019 - 7-5 - 8'-10' - RED CLAY

1024 - 7-6 - 10'-11' BROWN SAND, 11'-15' - RED CLAY/SAND MIX

1030 - 7-7 - LT. RED SAND/CLAY MIX 15'-20'

1034 - 7-8 - 20-21' - BROWN SAND, 21'-24 - LT RED CLAY, 24'-25 BROWN SAND

1040 - 7-9 - RED SAND/CLAY MIX - 25'-30'

1044 - 7-10 - LT BROWN/RED SANDS

1048 - 7-11 - ~~BRO~~ LT BROWN/RED SANDS

1102 – 8-1 – 0-2' – FINE BROWN SAND – ORGANICS
1105 – 8-2 – 2-4' – LT BROWN SAND
1108 – 8-3 – 4-6' – LT BROWN SAND
1114 – 8-4 – 6-8' – LT BROWN SAND
1117 – 8-5 – 8-10' – RED SAND/CLAY MIX
1121 – 8-6 – 10'-14' – RED CLAY/SAND MIX – 14'-15' – WHITE SAND
1125 – 8-7 – 15'-16' – LT RED SAND/CLAY MIX, 16'-19' – LT. RED CLAY, 19'-20' – BROWN SAND
1129 – 8-8 – 20'-24' – LT RED CLAY, 24'-25' – WHITE SAND
1133 – 8-9 – 25'-30' – LITE RED CLAY/SAND MIX
1137 – 8-10 – 30'-32.5' – LT BROWN SAND, 32.5'-35' – LT RED SAND
1140 – 8-11 – H_2O @ 38' BGS – LT RED/WHITE SAND MIX

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150 – 9-1 – 02 – BROWN SAND W/ ORGANICS
152 – 9-2 – 2-4 – LT BROWN SAND
155 – 9-3 4'-6' – LT BROWN SAND
208 – 9-4 – 6'-8' – LT BROWN SAND
212 – 9-5 – 8'-10' – RED CLAY
217 – 9-6 – 10'-11' – BROWN SAND, 11'-15' – RED CLAY
221 – 9-7 – 15'-20' LT RED CLAY
224 – 9-8 – 20'-25' – LT RED/YELLOW CLAY MIX
230 – 9-9 – 25-27.5 – RED BROWN CLAY, 27.5 – 30.0' – LT BROWN SAND
233 – 9-10 – WHITE/RED MIXED SAND
237 – 9-11 – H_2O @ 39' – RED/BROWN SAND MIX

1320 - 10-1 - 0-2' - BROWN SAND
1322 - 10-2 - 2'-4' - LT BROWN SAND
1325 - 10-3 - 4'-6' - LT BROWN SAND
1330 - 10-4 - 6'-8' - LT BROWN SAN
1334 - 10-5 - 8'-10' - RED CLAY
1340 - 10-6 - 10'-11 - LT BROWN SAND, 11'-15' - RED CLAY
1343 - 10-7 - 15'-18' - LT RED CLAY/SAND, 18'-20' - LT RED SAND
1347 - 10-8 - 20'-25' - RED CLAY
1350 - 10-9 - 25'-30' - LT RED CLAY/SAND
1355 - 10-10 - RED/BROWN CLAY (30-32.5') WHITE/RED SAND MIX (32.5 → 35'
1400 - 10-11 - LT BROWN SAND 37' to GW

1423 - 11-1 - 02 - LT BRN SAND
1425 - 11-2 - 2-4 - LT BRN SAND
1428 - 11-3 - 4-6 - LT BRN SAND

GW SCREENING

CAL DATA pH: 4.09/4.00
6.97/7.00
10.17/10.01
CON: 931/1000 uS/cm
ORP: 238.5/240.1
DO: 125.9%/100.1%

07J01366
LAMOTTE - ME 10467
0.00/0.00
0.96/0.99
10.57/9.99

GW SCREEN

(1) - 39' BGS SCREEN = 35' - 39'

1/11/12

0700- ON SITE
0730- HEAD to LOCATION
0748- BEGIN DRILLING @ LOC (4) 39' BGS

ph: 7.37 ORP: -117.0
temp: 21.55 DO: 1.60
cond: 198 TURB: ERROR TO HIGH

0815 - (4) COLLECTED

0824- BEGIN DRILLING AT (5)

pH: 6.64 ORP: -151.4 39' BGS
Temp: 21.34 DO: 2.89
Cond: 160 TURB: ERROR

0845 - (5) COLLECTED

~~0900~~ 0900- BEGIN DRILLING AT (6) 39' BGS

pH: 6.46 ORP: -130.5
Temp: 22.79 DO: 0.78
Cond: 160 TURB: ERROR

0918 - (6) COLLECTED

1-866-692-5721 19022 99 #

AQR Color-Tec® Data Log

Site Name: Sanofi Field Site 1

Sample ID	Sample Collection Date	Sample Collection Time	Sampling Depth Interval (feet)	Sample Matrix (water/soil)	Color-Tec Reading			Comments
DP01-1	2/8/2007	1530	15-19	water	0.5/LL/100			
DP01-2	2/8/2007	1600	20-24	water	6/LL/50			
DP01-3	2/8/2007	1630	25-29	water	10/L/100			
1-1	1/9/12	0930	0-2	Soil	0.0/LL/100			
1-2	↓	0930	2-4	Soil	0.0/LL/200			
1-3		0935	4-6	Soil	0.0/LL/200			
1-4		0940	6-8	Soil	0.0/LL/200			
1-5		1000	8-10	Soil	0.0/LL/200			
1-6		1010	10-15	Soil	0.0/LL/200			
1-7		1018	15-20	Soil	0.0/LL/200			
1-8		1020	20-25	↓	0.0/LL/200			
1-9		1025	25-30		0.0/LL/200			
1-10	↓	1042	30-33	↓	0.0/LL/200			Water table @ 33'
2-1	1/9/12	1100	0-2	Soil	0.0/LL/200			
2-2	↓	1105	2-4	" "	0.0/LL/200			
2-3		1113	4-6	" "	0.0/LL/200			
2-4		1125	6-8	" "	0.0/LL/200			
2-5		1126	8-10	" "	0.0/LL/200			
2-6		1134	10-15	" "	0.0/LL/200			
2-7		1145	15-20	" "	0.0/LL/200			
2-8		1147	20-25	" "	0.0/LL/200			
2-9		1159	25-30	" "	0.0/LL/200			
2-10	↓	1205	30-33					Water table @ 33'

AQR Color-Tec® Data Log

Site Name: Sawtley Field Site 1 - recording color conversion

Sample ID	Sample Collection Date	Sample Collection Time	Sampling Depth Interval (feet)	Sample Matrix (water/soil)	Color-Tec Reading			Comments
DP01-1	2/8/2007	1530	15-19	water	0.5/LL/100			
DP01-2	2/8/2007	1600	20-24	water	6/LL/50			
DP01-3	2/8/2007	1630	25-29	water	10/L/100			
3-1	1/11/12	1351	0-2	Soil	0/LL/200			
3-2		1355	2-4		0/LL/200			
3-3		1357	4-6		0/LL/200			
3-4		1400	6-8		0/LL/200			
3-5		1412	8-10		0/LL/200			
3-6		1415	10-15		0/LL/200			
3-7		1418	15-20		0/LL/200			
3-8		1423	20-25					
3-9		1428	25-30					
3-10		1431	30-33					H2O @ 33'
4-1	1/11/12	1440	0-2	Soil	0/LL/200			
4-2		1445	2-4		0/LL/200			
4-3		1450	4-6		0/LL/200			
4-4		1500	6-8		0/LL/200			
4-5		1512	8-10		0/LL/200			
4-6	1/10/12	0745	10-15	Soil	0/LL/200			
4-7		0750	15-20		0/LL/200			
4-8		0755	20-25		0/LL/200			
4-9		0800	25-30		0/LL/200			
4-10		0807	30-33		0/LL/200			H2O @ 33'

AQR Color-Tec® Data Log

Site Name: Sanftey Field Site 1

Sample ID	Sample Collection Date	Sample Collection Time	Sampling Depth Interval (feet)	Sample Matrix (water/soil)	Color-Tec Reading			Comments
DP01-1	2/8/2007	1530	15-19	water	0.5/LL/100			
DP01-2	2/8/2007	1600	20-24	water	6/LL/50			
DP01-3	2/8/2007	1630	25-29	water	10/L/100			
5-1	1/10/12	0810	0-2	Soil	0/LL/200			
5-2		0815	2-4		0/LL/200			
5-3		0820	4-6		0/LL/200			
5-4		0825	6-8		0/LL/200			
5-5		0830	8-10		0/LL/200			
5-6		0835	10-15		0/LL/200			
5-7		0900	15-20		0/LL/200			
5-8		0903	20-25		0/LL/200			
5-9		0905	25-30		0/LL/200			
5-10		0900	30-33		0/LL/200			Water @ 33.
6-1	1/10/12	0910	0-2	Soil	0/LL/200			
6-2		0912	2-4		0/LL/200			
6-3		0914	4-6		0/LL/200			
6-4		0919	6-8		0/LL/200			
6-5		0921	8-10		0/LL/200			
6-6		0925	10-15		0/LL/200			
6-7		0930	15-20		0/LL/200			
6-8		0933	20-25		0/LL/200			
6-9		0936	25-30		0/LL/200			
6-10		0942	30-33		0/LL/200			Water @ 31.

AQR Color-Tec® Data Log

Site Name: Sandy Field Site 1

	Sample ID	Sample Collection Date	Sample Collection Time	Sampling Depth Interval (feet)	Sample Matrix (water/soil)	Color-Tec Reading			Comments
	DP01-1	2/8/2007	1530	15-19	water	0.5/LL/100			
	DP01-2	2/8/2007	1600	20-24	water	6/LL/50			
	DP01-3	2/8/2007	1630	25-29	water	10/L/100			
0-2	7-1	1/10/12	1005	0-2	Soil	0/LL/100			
2-4	7-2		1004	2-4		0/LL/200			
4-6	7-3		1011	4-6		0/LL/100			
6-8	7-4		1016	6-8		0/LL/100			
8-10'	7-5		1019	8-10		0/LL/100			
	7-6		1024	10-15		0/LL/200			
	7-7		1030	15-20		0/LL/100			
	7-8		1034	20-25		0/LL/200			
	7-9		1040	25-30		0/LL/200			
	7-10		1044	30-35		0/LL/200			
	7-11		1048	35-40		0/LL/200			H2O @ 39'
	8-1	1/10/12	1102	0-2	Soil	0/LL/100			
	8-2		1105	2-4		0/LL/100			
	8-3		1108	4-6		0/LL/200			
	8-4		1114	6-8		0/LL/200			
	8-5		1117	8-10		0/LL/200			
	8-6		1121	10-15		0/LL/200			
	8-7		1125	15-20		0/LL/200			
	8-8		1129	20-25		0/LL/200			
	8-9		1133	25-30		0/LL/200			
	8-10		1137	30-35		0/LL/200			
	8-11		1140	35-40		0/LL/200			H2O @ 38'

AQR Color-Tec® Data Log

Site Name: Sandy Creek Site 1

Sample ID	Sample Collection Date	Sample Collection Time	Sampling Depth Interval (feet)	Sample Matrix (water/soil)	Color-Tec Reading			Comments
DP01-1	2/8/2007	1530	15-19	water	0.5/LL/100			
DP01-2	2/8/2007	1600	20-24	water	6/LL/50			
DP01-3	2/8/2007	1630	25-29	water	10/L/100			
9-1	1/10/12	1140	0-2	Soil	0/LL/200			
9-2		1142	2-4		0/LL/200			
9-3		1155	4-6		0/LL/200			
9-4		1200	6-8		0/LL/200			
9-5		1122	8-10		0/LL/200			
9-6		1217	10-15		0/LL/200			
9-7		1221	15-20		0/LL/200			
9-8		1224	20-25		0/LL/200			
9-9		1230	25-30		0/LL/200			
9-10		1233	30-35		0/LL/200			
9-11		1237	35-40		0/LL/200			
10-1	1/10/12	1320	0-2	Soil	0/LL/200			
10-2		1322	2-4		0/LL/200			
10-3		1325	4-6		0/LL/200			
10-4		1330	6-8		0/LL/200			
10-5		1334	8-10		0/LL/200			
10-6		1340	10-15		0/LL/200			
10-7		1343	15-20		0/LL/200			
10-8		1347	20-25		0/LL/200			
10-9		1350	25-30		0/LL/200			
10-10		1355	30-35		0/LL/200			
10-11		1400	35-40		0/LL/200			

Jse
Jes
Pullin' 25 mm
120 ft only

AQR Color-Tec® Data Log

Site Name:

Sample ID	Sample Collection Date	Sample Collection Time	Sampling Depth Interval (feet)	Sample Matrix (water/soil)	Color-Tec Reading			Comments
DP01-1	2/8/2007	1530	15-19	water	0.5/LL/100			
DP01-2	2/8/2007	1600	20-24	water	6/LL/50			
DP01-3	2/8/2007	1630	25-29	water	10/L/100			
11-1	1/10/12	1423	0-2	Soil	0/LL/200			
11-2	↓	1425	2-4	↓	0/LL/200			
11-3	↓	1429	4-6	↓	0/LL/200			
G-1	1/10/12	1519	33-36	water	0/LL/200			
G-2	↓	1607	33-39	↓	0/LL/200			
G-3	↓	1648	33-39	↓	0/LL/200			
G-4	1/11/12	0815	33-39	water	0/LL/200			
G-5	↓	0845	33-39	↓	0/LL/200			
G-6	↓	0918	33-39	↓	0/LL/200			
G-7	↓	0952		↓	0/LL/200			
G-8	↓	1036		↓	0/LL/200			

42-92-7040 7959

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME: Sanfley Site 1

SITE NAME:

PROJECT No.:

INSTRUMENT NAME/MODEL: FVA - 1000

MANUFACTURER: Foxboro

SERIAL NUMBER: 9607 - 0935

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings: Pre-calibration	Instrument Settings: ~~Post-calibration~~ Pre-Post	Instrument Readings: ~~Pre-calibration~~ Pre-Post	Instrument Readings: Post-calibration	Calibration Standard (Lot No.)	Remarks and Comments
1/9/12		A. Murphy	AMBIENT	0.00	AMBIENT	0.00	412227	~~100 ppm CH4~~
				0.00		0.00		
			CAL GAS	0.00 *				* MACHINE ERROR DUE TO NO PREV. CAL
			FID	0.00 *				
			Methane	100ppm	PID	98.0	100ppm	100ppm
			Isobutylene	100ppm	PID	102.0	100ppm	
1304 1/9/12		A. Murphy	AMBIENT	0.00ppm		0.30ppm	0.00ppm	
			METHANE	100ppm	PID	104ppm	100ppm	
			ISOBUTYLENE	100ppm	PID	*	100ppm	* Could Not Calibrate PID FOR ISOBUTYLENE
1/11/12	YSI 556MB	A. Murphy	Pre Cal	Post Cal	Pre Read	Post Read		
				10.00	10.25			
				Pre Calibration Reading		Post Reading		
1/11/12		A. Murphy	AMBIENT	0.00			0.00ppm	
			Methane	100ppm	PID	112	100ppm	* FID WOULD NOT CAL. ANY MORE ACCURATELY + BEFORE RAN OUT OF CAL GAS.
			ISOBUTYLENE	98.99	PID		100ppm	

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME: Sautley Site 1

SITE NAME:

PROJECT No.:

INSTRUMENT NAME/MODEL: YSI 556 MPS / LAMOTTE 2020

MANUFACTURER: YSI INCORPORATED / LAMOTTE

SERIAL NUMBER: 07J101366 / ME10457

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
1/11/12	556 MPS	A. Murphy	pH	10.00	10.49	10.02	10.0	pH 10.0 / 9265 exp. 10/21/12
				7.00	7.02	7.00	7.0	pH 7.0 / 9270 exp. 10/12/12
				4.00	~~4.05~~ 3.73	4.01	4.0	pH 4.0 / 0262-12 exp 8/27/12
				1000 µS/cm	878	999	1000 µS/cm	1000 µS/cm / 10600348 exp 6/30/12
			COND	1000	951	1000		
			ORP	240.0	246.2	240.0	1 16 100 mV	exp. 8/2013
			DO	100.0%	91.9%	100.1%	—	—
1/11/12	ME10457	KW	turb	0.0	0.02	0.01		
				1.0	0.33	0.99		
				10.0	8.72	9.99		
1/12/2012	ME10457	A. Murphy	Turb	0.0		0.00	0.00	Exp 6/12
				1.0	0.99	0.99	0.00	Exp 2/12
				10.0	9.72	9.92	10.00	Exp 12/11
1/12/2012	556 MPS	A. Murphy	pH	7.00	6.89	7.01	7.00	9270 Exp 10/12/2012
				4.0	4.22	4.00	4.00	0262-12 Exp 8/27/12
				10.0	10.06	10.01	10.00	9265 Exp 10/21/12
			DO	100%	104.1%	100.3%	100%	
			Conduct.	1000	990	1003	1000 µS/cm	12
			ORP	240*	245.1	240.0		*Passed on 14 Zobell chart Exp 8/2013

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Saufley Field Site 1
Project No.: 112G02760 F1 OP1

Sample ID No.: SF-1-SB02-15-20-01/2/12
Sample Location: 2-7
Sampled By: Kevin Weichert/Alex Murphy
C.O.C. No.: Amber Tyler

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1/12/12	1355 10/5			
Method:				
OPT				
Monitor Readings		15-20 feet	Rust	Med fine sands w/ clay
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	4-4oz Soil Kit	Yes	
SVOC	1-4oz jar		
Pest/PCB/ SVOC (Sim)	1-9oz jar		
Flo-Pro	1-4oz jar		
Metals	1-2oz jar		

OBSERVATIONS / NOTES:

MAP:

2* (Target trench)

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Sauflky Field Site 1
Project No.: 112W01760 61.OP1

Sample ID No.: SF-1-SB05-20-25-01/2012
Sample Location: 5-B
Sampled By: Kevin Weinbach/Alex Murphy
C.O.C. No.:

[] Surface Soil
[✓] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:			
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1/12/12	1055			
Method:				
OP7				20-24 rusty orange mottled clay
Monitor Readings		20-25		25-30 gray medium-fine sands
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	4-40 mL soil kit	✓	
SVOC	1-4 oz jar	✓	
Pest/PCB/SVOC (Sim)	1-4 oz jar	✓	
TL-PRO	1-4 oz jar	✓	
Metals	1-2 oz jar	✓	

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Ouplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Saufley Field Site 1
Project No.: 112G-02140 F1 OP1

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: SF-1-SB06-0530-01/20/12
Sample Location: 6-9
Sampled By: Kevin Weichert / Alex Murphy
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

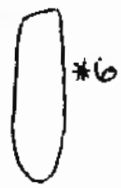
Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1/12/12	1125			
Method:				
DPT				
Monitor Readings		4.5 to 25-30		light orange mottling - fine sand
(Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	4-40mL vial	Y	
SVOC	1-4oz jar		
Pest/PCB/SVOC (Sim)	1-9oz jar		
FLD PID	1-4oz jar		
metals	1-2oz jar		

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Sawtelle Road Site 1
Project No.: 112G02760 01.001

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: SF-1-SB07-3035-01/2012
Sample Location: 7-10
Sampled By: Ken [illegible] / Alex Murphy
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

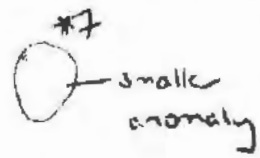
Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1/12/12	1150			
Method: DPT				
Monitor Readings (Range in ppm):		30-35	Rusty	Med fine sand

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	4-40 mL soil kit	Y	
SVOC	1-4 oz jar		
Pest/PCB/SVOC (S-m)	1-9 oz jar		
FL-PO	1-4 oz jar		
metals	1-2 oz jar		

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

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1

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: Saufley Field Site 1
Project No.: 112622 FI-OP1

Sample ID No.: SF-1-SB08-20-25-01/2012
Sample Location: 98
Sampled By: Kevin Weisbart
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

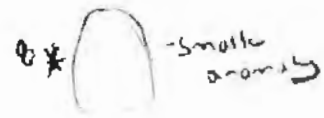
Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1/12/12	1225			
Method:				
Monitor Readings (Range in ppm):		20-25	orange-red	clayey w/ small amounts of sand

SAMPLE COLLECTION INFORMATION:

#	Analysis	Container Requirements	Collected	Other
	VOC	4 - 40 ml Soil kit		
	SVOC	1 - 4 oz jar		
	Pest/PCB/SVOC (S.m)	1 - 9 oz jar		
	FL-PRO	1 - 4 oz jar		
	Metals	1 - 2 oz jar		

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

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Project Site Name: Sauthy Creek Site 1
Project No.: 112G02760 FL.001

Sample ID No.: SF-1-SB06-35-40-01 2012
Sample Location: 8-11
Sampled By: Kevin Weidner
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

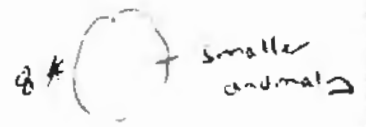
Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1/12/12	1225			
Method: DPT				
Monitor Readings (Range in ppm): N/A		35-40	rust	med fine sands

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	4 - 40 ml soil kit	V	
SVOC	1 - 4 oz jar		
Pest/PCB/SVOC (Sim)	1 - 9 oz jar		
FL-Pro	1 - 4 oz jar		
metals	1 - 2 oz jar		

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Sawtelle Field Site 1
Project No.: 112G 02760 FI.001

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: SF-1-SB09-30-35-01/2012
Sample Location: 9-10
Sampled By: Kevin Weinbert / Alex Murphy
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

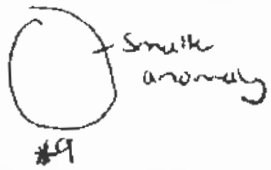
Date: 1/12/12	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
	1315			
Method: DPT				
Monitor Readings (Range in ppm): NA		30-35	rust	med-fine sand

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	4-40mL Soil kit		
SVOC	1-4 oz jar		
Pest/PCB/SVOC (Sim)	1-4 oz jar		
FL-PRO	1-4 oz jar		
metals	1-2 oz jar		

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Scuffly Creek Site
Project No.:

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Sample ID No.: SF-1-SB10-0-2-01/1412
Sample Location: 10-1
Sampled By: Kevin Wieczorek / Alex Murphy
C.O.C. No.:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1/12/12	1335			
Method: DPT				
Monitor Readings (Range in ppm):		0-2'		Dark brown mud sand

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	4- 40 mL Soil Kit		
SVOC	1- 4oz jar		
Pest/PCB/SVOC (SIM)	1- 9oz jar		
FloPRO	1- 4oz jar		
metals	1- 2oz jar		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:
✓/✓	FD01112608

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of___

Project Site Name: Sawtelle Field Site 1
Project No.: 112-02760

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: SF-1-SB10-10-15-01/2012
Sample Location: 10-6
Sampled By: Ken Weinhart / Alex Murphy
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1/12/12	1405	10-15	rust	med fine sands w/ small amounts of clay
Method: DPT				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	4- 40 mL w/ kit		
SVOC	1- 4oz jar		
Pest/PCB/SVOC (Sim)	1- 9oz jar		
Flo-Pro	1- 4oz jar		
metals	1- 2oz jar		

1431

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Saufley Field Site 1
Project No.: 112G-02760 F1.001

Sample ID No.: F-1-SB10-25-30-01202
Sample Location: 10-9
Sampled By:
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:			
Time:			
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

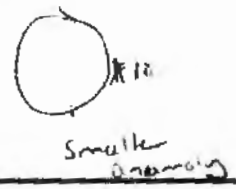
Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1/12/12	1420	25-30	light brown	[illegible]
Method: DPT				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	4 - 40ml soil kit		
SVOC	1 - 4 oz jar		
Pest/PCB/ SVOC(SIM)	1 - 4 oz jar		
FL - Pro	1 - 4 oz jar		
metals	1 - 2 oz jar		

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Sawtry Field Site 1
Project No.: 112G02760 FL0R2

Sample ID No.: SF-1-SB11-0-2-01/2012
Sample Location: 11-1
Sampled By: Kevin Weschert / Alex Murphy
C.O.C. No.:

[X] Surface Soil
[ ] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[X] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 1/12/2012 Time: 1440 Method: GRAB Monitor Reading (ppm):	0-2'	LT BROWN	MEDIUM - MEDIUM FINE SAND

COMPOSITE SAMPLE DATA:

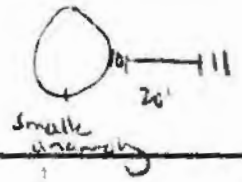
Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
1/12/12	1440	0-2	dark brown	organic sands
Method: auger				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOC	4-40ml Soil Kit	✓	
SVOC	1-4oz jar	✓	
Pest/PCB/SVOC (Sim)	1-9oz jar	✓	
Ft-Pro	1-4oz jar	✓	
Metals	1-2oz jar	✓	

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:
	FD01/12203

Signature(s):

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME:	SITE LOCATION:
WELL NO: G-4	SAMPLE ID: SF-1-GW04-35-39-01/2012 DATE: 1-12-12

PURGING DATA

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 35 feet to 39 feet	STATIC DEPTH TO WATER (feet): 35	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (39 feet – 35 feet) X x.04 x3.8 L/GAL gallons/foot = .606 L gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 36'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 36'	PURGING INITIATED AT: 0848	PURGING ENDED AT: 0903	TOTAL VOLUME PURGED (~~gallons~~ L): 4.5 L

TIME	VOLUME PURGED (~~gallons~~ L)	CUMUL. VOLUME PURGED (~~gallons~~ L)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ORP (describe)
0848	—	—	300	35*	—	—	—	—	—	—	—
0851	.9	.9	300	35	4.38	22.60	71	4.80	ERROR ①	BROWN	-26.6
0854	.9	1.8	300	35	4.37	22.78	80	5.29	ERROR	BROWN	-17.3
0857	.9	2.7	300	35	4.39	22.88	92	4.84	ERROR	BROWN	-17.4
0900	.9	3.6	300	35	4.44	22.68	74	4.95	ERROR	BROWN	-17.1
0903	.9	4.5	300	35	4.44	22.66	78	4.96	ERROR	BROWN	-18.0
0905 – SAMPLE TIME – 5 WELL VOLUMES PURGED											

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014, 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump, O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: KEVIN WEICHELT	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 0905	SAMPLING ENDED AT: 1015
PUMP OR TUBING DEPTH IN WELL (feet): 36'	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			

REMARKS: *ESTIMATION- PROBE WON'T FIT IN WELL
① TURB TO HIGH FOR INSTRUMENT TO READ

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump, RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Sanley Field - Site 1	SITE LOCATION: Pensacola, Florida
WELL NO: G-3	SAMPLE ID: SF-1-GW03-01/2012
DATE: 1/12/2012	

PURGING DATA

WELL DIAMETER (inches): 1"	TUBING DIAMETER (inches): 1/4"	WELL SCREEN INTERVAL DEPTH: 35 feet to 39 feet	STATIC DEPTH TO WATER (feet): 35	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (39 feet – 35 feet) X 0.04 gallons/foot = 0.608 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 36	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 36	PURGING INITIATED AT: 0813	PURGING ENDED AT: 0828	TOTAL VOLUME PURGED (gallons): 4.5

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (~~gpm~~)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ORP (describe)
0813	—	—	300 mL/L	35 *	— (1)	—	—	— (1)	—	—	—
0816	0.9	0.9	300 mL/L	35	7.75	20.94	127	13.56	3315	BROWN	-87.5
0819	0.9	1.8	300 mL/L	35	6.51	21.12	116	5.09	1173	BROWN	-72.0
0822	0.9	2.7	300 mL/L	35	5.43	21.3	111	5.28	386	BROWN	-67.6
0825	0.9	3.6	300 mL/L	35	5.60	21.50	111	5.33	305	LT BROWN	-57.2
0828	0.9	4.5	300 mL/L	35	5.43	21.50	109	5.95	177	LT BROWN	-55.1
0830		START	SAMPLING –	PURGED	5 WELL	VOLUMES					

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump, PP = Peristaltic Pump, O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: K. Alex Murphy	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 0830	SAMPLING ENDED AT: 1007
PUMP OR TUBING DEPTH IN WELL (feet): 36	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: (Y) N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
1	8	AG	1L	NONE	N/A	N/A	SVOC	APP	300 mL/min
2	8	AG	1L	ICE	N/A	N/A	SVOC (sim)	APP	300
3	8	AG	1L	ICE	N/A	N/A	PEST/PCB	APP	300
4	8	AG	1L	HCl	Pre preserved	<2	FLO-PRO	APP	300
5	4	P	250mL	HNO3	Pre preserved	<2	METALS	APP	300
6	12	CG	40mL	HCl	Pre preserved	<2	VOCs	RPPP	RPPP

REMARKS: * PROBE COULD NOT FIT BORING, DEPTH BASED ON SOIL SCREENING
(1) COULD NOT STABILIZE pH & DO DUE TO MECHANICAL LIFT METHOD USED

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon, O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump
RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain) O = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: SAUFLEY FIELD SITE 1	SITE LOCATION: PENSACOLA, FL
WELL NO: G-6	SAMPLE ID: SF-1-GW06-35-39-01/2012 DATE: 1/11/12

PURGING DATA

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 35 feet to 39 feet	STATIC DEPTH TO WATER (feet): 35	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (39 feet – 35 feet) X .04 X 3.84 GAL = .608 L
gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 36'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 36'	PURGING INITIATED AT: 1612	PURGING ENDED AT: 1627	TOTAL VOLUME PURGED (~~gallons~~): 4.5 L

TIME	VOLUME PURGED (~~gallons~~) L	CUMUL. VOLUME PURGED (~~gallons~~) L	PURGE RATE (mL/min)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ORP (describe)
1612	—	—	300	35	—	—	—	—	—	—	—
1615	.9	.9	300	35*	5.75	18.88	139	2.99	ERROR①	GREY	-90.7
1618	.9	1.8	300	35	6.27	21.76	141	1.11	ERROR	GREY	-98.2
1621	.9	2.7	300	35	5.85	21.24	125	4.08	ERROR	GREY	-80.1
1624	.9	3.6	300	35	5.82	21.46	130	4.46	ERROR	GREY	-84.3
1627	.9	4.5	300	35	5.44	22.10	127	5.35	ERROR	GREY	-67.6
1630 – SAMPLE TIME – 5 WELL VOLUMES PURGED											

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: KEVIN WEICHERT	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 1630	SAMPLING ENDED AT: 1713
PUMP OR TUBING DEPTH IN WELL (feet): 36 / RFPP	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y N (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
1	2	AG	1L	ICE	N/A	N/A	SVOC	APP	300
2	2	AG	1L	ICE	N/A	N/A	SVOC (SIM)	APP	300
3	2	AG	1L	ICE	N/A	N/A	Pest. / PCB	APP	300
4	2	AG	1L	HCl	PRE-PRESERVED	<2	Fld Pro	APP	300
5	1	P	250mL	HNO3	PRE-PRESERVED	<2	METALS	APP	300
6	3	CG	40mL	HCl	PRE-PRESERVED	<2	VOC	RFPP	RFPP

REMARKS: *ESTIMATION- PROBE WON'T FIT IN RODS
① TOO TURBID FOR INSTRUMENT TO READ

MATERIAL CODES AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene, S = Silicone, T = Teflon, O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump, B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump, RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ±5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: SAUFLEY FIELD SITE 1		SITE LOCATION: PENSACOLA, FL	
WELL NO: G-8	SAMPLE ID: SF-1-GW308-40-44-01/2012		DATE: 1/11/12

PURGING DATA

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 40 feet to 44 feet	STATIC DEPTH TO WATER (feet): 40'	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (44 feet – 40 feet) X .04 gallons/foot = ×3.84 GAL = .608 L gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 41	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 41	PURGING INITIATED AT: 1445	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons):

TIME	VOLUME PURGED (~~gallons~~) L	CUMUL. VOLUME PURGED (~~gallons~~) L	PURGE RATE (mpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ORP (describe)
1445	–	–	300	40'	–	–	–	–	–	–	–
1448	.9	.9	300	40'*	5.94	23.17	104	2.59	ERROR ①	BROWN	-82.3
1451	.9	1.8	300	40'	5.66	22.87	94	3.50	ERROR	BROWN	-63.3
1454	.9	2.7	300	40'	5.28	22.84	91	5.09	ERROR	BROWN	-55.3
1457	.9	3.6	300	40'	5.15	22.51	92	5.19	ERROR	BROWN	-52.0
1500	.9	4.5	300	40'	5.16	22.61	91	5.18	ERROR	BROWN	-53.1
1505 – SAMPLE TIME											

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: K. WEACHERT	SAMPLER(S) SIGNATURE(S): K. Weachert	SAMPLING INITIATED AT: 1505	SAMPLING ENDED AT: 1555
PUMP OR TUBING DEPTH IN WELL (feet): 41 / RFPP	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y N (replaced)	DUPLICATE: Y N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
1	2	AG	1L	ICE	N/A	N/A	SVOC	APP	300
2	2	AG	1L	ICE	N/A	N/A	SVOC (SIM)	APP	300
3	2	AG	1L	ICE	N/A	N/A	PEST / PCB	APP	300
4	2	AG	1L	HCl	PRE-PRESERVED	<2	FLO-PRO	APP	300
5	1	P	250mL	HNO3	PRE-PRESERVED	<2	METALS	APP	300
6	3	CG	40 mL	HCl	PRE-PRESERVED	<2	VOCS	~~RFPP~~ APP	~~RFPP~~

REMARKS: * ESTIMATE BASED ON SOIL SCREENING - PROBE WILL NOT FIT IN WELL
① TOO HIGH FOR DIRECTOR

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump, ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump, SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Saufley Field Site 1	SITE LOCATION: Pensacola, FL
WELL NO: G-10	SAMPLE ID: SF-1-GW10-40-44-01/2012 DATE: 1/11/2012

PURGING DATA

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 1/4	WELL SCREEN INTERVAL DEPTH: 40 feet to 44 feet	STATIC DEPTH TO WATER (feet): 40	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (44 feet – 40 feet) X 0.04 ~~0.16~~ 3.80 gallons/foot = 0.608 L ~~gallons~~

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 41	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 41	PURGING INITIATED AT: 1311	PURGING ENDED AT: 1320	TOTAL VOLUME PURGED (~~gallons~~): 2.4 L

TIME	VOLUME PURGED ~~(gallons)~~ L	CUMUL. VOLUME PURGED ~~(gallons)~~ L	PURGE RATE ~~(gpm)~~ mL/min	DEPTH TO WATER (feet)	pH (standard units)	TEMP (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ORP (describe)
1314	0.6 L	0.6 L	~~300~~	40	5.83	22.23	84	4.55	ERROR (1)	Cloudy	-66.3
1317	0.9 L	1.5 L	300	40	5.89	22.24	81	4.60	ERROR	Cloudy	-60.0
1320	0.9 L	2.4 L	300	40	5.84	22.22	80	4.59	ERROR	Cloudy	-58.6
1325 - SAMPLE TIME											

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: K.W.	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 1325	SAMPLING ENDED AT: 1430
PUMP OR TUBING DEPTH IN WELL (feet): 41	TUBING MATERIAL CODE: Polyethylene	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
1	2	AG	1L	ICE	N/A	N/A	SVOC	APP	300
2	2	AG	1L	ICE	N/A	N/A	SVOC (SIM)	APP	300
3	2	AG	1L	ICE	N/A	N/A	Pest / PCB	APP	300
4	2	AG	1L	HCl	PREPRESERVE	<2	Flo-Pro	APP	300
5	1	P	250mL	HNO3	PREPRESERVE	<2	Metals	APP	300
6	3	CG	40mL	HCl	PREPRESERVE	<2	VOCs	~~RFPP~~ APP	~~RFPP~~ APP

REMARKS: (1) TOO HIGH FOR INSTRUMENT TO READ

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2) optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER | PAGE 2 OF 2

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
129027GO	Sandfly Field Site 1	Frank Lessne 850 385 9899	Severn Trent Environmental Services Inc
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: Amber Jove 850 322 8033	ADDRESS: 106 Vantage Point Drive
		CARRIER/WAYBILL NUMBER: 8705 7387 3810	CITY, STATE: West Columbia, South Carolina 29172

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2012	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	SVOC	SVOC (SIM)	Pes. / PCB	Flo-Pro	Metals	VOC			COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G	G	G	G	G			
PRESERVATIVE USED						ICE	ICE	ICE	ICE	ICE	Methanol ICE			
1/12/2012	1335	SF-1-SB10-0-2-01/2012	S	G	24	3	✓	3	3	3	12			
1/12/2012	0000	FD01121202	S	G	8	1	✓	1	1	1	4			
1/12/2012	1405	SF-1-SB10-10-15-01/2012	S	G	8	1	✓	1	1	1	4			
1/12/2012	1420	SF-1-SB10-25-30-01/2012	S	G	8	1	✓	1	1	1	4			
1/12/2012	1440	SF-1-SB11-0-2-01/2012	S	G	8	1	✓	1	1	1	4			
1/12/2012	0000	FD01121203	S	G	8	1	✓	1	1	1	4			
1/12/2012	1515	FB01121201	QC	G	12	2	2	2	2	1	3			
1/12/2012	1540	FB01121202	QC	G	12	2	2	2	2	1	3			

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
[illegible]	[illegible]	1657			
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

TETRA TECH NUS, INC. | **CHAIN OF CUSTODY** | **NUMBER** | **PAGE 1 OF 2**

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
NG02700 F1 OP1	Ft Jackson	Frank Lisone 850-385-9899	Shealy Environmental Services, Inc.
SAMPLERS (SIGNATURE)		**FIELD OPERATIONS LEADER AND PHONE NUMBER**	**ADDRESS**
		Amos Tree 850-322-8033	106 Vantage Point Drive
		CARRIER/WAYBILL NUMBER	**CITY, STATE**
			West Columbia, South Carolina 29172

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2012	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	SVOC	SVOC (SIM)	Pest./PCB	Flo-Ro	METALS	VOC			COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G	G	G	G	G			
PRESERVATIVE USED						Ice	Ice	Ice	HCl*	HNO3	H2SO4			
11/12	1326	SF-1-GW10-40-44-01/2012	GW	G	12	2	2	2	2	1	3			*HCl PRES. ONLY for GW. No PRES for Soil
11/12	1505	SF-1-GW08-40-44-01/2012	GW	G	12	2	2	2	2	1	3			
11/12	1630	SF-1-GW06-35-39-01/2012	GW	G	12	2	2	2	2	1	3			HNO3 PRES. only for GW. No PRESERVE for Soil
12/12	0831	SF-1-GW03-35-39-01/2012	GW	G	36	6	6	6	6	3	9			
12/12	[illegible]	FD0112201	GW	G	12	2	2	2	2	1	3			(2) Plastic containers only for GW. Glass for soil.
12/12	0905	SF-1-GW01-35-39-01/2012	GW	G	12	2	2	2	2	1	3			
12/12	1015	SF-1-SB02-15-20-01/2012	S	G	8	1	✓	1	1	1	4			Sum. Sign sheet of PA/KB [illegible]
12/12	1055	SF-1-SB05-20-25-01/2012	S	G	8	1	✓	1	1	1	4			
12/12	1125	SF-1-SB06-25-30-01/2012	S	G	8	1	✓	1	1	1	4			(3) HCl preserve only for GW. TCL/MET-VOC for soil.
12/12	1150	SF-1-SB07-30-35-01/2012	S	G	8	1	✓	1	1	1	4			
12/12	1225	SF-1-SB08-20-25-01/2012	S	G	8	1	✓	1	1	1	4			
12/12	1235	SF-1-SB08-35-40-01/2012	S	G	8	1	✓	1	1	1	4			
12/12	1315	SF-1-SB09-30-35-01/2012	S	G	8	1	✓	1	1	1	4			

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
[illegible]	[illegible]	[illegible]			
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: Per the SAP worksheets included

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

Lot: NA13010

Sample Receiving Summary

Printed: 1/19/2012 2:19:27 PM by NMS

Quote: 14967

Client: (2306) Tetra Tech NUS / Frank Lessesne

Project Manager: NMS

Comments:

Program Area: DoD QSM

Project Name: 01-CTO JM30 Saufley

PO Number: 1065671

Project Number: 112G02760

Analysis Due: 01/25/2012

Level 1 Review: _____

Report Due: 01/28/2012

Level 2 Review: _____

Cooler #	Cooler ID (If applicable)	Temp (° C)	Comments
1		1.0	
2		1.0	
3		1.0	
4		1.0	
5		1.0	
6		1.0	
7		1.0	
8		1.0	
9		1.0	
10		1.0	
11		1.0	
12		1.0	
13		1.0	
14		1.0	

Shealy ID: NA13010-001 Client ID: SF-1-GW10-40-44-01/2012 Collected: 01/11/2012 at 1325 by CLIENT

Sample Receiving Matrix: Aqueous

Received: 01/13/2012 0900 by ECC

Entered: 1/13/2012 by ECC

Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	4	(007) 250 mL P HNO3	
	6	(009) 1 L amber G-NP	
	3	(011) 40 mL G-HCl	
	2	(046) 1 L amber G-HCl	

Tests:	Method	Test	Prep Method	Protocol
	8260B	TCL Volatiles (DOD) XLL Project List	5030B DOD XLL	Samples
	8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3520C DOD (1.0 mL FV - Acid Only)	Samples
	8270D	TCL Semivolatiles (DOD) Project List	3520C DOD (1.0 mL FV)	Samples
	FL-PRO	FL - PRO	3520C PRO	Samples
	8081B	Pesticides (DOD)	3520C PP DOD	Samples
	8082A	TCL Aroclors (DOD)	3520C PCB DOD	Samples
	6020A	ICP-MS Metals t DOD	3005A DOD	Samples
	7470A	Mercury (DOD)	7470A-P DDD	Samples

Sample Receiving Summary

Printed: 1/19/2012 2:19:27 PM by NMS

Client: (2306) Tetra Tech NUS / Frank Lesseane
Project Name: 01-CTO JM30 Saufley
Project Number: 112G02760

Project Manager: NMS
Program Area: DoD QSM
PO Number: 1065671

Shealy ID: NA13010-002 Client ID: SF-1-GW08-40-44-01/2012 Collected: 01/11/2012 at 1505 by CLIENT

Sample Receiving Matrix: Aqueous
Entered: 1/13/2012 by ECC

Received: 01/13/2012 0900 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(007) 250 mL P HNO3	
	6	(009) 1 L amber G-NP	
	3	(011) 40 mL G-HCl	
	2	(046) 1 L amber G-HCl	

Tests:	Method	Test	Prep Method	Protocol
	8260B	TCL Volatiles (DOD) XLL Project List	5030B DOD XLL	Samples
	8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3520C DOD (1.0 mL FV - Acid Only)	Samples
	8270D	TCL Semivolatiles (DOD) Project List	3520C DOD (1.0 mL FV)	Samples
	FL-PRO	FL - PRO	3520C PRO	Samples
	8081B	Pesticides (DOD)	3520C PP DOD	Samples
	8082A	TCL Aroclors (DOD)	3520C PCB DOD	Samples
	6020A	ICP-MS Metals t DOD	3005A DOD	Samples
	7470A	Mercury (DOD)	7470A-P DOD	Samples

Shealy ID: NA13010-003 Client ID: SF-1-GW06-35-39-01/2012 Collected: 01/11/2012 at 1630 by CLIENT

Sample Receiving Matrix: Aqueous
Entered: 1/13/2012 by ECC

Received: 01/13/2012 0900 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(007) 250 mL P HNO3	
	6	(009) 1 L amber G-NP	
	3	(011) 40 mL G-HCl	
	2	(046) 1 L amber G-HCl	

Tests:	Method	Test	Prep Method	Protocol
	8260B	TCL Volatiles (DOD) XLL Project List	5030B DOD XLL	Samples
	8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3520C DOD (1.0 mL FV - Acid Only)	Samples
	8270D	TCL Semivolatiles (DOD) Project List	3520C DOD (1.0 mL FV)	Samples
	FL-PRO	FL - PRO	3520C PRO	Samples
	8081B	Pesticides (DOD)	3520C PP DOD	Samples
	8082A	TCL Aroclors (DOD)	3520C PCB DOD	Samples
	6020A	ICP-MS Metals t DOD	3005A DOD	Samples
	7470A	Mercury (DOD)	7470A-P DOD	Samples

Shealy ID: NA13010-004 Client ID: SF-1-GW03-35-39-01/2012 Collected: 01/12/2012 at 0831 by CLIENT MS/MSD THIS SAMPLE

Sample Receiving Matrix: Aqueous
Entered: 1/13/2012 by ECC

Received: 01/13/2012 0900 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	3	(007) 250 mL P HNO3	

Sample Receiving Summary

Printed: 1/19/2012 2:19:27 PM by NMS

Client: (2306) Tetra Tech NUS / Frank Lessesne
Project Name: 01-CTO JM30 Saufley
Project Number: 112G02760

Project Manager: NMS
Program Area: DoD QSM
PO Number: 1065671

18	(009) 1 L amber G-NP	
9	(011) 40 mL G-HCl	
6	(046) 1 L amber G-HCl	

Tests: Method	Test	Prep Method	Protocol
8260B	TCL Volatiles (DOD) XLL Project List	5030B DOD XLL	Samples
8270D (SIM)	PAHs (SIM) DDD + 1-Methylnaph + 2-Methylna	3520C DOD (1.0 mL FV - Acid Only)	Samples
8270D	TCL Semivolatiles (DOD) Project List	3520C DOD (1.0 mL FV)	Samples
FL-PRO	FL - PRO	3520C PRO	Samples
8081B	Pesticides (DOD)	3520C PP DOD	Samples
8082A	TCL Aroclors (DOD)	3520C PCB DOD	Samples
6020A	ICP-MS Metals t DOD	3005A DOD	Samples
7470A	Mercury (DOD)	7470A-P DOD	Samples

Shealy ID: NA13010-005 Client ID: FD01121201 Collected: 01/12/2012 at 0000 by CLIENT

Sample Receiving Matrix: Aqueous
Entered: 1/13/2012 by ECC

Received: 01/13/2012 0900 by ECC
Receipt Method: Fed-Ex

Sample Containers: Qty	Sample Containers	Comments
1	(007) 250 mL P HNO3	
6	(009) 1 L amber G-NP	
3	(011) 40 mL G-HCl	
2	(046) 1 L amber G-HCl	

Tests: Method	Test	Prep Method	Protocol
8260B	TCL Volatiles (DOD) XLL Project List	5030B DDD XLL	Samples
8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylna	3520C DOD (1.0 mL FV - Acid Only)	Samples
8270D	TCL Semivolatiles (DOD) Project List	3520C DOD (1.0 mL FV)	Samples
FL-PRO	FL - PRO	3520C PRO	Samples
8081B	Pesticides (DOD)	3520C PP DOD	Samples
8082A	TCL Aroclors (DOD)	3520C PCB DOD	Samples
6020A	ICP-MS Metals t DOD	3005A DDD	Samples
7470A	Mercury (DOD)	7470A-P DOD	Samples

Shealy ID: NA13010-006 Client ID: SF-1-GW01-35-39-01/2012 Collected: 01/12/2012 at 0905 by CLIENT

Sample Receiving Matrix: Aqueous
Entered: 1/13/2012 by ECC

Received: 01/13/2012 0900 by ECC
Receipt Method: Fed-Ex

Sample Containers: Qty	Sample Containers	Comments
1	(007) 250 mL P HNO3	
6	(009) 1 L amber G-NP	
3	(011) 40 mL G-HCl	
1	(046) 1 L amber G-HCl	

Tests: Method	Test	Prep Method	Protocol
8260B	TCL Volatiles (DOD) XLL Project List	5030B DOD XLL	Samples
8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylna	3520C DOD (1.0 mL FV - Acid Only)	Samples
8270D	TCL Semivolatiles (DOD) Project List	3520C DOD (1.0 mL FV)	Samples

Sample Receiving Summary

Printed: 1/19/2012 2:19:27 PM by NMS

Client: (2306) Tetra Tech NUS / Frank Lessesne
Project Name: 01-CTO JM30 Saufley
Project Number: 112G02760

Project Manager: NMS
Program Area: DoD QSM
PO Number: 1065671

FL-PRO	FL - PRO	3520C PRO	Samples
8081B	Pesticides (DOD)	3520C PP DOD	Samples
8082A	TCL Aroclors (DOD)	3520C PCB DOD	Samples
6020A	ICP-MS Metals t DOD	3005A DOD	Samples
7470A	Mercury (DOD)	7470A-P DOD	Samples

Shealy ID: NA13010-007 Client ID: SF-1-SB02-15-20-01/2012 Collected: 01/12/2012 at 1015 by CLIENT

Sample Receiving Matrix: Solid
Entered: 1/13/2012 by ECC

Received: 01/13/2012 0900 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(015) 2 oz G	
	2	(016) 4 oz G	
	1	(017) 9 oz G	
	2	(025) 40 mL G-H2O w/SB	
	1	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	
	1	(045) 40 mL G-NP VOA Screening	

Tests:	Method	Test	Prep Method	Protocol
	160.3	% Solids		Samples
	8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples
	8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples
	8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
	FL-PRO	FL - PRO	3550B PRO	Samples
	8081B	Pesticides (DOD)	3550C PP DOD	Samples
	8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
	6010C	ICP-AES (DOD)	3050B DOD	Samples
	7471B	Mercury (DOD)	7471B-P DOD	Samples

Shealy ID: NA13010-008 Client ID: SF-1-SB05-20-25-01/2012 Collected: 01/12/2012 at 1055 by CLIENT

Sample Receiving Matrix: Solid
Entered: 1/13/2012 by ECC

Received: 01/13/2012 0900 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(015) 2 oz G	
	2	(016) 4 oz G	
	1	(017) 9 oz G	
	2	(025) 40 mL G-H2O w/SB	
	1	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	
	1	(045) 40 mL G-NP VOA Screening	

Tests:	Method	Test	Prep Method	Protocol
	160.3	% Solids		Samples
	8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples
	8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples

Sample Receiving Summary

Printed: 1/19/2012 2:19:27 PM by NMS

Client: (2306) Tetra Tech NUS / Frank Lessesne
Project Name: 01-CTO JM30 Saufley
Project Number: 112G02760

Project Manager: NMS
Program Area: DoD QSM
PO Number: 1065671

8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
FL-PRO	FL - PRO	3550B PRO	Samples
8081B	Pesticides (DOD)	3550C PP DOD	Samples
8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
6010C	ICP-AES (DOD)	3050B DOD	Samples
7471B	Mercury (DOD)	7471B-P DOD	Samples

Shealy ID: NA13010-009 Client ID: SF-1-SB06-25-30-01/2012 Collected: 01/12/2012 at 1125 by CLIENT

Sample Receiving Matrix: Solid
Received: 01/13/2012 0900 by ECC
Entered: 1/13/2012 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(015) 2 oz G	
	2	(016) 4 oz G	
	1	(017) 9 oz G	
	2	(025) 40 mL G-H2O w/SB	
	1	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	
	1	(045) 40 mL G-NP VOA Screening	

Tests:	Method	Test	Prep Method	Protocol
	160.3	% Solids		Samples
	8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples
	8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples
	8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
	FL-PRO	FL - PRO	3550B PRO	Samples
	8081B	Pesticides (DOD)	3550C PP DOD	Samples
	8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
	6010C	ICP-AES (DOD)	3050B DOD	Samples
	7471B	Mercury (DOD)	7471B-P DOD	Samples

Shealy ID: NA13010-010 Client ID: SF-1-SB07-30-35-01/2012 Collected: 01/12/2012 at 1150 by CLIENT

Sample Receiving Matrix: Solid
Received: 01/13/2012 0900 by ECC
Entered: 1/13/2012 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(015) 2 oz G	
	2	(016) 4 oz G	
	1	(017) 9 oz G	
	2	(025) 40 mL G-H2O w/SB	
	1	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	
	1	(045) 40 mL G-NP VOA Screening	

Tests:	Method	Test	Prep Method	Protocol
	160.3	% Solids		Samples
	8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples

Sample Receiving Summary

Printed: 1/19/2012 2:19:27 PM by NMS

Client: (2306) Tetra Tech NUS / Frank Lessesne
Project Name: 01-CTO JM30 Saufley
Project Number: 112G02760

Project Manager: NMS
Program Area: DoD QSM
PO Number: 1065671

8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples
8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
FL-PRO	FL - PRO	3550B PRO	Samples
8081B	Pesticides (DOD)	3550C PP DOD	Samples
8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
6010C	ICP-AES (DOD)	3050B DOD	Samples
7471B	Mercury (DOD)	7471B-P DDD	Samples

Shealy ID: NA13010-011 Client ID: SF-1-SB08-20-25-01/2012 Collected: 01/12/2012 at 1225 by CLIENT

Sample Receiving Matrix: Solid
Entered: 1/13/2012 by ECC

Received: 01/13/2012 0900 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(015) 2 oz G	
	2	(016) 4 oz G	
	1	(017) 9 oz G	
	2	(025) 40 mL G-H2O w/SB	
	1	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	
	1	(045) 40 mL G-NP VOA Screening	

Tests:	Method	Test	Prep Method	Protocol
	160.3	% Solids		Samples
	8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples
	8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples
	8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
	FL-PRO	FL - PRO	3550B PRO	Samples
	8081B	Pesticides (DOD)	3550C PP DOD	Samples
	8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
	6010C	ICP-AES (DOD)	3050B DOD	Samples
	7471B	Mercury (DOD)	7471B-P DOD	Samples

Shealy ID: NA13010-012 Client ID: SF-1-SB08-35-40-01/2012 Collected: 01/12/2012 at 1235 by CLIENT

Sample Receiving Matrix: Solid
Entered: 1/13/2012 by ECC

Received: 01/13/2012 0900 by ECC
Receipt Method. Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(015) 2 oz G	
	2	(016) 4 oz G	
	1	(017) 9 oz G	
	2	(025) 40 mL G-H2O w/SB	
	1	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	
	1	(045) 40 mL G-NP VOA Screening	

Tests:	Method	Test	Prep Method	Protocol
	160.3	% Solids		Samples

Sample Receiving Summary

Printed: 1/19/2012 2:19:27 PM by NMS

Client: (2306) Tetra Tech NUS / Frank Lessesne
Project Name: 01-CTO JM30 Saufley
Project Number: 112G02760

Project Manager: NMS
Program Area: DoD QSM
PO Number: 1065671

8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples
8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples
8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
FL-PRO	FL - PRO	3550B PRO	Samples
8081B	Pesticides (DOD)	3550C PP DOD	Samples
8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
6010C	ICP-AES (DOD)	3050B DOD	Samples
7471B	Mercury (DOD)	7471B-P DOD	Samples

Shealy ID: NA13010-013 Client ID: SF-1-SB09-30-35-01/2012 Collected: 01/12/2012 at 1315 by CLIENT

Sample Receiving Matrix: Solid
Received: 01/13/2012 0900 by ECC
Entered: 1/13/2012 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(015) 2 oz G	
	2	(016) 4 oz G	
	1	(017) 9 oz G	
	2	(025) 40 mL G-H2O w/SB	
	1	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	
	1	(045) 40 mL G-NP VOA Screening	

Tests: Method	Test	Prep Method	Protocol
160.3	% Solids		Samples
8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples
8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples
8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
FL-PRO	FL - PRO	3550B PRO	Samples
8081B	Pesticides (DOD)	3550C PP DOD	Samples
8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
6010C	ICP-AES (DOD)	3050B DOD	Samples
7471B	Mercury (DOD)	7471B-P DOD	Samples

Shealy ID: NA13010-014 Client ID: SF-1-SB10-0-2-01/2012 Collected: 01/12/2012 at 1335 by CLIENT MS/MSD THIS SAMPLE

Sample Receiving Matrix: Solid
Received: 01/13/2012 0900 by ECC
Entered: 1/13/2012 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	3	(015) 2 oz G	
	6	(016) 4 oz G	
	3	(017) 9 oz G	
	6	(025) 40 mL G-H2O w/SB	
	3	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	
	3	(045) 40 mL G-NP VOA Screening	

Tests: Method	Test	Prep Method	Protocol

Sample Receiving Summary

Printed: 1/19/2012 2:19:27 PM by NMS

Client: (2306) Tetra Tech NUS / Frank Lessesne
Project Name: 01-CTO JM30 Saufley
Project Number: 112G02760

Project Manager: NMS
Program Area: DoD QSM
PO Number: 1065671

160.3	% Solids		Samples
8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples
8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples
8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
FL-PRO	FL - PRO	3550B PRO	Samples
8081B	Pesticides (DOD)	3550C PP DOD	Samples
8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
6010C	ICP-AES (DOD)	3050B DOD	Samples
7471B	Mercury (DOD)	7471B-P DOD	Samples

Shealy ID: NA13010-015 Client ID: FD01121202 Collected: 01/12/2012 at 0000 by CLIENT

Sample Receiving Matrix: Solid
Entered: 1/13/2012 by ECC

Received: 01/13/2012 0900 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(015) 2 oz G	
	2	(016) 4 oz G	
	1	(017) 9 oz G	
	2	(025) 40 mL G-H2O w/SB	
	1	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	
	1	(045) 40 mL G-NP VOA Screening	

Tests:	Method	Test	Prep Method	Protocol
	160.3	% Solids		Samples
	8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples
	8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples
	8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
	FL-PRO	FL - PRO	3550B PRO	Samples
	8081B	Pesticides (DOD)	3550C PP DOD	Samples
	8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
	6010C	ICP-AES (DOD)	3050B DOD	Samples
	7471B	Mercury (DOD)	7471B-P DOD	Samples

Shealy ID: NA13010-016 Client ID: SF-1-SB10-10-15-01/2012 Collected: 01/12/2012 at 1405 by CLIENT

Sample Receiving Matrix: Solid
Entered: 1/13/2012 by ECC

Received: 01/13/2012 0900 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(015) 2 oz G	
	2	(016) 4 oz G	
	1	(017) 9 oz G	
	2	(025) 40 mL G-H2O w/SB	
	1	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	
	1	(045) 40 mL G-NP VOA Screening	

Sample Receiving Summary

Printed: 1/19/2012 2:19:27 PM by NMS

Client: (2306) Tetra Tech NUS / Frank Lessesne
Project Name: 01-CTO JM30 Saufley
Project Number: 112G02760

Project Manager: NMS
Program Area: DoD QSM
PO Number: 1065671

Tests:	Method	Test	Prep Method	Protocol
	160.3	% Solids		Samples
	8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples
	8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples
	8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
	FL-PRO	FL - PRO	3550B PRO	Samples
	8081B	Pesticides (DOD)	3550C PP DOD	Samples
	8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
	6010C	ICP-AES (DOD)	3050B DOD	Samples
	7471B	Mercury (DOD)	7471B-P DOD	Samples

Shealy ID: NA13010-017 Client ID: SF-1-SB10-25-30-01/2012 Collected: 01/12/2012 at 1420 by CLIENT

Sample Receiving Matrix: Solid
Received: 01/13/2012 0900 by ECC
Entered: 1/13/2012 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(015) 2 oz G	
	2	(016) 4 oz G	
	1	(017) 9 oz G	
	2	(025) 40 mL G-H2O w/SB	
	1	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	
	1	(045) 40 mL G-NP VOA Screening	

Tests:	Method	Test	Prep Method	Protocol
	160.3	% Solids		Samples
	8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples
	8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples
	8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
	FL-PRO	FL - PRO	3550B PRO	Samples
	8081B	Pesticides (DOD)	3550C PP DOD	Samples
	8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
	6010C	ICP-AES (DOD)	3050B DOD	Samples
	7471B	Mercury (DOD)	7471B-P DOD	Samples

Shealy ID: NA13010-018 Client ID: SF-1-SB11-0-2-01/2012 Collected: 01/12/2012 at 0000 by CLIENT

Sample Receiving Matrix: Solid
Received: 01/13/2012 0900 by ECC
Entered: 1/13/2012 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(015) 2 oz G	
	2	(016) 4 oz G	
	1	(017) 9 oz G	
	2	(025) 40 mL G-H2O w/SB	
	1	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	

Sample Receiving Summary

Printed: 1/19/2012 2:19:27 PM by NMS

Client: (2306) Tetra Tech NUS / Frank Lessesne
Project Name: 01-CTO JM30 Saufley
Project Number: 112G02760

Project Manager: NMS
Program Area: DoD QSM
PO Number: 1065671

	1	(045) 40 mL G-NP VOA Screening	

Tests:	Method	Test	Prep Method	Protocol
	160.3	% Solids		Samples
	8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples
	8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples
	8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
	FL-PRO	FL - PRO	3550B PRO	Samples
	8081B	Pesticides (DOD)	3550C PP DOD	Samples
	8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
	6010C	ICP-AES (DOD)	3050B DOD	Samples
	7471B	Mercury (DOD)	7471B-P DOD	Samples

Shealy ID: NA13010-019 Client ID: FD01121203 Collected: 01/12/2012 at 1515 by CLIENT

Sample Receiving Matrix: Solid
Received: 01/13/2012 0900 by ECC
Entered: 1/13/2012 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(015) 2 oz G	
	2	(016) 4 oz G	
	1	(017) 9 oz G	
	2	(025) 40 mL G-H2O w/SB	
	1	(026) 40 mL G-MeOH	
	1	(036) % Solid Snaps	
	1	(045) 40 mL G-NP VOA Screening	

Tests:	Method	Test	Prep Method	Protocol
	160.3	% Solids		Samples
	8260B	TCL Volatiles (DOD) Project List	5035 DOD	Samples
	8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3550C DOD (1.0 ml FV)	Samples
	8270D	TCL Semivolatiles Project List	3550C DOD (1.0 ml FV)	Samples
	FL-PRO	FL - PRO	3550B PRO	Samples
	8081B	Pesticides (DOD)	3550C PP DOD	Samples
	8082A	TCL Aroclors (DOD)	3550C PCB DOD	Samples
	6010C	ICP-AES (DOD)	3050B DOD	Samples
	7471B	Mercury (DOD)	7471B-P DOD	Samples

Shealy ID: NA13010-020 Client ID: FB01121201 Collected: 01/12/2012 at 1540 by CLIENT

Sample Receiving Matrix: Aqueous
Received: 01/13/2012 0900 by ECC
Entered: 1/13/2012 by ECC
Receipt Method: Fed-Ex

Sample Containers:	Qty	Sample Containers	Comments
	1	(007) 250 mL P HNO3	
	6	(009) 1 L amber G-NP	
	3	(011) 40 mL G-HCl	
	2	(046) 1 L amber G-HCl	

Tests:	Method	Test	Prep Method	Protocol

Sample Receiving Summary

Printed: 1/19/2012 2:19:27 PM by NMS

Client: (2306) Tetra Tech NUS / Frank Lessesne
Project Name: 01-CTO JM30 Saufley
Project Number: 112G02760

Project Manager: NMS
Program Area: DoD QSM
PO Number: 1065671

8260B	TCL Volatiles (DOD) XLL Project List	5030B DOD XLL	Samples
8270D (SIM)	PAHs (SIM) DOD + 1-Methylnaph + 2-Methylnaph	3520C DOD (1.0 mL FV - Acid Only)	Samples
8270D	TCL Semivolatiles (DOD) Project List	3520C DOD (1.0 mL FV)	Samples
FL-PRO	FL - PRO	3520C PRO	Samples
8081B	Pesticides (DOD)	3520C PP DOD	Samples
8082A	TCL Aroclors (DOD)	3520C PCB DOD	Samples
6020A	ICP-MS Metals t DOD	3005A DOD	Samples
7470A	Mercury (DOD)	7470A-P DOD	Samples

Totals:	Samples	Sample Containers	Tests/Items
	20	240	173

(end of report)

TETRA TECH NUS, INC.

CHAIN OF CUSTODY NUMBER

PAGE 1 OF 2

PROJECT NO: 112G02760 G1.OPL

SITE NAME: Hartley Field Site 1

SAMPLERS (SIGNATURE):

PROJECT MANAGER AND PHONE NUMBER: Frank Lysone 850 385-9899

FIELD OPERATIONS LEADER AND PHONE NUMBER: Anise Tyre 850-222-8033

CARRIER/WAYBILL NUMBER:

LABORATORY NAME AND CONTACT: Sheely Environmental Services Inc

ADDRESS: 106 Vantage Point Drive

CITY, STATE: West Columbia, South Carolina 29172

STANDARD TAT ☑

RUSH TAT ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G G G P P G

PRESERVATIVE USED: HCl HCl HCl HCl HNO3 HCl NA 13/10

TYPE OF ANALYSIS: SVOC, SVOC (SIM), Pest/PCB, Flo-Pro, Metals, VOC

DATE YEAR 2012	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	SVOC	SVOC (SIM)	Pest/PCB	Flo-Pro	Metals	VOC	COMMENTS
1/11/12	1345	SF-1-GW10-40-44-01/2012	GW	G	12	2	2	2	2	1	3	
1/11/12	1505	SF-1-GW08-40-44-01/2012	GW	G	12	2	2	2	2	1	3	
1/11/12	1630	SF-1-GW06-35-39-01/2012	GW	G	12	2	2	2	2	1	3	
1/12/12	0831	SF-1-GW03-35-39-01/2012	GW	G	36	6	6	6	6	3	9	
1/12/12	0800	FD0112120 1	GW	G	12	2	2	2	2	1	3	
1/12/12	0905	SF-1-GW01-35-39-01/2012	GW	G	12	2	2	2	2	1	3	
1/12/12	1015	SF-1-SB02-15-20-01/2012	S	G	8	1	✓	1	1	1	4	
1/12/12	1055	SF-1-SB05-20-25-01/2012	S	G	8	1	✓	1	1	1	4	
1/12/12	1125	SF-1-SB06-25-30-01/2012	S	G	8	1	✓	1	1	1	4	
1/12/12	1150	SF-1-SB01-30-35-01/2012	S	G	8	1	✓	1	1	1	4	
1/12/12	1225	SF-1-SB02-20-25-01/2012	S	G	8	1	✓	1	1	1	4	
1/12/12	1235	SF-1-SB08-35-40-01/2012	S	G	8	1	✓	1	1	1	4	
1/12/12	1315	SF-1-SB01-30-35-01/2012	S	G	8	1	✓	1	1	1	4	

COMMENTS:
* HCl PRES only for GW No PRES for Soil
HNO3 PRES only for GW No preservative for Soil
Plastic containers only for GW Glass for Soil
SVOC Sim out of Pest/PCB jar
HCl preserve only for GW ~~VOC~~ Metals for soil

		DATE	TIME		DATE	TIME
1 RELINQUISHED BY	Alex Murphy	1/12/12	1632	1 RECEIVED BY		
2 RELINQUISHED BY		DATE	TIME	2 RECEIVED BY		
3 RELINQUISHED BY	Fedex	1/13/12	0900	3 RECEIVED BY	1/13/12	0900

COMMENTS: Per the SAP worksheets included

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW FIELD COPY PINK FILE COPY

Send to Chuck with Analytical Data

FORM NO. TINUS-001

SHEELY ENVIRONMENTAL SERVICES, INC.

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER

PROJECT NO.: 112902760

SITE NAME: Sauflex Field Site 1

SAMPLERS (SIGNATURE):

PROJECT MANAGER AND PHONE NUMBER: Frank Lessig 850 385 9819

FIELD OPERATIONS LEADER AND PHONE NUMBER: Annie Ione 850 322 8033

CARRIER/WAYBILL NUMBER: 8755 7387 3810

LABORATORY NAME AND CONTACT: Shealy Environmental Services Inc

ADDRESS: 106 Vantage Point Drive

CITY, STATE: West Columbia, South Carolina 29172

STANDARD TAT ☑

RUSH TAT ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2012	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	SVOC	SVOC (SIM)	Pest. / PCB	Fuel-Pro	Metals	VOC		COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G	G	G	G	G		
PRESERVATIVE USED						ICE	ICE	ICE	ICE	ICE	HCl ICE		
TYPE OF ANALYSIS												EPA 1311	
1/12/12	1355	SF-1-SB10-0-2-01/2012	S	G	24	3	✓	3	3	3	12		
1/12/12	0006	FD01121202	S	G	8	1	✓	1	1	1	4		
1/12/12	1405	SF-1-SB10-10-15-01/2012	S	G	8	1	✓	1	1	1	4		
1/12/12	1420	SF-1-SB10-25-30-01/2012	S	G	8	1	✓	1	1	1	4		
1/12/12	1440	SF-1-SB11-0-2-01/2012	S	G	8	1	✓	1	1	1	4		
1/12/12	0000	FD01121203	S	G	8	1	✓	1	1	1	4		
1/12/12	1515	FB01121201	QC	G	12	2	2	2	2	1	3		
1/12/12	1540	FB01121202	QC	G	12	2	2	2	2	1	3		

1 RELINQUISHED BY: L. Mike Murphy	DATE: 1/12/12	TIME: 1652	1 RECEIVED BY	DATE	TIME
2 RELINQUISHED BY	DATE	TIME	2 RECEIVED BY	DATE	TIME
3 RELINQUISHED BY	DATE: 1-13-12	TIME: 0900	3 RECEIVED BY	DATE: 1/13/12	TIME: 0900

COMMENTS:

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99

FORM NO. TtNUS-001

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: [illegible] / 13 / 12 Lot #: NA13010

Means of receipt: ☐ SESI ☐ Client ☐ UPS ☑ FedEx ☐ Airborne Exp ☐ Other

Yes ☑	No ☐		1. Were custody seals present on the cooler?
Yes ☑	No ☐		2. If custody seals were present, were they intact and unbroken?

Cooler ID temperature upon receipt ___ / ___ °C ___ / ___ °C ___ / ___ °C ___ / ___ °C 14 Coolers at (2) 1.0°C

Method: ☑ Temperature Blank ☐ Against Bottles ☐ None

Method of coolant: ☑ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ None

If response is No (or Yes for 14, 15, 16), an explanation/resolution must be provided.

Yes ☐	No ☐	NA ☑	3. If temperature of any cooler exceeded 6.0°C, was Project Manager notified? PM notified by SRC, phone, note (circle one), other: ___. If coolers received via commercial courier, PMs are to be notified immediately
Yes ☑	No ☐	NA ☐	4. Is the commercial courier's packing slip attached to this form?
Yes ☑	No ☐		5. Were proper custody procedures (relinquished/received) followed?
Yes ☐	No ☑	NA ☐	5a. Were samples relinquished by client to commercial courier?
Yes ☑	No ☐		6. Were sample IDs listed?
Yes ☑	No ☐		7. Was collection date & time listed?
Yes ☑	No ☐		8. Were tests to be performed listed on the COC?
Yes ☑	No ☐		9. Did all samples arrive in the proper containers for each test?
Yes ☑	No ☐		10. Did all container label information (ID, date, time) agree with COC?
Yes ☐	No ☑		11. Did all containers arrive in good condition (unbroken, lids on, etc.)?
Yes ☑	No ☐		12. Was adequate sample volume available?
Yes ☑	No ☐		13. Were all samples received within the holding time or 48 hours, whichever comes first?
Yes ☐	No ☑		14. Were any sample containers missing?
Yes ☐	No ☑		15. Were there any excess samples not listed on COC? 1 of Blank (2)
Yes ☐	No ☑	NA ☐	16. Were bubbles present >"pea-size" (1/4") or 6 mm in diameter in any VOA vials?
Yes ☑	No ☐	NA ☐	17. Were all metals/O&G/HEM/nutrient samples received at a pH of <2?
Yes ☐	No ☐	NA ☑	18. Were all cyanide and/or sulfide samples received at a pH >12?
Yes ☐	No ☐	NA ☑	19. Were all applicable NH3/TKN/cyanide/phenol/BNA/pest/PCB/herb (<0.3mg/L) samples free of residual chlorine?
Yes ☐	No ☐	NA ☑	20. Were collection temperatures documented on the COC for NC samples?
Yes ☐	No ☐	NA ☑	21. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc...) correctly transcribed from the COC into the comment section in LIMS?

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) ___ were received incorrectly preserved and were adjusted accordingly in sample receiving with ___ (H_2SO_4/HNO_3/HCl/NaOH) with the SR # (number) ___

Sample(s) ___ were received with bubbles >6 mm in diameter.

Sample(s) ___ were received with TRC >0.2 mg/L for NH3/TKN/cyanide/BNA/pes/PCB/herb ___

Corrective Action taken, if necessary:

Was client notified: Yes ☐ No ☐ Did client respond: Yes ☐ No ☐

SESI employee: NA13010-006 Date of response: ___

Comments: [illegible]

Irby Engineering

(850) 452-6525 (Office)
(850) 452-2331 (Fax)
www.irbyengineering.com

Naval Air Station Pensacola
251 Hovey Rd., Bldg. 468
Pensacola, FL 32508

Mailing Address:
P.O. Box 33545
Pensacola, FL 32508-3545

FAX

To: AMBER IGOE

From: BOB NICHOL

Fax #: 385.9860

Pages: 4

Phone #:

Date: 1-5-12

Re:

cc:

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

* Comments:

AMBER, HERE'S THE FIRST ONE. I WILL GET TO THE OTHER ASAP.

EXCAVATION PERMIT
NAVAL AIR STATION PENSACOLA

[redacted]

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PERMIT NO: 12-137	DATE: 12-20-11	SPONSOR
1. PROJECT TITLE Title: Site 1 Burial of Metallic Objects Area Saufley Field	**2. PROJECT LOCATION** Street Address Nearest Intersection: Nearest Building: Northwest of airfield perimeter road between runways 9 and 13	**2a. NAME:** Greg Campbell **PHONE#:** 452-3131 x3007
3. PROJECT DESCRIPTION Detailed Descriptions: Proposal Start Date: 09 January 2012 Duration: 7 Days Machinery: DPT Rig Depth: 50FT Width: 1" Length: Drawing Attached: Yes	**4. REQUESTOR INFORMATION** Name: Amber Igoe Command/Company: Tetra Tech NUS E-Mail Address: Phone: 850-385-9899 FAX: 850-385-9860	

5. NASP REAL PROPERTY MANAGEMENT DIVISION (Steven Ward 452-3131 x 3024)
SIGNATURE: ON FILE **DATE:**
*** THIS PERMIT WILL REMAIN VALID AS LONG AS CONTRACTOR MAINTAINS UTILITY MARKINGS ***

6. COMMERICAL AND OTHER UTILITIES CLEARANCE
For AT&T, Gulf Power and Mediacom contact Sunshine State One-Call at 1-800-432-4770 between two and five days prior to the excavation.

Ticket Number: 003204623 **TIME:** **DATE:**

7. NASP ARCHEOLOGICAL REVIEW (Carrie Williams Bourgeois 452-3131 x 3011 or Bill Taylor 452-3131 x3003)
Comments: **DESPITE THE FACT THAT NO KNOWN ARCHAEOLOGICAL RESOURCES HAVE BEEN IDENTIFIED IN THE PROJECT AREA OF POTENTIAL EFFECTS (APE), THE CONTRACTOR IS ADVISED TO BE VIGILANT AND CONTACT THIS OFFICE IMMEDIATELY IN THE EVENT OF INADVERTENT ARCHAEOLOGICAL DISCOVERY.**
SIGNATURE: ON FILE **DATE:**

8. NASP ENVIRONMENTAL REVIEW (Greg Campbell 452-3131 x3007)
Comments: *** PROTECT ALL TREES ADJACENT TO SITE ***
SIGNATURE: **DATE:** ON FILE

9. NASP SAFETY REVIEW (Dodie Matlock 452-5115 or Renay Riley 452-8167)
Contact for all projects to ensure a competent person has been assigned to each excavation and provide standard operating procedures for excavation. Contractors have the ultimate responsibility to ensure compliance with applicable OSHA on their project.
Comments: *** EXCAVATION 5 FEET AND DEEPER IN DEPTH REQUIRES AN APPROVED EXCAVATION PERMIT**
SIGNATURE: **DATE:** ON FILE

NOTE: When locating services have revealed a concentration of telephone cables and or utilities in areas where excavation operations will be performed, a trench greater than the depth of the intended work, six (6) feet to either side and perpendicular to the intended line of work shall be hand dug to verify that all cables and or utilities in this area have been properly located and or identified. Machine excavation in areas of concentration shall not be undertaken until hand-digging operations have completed. One mark or flag could identify multiple utilities. Color code markings used are as established by Sunshine State One-Call conventions as provided by RPMD.

10. UTILITY CLEARANCE (Utility markings valid for 5 working days.) **Contact SCADA Desk at 452-2271 each day of digging**
Date Located: _____
Contact Irby Engineering at 452-5525 x3339/3340. Comments:
Electrical/Ground Electronics Present: YES / NO **SIGNATURE:** ON FILE
For Ground Electronics contact NASP at 452-2849 or Sherman Field at 452-3460 if applicable. Date Contacted: _____
*** EXCAVATIONS WITHIN 2 FEET OF MARKED UTILITIES MUST BE HAND DUG UNTIL UTILITIES ARE FULLY EXPOSED ***

11. BASE COMMUNICATIONS OFFICER (BCO) – Fiber Optic Cable and Navy Telephone Clearance Date Located: _____
Comments: NO CONFLICT
When locating services have revealed a concentration of telephone cables and or utilities in areas where excavation operations will be performed, a trench greater than the depth of the intended work, six (6) feet to either side and perpendicular to the intended line of work shall be hand dug to verify that all cables and or utilities in this area have been properly located and or identified. Machine excavation in areas of concentration shall not be undertaken until hand-digging operations have completed.
SIGNATURE: ON FILE

12. FIRE INSPECTION BUREAU (Steven Burke 452-2898)
SIGNATURE : **DATE:** ON FILE

FINAL PERMIT APPROVAL: Comments:
SIGNATURE: **DATE:**

13. PROJECT CLOSEOUT: As-built record drawings to Real Property Management Division

NASPNCLAINST 11010.3

From: 01/05/2012 08:00 #107 P.002/004
Received: Jan 5 2012 08:01am

STANDARD OPERATING PROCEDURE FOR EXCAVATIONS AND TRENCHING OPERATIONS

This standard operating procedure (sop) applies to all operations which involve excavations/trenching operations.
29 CFR 1926.650 defines excavations as "any man-made cut, cavity, trench, or depression in and earth surface, formed by earth removal." *Managers and supervisors shall ensure that this SOP is enforced and posted at all excavation/trenching worksites.*

Proper excavation safety practices are a priority on construction sites because a cave-in or collapse is likely to cause a fatality or severe injury from suffocation, crushing, loss of circulation, and falling objects. Most workers are unaware that a cubic yard of earth (3'x3'x3') weighs approximately 3000 pounds or about as much as a pickup truck.
This general SOP just highlights the requirements of reference (a).
The SOP has been developed to protect the PWC personnel from the hazardous conditions that could develop during excavation and trenching operations, and will use various engineering and personal protective systems. Reference (a) regulates the use of support systems, sloping and benching systems, and other systems of protection as a means of protection against excavation cave-ins. In addition, reference (a) regulates the means of access to and egress from excavations, and exposure to vehicular traffic, falling loads, hazardous atmospheres, water accumulation, and unstable structures in and adjacent to excavations.

A Competent Person (cp) shall be assigned to each excavation/trenching operation.
Reference (a) defines a competent person as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them," i.e., trained in excavation and trenching operations.

All excavation type operations shall be suitably shore, sloped, or benched as required by reference (a). The supervisor/-manager in charge of the jobsite shall:

1. Ensure an excavation permit is requested.
2. Assign a trained competent person to evaluate/inspect excavations using the attached daily check list. *Completed daily inspection check lists shall be kept on site.*
3. Ensure that suitable barricades are placed around excavations to warn unauthorized personnel and/or vehicular traffic. The barricades shall be illuminated at night and have a point of contact and phone number for further information.
4. Ensure the fire department is notified of any road closures including the time and approximate duration of closure.
5. Ensure that excavated soil (spoil), equipment, tools, and materials are kept at least two feet back from the edge of the excavation/trench.

6. Ensure the availability, and enforce the use of, personal protective equipment, including the use of fall protection, hard hats, eye and hand protection, traffic vests, etc.
7. Ensure that rescue equipment such as body harnesses are on hand, and radio/telephone is available to contact rescue crew/fire department in case of emergency.
8. Ensure that no employees are permitted underneath loads being handled by lifting or digging equipment
9. Ensure that runways/walkways have standard guardrails in place and kept clear of materials.
10. Ensure that employees are not permitted in excavations/trenches where there is an accumulation of water.
11. Ensure that all employees are trained and aware of hazards associated with working in trenches and excavations. Training must be documented on a training roster.
12. Ensure that excavations and trenches are completely covered, and barricades are removed at the completion of each job.
13. Ensure that enough time is allotted in the job plan to properly complete the job.

For further information, contact the *REGIONAL SAFETY OFFICE* (850) 452-3013.
For *Emergency* call (850)-452-3333.

EXCAVATION PERMIT
NAVAL AIR STATION PENSACOLA

[redacted]

An excavation permit must be obtained prior to any excavation on board Naval Air Station Pensacola, to include NOLF Bronson, Corry Station, and Saufley Field. **This permit must be displayed on the job site at all times.** To obtain a permit, fill out blocks 1-4, below, attach a site plan and other appropriate documentation, and submit this form to Heather Daniel at Irby Engineering (850) 452-5525 x3312. Instructions are on the second page of this form

PERMIT NO: 12-137	DATE: 12-20-11	SPONSOR
1. PROJECT TITLE Title: Site 1 Burial of Metallic Objects Area Saufley Field	**2. PROJECT LOCATION** Street Address Nearest Intersection: Nearest Building: Northwest of airfield perimeter road between runways 9 and 13	**2a. NAME:** Greg Campbell **PHONE#:** 452-3131 x3007
3. PROJECT DESCRIPTION Detailed Descriptions: Proposal Start Date: 09 January 2012 Duration: 7 Days Machinery: DPT Rig Depth: 50FT Width: 1" Length: Drawing Attached: Yes	**4. REQUESTOR INFORMATION** Name: Amber Igoe Command/Company: Tetra Tech NUS E-Mail Address: Phone: 850-385-9899 FAX: 850-385-9860	

5. NASP REAL PROPERTY MANAGEMENT DIVISION (Steven Ward 452-3131 x 3024)
SIGNATURE: ON FILE DATE:
*** THIS PERMIT WILL REMAIN VALID AS LONG AS CONTRACTOR MAINTAINS UTILITY MARKINGS ***

6. COMMERICAL AND OTHER UTILITIES CLEARANCE
For AT&T, Gulf Power and Mediacom contact Sunshine State One-Call at 1-800-432-4770 between two and five days prior to the excavation.

Ticket Number: 003204623 TIME: DATE:

7. NASP ARCHEOLOGICAL REVIEW (Carrie Williams Bourgeois 452-3131 x 3011 or Bill Taylor 452-3131 x3003)
Comments: **DESPITE THE FACT THAT NO KNOWN ARCHAEOLOGICAL RESOURCES HAVE BEEN IDENTIFIED IN THE PROJECT AREA OF POTENTIAL EFFECTS (APE), THE CONTRACTOR IS ADVISED TO BE VIGILANT AND CONTACT THIS OFFICE IMMEDIATELY IN THE EVENT OF INADVERTENT ARCHAEOLOGICAL DISCOVERY.**
SIGNATURE: ON FILE DATE:

8. NASP ENVIRONMENTAL REVIEW (Greg Campbell 452-3131 x3007)
Comments: *** PROTECT ALL TREES ADJACENT TO SITE ***
SIGNATURE: DATE: ON FILE

9. NASP SAFETY REVIEW (Dodie Matlock 452-5115 or Renay Riley 452-8167)
Contact for all projects to ensure a competent person has been assigned to each excavation and provide standard operating procedures for excavation. Contractors have the ultimate responsibility to ensure compliance with applicable OSHA on their project.
Comments: *** EXCAVATION 5 FEET AND DEEPER IN DEPTH REQUIRES AN APPROVED EXCAVATION PLAN**
SIGNATURE: DATE: ON FILE

NOTE: When locating services have revealed a concentration of telephone cables and or utilities in areas where excavation operations will be performed, a trench greater than the depth of the intended work, six (6) feet to either side and perpendicular to the intended line of work shall be hand dug to verify that all cables and or utilities in this area have been properly located and or identified. Machine excavation in areas of concentration shall not be undertaken until hand-digging operations have completed. One mark or flag could identify multiple utilities. Color code markings used are as established by Sunshine State One-Call conventions as provided by RPMD.

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Date Located: _____
Contact Irby Engineering at 452-5525 x3339/3340. Comments:
Electrical/Ground Electronics Present: YES / NO SIGNATURE: ON FILE
For Ground Electronics contact NASP at 452-2849 or Sherman Field at 452-3460 if applicable. Date Contacted: _____
*** EXCAVATIONS WITHIN 2 FEET OF MARKED UTILITIES MUST BE HAND DUG UNTIL UTILITIES ARE FULLY EXPOSED ***

11. BASE COMMUNICATIONS OFFICER (BCO) – Fiber Optic Cable and Navy Telephone Clearance Date Located: _____
Comments: NO CONFLICT
When locating services have revealed a concentration of telephone cables and or utilities in areas where excavation operations will be performed, a trench greater than the depth of the intended work, six (6) feet to either side and perpendicular to the intended line of work shall be hand dug to verify that all cables and or utilities in this area have been properly located and or identified. Machine excavation in areas of concentration shall not be undertaken until hand-digging operations have completed.
SIGNATURE: ON FILE

12. FIRE INSPECTION BUREAU (Steven Burke 452-2898)
SIGNATURE: DATE: ON FILE

FINAL PERMIT APPROVAL: Comments:
SIGNATURE: 1-5-12 DATE:

13. PROJECT CLOSEOUT: As-built record drawings to Real Property Management Division

NASPNCLAINST 11010.3

FROM: NSCA1V&C: Jan 5 2012 08:03am 01/05/2012 08:02 #108 P.001/001

Irby Engineering

(850) 452-5525 (Office)
(850) 452-2331 (Fax)
www.irbyengineering.com

Naval Air Station Pensacola
251 Hovey Rd., Bldg. 458
Pensacola, FL 32508

Mailing Address:
P.O. Box 33645
Pensacola, FL 32508-3645

FAX

To: AMBER IGOE

From: BOB NICHOL

Fax #: 385.9860

Pages: 4

Phone #:

Date: 1-19-12

Re:

cc:

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

• Comments:

Received: Jan 19 2012 08:36am 01/19/2012 08:34 #129 P.001/001
From:

EXCAVATION PERMIT
NAVAL AIR STATION PENSACOLA

[redacted]

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PERMIT NO: 12-158	**DATE: 1-3-11**	**SPONSOR**
1. PROJECT TITLE Title: Site 1, Burial of Metallic Objects Area Saufley Field	**2. PROJECT LOCATION** Street Address Nearest Intersection: Nearest Building: Northwest of airfield perimeter road between Runways 9 and 13	**2a. NAME:** **Greg Campbell** **PHONE#: 452-3131 x3007**
3. PROJECT DESCRIPTION Detailed Descriptions: Proposal Start Date: 01/09/2012 Duration: 7 days Machinery: DPT Rig Depth: 50 feet Width: 2" Length: 50 feet Drawing Attached: Yes	**4. REQUESTOR INFORMATION** Name: Amber Igoe Command/Company: Tetra Tech E-Mail Address: amber.igoe@tetratech.com Phone: 850-385-9899 FAX: 850-385-9860	

5. NASP REAL PROPERTY MANAGEMENT DIVISION (Steven Ward 452-3131 x 3024)
SIGNATURE: ON FILE **DATE:**
*** THIS PERMIT WILL REMAIN VALID AS LONG AS CONTRACTOR MAINTAINS UTILITY MARKINGS ***

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Ticket Number: 003204623 **TIME:** **DATE:**

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11. BASE COMMUNICATIONS OFFICER (BCO) – Fiber Optic Cable and Navy Telephone Clearance Date Located: _____
Comments: NO CONFLICT
[illegible]
SIGNATURE: ON FILE

12. FIRE INSPECTION BUREAU (Steven Burke 452-2898)
SIGNATURE : **DATE:** ON FILE

FINAL PERMIT APPROVAL: Comments:
SIGNATURE: [signature] 1-19-12 **DATE:**

13. PROJECT CLOSEOUT: As-built record drawings to Real Property Management Division

NASPNCLAINST 11010.3

Received: Jan 19 2012 08:36am
From: 01/19/2012 08:35 #129 P.002/004

STANDARD OPERATING PROCEDURE FOR EXCAVATIONS AND TRENCHING OPERATIONS

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13. Ensure that enough time is allotted in the job plan to properly complete the job.

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For *Emergency* call (850)-452-3333.

Location Saufley Field Site 1 Date 1/9/12

Project / Client 112002760 Fl. DP1 Navy

Weather Overcast ~72°

Obj Soil, ground water screening + Sampling

Personnel: See below

Equipment: Color Tec, OVA, Wind meter, VJI,

0630 Amber Tyre, Alex Murphy and Kevin Weichert Tetra Tech left hotel

0700 AT, KW on site met Dan Spicuzza + Jamie w/ AWS

0730 Patrick + Chris w/ Preferred Drilling on site + Ann arrived onsite Health + Safety meeting held

0915 Arrived @ site AT conducted drilling inspection + location calibrated PID/FID

0930 Began collecting first soils for screening @ down gradient location. Water @ contacted 33'

1045 Began collecting soils for screening @ Second location Water @ 33'

1345 Began collecting soils @ 3rd location

Location Saufley Field Site 1 Date 1/9/12

Project / Client 112002760 Fl. DP1 Navy

Sample ID	UPID	UFID	FPID	F-FID
0930 1-1	459	52.53	0.40	1.24
1-2	245	49.24	0.41	1.20
1-3	~~463~~	~~2.58~~	~~2.58~~ 7.21	~~0.52~~
1-4				
1-5	*		*	
1-6				
1-7				
1-8				
1-9				
1-10				

* Background Reading in Hanger for PID

Could not calibrate PID to FMOC, Just Doing FID Readings

Location Saufley Field Site 1 Date 1/9/12

Project / Client Isobutylene

Calibrated FID Standard Cal. Tu Reading

Sample ID	FID Filter	/ Unfiltered
	100ppm	100ppm 104ppm
1-1		Ø.Ø
1-2	Ø.25	/ Ø.25
1-3	Ø.Ø	/ Ø.ØØ
1-4	/	Ø.Ø
1-5	/	Ø.Ø
1-6	~~1.48~~	/ 1.48 ppm
1-7		/ 2.39
1-8		/ 7.39
1-9		/ 6.56
1-10	3.84	/ 10.Ø3
2-1		2.1Ø
2-2		1.78
2-3		1.3Ø
2-4		1.74
2-5		Ø.Ø
2-6		1.27
2-7	Ø.Ø	/ 4Ø.22
2-8		4.59
2-9		5.Ø8
2-10		7.62

Location Saufley Field Site 1 Date 1/9/12

Project / Client 112W02760 Fl. DP1 Navy

Sample ID	FID - U	FID - F	Corrected
3-1	1.82		
3-2	3.23		
3-3	3.20		
3-4	0.80		
3-5	1.17		
3-6	1.56		
3-7	1.35		
3-8	5.30		
3-9	4.70		
3-10	3.89		
4-1	1.Ø1		
4-2	3.Ø1		
4-3	3.78		
4-4	2.27		
4-5	2.13		
1/10/12 4-6	1.63	0.56	1.07
4-7	3.04	0.92	2.12
4-8	8.43	1.27	7.16
4-9	4.22	0.43	3.79
4-10	11.45	4.13	7.32

Location Sawmill Field Site 1 Date 1/9/12

Project / Client 112G02760 F1. DP1

Calibration issues w/ the PID spoke w/ AM readings will no longer be collected

1454 Began screening samples from 3 locations

1440 Began screening 4 location collected 0-2, 2-4, 4-6, 6-8 + 8-10 + then hydraulic lift on drill rig broke.

1540 Returned off site to by new hose

1610 AWS finished readings + off site

1630 TT secured site

1700 Arrived C NAS Pensacola End of Day

Location Sawmill Field Site 1 Date 1/10/12

Project / Client 112G02760 F1, DP1

Weather: overcast, raining

0630 AT, KW, AM left NAS Pensacola

0700 AT, KW met personnel drilling on site.

0710 AWS onsite

0717 AM arrived on site

Health + Safety meeting conducted headed to site to begin on boring 4-6.

0819 Began screening 4-6 location

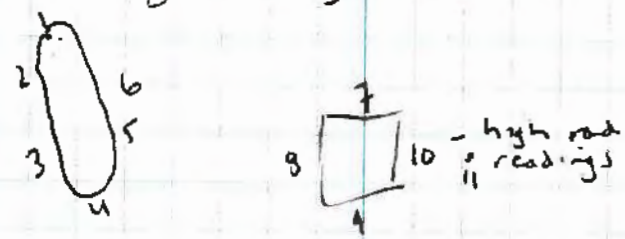
0845 Began drilling 5 location

0914 Began screening 5 samples

0917 Began drilling 6 location

1021 Began screening 6 samples

1005 Began drilling @ 7 location



1117 Began screening 7 location

1102 Began collecting 8 location

1115 Began screening 8 location

1150 Began collecting 9 location

[illegible] Began screening 9 location

Location: Sawfly Field Site 1 Date: 1/10/12

Project / Client: 1126-02760 F1 001

Depth	Sample ID	FID - 4	FID - 5	Corrected
0-2	5-1	2.01	0.72	1.29
2-4	5-2	1.37	0.60	0.77
4-6	5-3	0.60	0.59	0.01
6-8	5-4	0.52	0.17	0.35
8-10	5-5	9.55	2.13	7.42
10-15	5-6	1.23	0.79	0.44
15-20	5-7	5.12	1.11	4.01
20-25	5-8	~~27.64~~ 23.97	1.04	22.93
25-30	5-9	20.01	4.73	15.28
30-33	5-10	21.81	1.47	20.34
0-2	6-1	10.45	1.35	9.10
2-4	6-2	12.90	1.12	11.78
4-6	6-3	10.62	1.23	9.39
6-8	6-4	8.04	1.25	6.79
8-10	6-5	10.70	0.66	10.04
10-15	6-6	5.91	0.72	5.19
15-20	6-7	15.78	1.27	14.51
20-25	6-8	18.35	1.51	16.84
25-30	6-9	19.57	1.39	18.18
30-33	6-10	19.54	1.37	18.17

Location: Sawfly Field Site 1 Date: 1/10/12

Project / Client: 1126-02760 F1 001

Depth - Hole # 34

Depth	Sample ID	FID 4	FID - F	Corrected
0-2	7-1	10.60	0.36	10.24
2-4	7-2	13.30	0.48	12.82
4-6	7-3	4.36	0.57	3.79
6-8	7-4	3.59	0.22	3.37
8-10	7-5	3.18	0.10	3.08
10-15	7-6	3.03	0.17	2.86
15-20	7-7	3.54	0.99	2.55
20-25	7-8	13.80	2.14	11.66
25-30	7-9	5.32	0.29	5.03
30-35	7-10	16.75	0.70	16.05
35-40	7-11	7.21	0.53	6.68
0-2	8-1	8.01	0.80	7.21
2-4	8-2	7.31	0.93	6.38
4-6	8-3	2.93	0.10	2.83
6-8	8-4	6.26	0.33	5.93
8-10	8-5	3.43	1.01	2.42
10-15	8-6	6.59	1.92	4.67
15-20	8-7	11.18	1.25	9.93
20-25	8-8	17.93	1.73	16.20
25-30	8-9	3.36	0.60	2.76
30-35	8-10	11.50	0.41	11.09
35-40	8-11	14.01	0.53	13.48

Location Sandy Field Site 1 Date 1/10/12

Project / Client 112602760 F1 DP1

Depth	Sample ID	U	F	Corrected
0 0-2	9-1	7.80	0.97	6.93
2 2-4	9-2	5.20	0.86	4.34
4 4-6	9-3	2.59	0.23	2.36
6 6-8	9-4	7.05	0.99	6.06
8 8-10	9-5	13.30	3.71	9.59
10 10-15	9-6	0.78	0.10	0.68
15 15-20	9-7	11.53	1.46	10.07
20 20-25	9-8	8.40	0.93	7.47
25 25-30	9-9	13.50	3.34	10.16
30 30-35	9-10	13.76	1.82	11.94
35 35-40	9-11	7.25	0.74	6.51
0 0-2	10-1	10.52	0.60	9.92
2 2-4	10-2	1.60	0.22	1.38
4 4-6	10-3	5.00	0.59	4.41
6 6-8	10-4	1.04	0.60	0.44
8 8-10	10-5	0.96	0.17	0.79
10 10-15	10-6	1.13	0.93	0.20
15 15-20	10-7	1.04	0.96	0.08
20 20-25	10-8	5.63	1.15	4.48
25 25-30	10-9	19.63	1.60	18.03
35 35-40	10-10	3.33	0.98	2.35
40 40-45	10-11	14.79	1.33	13.46

Location Sandy Field Site 1 Date 1/10/12

Project / Client 112602760 F1 DP1

Rad readings were high to the east of location 10 so a 20 foot step out was selected and screening will continue until rad readings return to normal.

Depth	Sample ID	U ppm	F	Corrected
0-2	11-1	24.93	0.61	24.32
2-4	11-2	6.10	0.21	5.89
4-6	11-3	9.86	0.33	9.53
33-38	G-1	1,118	3.93	1,114.07
	G-2	1268	2.59	10.09
	G-3	15.40	0.92	

1320 Began collecting 10 locations
1423 Began collecting 11 location
1451 Began screening samples
1519 Collected G-1 sample
1607 collected G-2 sample
1648 collected G-3 sample
1506 began screening ground water samples
1556 Arm to Fed Ex to pick up o-cash
1516 Arm off site
1600 TT, + Referred second site + left Sandy
1630 Arrival @ NAS Pensa

CWD

Location Sandy Field Site 1 Date 1/11/12

Project / Client 112002700 FI DP2

Weather: overcast high 63°

0620 AT, KM left ~~site~~ NAS Pensacola

0652 Arrived on site. Preferred drilling shortly to follow

0715 AM + AWS

0730 Began collecting HVOC G-4 location

0915 collected location 4 sample

0945 set up on 5 location

0916 set up on 6 location

0952 set up on 7 location

1032 set up on 8 location

Depth	Sample ID	U	F	Conc
33-39	G-4	5.20	0.30	4.90
↓	G-5	5.16	0.20	4.96
	G-6	4.21	0.17	4.04
	G-7	9.00	0.56	8.44
	G-8	15.21	0.72	14.49
	G-9	9.16	0.20	8.96
	G-10	8.40	0.16	8.24

Location Sandy Field Site 1 Date 1/11/12

Project / Client 112002700 FI DP2

1100 set up on 9 location

1142 set up on 10 location

1200 Began screening sample locations

1230 Spoke w/ Frank Lessone + Dan Spinazza to determine soil + gw locations

Soil	Gw
✓2-7 (15-20')	✓G-1
✓5-8 (20-25')	✓G-3 (MS/MSD/Dup)
✓6-9 (25-30')	✓G-6
✓7-10 (30-35')	✓G-9
✓8-8 (20-25')	✓G-10
✓8-11 (35-40')	
✓9-10 (30-35')	
✓10-1 (Dup/MS/MSD) (0-2')	
10-6 (10-15')	
10-9 (25-30')	
11-1 (Dup) (0-2')	

1300 set up on GW-10 location collected sample @ 1325

1440 set up on G-8 location collected sample @ 1505

1547 Set up on G-6 location sample @

1610 AWS left site Sandy Site

88 90

Location Saufley Field Site 1 Date 1/12/12

Project / Client 112G02760 F1.DP1

weather: clear ~50°

0615 AT, KW left NAS Pensacola

0650 AT, KW, Am, Pretend drilling arrived onsite

0710 Ann's onsite Health + Safety meeting conducted + Equipment Calibrated

0720 set up GW-3 location collected sample @ 0841 MS/MSD collected FD011212-01

0956 Set up on GW-1 location

1015 Set up on 2-7 location sample 1015

Set up on 5-8 location sample @

Set up on 6-9 location sample @

Set up on 7-10 location sample @

1214 Set up on 8-9 location Sample @ 1225

Set up @ 8-11 sample @ 1235

Location Southy field Date 1/13/12

Project / Client 112602760 FT. OP1

Weather: clear ~30°

0615 AJ checked out of hotel + left

NAS Appointed

0645 AJ arrived @ South field

0713 AWS arrived onsite

0720 Petroed Drilling arrived on site

Health + Safety Briefing conducted

Went to site to backfill borings

+ load drums

0835 Began packing drums

3 drums

2 soil, 1 purge water

0851 Site secured AJ, Petroed drilling

AWS off-site

1330 AJ arrived @ office,

unloaded equipment.

Location Date

Project / Client

FedEx

5903 N W ST
PENSACOLA, FL 32505

Location:	PNSCE
Device ID:	PNSCE-POS1
Employee:	647029
Transaction:	77042109635

STANDARD OVERNIGHT

874847555644	31.35 lb (S)	40.56

Scheduled Delivery Date 01/10/2012

Shipment subtotal:	40.56
Total Due:	**40.56**
FedEx Account: *****5519	40.56

M = Weight entered manually
S = Weight read from scale
T = Taxable item

Subject to additional charges. See FedEx Service Guide at fedex.com for details. All merchandise sales final.

Visit us at: fedex.com
Or call 1.800.GoFedEx
1.800.463.3339

January 9, 2012 4:31:31 PM

FedEx Express US Airbill — FedEx Tracking Number 8748 4755 5644

Form ID No. 0215 — Sender's Copy

1 From — Date 1/9/12 — Sender's FedEx Account Number 1515-8851-9
Sender's Name DISTRIBUTION — Phone (850) 385-9899
Company TETRA TECH NUS INC GOVT
Address 1558 VILLAGE SQUARE BLVD STE 2 — Dept./Floor/Suite/Room
City TALLAHASSEE — State FL — ZIP 32309-2748

2 Your Internal Billing Reference — First 24 characters will appear on invoice. 112G02760 FT. DP1

3 To — Recipient's Name Eric Morgan — Phone (813) 628 4200
Company U.S. Environmental Corp
Address 1202 Tech Blvd Suite 1116 — Dept./Floor/Suite/Room
We cannot deliver to P.O. boxes or P.O. ZIP codes.
Address — Use this line for the HOLD location address or for confirmation of your shipping address.
City Tampa — State FL — ZIP 33619

0433255761

4a Express Package Service — Packages up to 150 lbs.
☐ FedEx Priority Overnight — Next business morning.* Saturday Delivery NOT available.
☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.
☐ FedEx First Overnight — Earliest next business morning delivery to select locations.*
☐ FedEx 2Day — Second business day.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

4b Express Freight Service — Packages over 150 lbs.
☐ FedEx 1Day Freight — Next business day.** Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
☐ FedEx 1Day Freight — FedEx 1Day Freight Banking Net.
☐ FedEx 2Day Freight — Second business day.** Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
☐ FedEx 3Day Freight — Third business day.** Saturday Delivery NOT available.

5 Packaging
☐ FedEx Envelope* ☐ FedEx Pak* Includes FedEx Small Pak and FedEx Large Pak. ☐ FedEx Box ☐ FedEx Tube ☒ Other

6 Special Handling and Delivery Signature Options
☐ SATURDAY Delivery — NOT available for FedEx Standard Overnight, FedEx Express Saver, or FedEx 3Day Freight.
☐ No Signature Required — Package may be left without obtaining a signature for delivery.
☐ Direct Signature — Someone at this address may sign for delivery.
☐ Indirect Signature — If no one is available at this address this package may be left with a neighboring address may sign for delivery. For residential delivery only.
Does this shipment contain dangerous goods?
One box must be checked.
☒ No ☐ Yes As per attached Shipper's Declaration. ☐ Yes Shipper's Declaration not required. ☐ Dry Ice Dry Ice, 9, UN 1845 ____ kg
Dangerous goods (including dry ice) cannot be shipped in FedEx packaging or placed in a FedEx Express Drop Box.
☐ Cargo Aircraft Only

7 Payment Bill to:
☒ Sender — Acct. No. in Section 1 will be billed. ☐ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check
Enter FedEx Acct. No. or Credit Card No. below.
Total No. of Packages ____ Total Weight ____ lbs. Total Declared Value* $ ____ .00
Your liability is limited to $100 unless you declare a higher value. See back for details. By using this AWB you agree to the service conditions on the back of this AWB and in the current FedEx Service Guide, including terms that limit our liability.

605

Ship on the go at mobile.fedex.com
Tap into all our FedEx® shipping tools with FedEx® Mobile.

FedEx

5903 N W ST
PENSACOLA, FL 32505

Location:	PNSCE
Device ID:	PNSCE-POS1
Employee:	647029
Transaction:	77042462364

FIRST OVERNIGHT

875573873810	720.45 lb (S)	2,455.40
795761180250		
795761180281		
795761180272		
795761180283		
795761180294		
795761180309		
795761180310		
795761180320		
795761180331		
795761180342		
795761180353		
795761180364		
795761180375		

Scheduled Delivery Date 01/13/2012

Tape

051131572034	7 (T)	17.50

Shipment subtotal:	2,455.40
Merchandise taxable subtotal:	17.50
Tax(FL) 6.000%	1.05
Tax(County) 1.500%	0.26
Total Due:	**2,474.21**
FedEx Account: *****5519	2,474.21

N = Weight entered manually
S = Weight read from scale
T = Taxable item

Appendix C

March 2012 – Geophysical Survey

Location Saufley Field Site 1+2 Date 3/9/11

Project / Client 112G02760 Jm30 FL012

Site 2 mw Survey + Site 1 grid setup

0912 (EST) Amber Igue Tetra Tech left Tallahassee

Weather cloudy windy progressing to severe thunderstorms

1157 (CT) AI arrived in Pensacola. Severe thunderstorms in the area, tornado warnings and sirens are in effect. Field work has been suspended for safety.

1411 AI met w/ Jamie Metzger of Campbell Engineering to locate vertical and horizontal controls for the base. A27 + A14 were also marked as hard point corners on the grid to be tied in.

1640 AI, Jm left base

1706 AI arrived @ hotel EOD

Location Saufley Field Site 1 + 2 Date 3/10/11

Project / Client 112G02760 Jm30 FL012

Site 2 mw Survey + Site 1 grid setup

0630 AI left hotel

0645 AI on site

Weather: clear, sunny high 60°

Personell: AI, Jamie Metzger Campbell Eng + Anita Metzger Campbell Engineering

Field Equipment: pinflags, measuring tapes, steel pins, spray paint and survey equipment provided by Campbell Engineering

Obj: Survey in the 3 mws @ Site 2 and establish 50x50 foot grid for Site 1

0700 Am, Jm arrived on site Health & Safety topics covered. federal prison, slips, trips, falls, etc Scope of work for Site 1 and Site 2 covered.

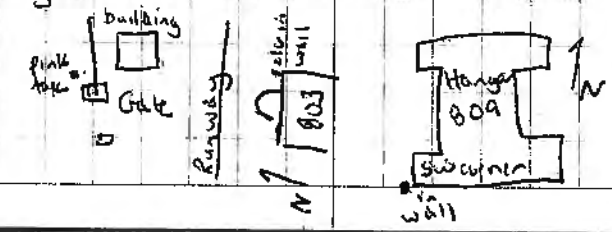
0730 Began establishing controls. All equipment calibrated

Vertical Control Locations

Security Gate Fenceline X103 hard to read

Bld 803 north eastside entrance Clev 7542 E103

Hangar 809 SW corner Y103

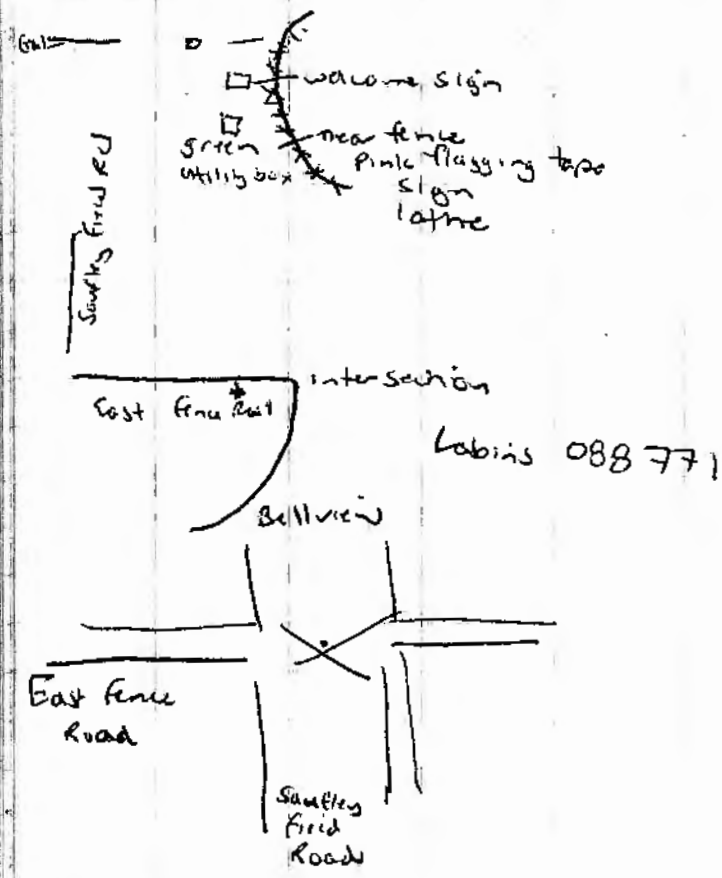


Location Saufley Field Site 2+1 Date 3/10/11

Project / Client 112602760 Jm 30 FI W12

Site 2 mw Survey + Site 1 grid

Horizontal Locations



0946 Began GPSing ~~locations~~ controls

1044 Began setting up control for grid on site 1

Iron rebar + cap set into center of skeet range pond.

Location Saufley Field Site 1+2 Date 3/10/11

Project / Client 112602760 Jm 30 FI W12

A-27 Trav point #9 Iron rebar cap set

1116 Began GPSing monitoring wells @ Site 1 3 points natural ground, rim + PVC pipe. Set up on mw01 first. SF-2-mw04 3 readings SF-2-mw03

1200 AI left site to go to NAS Pensacola to pick up Brown PA report and do records search in the map room.

1350 AI returned to the site. JM + AM had begun setting up grid for Site 1

1755 left site 100 grid set up to 7 line

1830 arrived ~~left~~ hotel

GPS Amber Tyge

Location Saufley Field Site 1+2 Date 3/11/11

Project / Client 1126 02760 Jm 30 F1W12

Site 2 mw Survey + Site 1 grid

Weather: Sunny, 58° high

0700 AI checked out + left hotel

0720 AI arrived on site. Jm + Am coordinating w/ Campbell Engineering office on confirming grid for site 1

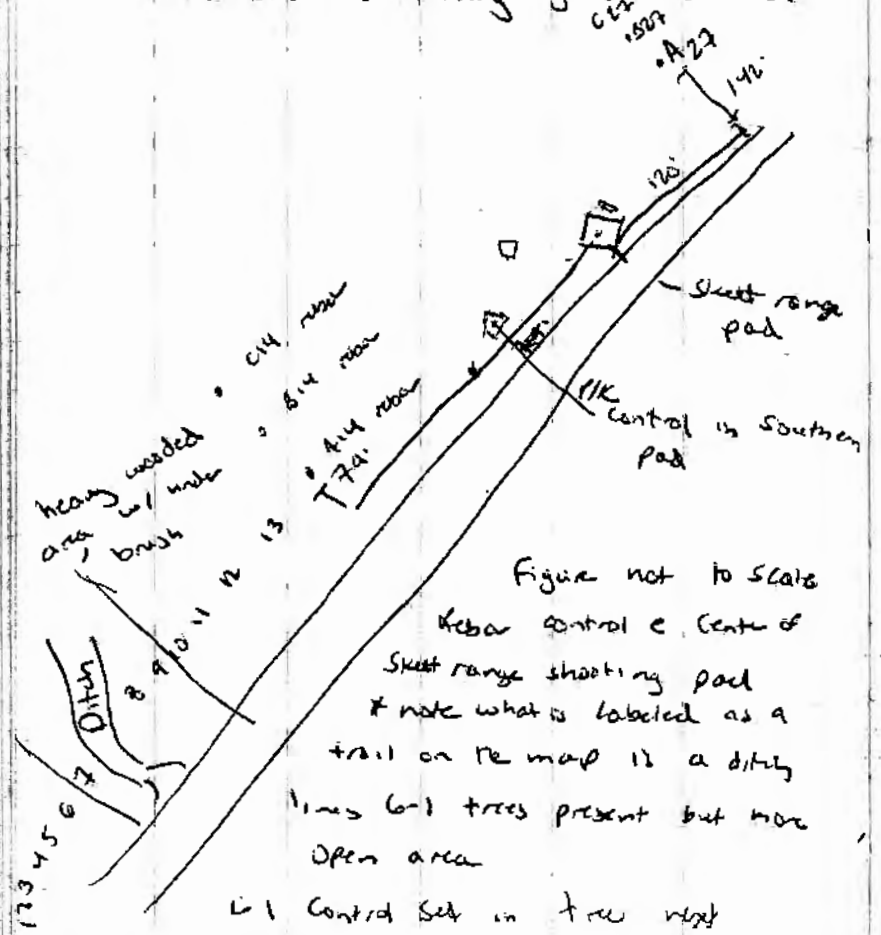


Figure not to scale

Rebar control @ Center of Skeet range shooting pad

* note what is labeled as a trail on the map is a ditch

lines 6-1 trees present but more open area

6-1 Control set in tree next to ditch

Location Saufley Field Site 1+2 Date 3/11/11

Project / Client 1126 02760 Jm 30 F1W12

Site 2 mw Survey + Site 1 grid

0900 Jm, Am arrived on site. Health + Safety meeting conducted. Began finishing up 6-1 line.

1007 Finished up 6-1 line starting on gathering x,y + z @ every pin flag location

1500 Finished grid secured site and left

1917 (CST) arrived @ Tallahassee, EOD

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Location Saufley Field Site 1+2 Date 3/14/11

Project / Client 1126 02760 Jm 30 FI W12

Site 1 Rad Survey

0530 (CST) Amber Tyler Tetra Tech NUS left Tallahassee.

0745 AI arrived @ Saufley Field.

Weather: clear, sunny high 73°

Objective: Conduct radio log, cal survey @ Site 1

Field Equipment: pin flags, markers, lathes AWS rad equipment

0800 Alan Brady + Dymaris McFarlin with AWS arrived on site. Health + Safety Topics covered.

0847 Began calibrating instruments

0854 Began collecting background readings 30 bkgs collected on each probe, 2 probes used.

1011 Began 30 count check on Cesium source for each probe

1300 Began survey @ A-27 block

A-27 no flags

A-26 flags SW corner

A-25 no flags

A-24 flags NW corner + throughout readings 6-7k counts per minute

Location Saufley Field Site 1 Rad Date 3/14/11

Project / Client 1126 02760 Jm 30 FI W12

Site 1 Rad Survey

1600 Finished grids A-27 - A-24 + Alan wanted to end the day. Site secured

1630 AI @ Home Depot to purchase field supplies

1700 AI @ hotel COD

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Location Saufley Field Site 1 Date 3/15/11

Project / Client 112002760 Fl. 012

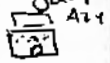
Site 1 Rad Survey

Weather clear sunny high 75

0630 AI left hotel

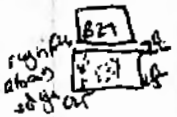
0647 AI met AB + Dm onsite health and safety meeting conducted. Aws instruments sourced checked.

0714 Began gamma survey on A23

A23 

B27 no flags

A22

B26 

A21

roads outside grid ~ 2'

1152 Double checked backgrounds + background was lower today so readings we are collecting w/ the Ludlum are confirmed

Alans action level went from 5133 to 4500. Dymarys went from 4600 to 3950.

Location Saufley Field Site 1 Date 3/15/11

Project / Client 112002760 Fl. 012

Site 1 Rad Survey

A20

no flags

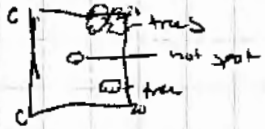
A19 no flags

B19

no flags

B20

no flags

B21 

1600 secured site + left

1630 AI @ hotel departed

1700 AI @ hotel

left blank

Location Sampling Field Site 1 Date 3/16/11

Project / Client 1126.02760 Fl. W12

Site 1 Rad Survey

Weather sunny, clear, high of 73°

0630 AI left hotel

0642 AI on site

0655 DM, AB AOS on site health and safety meeting held. Performed background check on instruments and did a source check. One of the ludlums needs a new cord + it will be Fed Ex @ 10 am AB will pick up when it arrives.

B22

no flags

B23

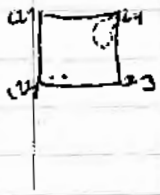
trees + picnic table

* outside grid *

0920 fog burned off calculated an additional background.

0939 AB left site to pick up cords for instruments.

B24

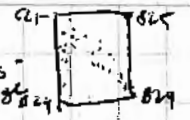


Location Sampling Field Site 1 Date 3/16/11

Project / Client 1126.02760 Fl. W12

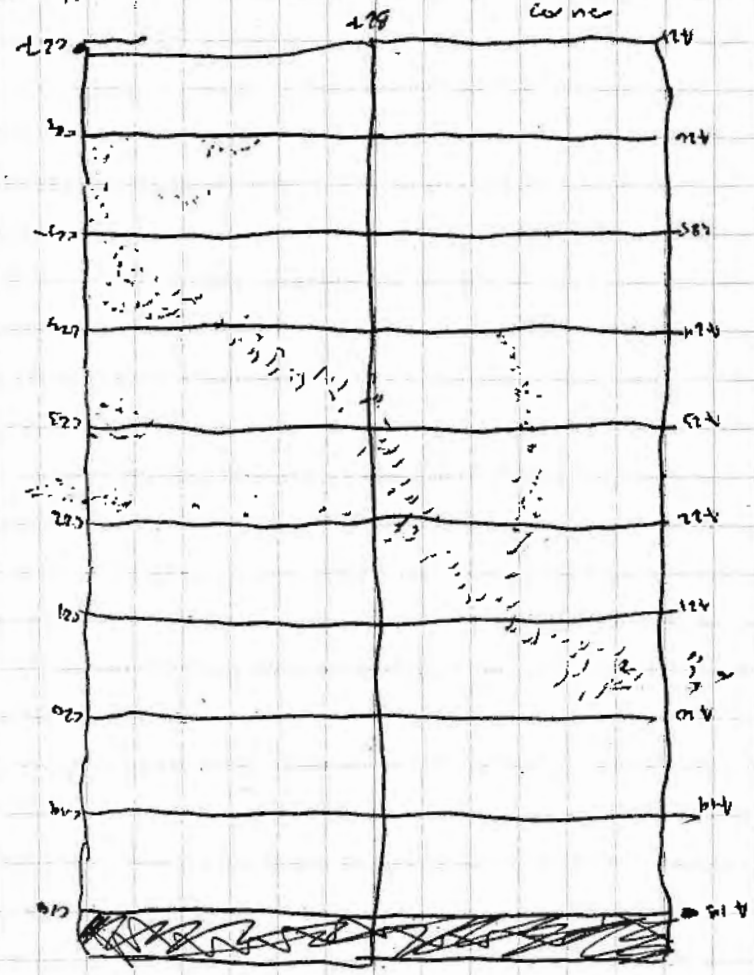
Site 1 Rad Survey

B25 flags - on edge



Looking from 27-18

Standing in C27 corner

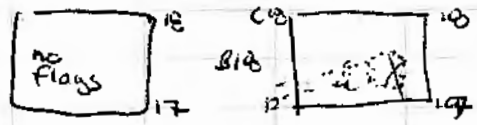


Location Soufley Field Site 1 Date 3/16/11

Project / Client 1126-02760 Fl.w12

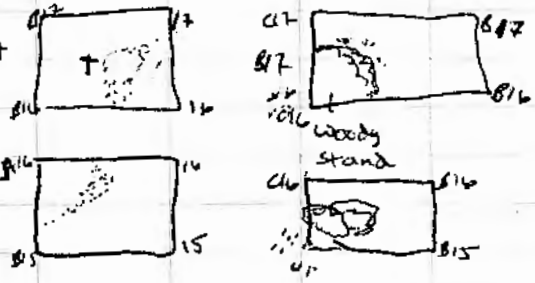
Site 1 Rad Survey

A 18



1230 AB returned to Site

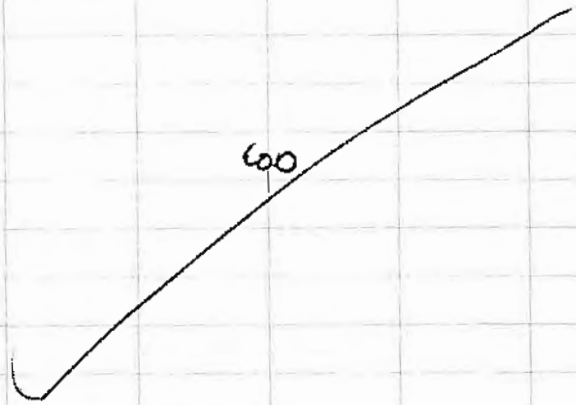
A 17
T=tree



A=16

1600 secured site

1630 AI arrived @ hotel



Location Soufley Field Site 1 Date 3/17/11

Project / Client 1126-02760 Fl.w12

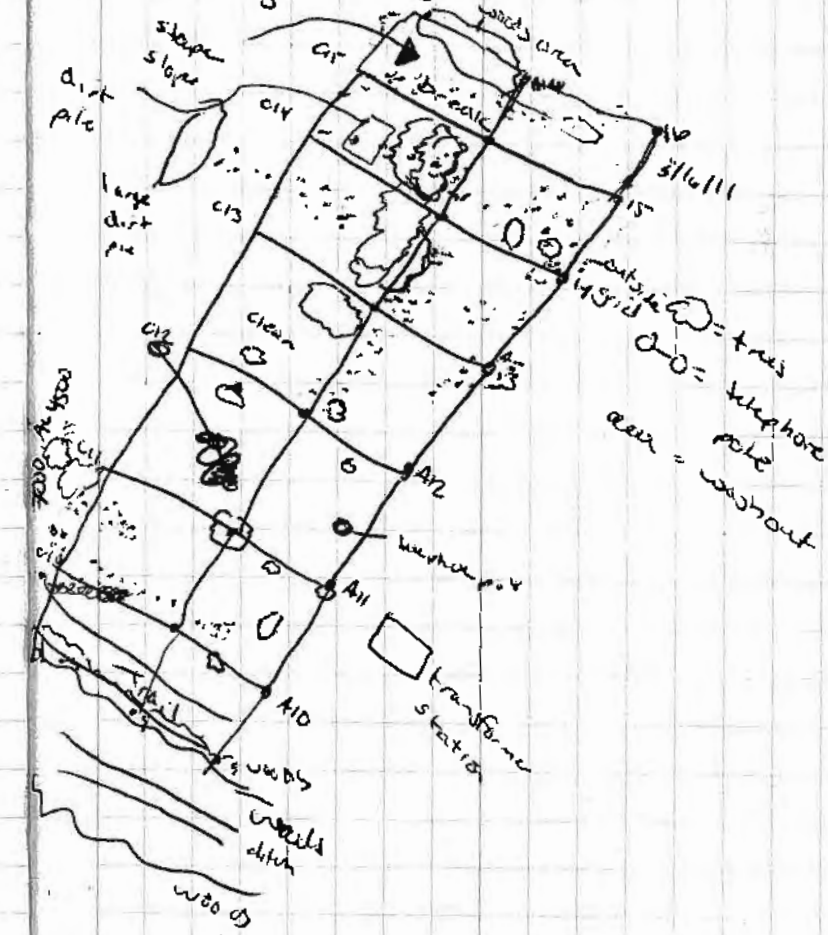
Site 1 Rad Survey

Weather: clear, sunny high 75°

0610 AI left hotel

0646 AI arrived on site

0655 AB + DM arrived on site. Health + Safety meeting conducted.



Location Saultry Field Site 1 Date 3/17/11

Project / Client 112602760 F1. w12

Site 1 Rad Survey

0708 Background + source check performed on both instruments.

1444 collected bkg outside of grid starting e A7 readings in grid ranged from 4700 - 7700 sigmas

1504 A1, Om collected 2 static readings from 7-1 line grids

bkg 4800

A1 #1 = 5697

A1 #2 = 5464

B1 #1 5942

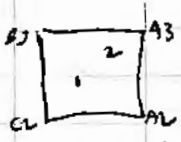
B1 #2 4861

B2 #1 4796

B2 #2 4924

A2 #1 4812

A2 #2 4541



A3 #1 4300

A3 #2 3483

Location Saultry Field Site 1 Date 3/17/11

Project / Client 112602760 F1. w12

Site 1 Rad Survey

B3 #1 4820

B3 #2 4857

B4 #1 4920

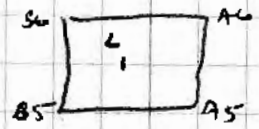
B4 #2 5560

A4 #1 4765

A4 #2 4424

A5 #1 4940

A5 #2 5140

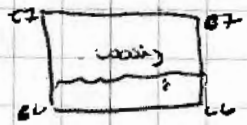


B5 #1 5331

B5 #2 5277

B6 #1 4900

B6 #2 N/A



A6 #1 5166

A6 #2 7100

1403 Begin area site

1420 A7e hotel 820

Location Saufley Field Site 1 Date 3/18/11

Project / Client 112602760 F1.012

Site 1 Rad Survey

Weather: foggy forecast to turn sunny high 81°

0630 AI checked out of hotel

0645 AI on site

0657 AB, Om on site health + safety meeting conducted. AB wants to perform background checks when the fog burns off.

0807 Begin background checks

1000 (c) 850-982-7080 Curtis Bruer

850-452-1067 RSSI.

Driver RSSI Rick Williams 850-207-8792

Navy Norm Feinberg 3131

Doug Brooks RSSI.

Spoke w/ Curtis Bruer regarding clearing the woody areas of the grid. He will need ~3 weeks heads up to do the work

1044 Drum rally for Site 1

2 empty

1 55 gal John School fields mmRP

1 decon materials from pad

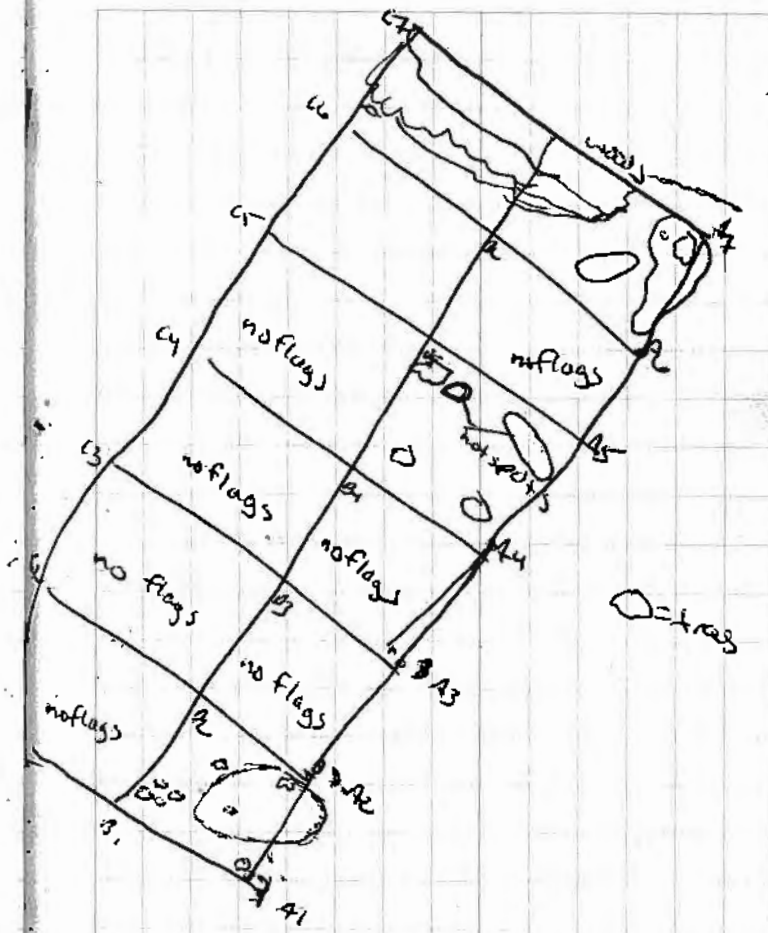
1243 verification of hot spots began

1359 began survey on lower grid

Location Saufley Field Site 1 Date 3/16/11

Project / Client 112602760 F1.012

Site 1 Rad Survey



1630 Secured site

1700 AI arrive hotel

Location Saufley Field Site 1 Date 3/19/11

Project / Client 112602760 FI.012

Site 1 Rad Survey

weather foggy forcasted to clear high 80°

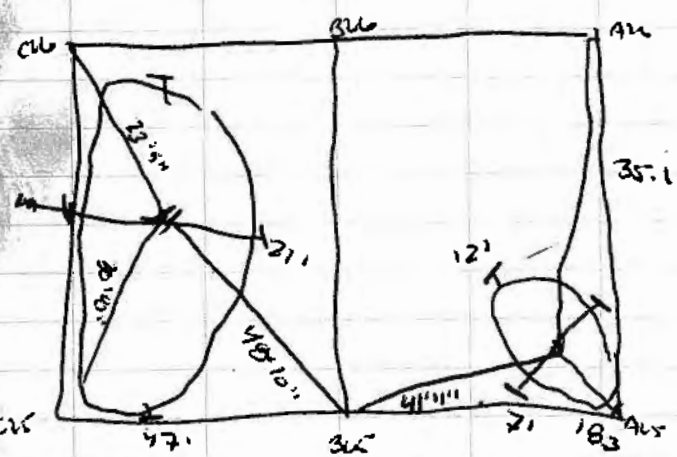
0630 AI checked out of hotel

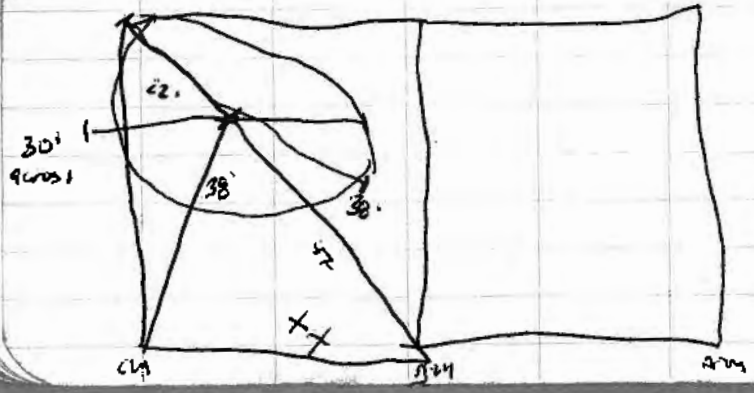
0643 AI arrived on site

0650 AB + DM arrived on site. Health and safety briefing held.

0730 started on grids

1126 AI began collecting dimensions on area of concern.

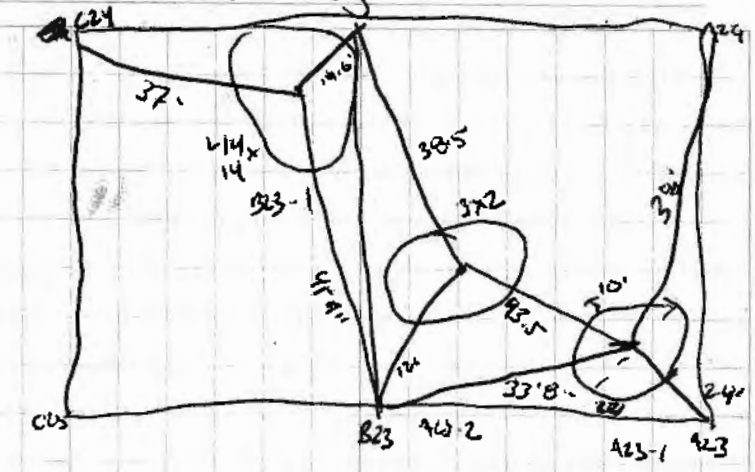


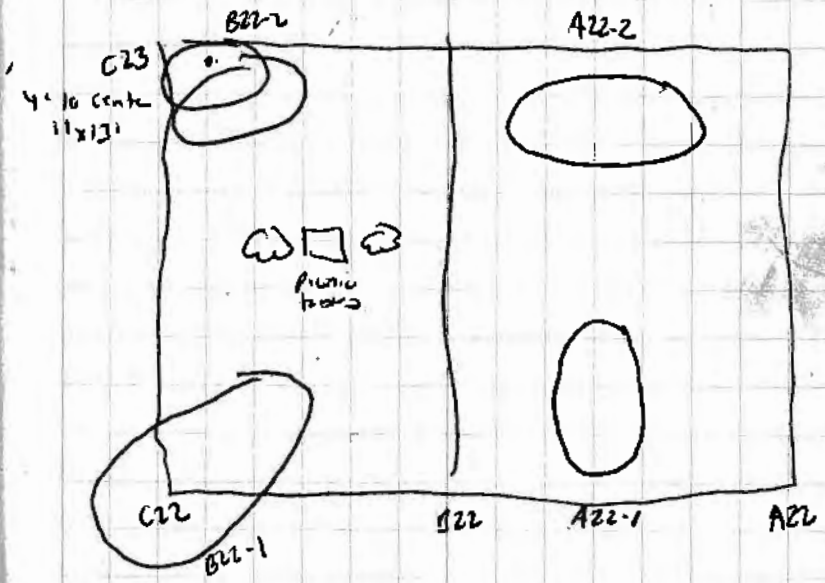


Location Saufley Field Site 1 Date 3/19/11

Project / Client 112602760 FI.012

Site 1 Rad Survey

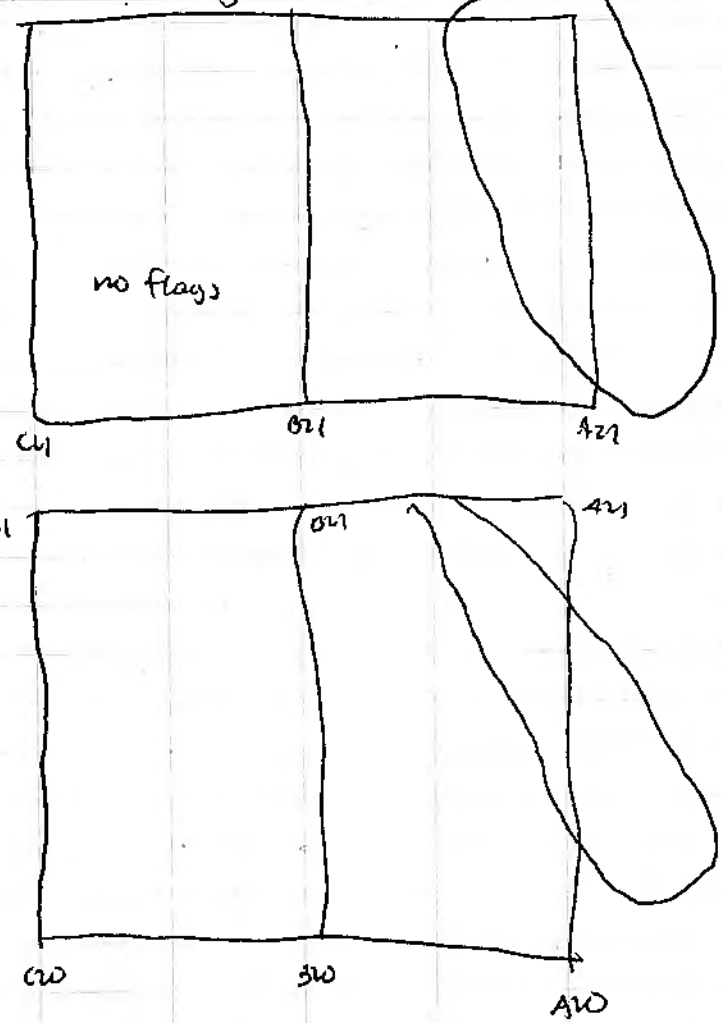




Location Saufley Field Site 1 Date 3/19/11

Project / Client 112602760 F1.012

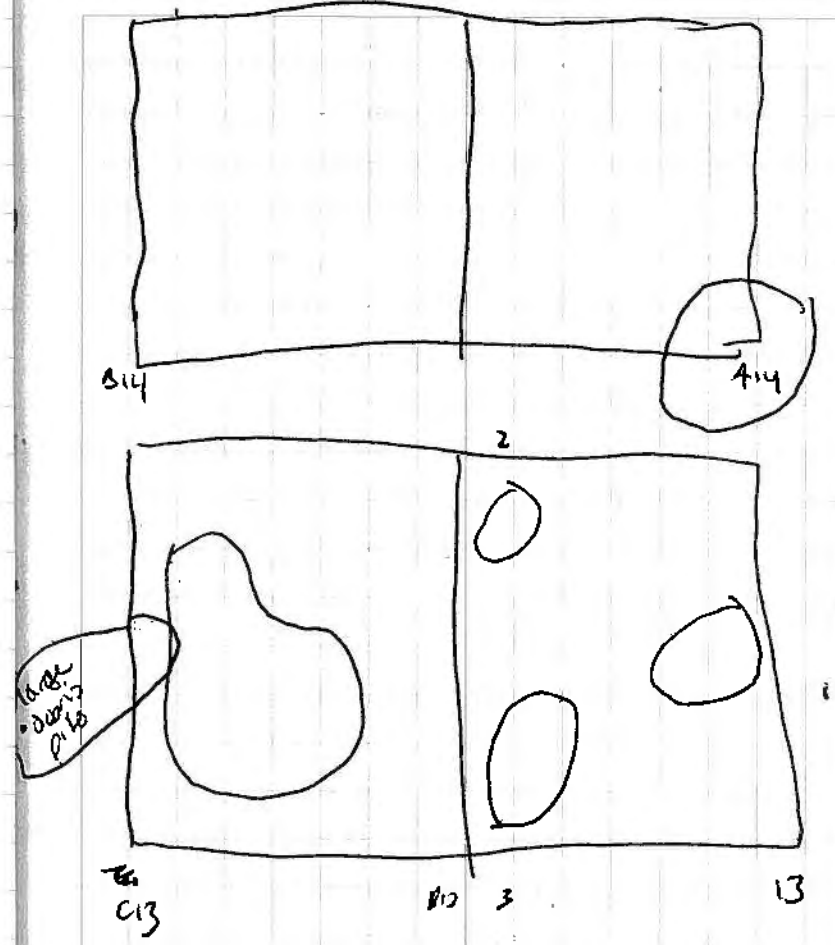
Site 1 Rad Survey A21-1



Location Saufley Field Site 1 Date 3/19/11

Project / Client 112602760 F1.012

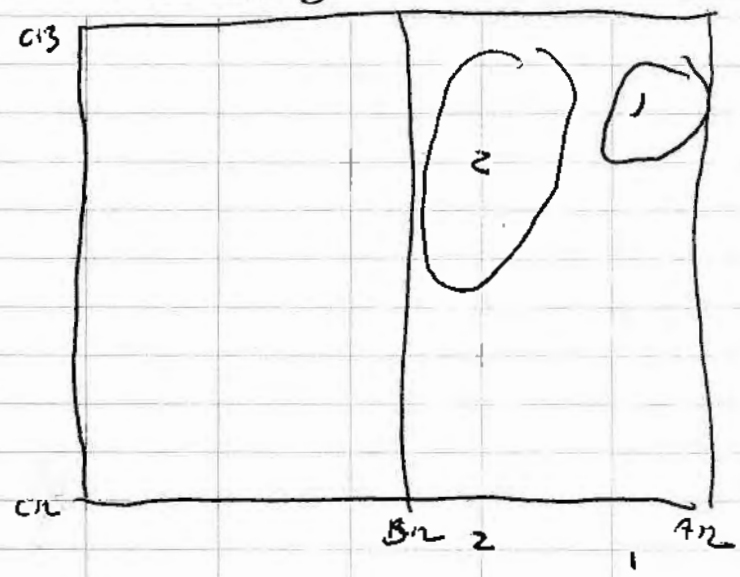
Site 1 Rad Survey

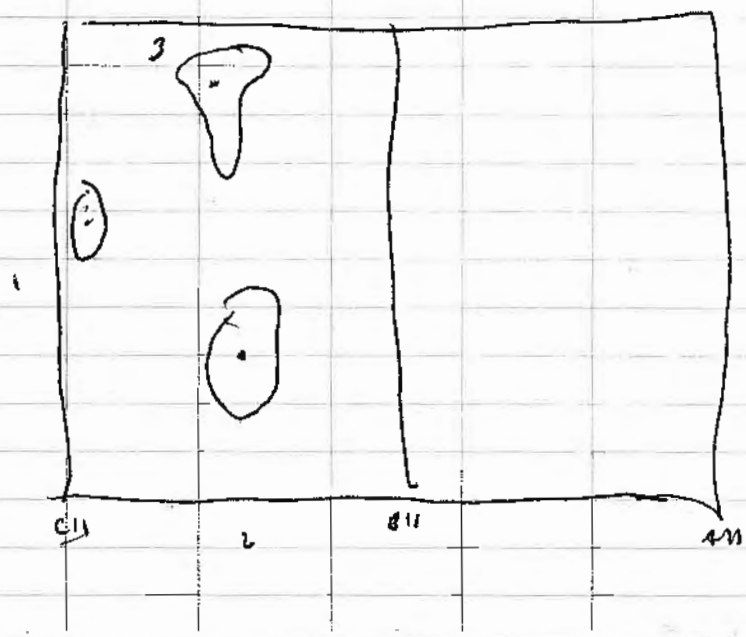


Location Saulty Field Site 1 Date 3/19/11

Project / Client 1126-02760 F1.W12

Site 1 Rad Survey

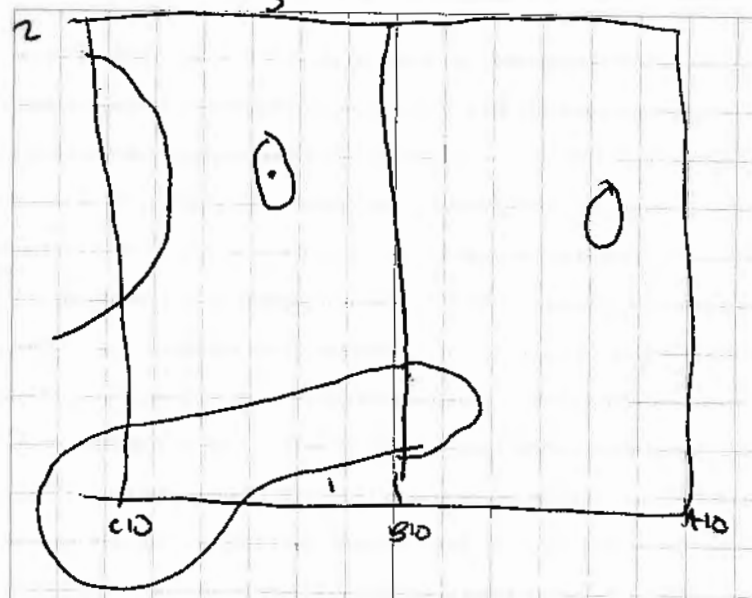


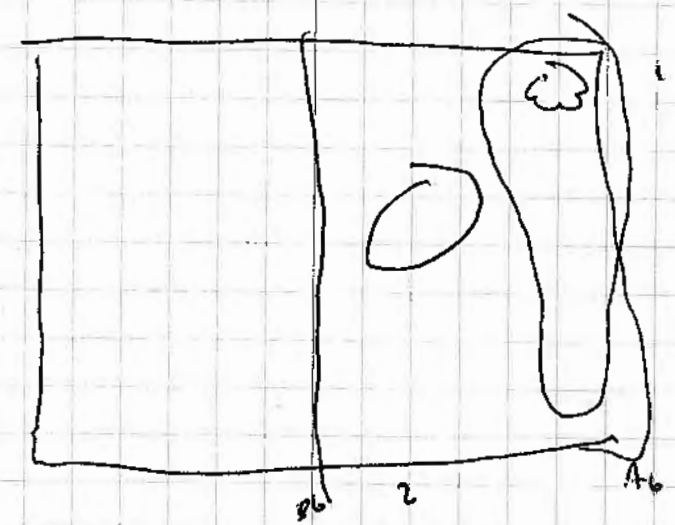


Location Saulty Field Site 1 Date 3/19/11

Project / Client 1126-02760 F1.W12

Site 1 Rad Survey

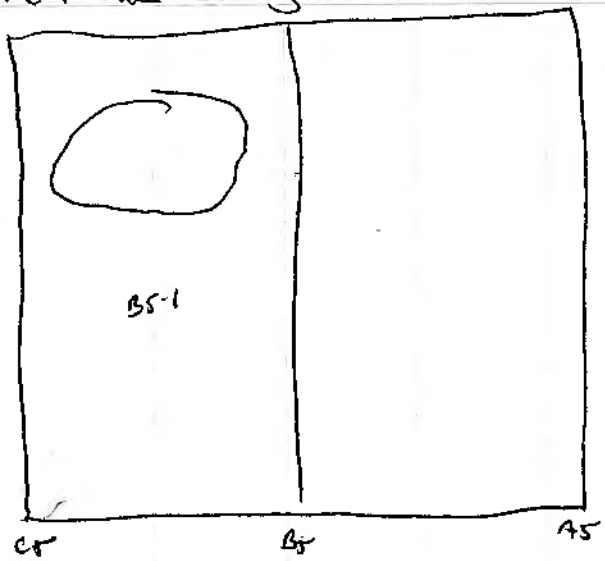


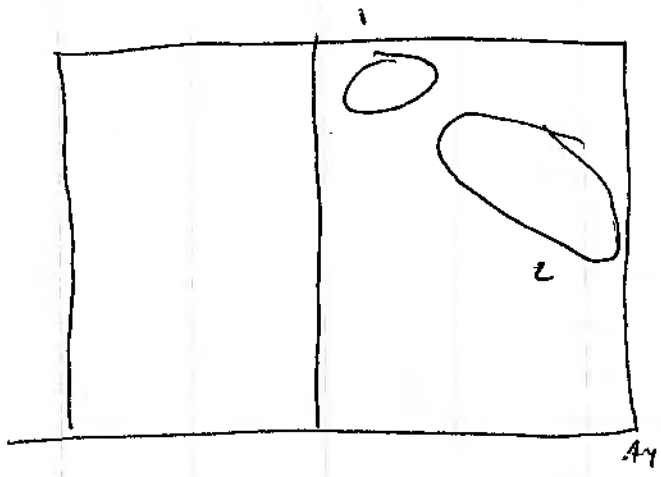


Location Saufley Field Site 1 Date 3/19/11

Project / Client 1126 02700 Fl. W12

Site 1 Rad Survey

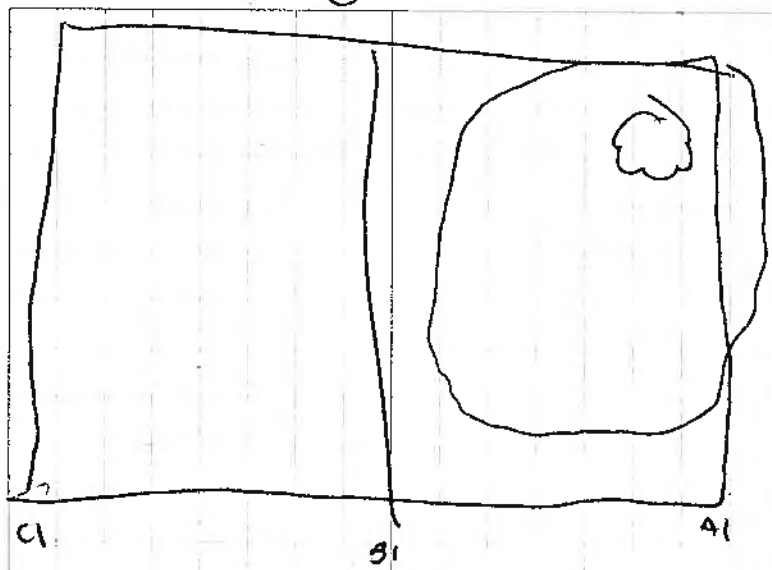




Location Saufley Field Site 1 Date 3/19/11

Project / Client 1126 02700 Fl. W12

Site 1 Rad Survey



1300 A-05 left side

1350 ~~A-05~~ A1 left side

1800 (EST) A1 arrived in Tallahassee

Appendix C

June 2012 – Test Pit Excavation and Soil Sampling

Tetra Tech

PROJECT: 112G02760 **JOB #:** 112G02760
LOCATION: Saufley Field Site 1 **DATE:** 6/24/11
PROJECT MANAGER: Frank Lerone **FOL:** Amber Fryer

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (Tetra Tech and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 PID			
2 FID			
3			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place (OSHA poster, hospital route, key phone numbers, etc.)	✓		

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped	✓		
COCs faxed to appropriate in-house personnel			✓
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis.

Tetra Tech

PROJECT: 112G02760 JOB #: 112G02760
LOCATION: Sauflo Field Site 1 DATE: 6/25/12
PROJECT MANAGER: Frank Lenore FOL: Amber Fyler

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (Tetra Tech and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 PID			
2 FID			
3			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place (OSHA poster, hospital route, key phone numbers, etc.)	✓		

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped	✓		
COCs faxed to appropriate in-house personnel			✓
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis.

Tetra Tech

PROJECT: 112G02760 **JOB #:** 112G02760
LOCATION: Saufley Field Site 1 **DATE:** 6/26/12
PROJECT MANAGER: Frank Lewis **FOL:** Amber Tyler

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (Tetra Tech and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 PID			
2 FID			
3			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place (OSHA poster, hospital route, key phone numbers, etc.)	✓		

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped	✓		
COCs faxed to appropriate in-house personnel			✓
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis.

Tetra Tech

PROJECT: 112G02760 **JOB #:** 112G02760
LOCATION: Sanford Field Site 1 **DATE:** 6/27/12
PROJECT MANAGER: Frank Lessure **FOL:** Amber Tyler

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (Tetra Tech and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 PID			
2 FID			
3			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place (OSHA poster, hospital route, key phone numbers, etc.)	✓		

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped	✓		
COCs faxed to appropriate in-house personnel			✓
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis

Tetra Tech

PROJECT: 112G02760 **JOB #:** 112G02760
LOCATION: Sanford Field Site 1 **DATE:** 6/20/12
PROJECT MANAGER: Frank Lerone **FOL:** Amber Fojo

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (Tetra Tech and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 PID			
2 FID			
3			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place (OSHA poster, hospital route, key phone numbers, etc.)	✓		

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped	✓		
COCs faxed to appropriate in-house personnel			✓
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis

Tetra Tech

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of___

Project Site Name: Southfield Site 1
Project No.: 112G02760 Test Pit

Sample ID No.: SF-1-A2TP1-4-5-06/20/12
Sample Location: NE corner of trench
Sampled By: A2 A
C.O.C. No.:

- [ ] Surface Soil
- [x] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [ ] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA:

Date:	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time:	4-5	light brown	med fine to fine sands
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other

OBSERVATIONS / NOTES:

MAP:

QC/QA Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Saufley Road Site 1
Project No.: 112G0160 Test Pit

Sample ID No.: SF-1-A2TP1-01-062012
Sample Location: NE corner of trench
Sampled By: AL
C.O.C. No.:

- [x] Surface Soil
- [ ] Subsurface Soil
- [ ] Sediment
- [ ] Other:
- [ ] QA Sample Type:

Type of Sample:
- [ ] Low Concentration
- [ ] High Concentration

GRAB SAMPLE DATA

Date: 6/25/12
Time: 1124
Method: auger
Monitor Reading (ppm):

Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
0-1'	med brown	med fine to fine sand

COMPOSITE SAMPLE DATA

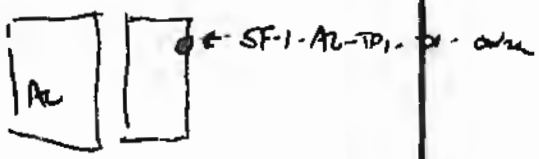
Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION

~~Pest/PCB~~ Analysis	Container Requirements	Collected	Other
Pest/PCB/SVOC (SIM)	1 glass jar	✓	
Fluo-PID	1		
SVOC	1		
metals	1		
& VOCs	4 x 40 ml methanol	✓	

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Sandy Fred Site 1
Project No.: 116002760

Sample ID No.: SF-1-A1TP1-4-5-06/20/12
Sample Location: 10' into A1TP1
Sampled By:
C.O.C. No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/25/12	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1510	4-5	light brown	med fine to fine sand
Method: auger			
Monitor Reading (ppm): 0			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Pest/PCBs 1SVOCs (Sim)	1 glass jar		
Flo-Pro	1		
SVOC	1		
metals	1		
VOCs	4 3 vials, 1 unpreserved		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Saufley Field Site
Project No.: 112G01160

Sample ID No.: SF-1-A1TP-04-00 1012
Sample Location: 10 east TP1
Sampled By: AL
C.O.C. No.:

[ ] Surface Soil
[X] Subsurface Soil
[ ] Sediment
[ ] Other:
[ ] QA Sample Type:

Type of Sample:
[ ] Low Concentration
[ ] High Concentration

GRAB SAMPLE DATA

	Depth Interval	Color	
Date:			
Time:	0-9	red brown	
Method:			
Monitor Reading (ppm):			

COMPOSITE SAMPLE DATA

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION

Analysis	Container Requirements	Collected	Other

OBSERVATIONS / NOTES

clay had higher rad readings

MAP

TP1
Single

QUALITY CONTROL

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: SAMPLEY - SITE 1
Project No.:

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: SF-1-A1TP2-4-5-06/2012
Sample Location: A1 TP2
Sampled By: A. MURPHY
C.O.C. No.: 1029

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/26/12 Time: 1025 Method: Monitor Reading (ppm): 0-0	4'-5'	LIGHT BROWN	MED FINE TO FINE SANDS

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PAH/PCBs/SVOCs (SIM)	1 GLASS JAR	YES	
FLD-PRO	1		
SVOC	1		
METALS	1		
VOCS	4 3 DI + Methanol		

OBSERVATIONS / NOTES:

MAP:

QC/QA Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: Smurfey - Site 1
Project No.: 112G02760

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: SF-1-A1TP2-9-10-06/2012
Sample Location: A1TP2
Sampled By: A. Murphy
C.O.C. No.: 1029

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/26/2012 Time: 1045 Method: Monitor Reading (ppm): 0.0	9-10'	Brand-Orange	Fine Sands w/ clay

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
Pest/PCB/SVOCs (6IN)	1 Glass Jar		
METALS	1		
Flo-Pro	1 3		
SVOCs	1		
VOCs	4 2DI Water, 1 Methanol		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of ___

Project Site Name: SHELBY FIELD SITE 1
Project No.: 112G02760

[] Surface Soil
[x] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: SF-1-A1-TP3-4-5-06/2012
Sample Location: A1 TP3
Sampled By: A. MURPHY
C.O.C. No.: 1029

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/26/2012 Time: 1408 Method: Monitor Reading (ppm): 0.0	4'-5'	LT BROWN	MED FINE - FINE SAND

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
VOCS	4 EDI / METHANOL		
PAHS / PCB / SVOC (SIM)	1 GLASS JAR		
FLO-PRO	1		
SVOC	1		
METALS	1		

OBSERVATIONS / NOTES:

MAP:

Circle If Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page ___ of ___

Project Site Name: SAUGERTIES SITE1
Project No.: 112G02760

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: SF-1-A1TP4-4-5-20/2012
Sample Location: A1TP4
Sampled By: A. MURPHY
C.O.C. No.: 1029

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 6/27/2012 Time: 0953 Method: Monitor Reading (ppm): 0.0	4-5	Light Brown	MED FINE SAND

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PESTICIDES / PCBs / SVOC (SIM)	1 GLASS JAR		
FLD-PRO			
SVOC			
METALS			
VOCS	4 ZOA 1 METHANOL		

OBSERVATIONS / NOTES:

MAP:

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Page___ of___

Project Site Name: Energy Site 1
Project No.: 112G02760

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: SF-1-A1TP4-9-10-06/2012
Sample Location: A1 TP4
Sampled By: A. Murphy
C.O.C. No.: 1024

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

Date: 6/27/2012	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Time: 1005	9-10	Red-Brown	Fine Sand w/ Clays
Method:			
Monitor Reading (ppm): 0-0			

COMPOSITE SAMPLE DATA:

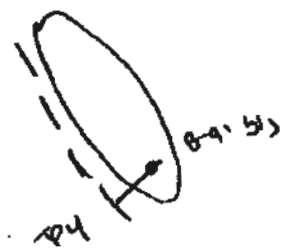
Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PEST / PCB / SVOC (SIM)	1 Glass Jar	YES	
METALS			
FLO-PRO			
SVOC			
VOC	4 2DI, 1 METHANOL		

OBSERVATIONS / NOTES:

MAP:



Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech

EQUIPMENT CALIBRATION LOG

PROJECT NAME: Smiley Site 1

INSTRUMENT NAME/MODEL: MicroFID

SITE NAME:

MANUFACTURER: Photovac

PROJECT No.: 112G02760

SERIAL NUMBER: CZEF216

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
6-25-12	CZEF216	A Murphy	0.0	0.0	0.0	0.0		0.0 ppm Ambient Air
			100.0%	100.0%	83.5	94.8	Gm-1000-4-1	Methane Exp 2-21-2016
6-26-12	CZEF216	A. Murphy	0.0	0.0	0.0	0.0	"	"
			100.0%	100.0%	85.7	94.6	"	"
6-27-12	CZEF216	A. Murphy	0.0	0.0	0.0	–	"	"
			95	95	95.4	–	"	

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME: Smiley Field

SITE NAME: Smiley Field Site 1

PROJECT No.: 112G02760

INSTRUMENT NAME/MODEL: MiniRAE 3000

MANUFACTURER: MiniRAE

SERIAL NUMBER: 592-901941

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
6/25/12	592-901941	A Murphy	0.0	0.0	0.0	0.0		0.0 Ambient Air
			100.00	100.0	107.2	100.1	141-748-100-9	100.0 ppm Isobutylene Exp. 2/20/2016
6/26/12	592-901941		0.0	0.0	0.0	0.0		
			100.00	100.00	72.8	100.0	"	"
6/27/12	592-901941	A Murphy	0.0	0.0	0.0	0.0	"	"
			100.0	100.0	147.5	100.1		

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number
2. Page 1 of 1
3. Emergency Response Phone
4. Waste Tracking Number

5. Generator's Name and Mailing Address
Generator's Site Address (if different than mailing address)
Generator's Phone:

6. Transporter 1 Company Name
U.S. EPA ID Number

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
U.S. EPA ID Number
Facility's Phone:

9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.
1. NON HAZARDOUS NON REGULATED INDUSTRIAL SOLID WASTE	005	DM	0600	P
2.				
3.				
4.				

13. Special Handling Instructions and Additional Information

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name | Signature | Month | Day | Year

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name | Signature | Month | Day | Year
Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

17. Discrepancy
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:

17b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator) | Month | Day | Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a
Printed/Typed Name | Signature | Month | Day | Year

GENERATOR | INT'L | TRANSPORTER | DESIGNATED FACILITY

GENERATOR'S/SHIPPER'S INITIAL COPY

TETRA TECH NUS, INC. **CHAIN OF CUSTODY** | **NUMBER** | **PAGE ____ OF _____**

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G02760				
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		CARRIER/WAYBILL NUMBER		CITY, STATE

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G)

PRESERVATIVE USED

TYPE OF ANALYSIS

DATE YEAR 06/2012	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS									COMMENTS
	1121	SF-1-A1TP1-0-1-06/2012		0	1	SO	G	8	1	1	1	1	4				
	1141	SF-1-A1TP1-4-5-06/2012		4	5	SO	G	8	1	1	1	1	4				
	1426	SF-1-A1TP1-8-9-06/2012		8	9	SO	G	8	1	1	1	1	4				
	1519	SF-1-A1TP1-4-5-06/2012		4	5	SO	G	8	1	1	1	1	4				
26	1625	SF-1-A1TP2-4-5-06/2012		4	5	SO	G	8	1	1	1	1	4				
	1645	SF-1-A1TP2-9-10-06/2012		9	10	SO	G	8	1	1	1	1	4				
	~~0000~~	~~FB06261261~~															
	1408	SF-1-A1TP3-4-5-06/2012		4	5	SO	G	8	1	1	1	1	4				
27	0953	SF-1-A1TP4-4-5-06/2012		4	5	SO	G	8	1	1	1	1	4				
	1005	SF-1-A1TP4-9-10-06/2012		9	10	SO	G	8	1	1	1	1	4				

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
	6/27/12	1530			
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 1030 | PAGE ___ OF ___

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G07760	FIELD FIELD	Frank Lessing	850 385-5854	Lucano Sciuto
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER: Andre Igue	PHONE NUMBER: 850 322 8633	ADDRESS
		CARRIER/WAYBILL NUMBER		CITY, STATE

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): P G G G G G

PRESERVATIVE USED: HNO3 HCL TCE TCE TCE HCL

DATE YEAR 06/2017	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: METALS	VOCS	SVOC	SVOC (SW)	PEST/TCE	FLU-PBU	COMMENTS
26	0000	FB0626120 1					G	12	1	3	2	2	2	2	
27	0000	FB0627120 1					G	12	1	3	2	2	2	2	

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
	06/27/17	1530			
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

AQR Color-Tec® Data Log

Site Name: Saufley Field Site 1

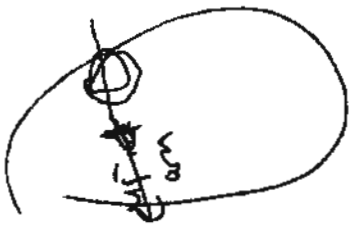
Sample ID	Sample Collection Date	Sample Collection Time	Sampling Depth Interval (feet)	Sample Matrix (water/soil)	Color-Tec Reading			Comments
DP01-1	2/8/2007	1530	15-19	water	0.5/LL/100			
DP01-2	2/8/2007	1600	20-24	water	6/LL/50			
DP01-3	2/8/2007	1630	25-29	water	10/L/100			
A2T1 0-1	6/25/2012	0920	0-1	SOIL	0/LL/100			
A2T1 1-2	6/25/2012	0930	1-2	SOIL	0/LL/100			
A2 T1 2-3	6/25/2012	0940	2-3	SOIL	0/LL/100			
A1 T1 3-4	6/25/2012	0947	3-4	SOIL	0/LL/100			
A1 T1 4-5	6/25/2012	1000	4-5	SOIL	0/LL/100			
A1 T1 0-1	6/25/2012	1330	0-1	SOIL	0/LL/100			
A1 T1 1-2	6/25/2012	1337	1-2	SOIL	0/LL/100			
A1 T1 2-3	6/25/2012	1343	2-3	SOIL	0/LL/100			
A1 T1 3-4	6/25/2012	1351	3-4	SOIL	0/LL/100			
A1 T1 4-5	6/25/2012	1358	4-5	SOIL	0/LL/100			
A1 T1 5-6	6/25/2012	1406	5-6	SOIL	0/LL/100			
A1 T1 6-7	6/25/2012	1408	6-7	SOIL	0/LL/100			
A1 T1 7-8	6/25/2012	1410	7-8	SOIL	0/LL/100			
A1 T1 8-9	6/25/2012	1417	8-9	SOIL	0/LL/100			
A1 T2 0-1	6/26/2012	0800	0-1		0/LL/100			
A1 T2 1-2		0810	1-2		0/LL/100			
A1 T2 2-3		0820	2-3		0/LL/100			
A1 T2 3-4		0830	3-4		0/LL/100			
A1 T2 4-5		0840	4-5		0/LL/100			
A1 T2 5-6		0850	5-6		0/LL/100			
A1 T2 6-7		0900	6-7		0/LL/100			
A1 T2 7-8		0910	7-8		0/LL/100			

AQR Color-Tec® Data Log

Site Name: Saufley Field Site 1

Sample ID	Sample Collection Date	Sample Collection Time	Sampling Depth Interval (feet)	Sample Matrix (water/soil)	Color-Tec Reading			Comments
DP01-1	2/8/2007	1530	15-19	water	0.5/LL/100			
DP01-2	2/8/2007	1600	20-24	water	6/LL/50			
DP01-3	2/8/2007	1630	25-29	water	10/L/100			
A1T2 8-9	6/26/2012	0920	8-9	Soil	0/LL/100			
A1T3 0-1		1240	0-1		0/LL/100			
A1T3 1-2		1250	1-2		0/LL/100			
A1T3 2-3		1300	2-3		0/LL/100			
A1T3 3-4		1310	3-4		0/LL/100			
A1T3 4-5		1320	4-5		0/LL/100			
A1T3 5-6		1330	5-6		0/LL/100			
A1T3 6-7		1340	6-7		0/LL/100			
A1T3 7-8		1350	7-8		0/LL/100			
A1T3 8-9		1400	8-9		0/LL/100			
A1T4 0-1	6/27/2012	0920	0-1	Soil	0/LL/100			
A1T4 1-2		0930	~~0-1~~ 1-2		0/LL/100			
A1T4 2-3		0940	~~1-2~~ 2-3		0/LL/100			
A1T4 3-4		0950	~~2-3~~ 3-4		0/LL/100			
A1T4 4-5		1000	~~3-4~~ 4-5		0/LL/100			
A1T4 5-6		1010	~~4-5~~ 5-6		0/LL/100			
A1T4 6-7		1020	~~5-6~~ 6-7		0/LL/100			
A1T4 7-8		1030	~~6-7~~ 7-8		0/LL/100			
A1T4 8-9		1040	~~7-8~~ 8-9		0/LL/100			
A1T4 9-10		1050	~~8~~ 9-10		0/LL/100			

A1 T3	PID ~~DEPTH~~	UN FILTERED	FILTERE
0-1	0.3	1.5	
1-2	2.4	3.4	
2-3	6.1	6.8	
3-4	5.3	2.3	
4-5	11.7	10.9	
5-6	13.8	9.5	
6-7	11.7	3.4	
7-8	10.7	10.6	
8-9	16.7	9.5	



TPH	PID	UNFIL	FIL
0-1	3.8	1.6	
1-2	4.1	0.4	
2-3	~~0.1~~ 3.4	1.4	
3-4	5.6	1.1	
4-5	3.4	2.4	
5-6	4.8	2.5	
6-7	5.4	2.6	
7-8	3.4	3.1	
8-9	3.4	3.2	
9-10	5.9	1.8	

FIGURE 8-1
SITE-SPECIFIC TRAINING DOCUMENTATION

My signature below indicates that I am aware of the potential hazardous nature of performing field investigation activities at NAS Pensacola, Florida and that I have received site-specific training which included the elements presented below:

- Names of designated personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present on site
- Use of personal protective equipment
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Emergency response procedures (evacuation and assembly points)
- Incipient response procedures
- Review of the contents of relevant Material Safety Data Sheets
- Review of the use of AHAs
- Review Tetra Tech SOP Excavation
- Stop work authority

I have been given the opportunity to ask questions and my questions have been answered to my satisfaction. The dates of my training and my medical surveillance requirements indicated below are accurate to the best of my knowledge.

Name (Printed and Signature)	Site-Specific Training Date	40-Hour Training (Date)	8-Hour Refresher Training (Date)	8-Hour Supervisory Training (Date)	Medical Exam
Amber Tga	6/25/12	6/05	1/12	1/10	9/10
Dan Spencer	6/25/12	5/1992	5/2012	6/1992	8/2011
James C. Yamito Jr	6-25-12	5/1992	6/2012	N/A	10/2011
[illegible]	6-25-12	1/2011	11-18-11	N/A	3/8/12
Terry Oxso	6/25/12	11/2008	11/11	N/A	2/14/12
Bubba Draper	6.25.12	9/3/12	N/A	N/A	9/3/12
Andy Murphy	6-25-2012	11/12	N/A	N/A	12/11

Instructor(s):_____

Tetra Tech, Inc.	ACTIVITY HAZARD ANALYSIS (AHA)				
	Site Name: Site 1 OLF Saufley Field				
	Task: Mobilization / Demobilization				
Prepared by	C.J. Snyder	**Date**	6/2011	**FOL**	
Reviewed by	J. Laffey	**Date**	6/2011	**SSO**	

Task Steps	Hazards	Critical Safety Procedures and Controls
1. Drill rig Excavation Equipment Mobilization / Site Set Up) Tetra Tach personnel vehicle operation and mobilization.	1) Accidents and injuries resulting from the transport of the drill rig and associated equipment to the site: . A. Materials falling from the drill rig during transport. B. Equipment failure – leading to a potential accident or hazardous situation. C. Distracted Driving – Vehicle accidents.	1. The vehicle operator will perform a walk around inspection to ensure • All equipment, samplers, rods and tools will be properly secured forlduring transport. • Vehicle components – Turn signals brake lights, etc. all function properly. • There are no materials carried or stored in the cab that will interfere with the safe operation of this motor vehicle on the highways. • All critical fluid levels (brake fluid, motor oil, antifreeze) are at their recommended levels. • Seat belts are functioning properly. • Mirrors are properly adjusted. • Cell phone use during driving is prohibited unless a hands free device is used. • If the vehicle GVWR (single or combination) is greater than 26,001 pounds, the operator will have a Commercial Driver's License (CDL). • If the vehicle has air brakes, the CDL will have an air brake endorsement. • The vehicle will be operated within DOT specific guidelines including adhering to the speed limit and obeying all posted signs. • Where necessary, use escort vehicles with flashing lights to warn and control local traffic when moving large equipment to support area. • Practice defensive driving whenever traveling in a vehicle • Ensure you have an Orange Vest and a Reflective Triangle in your vehicle at all times and a disposable camera in the event of a breakdown and/or accident. • Keep a safe distance between cars (Use the 4-second rule). ***For Tetra Tech Personnel:*** • Ensure driver is "authorized" per the Tetra Tech Vehicle Safety Program for all Tetra Tech vehicles. • Always carry the AR-1 (Section C) Incident Reporting form in your Vehicle should there be an accident

Task Steps	Hazards	Critical Safety Procedures and Controls
		• If you are in an accident – Visually Examine the area ensure the scene is safe to enter and provide assistance as necessary. – Move you vehicle if possible from the travel lanes. – Turn on your emergency flashers. – Do not step into traffic when exiting your vehicle. – Secure your vehicle and all valuables. Be aware there will be a fee for towing, traffic citations, etc.) – Place your warning triangle (100-feet behind your vehicle) and put on your High Visibility vest. – Provide assistance to injured persons as training permits and as necessary. – Contact the FOL and the SSO. – Be respectful to the Local authorities. – Do NOT attempt to argue who's fault Take the Incident Form (Last section) and begin to complete the information. Take photos, record locations, get witness names and contact information where and as possible.
2. Site preparation	2. Fall hazards • Utility contact • Physical hazards • Biological hazards	2. Site preparation is critical in the identification, barricading or removal of hazards that may exist and hence the protection of site personnel and resources. Before committing personnel and equipment, the FOL and/or the SSO shall • Perform a site walk over – The purpose is to identify potential hazards within planned work areas and remove these hazards. Where they cannot be removed, efforts will be directed at the demarcation of these hazards and notification of all personnel. • Identify utilities. Examine for – Overhead lines – Do not approach with the mast closer than 10-feet – Meter boxes, manhole covers, valves. Where possible open manhole covers to determine the direction piping may be running. Communication boxes will have arrows indicating the direction of the lines • Identify potential biological or natural hazards within the identified work area. – Wear snake chaps in heavily vegetated areas – Do not pick items up that may serve as ground cover for snakes. If you must pull it towards yourself. • Traffic routes – As part of this effort select the best travel route to move equipment and personnel.
3. Preparatory tasks, such as: (i) Assembling, packing, unpacking equipment and supplies	3A. Minor cuts, abrasions or contusions handling equipment and tools	3A. Wear cut-resistant gloves when handling items with sharp or rough edges or when using knives to cut open packages. A cut resistant glove should at least be worn on the non-knife hand. • Exercise caution when unpacking boxes.

Task Steps	Hazards	Critical Safety Procedures and Controls
	3B. Strains or sprains during manual lifting and carrying activities	• Make sure you can see clearly into the box and do not reach in and contact broken glass (possibly damaged in shipment) or sharp articles. See Section 4.13 of the HSGM for additional safe work practices as it pertains cuts/lacerations 3B. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible), and plan each lift: • Inspect/clear the intended path of travel and areas where loads will be deposited, • test lift each object, • ensure good grasp is obtainable on object, • keep back straight and lift with legs not back, • obtain help when needed to lift large, bulky, or heavy items. **Remember:** Your muscles, tendons, and ligaments are not as flexible in the early morning hours. Stretch before physical taxing activities. In the later afternoon, your muscles, tendons, and ligaments maybe stressed from fatigue. Take breaks as necessary to avoid injury. See Section 4.4 of the HSGM for additional safe lifting practices.
4. Receiving chemicals, storing chemicals, preparing to use chemicals, collecting Material Safety Data Sheets completing chemical inventory;	4. Chemical Exposure Providing and maintaining hazard awareness information	4. Chemical hazards – It is not anticipated that site personnel will encounter chemical hazards as it pertains to mobilization. However, it will be the responsibility of the FOL and/or the SSO implement the Onsite Hazard Communication Program (See Section 5.0 of the HSGM). In this effort all chemicals brought onsite (decontamination fluids; sample preservatives, calibration gases) will • Have an accompanying Materials Safety Data Sheet (MSDS) that has been reviewed and approved for use by the SSO. o The SSO will review the HASP to ensure emergency equipment or associated PPE necessary to ensure the safety of the workers are equal or better than that listed in the MSDS. • All incoming containers will be properly labeled and will be in English and not defaced. If the materials will be transferred to temporary containers, these too will be appropriately labeled by the SSO or the person using the materials. • All materials received onsite will be added to the Chemical Inventory List. Included in this information is the volume and location stored. • All materials will be stored as prescribed with compatible chemical. • As necessary employ spill prevention pans or like equipment to capture or contain spills.

Task Steps	Hazards	Critical Safety Procedures and Controls
5. Performing Equipment inspections of vehicles and equipment arriving/preparing to depart the site • Equipment Inspection DPT Rig/Heavy Equipment and hand tools	5. Injuries due to faulty equipment • Pinch/compressions • Struck by	5. Pinches and compressions; uncontrolled energy sources – During the inspection, the DPT rig will need to operate in order to make visual and operational assessments. At this time: • Do not place hands or fingers within pinch or compression points. If this is necessary (which it should never be) use blocking to secure potential energy. • Threads of sampling devices will be examined. If they are washed out difficult to assemble and disassembled have them replaced. • Connectors for extracting soil sampling or well installation tools will be adequately rate and not show signs of excessive wear. This will also pertain to pipe wrenches and tools used to open the sampling devices. Check teeth and gripping surfaces to minimize the potential for slip. Make sure when using pipe wrenches they are properly adjusted to prevent slippage. • Do not use cheater pipes for additional leverage. • Complete Attachment IV Equipment Inspection Checklist for the DPT Rig and Heavy Equipment prior to use. Correct any deficiencies prior to use.
6. Access/egress into controlled areas.	6A. Coordinate efforts with facility personnel • Potential hazards – Fuel storage and dispensing • Emergency Action Requirements • Security measures • PPE requirements for location (such as flame retardant clothing) • Restriction boundaries	6A. In order to address the potential hazards associated with the initial entry • The FOL and/or the SSO will meet the facility caretakers or operators to ensure they are aware of planned activities and to coordinate this activity with any potential ongoing operations. • All workers entering controlled areas will have passes and possibly decals or passes for vehicles to demonstrate authorized entry. • If persons must enter into an operational area the local requirements will prevail. These include – Signing in – PPE minimum requirements for the location • The FOL and/or the SSO will survey the area to ensure areas prone to slip, trip, and fall hazards are flagged or removed. – Entry routes to move the DPT will be determined and the trees to be felled will be marked. (Note: It is recommended that someone from the Natural Resources approve tree selections greater than six inches in diameter. • During the walk through of unimproved areas (to mark sample locations and access routes), the use of snake chaps and Insect Repellant is recommended. See Item 3 below. In addition, the use of safety glasses is also directed when moving through brush as this may result in eye punctures or abrasions. All workers are to wear sturdy work shoes that are outfitted with slip resistant aggressive tread. All exits and selected access pathways will be maintained free of obstructions.

Task Steps	Hazards	Critical Safety Procedures and Controls
6B. Initial site survey of the intended work areas	6B. Biological hazards – Initial site survey	6B. The work areas are regularly uninhabited and unmaintained. Avoid leaving debris piles which could be a habitat for snakes, rats, or other indigenous animals. Also, all personnel will use insect repellants for protection. Primary efforts shall be directed at the following - Leave any observed snakes or other animals alone, do not harass or try to capture. - Snake chaps or high leather boots should be worn if working in or moving through suspect areas on an initial sweep of the area, or if it becomes necessary to move debris where animals may be nesting. - Keep hands and feet out of areas you cannot see. Exercise extreme care when lifting any debris potentially providing ground cover as snakes and other animals prefer these areas to nest. If you must move these items, when picking up items lying on the ground always pull it towards your body so that it may provide a shield should a snake be nesting underneath. Do not use your hands to separate debris piles. Use equipment (hand tools or heavy equipment, as available). - Ticks, mosquitoes, bees, and other insects may be anticipated to be encountered. At SSO's discretion, personnel may be directed to tape ankle joints (pant legs to boots), and personnel are to use insect repellant (containing DEET or Permanone) in accordance with manufacturer's recommendations. If conditions of heat stress are not prevalent, the use of Tyvek with taped pant legs may be specified by the SSO to help protect from bites and as the light color of the coveralls makes detection easier.
	6C. Cuts and lacerations/Biological hazards	6C. Wear leather or cotton work gloves when moving tree litter and debris from the selected access routes. See Land clearing AHA for additional instruction.

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Hand tools (dollies, hand carts, hand knives, carpenter tools, fixed and portable ladders, etc.)	Visual inspection of hand and power tools will be performed by the SSO. Tools will be tagged with colored electrical tape. Green tape ok for use. Red tape do not use. All red taped items should be repaired or removed from the site. Each time a tool is used it will undergo a cursory inspection by the user. Noted damage (mushroomed head, splintered	All personnel • 40-Hour General Site Worker Training [OSHA 29 CFR 1910.120 (e)] • 8-Hour General Site Worker Refresher Training [OSHA 29 CFR 1910.120 (e)(8)] • Site Specific Training – All personnel shall review this Abbreviated Health and Safety Plan prior to the commencement of on-site activity. • Participate in a Medical Clearance/Surveillance Program as described in OSHA 29 CFR 1910.120 (f). • Complete a Medical Data Sheet • Review applicable MSDSs if you are unaware of the hazards and recommended control measures for diesel fuel and grout.

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
	handle, etc.) will require removal from service. FOL and SSO to perform regular (e.g., daily) inspections for housekeeping issues. The results of these efforts will be documented in the Field Logbook	Supervisory personnel: 8-Hour General Site Worker Supervisory Training [OSHA 29 CFR 1910.120 (e)(4)] • Documentation attesting to applicable training and medical clearance will be collected by the FOL and/or the SSO. DPT Equipment Inspection – As it is necessary to ensure certain categories are addressed when inspecting this equipment an Equipment Inspection Checklist for Drill Rigs have been provided to assist you. See Attachment IV • Obtain Drillers License or Certification
Personal Protective Equipment: <u>Minimum</u>: Heavy work boots, hardhats when required by the location or when overhead hazards exist, safety glasses, flashlights. **<u>Optional items:</u>** High visibility vest, snake chaps, works gloves. **<u>HTRW</u>**: None anticipated for this task.	Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities. The SSO will be responsible for the implementation of the following Site Specific Health and Safety Programs: • Hazard Communication • Hearing Conservation

All persons working within the operational will sign this AHA indicating that they have reviewed the document and are aware of their responsibilities as stated in the AHA. All persons in the operational zone during this activity will have signed off this AHA. It is preferred that the sign off take place once any additional site specific information has been incorporated immediately prior during the review

Name (Printed)	Signature	Occupation	Date Reviewed/Training
Amber Fane		Environmental Scientist	6/25/12
Bobby Draper		Equip Oper	6.25.12
Russell Entringer		Driller	6.25.12
Terry Orso		Operations Manager	6/25/12

Tetra Tech, Inc.

ACTIVITY HAZARD ANALYSIS (AHA)

Site Name: Site 1 OLF Saufley Field

Task: IDW Management

Prepared by	C.J. Snyder	**Date**	6/2011	**FOL**	
Reviewed by	J. Laffey	**Date**	6/2011	**SSO**	

Task Steps	Hazards	Critical Safety Procedures and Controls
Filling, moving 55-gallon drums of IDW	1. Heavy lifting 2. Struck by/pinches compressions 3. Falling objects (drums) 4. Slips, Trips, Falls 5. Foot hazards 6. Strains/sprains due to heavy lifting 7. Minor contusions, abrasions, cuts	1. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, ensure clear path of travel, good grasp on object, perform "test lift" to gauge ability to safely make the lift, lift with legs not back, obtain help when needed to lift large, bulky, or heavy items). 2. Exercise caution when handling drums. Position drums so that there is adequate room between them for placement and repositioning. 3. Do not stack drums on top of each other. Do not place more than 4 drums to a pallet. Leave at least 4 ft. of clearance between pallets for clear access. 4. Maintain good housekeeping in IDW storage areas, keeping it clear of loose debris and other potential tripping hazards. Wear appropriate foot protection to prevent slips and trips. Use caution when working on uneven and wet ground surfaces. 5. Safety toe foot protection will be required for IDW container handling activities. 6. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, ensure clear path of travel, good grasp on object, lift with legs not back, and obtain help when needed to lift large, bulky, or heavy items). 7. Wear cut-resistant gloves when handling items with sharp or rough edges.

EQUIPMENT	INSPECTION	TRAINING

EQUIPMENT	INSPECTION	TRAINING
Hand tools (drum dollies, wrenches, etc.)	1. Visual inspection prior to use by user. Check wooden handles for cracks or splinters.	1. All personnel participating in this activity must be current with HAZWOPER training requirements.
Personal Protective Equipment: Minimum: Safety toe boots, safety glasses Optional items: Hardhat, cotton or leather work gloves. HTRW: If contact with IDW is likely, wear chemical-resistant coveralls (e.g., Tyvek) or aprons and surgeon's nitrile gloves under leather/cotton work gloves.	1. Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	1. PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.

I have read and understand this AHA:

Name (Printed)	Signature	Date
Andy [illegible]	[illegible]	6/25/12
Terry Dixso	[illegible]	6/25/12
Bobby Dempse	[illegible]	6.25.12
Russell Enfinger	[illegible]	6.25.12

Tetra Tech, Inc.	ACTIVITY HAZARD ANALYSIS (AHA)				
	Site Name: Site 1 OLF Saufley Field				
	Task: Decontamination				
Prepared by	C.J. Snyder	**Date**	6/2011	**FOL**	
Reviewed by	J. Laffey	**Date**	6/2011	**SSO**	

Task Steps	Hazards	Critical Safety Procedures and Controls
Personal Decontamination • Equipment drop • Segregated removal of PPE (wash and rinse reusable items, dispose of non-reusable items)	1. Slips, Trips, Falls 2. Exposure to contaminated media	1. Clear intended decon area location of roots, weeds, limbs and other ground hazards. Practice good housekeeping to keep the site clear of obstructions, materials, equipment and other tripping hazards. Wear appropriate foot protection to prevent slips and trips. Use caution when working on uneven and wet ground surfaces. 2. Follow good decontamination practices (work from top down and outside in). Nitrile gloves are to be the last item of PPE removed. Wash hands and face following personal decontamination and prior to performing any hand-to-mouth activity.
Decontamination of heavy equipment and large tooling (e.g., vehicles, etc.) using pressure washer	1. Noise 2. Flying projectiles 3. Falling objects 4. Strains/sprains from heavy lifting	1. Pressure washer operator must wear hearing protection (muffs or plugs with NRR of at least 25 dB) 2. Restrict other personnel from decon pad during pressure washing operations. Pressure washer operator must exercise care when directing the wand so that it is not pointing at himself/herself or at any other worker. Pressure washer operator must wear full face shield over safety glasses with side shields and brow protection. At SSO discretion, additional PPE consisting of hardhat, rainsuit, apron, and or boot covers may be required during heavy equipment decon operations - depending on observations indicating that significant contact with decon overspray and/or windy conditions during washing activities. 3. Place items to be decontaminated on ground or on washing/drying racks in a manner that they are secure and will not fall. Wear safety toe safety footwear. 4. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, ensure clear path of travel, good grasp

Task Steps	Hazards	Critical Safety Procedures and Controls
		on object, perform "test lift" to gauge ability to safely make the lift, lift with legs not back, obtain help when needed to lift large, bulky, or heavy items).
	5. Slips/trips/falls	5. Keep decon areas orderly, maintain good housekeeping, spread light coating of sand on decon pad liner to increase traction.
	6. Exposure to contaminated media	6. Follow good decontamination practices (work from top down and outside in). Surgeon's gloves are to be the last item of PPE removed. Wash hands and face following personal decontamination and prior to performing any hand-to-mouth activity.

Equipment	Inspection	Training
Hand tools (hand brushes, garden sprayers, etc.)	1. Visual inspection prior to use by user. Check wooden handles for cracks or splinters.	1. None required.
Pressure washer	2. Inspect pressure washer prior to putting into service to ensure that it is in good working order, and ensure that fittings are secure.	2. Review manufacturers instructions and safety guidelines prior to use..
PID/FID for screening to ensure effective decontamination	3. PID/FID to be calibrated and operated in accordance with manufacturer's recommendation (daily)	3. SSO trained in proper calibration, use, and care of air monitoring devices used (PID/FID). This is a general component of 40 hour HAZWOPER training, and SSO must become very familiar with the Operator's Manual for any instrument used. Review manufacturers operating and maintenanca manual for monitoring instruments used.
Personal Protective Equipment: Minimum: Safety toe boots, safety glasses Optional Items: Hardhat, hearing protection. HTRW: Decontamination pad pressure washer operators are to wear full face shield over safety glasses with side shields and brow protection, hearing protection, and	1. Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	1. OSHA 40 Hazardous Waste Operations and Emergency Response (HAZWOPER) training, plus appropriate 8-hour annual refresher training for all task participants. Supervisors must have completed additional 8 hours of HAZWOPER training. Also Review of AHA during tailgate safety briefing with the intended task participants. 2. PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees' 40 hour HAZWOPER training, which is to be verified by the SSO through

ACTIVITY HAZARD ANALYIS
Decontamination

Equipment	Inspection	Training
nitrile gloves. If contact with overspray cannot be avoided, rain suit or moisture-repellant disposable coveralls may be specified by the SSO.		Initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities.

I have read and understand this AHA:

Name (Printed)	Signature	Date
Amy Joe		6/25/12
Bobby Draper		6.25.12
[illegible] Finsen		6.25.12
Terry SSO		6-25/12

Heavy Equipment Inspection Checklist

Company: Singley Environmental **Unit/Serial No#:** _____

Inspection Date: 06 / 25 / 12 **Time:** ____ : ____ **Equipment Type:** Backhoe
(e.g., earthmoving equipment - tractors backhoes, bulldozers, etc.)

Project Name: Southley Fuel Site 1 **Project No#:** 112-00176

Yes	No	NA	Requirements	Comments
☑	☐	☐	**Seat Belts** • Are available for intended operator and passengers (where applicable)	
☑	☐	☐	• Seat Belts are operational?	
☑	☐	☐	**Roll-Over Protection (ROPS)** • Roll-over protection structures (ROPS) are provided on vehicles and heavy equipment (including scrapers, tractors, loaders, bulldozers, carryalls, etc.)	
☑	☐	☐	**Brakes** • Brake systems capable of stopping and holding fully loaded equipment	
☑	☐	☑	• Parking Brake functions properly	
☑	☐	☑	• Wheel Chocks available (where and as applicable)	
☑	☐	☐	**Access** • Non-slip steps	
☑	☐	☐	• Grab Handles (3-Point Grab/Step Mounting Points)	
☑	☐	☐	**Audible Alarms** • Audible alarms –Bidirectional machines, such as rollers, compacters, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction.	
☑	☐	☐	- Back up Alarms –Self propelled equipment with an obstructed view to the rear will be equipped with a reverse gear signal alarm distinguishable from the surrounding noise level.	
☑	☐	☐	• Horn functioning properly	

Yes	No	NA	Requirements	Comments
			Highway Use	
☐	☐	☐	• Fenders for equipment that can exceed 15mph	
☐	☐	☐	• Fire Extinguisher	
☐	☐	☐	• Are exhaust emissions directed away from the Operator?	
☐	☐	☐	• Cab	
☐	☐	☐	- Clean, free from debris, tools or equipment that can interfere with foot Control.	
☐	☐	☐	- Free from storage of flammable material/solvents	
☐	☐	☐	• Mirrors,	
☐	☐	☐	• Safety glass	
☐	☐	☐	- Equipped with defrosters	
☐	☐	☐	- Windshield wipers	
☐	☐	☐	• Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use?	
☐	☐	☐	• Gauges functioning properly	
☐	☐	☐	• Tires (Tread) or tracks	
☐	☐	☐	• Steering (standard and emergency)	
☐	☐	☐	• Are tools and material secured to prevent movement during transport?	
			Fluid Levels:	
☑	☐	☐	• Engine oil	
☑	☐	☐	• Transmission fluid	
☑	☐	☐	• Brake fluid	
☑	☐	☐	• Cooling system fluid	
☑	☐	☐	• Hoses and belts	
☑	☐	☐	• Hydraulic oil	
			Fueling	
☑	☐	☐	• Fueling of vehicles and heavy equipment is done with the engine off.	
☑	☐	☐	• No smoking is permitted at or near the fuel storage or refueling area. A sign is posted stating: NO SMOKING WITHIN 50 FEET.	
☑	☐	☐	• No sources of ignition are present near the fuel storage or refueling area.	
☑	☐	☐	• A dry chemical or carbon dioxide fire extinguisher (rated 6:BC or larger) is in a location accessible to the fueling area, no closer than 50-feet.	
☑	☐	☐	• Safety cans available?	

Yes	No	NA	Requirements	Comments
			Safety Guards –	
☐	☐	☐	• Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) the points of operations protected from accidental contact?	
☐	☐	☐	• Hot pipes and surfaces are protected from accidental contact?	
☐	☐	☐	• High pressure pneumatic lines have safety cable to prevent thrashing should it become disconnected?	
			Attachments	
☐	☐	☐	• Have the attachments designed for use (as per manufacturer's recommendation) with this equipment been inspected and are considered suitable for use?	
			Operator Qualifications	
☐	☐	☐	• Does the operator have proper licensing where applicable, (e.g., CDL)?	
☐	☐	☐	• Does the operator, understand the equipment's operating instructions?	
☐	☐	☐	• Is the operator experienced with this equipment?	
☐	☐	☐	• Is the operator 21 years of age or more?	
			PPE Required	
☐	☐	☐	• Hardhat	
☐	☐	☐	• Safety glasses	
☐	☐	☐	• Work gloves	
☐	☐	☐	• Chemical resistant gloves_____	
☐	☐	☐	• Steel toed Work Boots	
☐	☐	☐	• Chemical resistant Boot Covers	
☐	☐	☐	• Apron	
☐	☐	☐	• Coveralls Tyvek, Saranex, cotton)_____	
☐	☐	☐	Key(s)?	
☐	☐	☐	Operating Manual?	
			Other Hazards	
☐	☐	☐	• Excessive Noise Levels 400 dBA	
☐	☐	☐	• Chemical hazards (Drilling supplies - Sand, bentonite, grout, fuel, etc.)	
☐	☐	☐	- MSDSs available?	

Approved for Use ☐ Yes ☐ No ☐ See Comments

Site Health and Safety Officer

Operator

ATTACHMENT V

OSHA POSTER

Project / Client 112601 RAO FL-002

Weather: clear ~30°

0615 AJ checked out of hotel + left NAS Pensacola

0645 AJ arrived @ South field

0713 AWS arrived onsite

0720 Patterson Drilling arrived on site
Health + Safety Briefing conducted
move to site to backfill borings
+ load drums

0835 Began packing drums
3 drums
2 soil, 1 purge water

0851 Site secured AJ, Patterson drilling
AWS off site

1330 AJ arrived @ office.
unloaded equipment.

Project / Client 112601 RAO Site 1 test pits

0700 Amber Tyger + Alex Murphy Tetra Tech left NAS Pensacola

Purpose: Conduct test pits @ Site 1 trenching
Equipment: PID, FID, color tape, soil sampling equipment general field equipment

Weather: Cloudy breezy high 80°

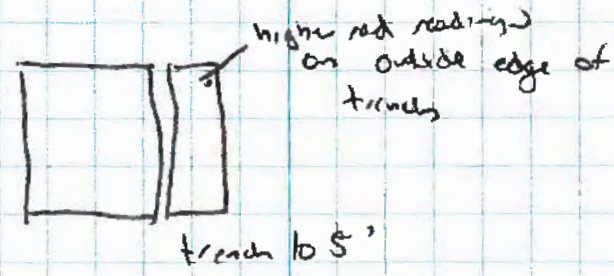
0745 AJ, AM met Don Spicuzza + Jamie Young w/ AWS

0800 Tailgate. Passed Safety to Bob w/ Singley Environmental
Health + Safety Briefing conducted
rad, UXO, poisons + tropical storm approach discussed.
Safe Work permits filled out + equipment inspected + AM calibrated PID/FID

0857 Set up on Trench 2
samples collect 0-1
1-2
2-3
3-4
4-5

Auto screened every interval before back hoe digging + TT sampling began

Sample	PID	FID(4)	FID(F)	Total
T2 0-1	2.4	0.6	0.0	
T2 1-2	0.0	0.4	0.0	
T2 2-3	1.9	1.7	0.4	
T2 3-4	3.7	2.2	0.3	
T2 4-5	6.8	3.2	0.8	

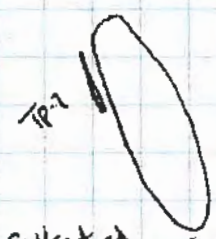


collect two soils from eastern side of T2 from 0-1' + 4-5' intervals.

1203 No odor, PID, FID + rad so dirt put back in trench

1307 John Schaal Field Party Chief arrived onsite

1334 started on Trench 2



1446 collected soil sample from 4-9' clay unit present w/ higher rad readings

	0-1	2.1	2.1
	1-2	1.7	1.8
	2-3	2.5	1.3
S	3-4	3.2	2.6
T	4-5	1.9	2.9
7	5-6	1.2	3.2
	6-7	2.3	1.7
	7-8	3.7 clay and 8'	1.8
	8-9	1.3	2.3

1433 began digging side ways into trench to determine bottle location

stock stained soil ~ 4 feet down to feet into trench

1514 collected additional sample from 4-5' - 10' into trench @ location of large metallic debris

1650 John Schoolcraft ... site

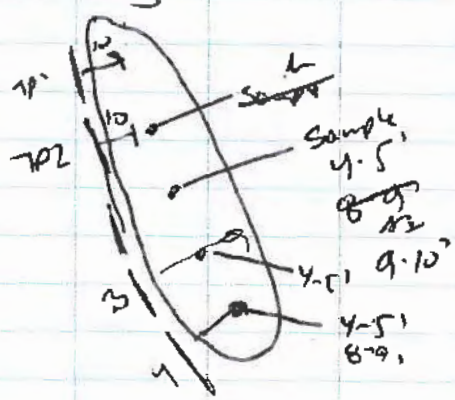
1700 TT + Single seam site @ lake

1732 TT @ 30Q COD

0700 AI, Am left NAS Pensacola

0714 Arrived @ Simply Fried & met Andy & Singley on site H+S briefing conducted. Topics included safety around large machines & ~~been~~ not entering test pit area

0807 Began set up for test pit 2 along western side of anomaly



Concrete rubble in pit

1000 John Schoolfield on site
Jean-Claude Rancourt ~~Jean Claude~~ arrived on site

10 ea collected soil sample from middle of TP-2 @ anomaly
AI @

1113 Andy left site for lunch

1200 Andy back on site

1215 John Schoolfield + Jean Claude Rancourt left site

1227 Began test pit #3
- smashed 55 gal drum no readings
- concrete rubble
- chain link fence

1400 Began clearing area for Site 3 berm.

1700 Site secured & AI, Am heading to hotel

1755 AI, Am arrived @ hotel

0645 AI, Am left NAS Anacostia
0722 Arrived @ Scouting Field & met Ames onsite
met Singley onsite
Health + Safety Briefing conducted
Topics included safety around open pits + using the shaker.
0800 Began on TPH + cleaning up drug areas of the pit
- crushed drums
- anchor line, fencing
0900 Patrick Owens KAD arrived on site H+S briefing conducted + names added to UXO log list
1155 Ames left site for lunch
1206 Singley left site for lunch
1243 John Schoolfield + Jean-Claude left site + Ames arrived
Patrick Owens left site
1345 Singley back on site
1400 Am left site to deliver samples + equipment to field lab

3 Sample coolers to Shealy Env
8755 7387 3820
PID FID
8755 7387 3831
1420 Russell w/ Singley left site to dispose of concrete rubble @ McDivit Landfill
1504 John Schoolfield + Jean Claude + Russell returned to site
1510 Began sifting bullets
1700 Finished for the day
1735 AI back @ hotel EOD

[illegible] left NAS Pensacola

0722 AI, Am arrived on site @ Sandy Field

0730 Singley arrived on site H+S briefing conducted. Topic included being around heavy machinery + properly hydrating to avoid dehydration

0800 Singley removed metal debris and seeded trench areas

1000 AI to NAS Pensacola for multi increment sampling. Am, Ang + Singley left site. Site secured end of day

Appendix C

October 2012 – Monitoring Well Installation and Groundwater Sampling

Tetra Tech NUS, Inc.

PROJECT: Saufley Field Site 1 JOB #: 112G02760
LOCATION: Pensacola FL DATE: 10/13/12
PROJECT MANAGER: Frannie Kersure FOL: Amber Tyre

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (TtNUS and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 YSI			
2 WL			
3 Turbidity meter			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place	✓		
(OSHA poster, hospital route, key phone numbers, etc.)	✓		

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped	✓		
COCs faxed to appropriate in-house personnel	✓		
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis.

Tetra Tech NUS, Inc.

PROJECT: Saufley Field Site 1 **JOB #:** 112G02760
LOCATION: Pensacola FL **DATE:** 10/10/12
PROJECT MANAGER: Frank Lesaine **FOL:** Amber Ford

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (TtNUS and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 FID			
2			
3			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place (OSHA poster, hospital route, key phone numbers, etc.)	✓		

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped			✓
COCs faxed to appropriate in-house personnel			✓
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis.

Tetra Tech NUS, Inc.

PROJECT: Saufley Field Site 1 **JOB #:** 112G02700
LOCATION: Pensacola FL **DATE:** 10/4/12
PROJECT MANAGER: Frank Leisure **FOL:** Amber Fyke

DAILY ACTIVITIES CHECKLIST

Startup Checklist

Activity	Yes	No	N/A
Pertinent site activities/information entered into site logbook	✓		
All onsite personnel listed in logbook	✓		
Required medical information onsite for all workers (TtNUS and Subcontractors)	✓		
Required MSDS's onsite	✓		
Proper equipment calibrations performed (list equipment)	✓		
1 PID			
2			
3			
4			
Calibration logs filled out	✓		
Tailgate H&S meeting held prior to beginning field activities	✓		
Required work permits filled out/signed	✓		
Required utility clearances obtained	✓		
Required PPE onsite and in use	✓		
Information required to be posted is in place (OSHA poster, hospital route, key phone numbers, etc.)	✓		

Exit Checklist

Activity	Yes	No	N/A
Logbooks completely and comprehensively filled out	✓		
Field forms complete and accounted for/properly filed	✓		
Samples properly packaged/shipped			✓
COCs faxed to appropriate in-house personnel			✓
All equipment accounted for, on charge if needed, and properly secured	✓		
All personnel accounted for	✓		
Arrangements made for upcoming work (permits, clearances, equipment, etc.)	✓		
Site properly secured	✓		

Note - not all items listed apply to every job, and some additional requirements may apply on a job-specific basis.

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Sandy Field Site 1	SITE LOCATION: Pensacola FL
WELL NO: SF-1-MW01	SAMPLE ID: SF-1-MW01-~~10/12~~ 27-42-10/12
DATE: 10/13/12	

PURGING DATA

WELL DIAMETER (inches): 2"	TUBING DIAMETER (inches): 1/2"	WELL SCREEN INTERVAL DEPTH: 27 feet to 42 feet	STATIC DEPTH TO WATER (feet): 27.06	PURGE PUMP TYPE OR BAILER: bennett

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (42 feet – 27.06 feet) X 0.010 gallons/foot = 0.14 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 35'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 35'	PURGING INITIATED AT: 0810	PURGING ENDED AT: 0915	TOTAL VOLUME PURGED (gallons): 11.5

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or mS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ORP (describe)
0815					8.00	20.63	287	20.67,	56.2	clear	9.58
0841	5	5	500 mls	27.35	5.65	22.12	141	73.7%, 6.44	120	clear	6.43
0848	2.5	7.5	↓	↓	5.62	22.23	148	75.3%, 6.50	54.9	" "	6.59
0905	2.5	10			5.66	22.12	150	" "	16.3	" "	56.3
0915	1.5	11.5			5.62	" "	151	" "		" "	61.0

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Amber Fox / Tetra Tech	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 0917	SAMPLING ENDED AT: 1009
PUMP OR TUBING DEPTH IN WELL (feet):	TUBING MATERIAL CODE: TeHD	FIELD-FILTERED: Y N Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y N	TUBING (Y) N (replaced)	DUPLICATE: (Y) N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
SF-1-MW01-27-42-10/12	2	AG	1L	HCl	preprepared	<2	TRPH	APP	200 mls
	2	AG	1L	ice	NA	NA	SVOCs	APP	200 mls
	2	AG	1L	ice	NA	↓	LLSVOCs	APP	200 mls
↓	1	PE	500 mls	HNO3	prepreserved	<2	metals	APP	500 mls

REMARKS: FD 101312 01 MS/MSD

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; T = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

TO 11/4

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Saufley Field Site 1	SITE LOCATION: Pensacola
WELL NO: SF-1-MW02	SAMPLE ID: SF-1-MW02-29-44-101/12 DATE: 10/13/12

PURGING DATA

WELL DIAMETER (inches):	TUBING DIAMETER (inches):	WELL SCREEN INTERVAL DEPTH: 29 feet to 44 feet	STATIC DEPTH TO WATER (feet): 29.65	PURGE PUMP TYPE OR BAILER: Bennett

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (44 feet – 29.65 feet) X ~~0.01~~ 0.16 gallons/foot = ~~0.14~~ 2.2 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 35'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 35'	PURGING INITIATED AT: 1125	PURGING ENDED AT: 1335	TOTAL VOLUME PURGED (gallons): 14.0

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ORP (describe)
1130	0.5	0.5	0.1	30.07	6.51	28.65	5	66.68, 5.18	3.31	clear	79.6
1135	~~0.5~~ 2.0	~~1.0~~ 2.5	0.1	" "	6.13	28.54	5	" " " "	11.2	" "	93.0
1145	0.5	3.0	0.1	" "					450	cloudy	~~471~~
1203	1.0	4.0	0.1	" "	5.42	28.69	89	65.77, 5.17	435		
1228	2.5	7.3	0.1	" "	5.49	27.80	89	" "	98.6	cloudy	172.9
1240	1.2	8.5	0.1	" "	5.45	27.12	87	" "	39.0	clear	177.5
1256	1.6	10.1	0.1	" "	5.53	27.12	88	" "	23.0	" "	170.5
1313	1.7	11.8	0.1	" "	5.59	26.31	89	" "	14.3	" "	179.9
1335	2.2	14.0	0.1	" "	5.57	26.31	89	" "	14.3	" "	174.7

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016

PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Amber Jones / Tetra Tech	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1335	SAMPLING ENDED AT: 1340
PUMP OR TUBING DEPTH IN WELL (feet): 35'	TUBING MATERIAL CODE: Teflon	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP (Y) N	TUBING (Y) N (replaced)	DUPLICATE: Y N	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
SF-1-MW02	2	AG	1L	HCL	pre preserved	<2	TRPH	APP	200 mL
	2	AG	↓	ice	NA	NA	SVOCs	↓	
	2	AG	↓	ice	↓	↓	LL SVOCs		
	1	PE	500 mL	HNO_3	pre preserved	<2	metals		

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump, B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: Sauffley Field Site 1	SITE LOCATION: Pensacola FL
WELL NO: SF-1-MW03	SAMPLE ID: SF-1-MW03-3045-10/12 — DATE: 10/13/12

PURGING DATA

WELL DIAMETER (Inches): 2"	TUBING DIAMETER (Inches): 1/2"	WELL SCREEN INTERVAL DEPTH: 30 feet to 45 feet	STATIC DEPTH TO WATER (feet): 24.9	PURGE PUMP TYPE OR BAILER: bennet

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (45 feet – 24.9 feet) X 0.16 gallons/foot = 1.6 gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 37'	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 37'	PURGING INITIATED AT: 1445	PURGING ENDED AT:	TOTAL VOLUME PURGED (gallons).

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ORP (describe)
1501	1.6	1.6	0.1	34.85	6.57	25.63	119	7.38, 5.73	321	dark	124.9
1511	1.0	2.6	0.1	" "	6.24	26.33	123	6.38, 5.58	18.1	↓	71.6
1521	1.0	3.6	0.1	" "	6.32	26.15	124	" "	44.4	↓	19.0
1531	1.0	4.6	0.1	" "	6.39	26.04	127	" "	38.6	clear	-14.0
1541 ~~1537~~	1.0	5.6	0.1	" "	6.36	26.03	124	" "	19.0	↓	-42.5
1551	1.0	6.6	0.1	" "	6.31	26.02	121	" "	11.6	↓	-51.8
1601	1.0	7.6	0.1	" "	6.30	26.01	119	" "	7.81	" "	-54.6
1611	1.0	8.6	0.1	" "	6.30	25.36	47	" "	4.74	" "	-52.1

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014, **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Amber Fox / Tetra Tech	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1611	SAMPLING ENDED AT:
PUMP OR TUBING DEPTH IN WELL (feet): 37'	TUBING MATERIAL CODE: Teflon	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP (Y) N	TUBING (Y) N (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
MW03-3045-10	2	AG	1L	HCL	preserved	<2	TRPH	APP	<100
↓	2	AG	1L	NA	NA	NA	SVOCs	↓	
	2	AG	1L	↓	↓	↓	LL SVOCs		
	1	PE	500 mls	HNO_3	preserved	<2	metals		

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.

2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

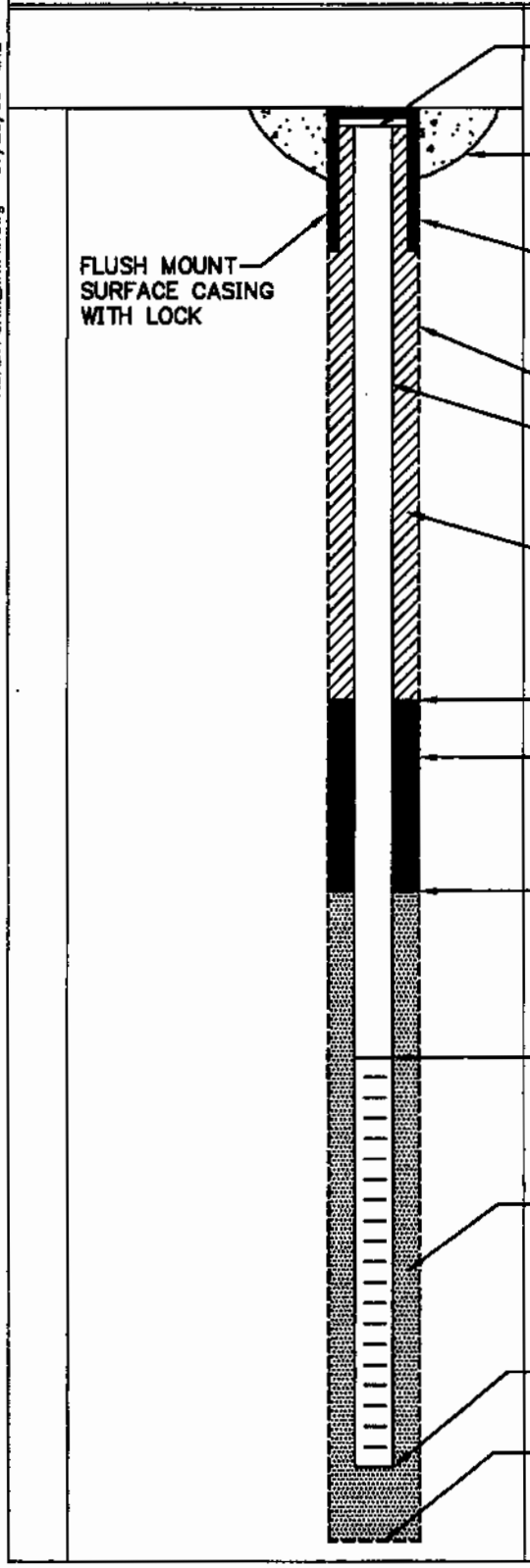
Revision Date: February 12, 2009

WELL NO.: SF-1-MW03

Tetra Tech

OVERBURDEN
MONITORING WELL SHEET
FLUSH - MOUNT

PROJECT Sandy Creek Site 1	LOCATION Downgradient of small trench	DRILLER Prokind
PROJECT NO. 112062760	BORING	DRILLING METHOD HSA
DATE BEGUN 10/10/12	DATE COMPLETED 10/10/12	
FIELD GEOLOGIST Amber Fye		DEVELOPMENT METHOD Submersible
GROUND ELEVATION	DATUM N 30.47341 W 87.34796	



ELEVATION TOP OF RISER: _____

TYPE OF SURFACE SEAL: Concrete pad

TYPE OF PROTECTIVE CASING: vault bolt down

I.D. OF PROTECTIVE CASING: _____

DIAMETER OF HOLE: _____

TYPE OF RISER PIPE: _____

RISER PIPE I.D.: _____

TYPE OF BACKFILL/SEAL: grout to surface

ELEVATION/DEPTH TOP OF SEAL: /

TYPE OF SEAL: grout to surface

ELEVATION/DEPTH TOP OF SAND: 29 /

ELEVATION/DEPTH TOP OF SCREEN: 30 /

TYPE OF SCREEN: slotted

SLOT SIZE x LENGTH: 0.010 x15

TYPE OF SAND PACK: 30/45

DIAMETER OF HOLE IN BEDROCK: _____

ELEVATION / DEPTH BOTTOM OF SCREEN: 45 /

ELEVATION / DEPTH BOTTOM OF SAND: /

ELEVATION/DEPTH BOTTOM OF HOLE: /

BACKFILL MATERIAL BELOW SAND: _____

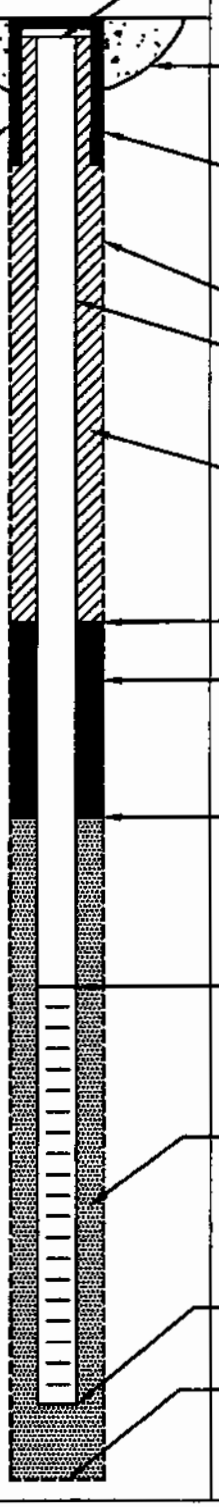
ACAD:FORM_MWFM.dwg 07/28/99 INL

WELL NO.: SF-1-MW02

Tetra Tech

OVERBURDEN
MONITORING WELL SHEET
FLUSH - MOUNT

PROJECT Sinclair Creek Site 1	LOCATION Downgradient of large trench	DRILLER Preferred Drilling
PROJECT NO. 112G02760	BORING	DRILLING METHOD ~~HAS~~ HSA
DATE BEGUN 10/9/12	DATE COMPLETED 10/10/12	
FIELD GEOLOGIST Ambe Tyge		DEVELOPMENT METHOD Submersible
GROUND ELEVATION	DATUM 130.47358 W 87.4922	



ELEVATION TOP OF RISER:

TYPE OF SURFACE SEAL: Concrete pad

TYPE OF PROTECTIVE CASING: Vault bolt down

I.D. OF PROTECTIVE CASING:

DIAMETER OF HOLE:

TYPE OF RISER PIPE:

RISER PIPE I.D.:

TYPE OF BACKFILL/SEAL: grout to surface

ELEVATION/DEPTH TOP OF SEAL: /

TYPE OF SEAL: grout to surface

ELEVATION/DEPTH TOP OF SAND: 27 /

ELEVATION/DEPTH TOP OF SCREEN: 29 /

TYPE OF SCREEN:

SLOT SIZE x LENGTH: 0.010x15'

TYPE OF SAND PACK: 30/45

DIAMETER OF HOLE IN BEDROCK:

ELEVATION / DEPTH BOTTOM OF SCREEN: 44 /

ELEVATION / DEPTH BOTTOM OF SAND: /

ELEVATION/DEPTH BOTTOM OF HOLE: /

BACKFILL MATERIAL BELOW SAND:

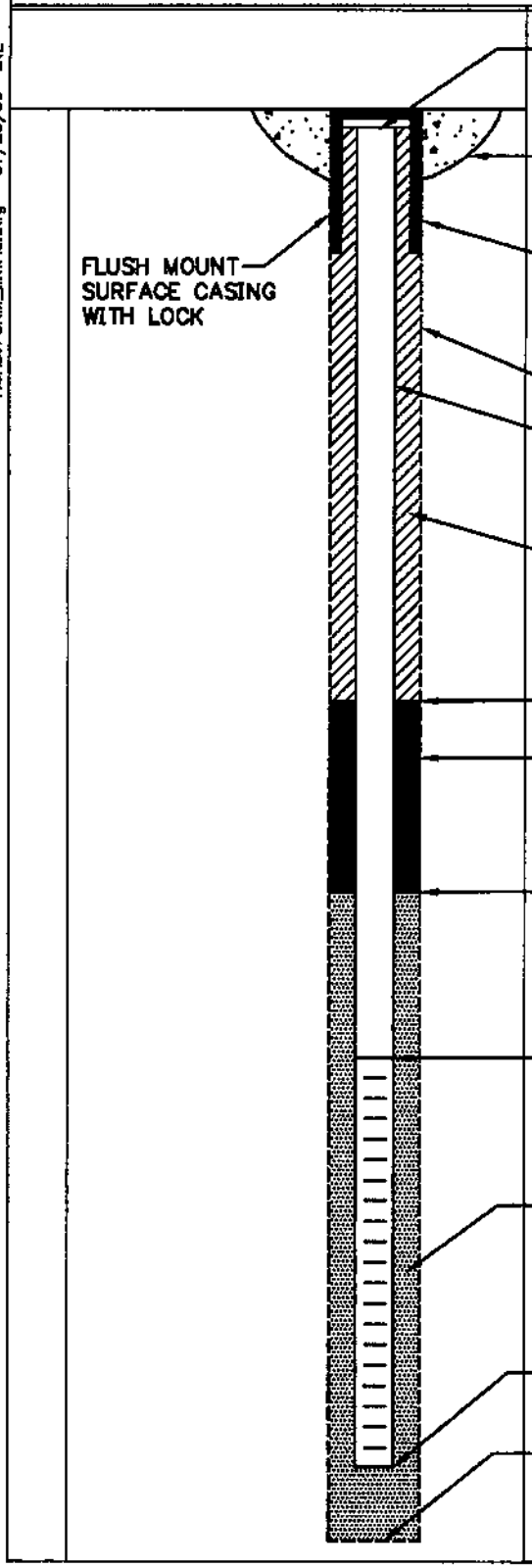
ACAD: FORM_MWFM.dwg 07/20/09 INL

WELL NO.: SF-1-MW01

Tetra Tech

OVERBURDEN MONITORING WELL SHEET FLUSH - MOUNT

PROJECT Soufly Field Site 1	LOCATION Replacement of existing well downgradient of the site	DRILLER Preferred
PROJECT NO. 112602760	BORING	DRILLING METHOD HSA
DATE BEGUN 10/9/12	DATE COMPLETED 10/9/12	
FIELD GEOLOGIST Amber Fryer		DEVELOPMENT METHOD Submersible
GROUND ELEVATION	DATUM N 20.47361 W 87.34032	



ELEVATION TOP OF RISER:

TYPE OF SURFACE SEAL: Concrete

TYPE OF PROTECTIVE CASING: Vault in 2'x2'x1' pad bolt down

I.D. OF PROTECTIVE CASING:

DIAMETER OF HOLE:

TYPE OF RISER PIPE:

RISER PIPE I.D.:

TYPE OF BACKFILL/SEAL: Grout

ELEVATION/DEPTH TOP OF SEAL: /

TYPE OF SEAL: Grout to surface

ELEVATION/DEPTH TOP OF SAND: 25 /

ELEVATION/DEPTH TOP OF SCREEN: 27 /

TYPE OF SCREEN: Slotted

SLOT SIZE x LENGTH: 0.010 x 15 feet

TYPE OF SAND PACK: 30/45

DIAMETER OF HOLE IN BEDROCK:

ELEVATION / DEPTH BOTTOM OF SCREEN: 42 /

ELEVATION / DEPTH BOTTOM OF SAND: /

ELEVATION/DEPTH BOTTOM OF HOLE: /

BACKFILL MATERIAL BELOW SAND:

ACAD: FORM_MWFM.dwg 07/28/99 INL

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE ____ OF _____

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112002760	Site 1	Frank Greene 850-385-9819	Shealy Environmental
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER AND PHONE NUMBER: Amber Jones 850-322-9030	ADDRESS: 106 Vantage Point Drive
		CARRIER/WAYBILL NUMBER: 8008 2540 7396	CITY, STATE: West Columbia, SC 29172

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2012	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: TRPH	SVOCs	VOCs	PAH SIM	metals				COMMENTS
		CONTAINER TYPE PLASTIC (P) or GLASS (G)				G	G	G	PE					
		PRESERVATIVE USED				HCl	ice	ice	HNO3					
10/12	1117	SF-1-MW01-27-42-10/12	GW	G	21	6	6	6	3					MS/MSD
	0000	FD013120!	GW	G	7	2	2	2	1					
	1335	SF-1-MW02-24-44-10/12	GW	G	7	2	2	2	1					
	1611	SF-1-MW03-30-41-10/12	GW	G	7	2	2	2	1					
↓	0000	FB101312!01	AQ	G	7	2	2	2	1					

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
	10/15/12	1700			
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

Location Southy Field Site 1 Date 6/20/12

Project / Client 112W00760 NAVY

0645 AI, Am left NAS Pensacola

0722 AI, Am arrived on site @ Southy Field

0730 Singley arrived on site H&S briefing conducted. Topic included being around heavy machinery + properly hydrating to avoid dehydration

0800 Singley removed metal debris and secured trench areas

1000 AI to NAS Pensacola for multi increment sampling. Am, Andy + Singley left site. Site secured end of day

Location Southy Field Site 1 Date 10/9/12

Project / Client 112W00760 Navy

Weather. Sunny high around 75°

Equipment: Water level meter + PID

Personnel: Amber Fyre (TT), Dan Spicuzza (AMS), Alan Brady (AMS), Christopher Burger (Preferred Drilling), Patrick Burger (Preferred Drilling) +

Objective: Install 3 monitoring wells @ Site 1 and abandon the existing 1½ well located down gradient of the site.

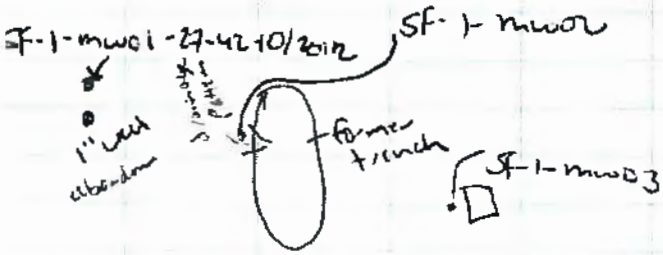
0722 AI left NAS Pensacola

0750 AI arrived @ Southy Field

0810 H&S safety meeting conducted. Topics included project objectives for the site, AHA's completed + Drill rig inspection completed. The crew was informed that the base houses a federal prison and general base rules

Location Sawyer Field Site 1 Date 10/9/12

Project / Client 112G02760 Navy



Sands tight + clay are slowing drilling down

cemented sands @ 25-30'

1141 ~~DS + AB~~

well SF-1-MW01 TD 42'

15' screen

30/45 sand pack

1348 ~~AB~~ AI finished installing SF-1-MW01

Drillers needed more water to decon before installing 2nd well. Having issues w/ starting generator to decon rods

1447 Began developing SF-MW01.

Location Sawyer Field Site 1 Date 10/9/12

Project / Client 112G02760 Navy

SF-1-MW02

TD 45' 44' ft due to bridging

15' screen

Tight sands creating an issue w/ drilling + causing the augers to bridge

- Both wells clear of RAD readings

1800 Began ~~site secure securing~~ packing up night

AB + DS left site

1402 Pretend drilling + AI left site

1938 AI arrived @ NAS Pensacola to complete end of day paperwork.

LOD

Location Sawyer Field Site 1 Date 10/10/12

Project / Client Navy N62470-00-760

Weather: Sunny high ~80

0651: AI and Alex Murphy (Tetra Tech) left NAS Pensacola

0728 AI, AM arrived @ Sawyer Field Site 1 + met DS + AB (Aus)

0730 Preferred Drilling arrived on site Health + Safety briefing conducted

0803 Set up on MW03 10 ft 15' screen

0814 Began developing MW02

0856 MW03 having issues w/ tight sands + bridging the auger flights

1141 Began finishing well construction DS, AB left site

1100 Began developing MW03

1230 Began securing site

1252 Site secure. AI, AM left site to head to NAS Pensacola Site 44

P.DP

Location Sawyer Field Site 1 Date 10/13/12

Project / Client Navy N62470-00-760

Weather: clear sunny high 80's

Personnel: Amber Iyer, Alex Murphy Tetra Tech + Dan Spicuzza + Alan Bodo w/ AWS

Equipment: Bennet pump, water level meter, YSI + turbidity meter

Purpose: Collect gw samples from 3 newly installed monitoring wells

0651 AM + AI left NAS Pensacola

0740 Arrived @ Sawyer Field Site Set up on SF-MW01 equipment calibrated + H+S briefing conducted

0749 DS, AB arrived on site H+S conducted

0848 Having turbidity issues w/ MW01

0917 Turbidity dropped to acceptable sampling number collected MS/MSD

Location Sawtley Field Site 1 Date 10/13/12

Project / Client Navy N62602-2760

1055 @ decon station

1115 Set up on MW02

turbidity jumped up to 450

After purging 14 gallons turbidity would not drop below 14 NTU

sample collected @ ~~1355~~ 1335

1420 @ decon station

1440 Set up on MW03

GPS

MW01 N 30.47361 W 87.34832

MW02 N 30.47358 W 87.34824

MW03 N 30.47341 W 87.34746

1711 Collected blank

1737 Left Sawtley Field to check H_2O level in MW @ Barrancas Field

Location Date

Project / Client

FIGURE 8-1
SITE-SPECIFIC TRAINING DOCUMENTATION

My signature below indicates that I am aware of the potential hazardous nature of performing field investigation activities at NAS Pensacola, Florida and that I have received site-specific training which included the elements presented below:

- Names of designated personnel and alternates responsible for site safety and health
- Safety, health, and other hazards present on site
- Use of personal protective equipment
- Safe use of engineering controls and equipment
- Medical surveillance requirements
- Signs and symptoms of overexposure
- Emergency response procedures (evacuation and assembly points)
- Incipient response procedures
- Review of the contents of relevent Material Safety Data Sheets
- Review of the use of AHAs
- Review Tetre Tech SOP Excavation
- Stop work authority

I have been given the opportunity to ask questions and my questions have been answered to my satisfaction. The dates of my training and my medical surveillance requirements indicated below are accurate to the best of my knowledge.

Name (Printed and Signature)	Site-Specific Training Date	40-Hour Training (Date)	8-Hour Refresher Training (Date)	8-Hour Supervisory Training (Date)	Medical Exam
Amber Tyre	10/9/12	6/2011	1/2012	1/2011	8/2012
Christopher Burger C.B	10/9/12	2002	6/12	NA	1/12
Jeffrey Barnes	10/9/12	8/11	6/12	↓	1/12
Patrick Burger	10.9.12	10/12	6/12	↓	6/10
KEN BRADLEY	10/9/12	NA	NA	NA	NA
Dan [illegible]	10/9/12	3/94	5/2011	5/2011	8/2011
K. Alex Murphy	10/10/12	12/11	NA	NA	11/11

Instructor(s):_____

_____

Equipment Inspection Checklist for Drill Rigs

Company: Preferred Drilling

Unit/Serial No#:

Inspection Date: 10 / 9 / 12 **Time:** 08 : 30

Equipment Type: HSA
(e.g., Drill Rigs Hollow Stem, Mud Rotary, Direct Push, HDD)

Project Name: Sanfilippo Field Site 1

Project No#: 112102060

Yes	No	NA	Requirement	Comments
			Emergency Stop Devices	
☑	☐	☐	• Emergency Stop Devices (At points of operation)	
☑	☐	☐	• Have all emergency shut offs identified been communicated to the field crew?	
☑	☐	☐	• Has a person been designated as the Emergency Stop Device Operator?	
			Highway Use	
☐	☐	☑	• Cab, mirrors, safety glass?	
☐	☐	☑	• Turn signals, lights, brake lights, etc. (front/rear) for equipment approved for highway use?	
☐	☐	☑	• Seat Belts?	
☐	☐	☑	• Is the equipment equipped with audible back-up alarms and back-up lights?	
☐	☐	☑	• Horn and gauges	
☐	☐	☑	• Brake condition (dynamic, park, etc.)	
☐	☐	☑	• Tires (Tread) or tracks	
☐	☐	☑	• Windshield wipers	
☐	☐	☑	• Exhaust system	
☐	☐	☑	• Steering (standard and emergency)	
☐	☐	☑	• Wheel Chocks?	
☐	☐	☑	• Are tools and material secured to prevent movement during transport? Especially those within the cab?	
☐	☐	☑	• Are there flammables or solvents or other prohibited substances stored within the cab?	
☐	☐	☑	• Are tools or debris in the cab that may adversely influence operation of the vehicle (in and around brakes, clutch, gas pedals)	

Yes	No	NA	Requirement	Comments
☐	☐	☐	Fluid Levels: • Engine oil	
☐	☐	☐	• Transmission fluid	
☐	☐	☐	• Brake fluid	
☐	☐	☐	• Cooling system fluid	
☐	☐	☐	• Hoses and belts	
☒	☐	☐	• Hydraulic oil	
☐	☐	☐	High Pressure Hydraulic Lines • Obvious damage	
☐	☐	☐	• Operator protected from accidental release	
☐	☐	☐	• Coupling devices, connectors, retention cables/pins are in good condition and in place	
☐	☐	☐	Mast Condition • Structural components/tubing	
☐	☐	☐	• Connection points	
☐	☐	☐	• Pins	
☐	☐	☐	• Welds	
☐	☐	☐	• Outriggers	
☐	☐	☐	• Operational	
☐	☐	☐	• Plumb (when raised)	
☒	☐	☐	Hooks • Are the hooks equipped with Safety Latches?	
☐	☒	☐	• Does it appear that the hook is showing signs of wear in excess of 10% original dimension?	
☐	☒	☐	• Is there a bend or twist exceeding 10% from the plane of an unbent hook?	
☐	☒	☐	• Increase in throat opening exceeding 15% from new condition	
☐	☒	☐	• Excessive nicks and/or gouges	
☒	☐	☐	• Clips	
☒	☐	☐	• Number of U-Type (Crosby) Clips (cable size 5/16 – 5/8 = 3 clips minimum) (cable size 3/4 – 1 inch = 4 clips minimum) (cable size 1 1/8 – 1 3/8 inch = 5 clips minimum)	

Yes	No	NA	Requirement	Comments
			Power cable and/or hoist cable	
☑	☐	☐	• Reduction in Rope diameter π (5/16 wire rope>1/64 reduction nominal size -replace) (3/8 to 1/2 wire rope>1/32 reduction nominal size-replace) (9/16 to 3/4 wire rope>3/64 reduction nominal size-replace)	
☐	☑	☐	• Number of broken wires (6 randomly broken wires in one rope lay) (3 broken wires in one strand)	
☑	☐	☐	• Number of wire rope wraps left on the Running Drum at nominal use (≥3 required)	
☑	☐	☐	- Lead (primary) sheave is centered on the running drum	
☑	☐	☐	• Lubrication of wire rope (adequate?)	
☐	☑	☐	• Kinks, bends – Flattened to > 50% diameter	
			Hemp/Fiber rope (Cathead/Split Spoon Hammer)	
☐	☐	☑	• Minimum ¾; maximum 1 inch rope diameter (Inspect for physical damage)	
☐	☐	☑	• Rope to hammer is securely fastened	
			Safety Guards –	
☑	☐	☐	• Around rotating apparatus (belts, pulleys, sprockets, spindles, drums, flywheels, chains) all points of operations protected from accidental contact?	
☑	☐	☐	• Hot pipes and surfaces exposed to accidental contact?	
☑	☐	☐	• High pressure lines	
☑	☐	☐	• Nip/pinch points	
			Operator Qualifications	
☑	☐	☐	• Does the operator have proper licensing where applicable, (e.g., CDL)?	
☑	☐	☐	• Does the operator, understand the equipment's operating instructions?	
☑	☐	☐	• Is the operator experienced with this equipment?	
☑	☐	☐	• Is the operator 21 years of age or more?	

Yes	No	NA	Requirement	Comments
☒	☐	☐	PPE Required for Drill Rig Exclusion Zone • Hardhat	
☒	☐	☐	• Safety glasses	
☒	☐	☐	• Work gloves	
☐	☒	☒	• Chemical resistant gloves_____	
☒	☐	☐	• Steel toed Work Boots	
☐	☐	☒	• Chemical resistant Boot Covers	
☐	☐	☒	• Apron	
☐	☐	☒	• Coveralls Tyvek, Saranex, cotton)_____	
☒	☐	☐	Other Hazards • Excessive Noise Levels? 250 dBA	
☒	☐	☐	• Chemical hazards (Drilling supplies - Sand, bentonite, grout, fuel, etc.)	
☒	☒	☐	- MSDSs available?	
☐	☒	☐	• Will On-site fueling occur	
☐	☒	☐	- Safety cans available?	
☒	☐	☐	- Fire extinguisher (Type/Rating -_____)	

Approved for Use ☒ Yes ☐ No ☐ See Comments

Site Safety and Health Officer

Operator

Tetra Tech, Inc.	ACTIVITY HAZARD ANALYSIS (AHA)				
	Site Name: Site 1 OLF Saufley Field				
	Task: Groundwater sampling, Water levels and monitoring well purging and development				
Prepared by	C.J. Snyder	**Date**	5/20/2011	**FOL**	Arnbie Fox
Reviewed by	J. Laffey	**Date**	5/22/2011	**SSO**	Arnbie Fox

Task Steps	Hazards	Critical Safety Procedures and Controls
1 thru 9. Groundwater sampling • Well purging and development • Collection of groundwater samples (via small battery-operated pumps such as whale pumps or peristaltic) and placement into sample containers	1. Minor cuts, abrasions or contusions handling equipment and tools	1. Use hand tools that are in good condition. Hand tool users must be familiar with their proper use and must use them only in a manner that is consistent with their intended operation. As indicated earlier, the users will be responsible for inspecting tools prior to use. Additional measures include: • When cutting tubing cut away from yourself and not towards others • It is recommended that scissors be used to cut tubing versus knives. Where this is not possible, wear a leather glove on your non-knife hand. • Sample glassware should be transported in hard sided containers such as coolers, that way if you fall the likelihood of falling onto glassware causing lacerations and punctures are greatly minimized. • Do not throw broken glass directly into the trash. Place it into a hard sided container such as a cardboard box. That way when you are transporting the garbage bag to the waste receptacle it will not cut through the bag and potentially cause lacerations. • Do not arbitrarily reach into the trash to retrieve something. Dump it out onto a flat surface. This will minimize potential punctures if someone else has thrown sharp articles into the trash.
	2. Slips, Trips, Falls	2. Clear intended work areas and walking paths of roots, weeds, limbs and other ground hazards. Practice good housekeeping to keep the site clear of obstructions, materials, equipment and other tripping hazards. Ensure that work boots have adequately-aggressive sole design. Use caution when working on uneven and wet ground. Mark obstructions such as tree stumps sticking up from the clearing operation. Use orange marking paint to increase visual recognition.

Task Steps	Hazards	Critical Safety Procedures and Controls
	3. Entanglement – This hazard potential is only recognized when it is necessary to connect power supplies to the vehicle battery. 4. Electrical hazards – This hazard exists only when connecting to vehicle batteries. It does not exist when using sealed batteries or the 12v power plug 5. Back Strain 6. Snake and Insect Bites	Make sure during well construction that the well is of adequate height to support visual recognition and suitably protected to avoid potential damage. 3. Entanglement – When connecting battery leads, do not do so when the vehicle is running. Collect and secure all loose articles (jewelry, long hair, etc.) that could become entangled in the rotating fans or belts. Place sampling apparatus near the wire leads to prevent personnel walking through and tripping on the wires. During clearing operations cut and remove wisteria and associated vine plants in which your feet may become entangled creating a trip and fall hazard. 4. When possible use the 12V power connection such as the cigarette lighter or provided 12v power inlet. When this is not possible: • Wearing leather gloves and safety glasses, connect negative terminal first, then positive 5. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible, ensure clear path of travel, good grasp on object, lift with legs not back, and obtain help when needed to lift large, bulky, or heavy items). Fill buckets and drums only to 80% which is manageable. Place lids on during transport. 6. When approaching a well the following will be conducted to minimize these hazards: • Examine the nearby area. Snakes may be sunning themselves on the well pad or nearby. Do not disturb. • Examine the area around the well pad for fire ants. This insect will build nests (mounds) along the concrete perimeter of the well pad. The insects will swarm onto your body then bite. • When opening the protective casing examine the casing for bees nests and spiders (Black widow). Disturbing these nests insects

Task Steps	Hazards	Critical Safety Procedures and Controls
		or spiders may result in a bite/sting. • Where necessary, with the well closed use insect spray to eliminate the threat. Allow the protective casing to ventilate. Record the ingredients and list the use of these materials on the sample log sheet. As the potential for insects cannot be eliminated and some of the sampling will occur along wooded areas practice some simple measures to minimize contact, as determined to be necessary and/or as directed by the SSO: • Shake out boots before donning. Use insect repellants (products containing DEET should be applied to exposed skin, products containing Permethrin should be applied to clothing only. Follow manufacturer's recommendations for application). Tape up pants leg-to work boot joints with duct tape to control access. Wear light-colored clothing to better see and remove any insects. Perform close body inspections at least daily upon leaving the site.
	Sample preservatives	7. During groundwater sampling or well development, the following measures should be conducted to minimize contaminant exposure: • At arm's length, open the well and remove the J-Plug and retreat. During this time the well may off gas and water levels shall reach equilibrium once pressure is removed. • Prepare your equipment. • Set up your sampling station from an upwind position. • The lid on the discharge bucket or drum should be placed loosely to allow the collection of the water but to contain any volatiles during discharge. • Wear nitrile surgeon's gloves during sample collection activities to minimize contact. • Use good work hygiene practices including – Minimizing hand to mouth contact during this sample collection period. – Flushing disposable tubing out and wiping down the exterior as it is extracted prior to disposal. • Sample collection buckets and flow through cells should be placed in a mortar tub or similar secondary containment to

Task Steps	Hazards	Critical Safety Procedures and Controls
		minimize incident release. Based on past use and historical info the primary constituent of concern is VOC's, SVOC's, PAH's , PCB's, Pesticides and Metals. Air monitoring during well development and sampling is required and action levels will be observed as follows:: • PID Action Level: 10 ppm above BG in BZ areas for no more than 4 exposures of 5 minutes in one work day. • FID Action Level: 10 ppm above BG in BZ areas for no more than 4 exposures of 5 minutes in one work day. Various sample preservatives that maybe encountered include • Nitric Acid – metals - Rinsates These substances are used to minimize microbial degradation while not impacting the sample quality. The problem with all of these substance are that they are corrosive and will degrade steel and human tissue. Following the guidelines provided in the Mobilization/demobilization AHA including • Completing the on site Hazard Communication Program – Know the hazards and how to prevent them. Review the MSDS; • Provide for the emergency even if it is using drinking water to flush a contact point; • Wear proper PPE – When opening sample bottles wear nitrile surgeons gloves and safety glasses • Store containers in the upright position. • Hold over your secondary containment when opening.

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Whale or peristaltic pump portable battery operated.	Electrical connections, wiring, tubing connections	General operating/demonstrated skill of the sampling technician per the SOP for groundwater sampling and/or well development should be assessed by the FOL. Instruction should be provided as necessary..
Personal Protective Equipment:	None required	All personnel

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Minimum: Safety Glasses; footwear with adequate Lug and ankle support/steel toes; leather/canvas work gloves for site set up. Nitrile surgeons or nitrile outer gloves will be utilized when handling contaminated tubing or sampling. **Optional Items:** High visibility vests are recommended for these activities in high traffic areas.		• 40-Hour General Site Worker Training [OSHA 29 CFR 1910.120 (e)] • 8-Hour General Site Worker Refresher Training [OSHA 29 CFR 1910.120 (e)(8)] • Site Specific Training – All personnel shall be instructed and attest to the review and understanding of this HASP prior to the commencement of on-site activity. • Periodically, Tailgate Training Sessions will be conducted to review activities in progress, results of site surveys, and upcoming tasks. It is recommended that AHAs be reviewed prior to conducting the identified task. • Participate in a Medical Clearance/Surveillance Program as described in OSHA 29 CFR 1910.120 (f). • Complete a Medical Data Sheet • Review applicable MSDSs if you are unaware of the hazards and recommended control measures for diesel fuel and grout. Supervisory personnel: 8-Hour General Site Worker Supervisory Training [OSHA 29 CFR 1910.120 (e)(4)] Documentation attesting to applicable training and medical clearance will be collected by the FOL and/or the SSO and maintained on site.

All persons working within the operational will sign this AHA indicating that they have reviewed the document and are aware of their responsibilities as stated in the AHA. All persons in the operational zone during this activity will have signed off this AHA. It is preferred that the sign off take place once any additional site specific information has been incorporated immediately prior during the review

Name (Printed)	Signature	Occupation	Date Reviewed/Training
Christopher Burger	C. B	Driller	10/9/12
Jeffrey Barnes	[illegible]	Driller	10/9/12
Patrick Burger	[illegible]	Driller	10.9.12
KEN BRADLEY	[illegible]	RP	10/9/12
Dan Spicer	[illegible]	AWS RP	10/9/12
K. Alex Murphy	[illegible]	TE Engineer	10/9/12
Amber Tyge	[illegible]	FOL / SSO	

Tetra Tech, Inc.	ACTIVITY HAZARD ANALYSIS (AHA)				
	Site Name: Site 1 OLF Saufley Field				
	Task: Mobilization / Demobilization				
Prepared by	C.J. Snyder	**Date**	6/2011	**FOL**	Amber Tyre
Reviewed by	J. Laffey	**Date**	6/2011	**SSO**	Amber Tyre

Task Steps	Hazards	Critical Safety Procedures and Controls
1. Drill rig Excavation Equipment Mobilization / Site Set Up) Tetra Tech personnel vehicle operation and mobilization.	1) Accidents and injuries resulting from the transport of the drill rig and associated equipment to the site: A. Materials falling from the drill rig during transport. B. Equipment failure – leading to a potential accident or hazardous situation. C. Distracted Driving – Vehicle accidents.	1. The vehicle operator will perform a walk around inspection to ensure • All equipment, samplers, rods and tools will be properly secured for/during transport. • Vehicle components – Turn signals brake lights, etc. all function properly • There are no materials carried or stored in the cab that will interfere with the safe operation of this motor vehicle on the highways. • All critical fluid levels (brake fluid, motor oil, antifreeze) are at their recommended levels. • Seat belts are functioning properly. • Mirrors are properly adjusted. • Cell phone use during driving is prohibited unless a hands free device is used. • If the vehicle GVWR (single or combination) is greater than 26,001 pounds, the operator will have a Commercial Driver's License (CDL). • If the vehicle has air brakes, the CDL will have an air brake endorsement. • The vehicle will be operated within DOT specific guidelines including adhering to the speed limit and obeying all posted signs. • Where necessary, use escort vehicles with flashing lights to warn and control local traffic when moving large equipment to support area. • Practice defensive driving whenever traveling in a vehicle • Ensure you have an Orange Vest and a Reflective Triangle in your vehicle at all times and a disposable camera in the event of a breakdown and/or accident. • Keep a safe distance between cars (Use the 4-second rule). ***For Tetra Tech Personnel:*** • Ensure driver is "authorized" per the Tetra Tech Vehicle Safety Program for all Tetra Tech vehicles. • Always carry the AR-1 (Section C) Incident Reporting form in your Vehicle should there be an accident

Task Steps	Hazards	Critical Safety Procedures and Controls
		• If you are in an accident – Visually Examine the area ensure the scene is safe to enter and provide assistance as necessary. – Move you vehicle if possible from the travel lanes. – Turn on your emergency flashers. – Do not step into traffic when exiting your vehicle. – Secure your vehicle and all valuables. Be aware there will be a fee for towing, traffic citations, etc.) – Place your warning triangle (100-feet behind your vehicle) and put on your High Visibility vest. – Provide assistance to injured persons as training permits and as necessary. – Contact the FOL and the SSO. – Be respectful to the Local authorities. – Do NOT attempt to argue who's fault Take the Incident Form (Last section) and begin to complete the information. Take photos, record locations, get witness names and contact information where and as possible.
2. Site preparation	2. Fall hazards • Utility contact • Physical hazards • Biological hazards	2. Site preparation is critical in the identification, barricading or removal of hazards that may exist and hence the protection of site personnel and resources. Before committing personnel and equipment, the FOL and/or the SSO shall • Perform a site walk over – The purpose is to identify potential hazards within planned work areas and remove these hazards. Where they cannot be removed, efforts will be directed at the demarcation of these hazards and notification of all personnel. • Identify utilities. Examine for – Overhead lines – Do not approach with the mast closer than 10-feet – Meter boxes, manhole covers, valves. Where possible open manhole covers to determine the direction piping may be running. Communication boxes will have arrows indicating the direction of the lines • Identify potential biological or natural hazards within the identified work area. – Wear snake chaps in heavily vegetated areas – Do not pick items up that may serve as ground cover for snakes. If you must pull it towards yourself. • Traffic routes – As part of this effort select the best travel route to move equipment and personnel.
3. Preparatory tasks, such as: (I) Assembling, packing, unpacking equipment and supplies	3A. Minor cuts, abrasions or contusions handling equipment and tools	3A. Wear cut-resistant gloves when handling items with sharp or rough edges or when using knives to cut open packages. A cut resistant glove should at least be worn on the non-knife hand. • Exercise caution when unpacking boxes.

Task Steps	Hazards	Critical Safety Procedures and Controls
	3B. Strains or sprains during manual lifting and carrying activities	• Make sure you can see clearly into the box and do not reach in and contact broken glass (possibly damaged in shipment) or sharp articles. See Section 4.13 of the HSGM for additional safe work practices as it pertains cuts/lacerations 3B. Practice safe lifting techniques (use mechanical lifting devices such as a dolly whenever possible), and plan each lift: • Inspect/clear the intended path of travel and areas where loads will be deposited, • test lift each object, • ensure good grasp is obtainable on object, • keep back straight and lift with legs not back, • obtain help when needed to lift large, bulky, or heavy items. **Remember:** Your muscles, tendons, and ligaments are not as flexible in the early morning hours. Stretch before physical taxing activities. In the later afternoon, your muscles, tendons, and ligaments maybe stressed from fatigue. Take breaks as necessary to avoid injury. See Section 4.4 of the HSGM for additional safe lifting practices.
4. Receiving chemicals, storing chemicals, preparing to use chemicals, collecting Material Safety Data Sheets completing chemical inventory;	4. Chemical Exposure Providing and maintaining hazard awareness information	4. Chemical hazards – It is not anticipated that site personnel will encounter chemical hazards as it pertains to mobilization. However, it will be the responsibility of the FOL and/or the SSO implement the Onsite Hazard Communication Program (See Section 5.0 of the HSGM). In this effort all chemicals brought onsite (decontamination fluids; sample preservatives, calibration gases) will • Have an accompanying Materials Safety Data Sheet (MSDS) that has been reviewed and approved for use by the SSO. o The SSO will review the HASP to ensure emergency equipment or associated PPE necessary to ensure the safety of the workers are equal or better than that listed in the MSDS. • All incoming containers will be properly labeled and will be in English and not defaced. If the materials will be transferred to temporary containers, these too will be appropriately labeled by the SSO or the person using the materials. • All materials received onsite will be added to the Chemical Inventory List. Included in this information is the volume and location stored. • All materials will be stored as prescribed with compatible chemical. • As necessary employ spill prevention pans or like equipment to capture or contain spills.

Task Steps	Hazards	Critical Safety Procedures and Controls
5. Performing Equipment inspections of vehicles and equipment arriving/preparing to depart the site • Equipment Inspection DPT Rig/Heavy Equipment and hand tools	5. Injuries due to faulty equipment • Pinch/compressions • Struck by	5. Pinches and compressions; uncontrolled energy sources – During the inspection, the DPT rig will need to operate in order to make visual and operational assessments. At this time: • Do not place hands or fingers within pinch or compression points. If this is necessary (which it should never be) use blocking to secure potential energy. • Threads of sampling devices will be examined. If they are washed out difficult to assemble and disassembled have them replaced. • Connectors for extracting soil sampling or well installation tools will be adequately rate and not show signs of excessive wear. This will also pertain to pipe wrenches and tools used to open the sampling devices. Check teeth and gripping surfaces to minimize the potential for slip. Make sure when using pipe wrenches they are properly adjusted to prevent slippage. • Do not use cheater pipes for additional leverage. • Complete Attachment IV Equipment Inspection Checklist for the DPT Rig and Heavy Equipment prior to use. Correct any deficiencies prior to use.
6. Access/egress into controlled areas.	6A. Coordinate efforts with facility personnel • Potential hazards – Fuel storage and dispensing • Emergency Action Requirements • Security measures • PPE requirements for location (such as flame retardant clothing) • Restriction boundaries	6A. In order to address the potential hazards associated with the initial entry • The FOL and/or the SSO will meet the facility caretakers or operators to ensure they are aware of planned activities and to coordinate this activity with any potential ongoing operations. • All workers entering controlled areas will have passes and possibly decals or passes for vehicles to demonstrate authorized entry. • If persons must enter into an operational area the local requirements will prevail. These include – Signing in – PPE minimum requirements for the location • The FOL and/or the SSO will survey the area to ensure areas prone to slip, trip, and fall hazards are flagged or removed. – Entry routes to move the DPT will be determined and the trees to be felled will be marked. (Note: It is recommended that someone from the Natural Resources approve tree selections greater than six inches in diameter. • During the walk through of unimproved areas (to mark sample locations and access routes), the use of snake chaps and Insect Repellant is recommended. See Item 3 below. In addition, the use of safety glasses is also directed when moving through brush as this may result in eye punctures or abrasions. All workers are to wear sturdy work shoes that are outfitted with slip resistant aggressive tread. All exits and selected access pathways will be maintained free of obstructions.

Task Steps	Hazards	Critical Safety Procedures and Controls
6B. Initial site survey of the intended work areas	6B. Biological hazards – Initial site survey	6B. The work areas are regularly uninhabited and unmaintained. Avoid leaving debris piles which could be a habitat for snakes, rats, or other indigenous animals. Also, all personnel will use insect repellants for protection. Primary efforts shall be directed at the following - Leave any observed snakes or other animals alone, do not harass or try to capture. - Snake chaps or high leather boots should be worn if working in or moving through suspect areas on an initial sweep of the area, or if it becomes necessary to move debris where animals may be nesting. - Keep hands and feet out of areas you cannot see. Exercise extreme care when lifting any debris potentially providing ground cover as snakes and other animals prefer these areas to nest. If you must move these items, when picking up items lying on the ground always pull it towards your body so that it may provide a shield should a snake be nesting underneath. Do not use your hands to separate debris piles. Use equipment (hand tools or heavy equipment, as available). - Ticks, mosquitoes, bees, and other insects may be anticipated to be encountered. At SSO's discretion, personnel may be directed to tape ankle joints (pant legs to boots), and personnel are to use insect repellant (containing DEET or Permanone) in accordance with manufacturer's recommendations. If conditions of heat stress are not prevalent, the use of Tyvek with taped pant legs may be specified by the SSO to help protect from bites and as the light color of the coveralls makes detection easier.
	6C. Cuts and lacerations/Biological hazards	6C. Wear leather or cotton work gloves when moving tree litter and debris from the selected access routes. See Land clearing AHA for additional instruction.

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Hand tools (dollies, hand carts, hand knives, carpenter tools, fixed and portable ladders, etc.)	Visual inspection of hand and power tools will be performed by the SSO. Tools will be tagged with colored electrical tape. Green tape ok for use. Red tape do not use. All red taped items should be repaired or removed from the site. Each time a tool is used it will undergo a cursory inspection by the user. Noted damage (mushroomed head, splintered	All personnel • 40-Hour General Site Worker Training [OSHA 29 CFR 1910.120 (e)] • 8-Hour General Site Worker Refresher Training [OSHA 29 CFR 1910.120 (e)(8)] • Site Specific Training – All personnel shall review this Abbreviated Health and Safety Plan prior to the commencement of on-site activity. • Participate in a Medical Clearance/Surveillance Program as described in OSHA 29 CFR 1910.120 (f). • Complete a Medical Data Sheet • Review applicable MSDSs if you are unaware of the hazards and recommended control measures for diesel fuel and grout.

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
	handle, etc.) will require removal from service. FOL and SSO to perform regular (e.g., daily) inspections for housekeeping issues. The results of these efforts will be documented in the Field Logbook	Supervisory personnel 8-Hour General Site Worker Supervisory Training [OSHA 29 CFR 1910.120 (e)(4)] • Documentation attesting to applicable training and medical clearance will be collected by the FOL and/or the SSO. DPT Equipment Inspection – As it is necessary to ensure certain categories are addressed when inspecting this equipment an Equipment Inspection Checklist for Drill Rigs have been provided to assist you. See Attachment IV • Obtain Drillers License or Certification
Personal Protective Equipment: Minimum: Heavy work boots, hardhats when required by the location or when overhead hazards exist, safety glasses, flashlights. **Optional Items:** High visibility vest, snake chaps, works gloves. **HTRW**: None anticipated for this task.	Initial PPE inspection performed by SSO. Ongoing (prior to each use) inspections responsibilities of PPE users.	PPE training in proper use, care, storage, and limitations. It is anticipated that this has been covered in employees 40 hour HAZWOPER training, which is to be verified by the SSO through initial training documentation and review prior to permitting personnel to participate in site activities, and will be confirmed by visual observations of worker activities. The SSO will be responsible for the implementation of the following Site Specific Health and Safety Programs: • Hazard Communication • Hearing Conservation

All persons working within the operational will sign this AHA indicating that they have reviewed the document and are aware of their responsibilities as stated in the AHA. All persons in the operational zone during this activity will have signed off this AHA. It is preferred that the sign off take place once any additional site specific information has been incorporated immediately prior during the review

Name (Printed)	Signature	Occupation	Date Reviewed/Training
Christopher Burger	C. B	Driller	10/9/12
Jeffrey Barnes	[illegible]	Driller	10/9/12
Patrick Burger	[illegible]	Driller	10.9.12
KEN BRADLEY	[illegible]	RP	10/9/12
Dan Sprouse	[illegible]	AWS RP	10/9/12
K. ALEX Murphy	[illegible]	TE ENGINEER	10/10/12
Amber Tyree	[illegible]	FOL/SSO	10/9/12

Tetra Tech, Inc.	ACTIVITY HAZARD ANALYSIS (AHA)				
	Site Name: Site 1 OLF Saufley				
	Task: Soil Boring via DPT, soil sampling and monitoring well installation				
Prepared by	C.J. Snyder	**Date**	6/2011	**FOL**	
Reviewed by	J. Laffey	**Date**	6/2011	**SSO**	

Task Steps	Hazards	Critical Safety Procedures and Controls
1. Site set up/ Site preparation	1A. Natural hazards 1B. Terrain challenges 1C. Traffic control 1D. Struck by	1A,1B, 1C, & 1D. Site preparation is critical in the identification, barricading or removal of hazards that may exist and hence the protection of site personnel and resources. Before committing personnel and equipment, the FOL and/or the SSO shall • Perform a site walk over – The purpose is to identify potential hazards within planned work areas and remove these hazards. Where they cannot be removed, efforts will be directed at the demarcation of these hazards and notification of all personnel. The hazards types include – Natural hazards – Nesting areas, bees nests in dead falls or ground nests; snakes, etc. – Terrain challenges – Paths the equipment will travel, soft spots, embankments that could affect the travel of the equipment. – Utilities – Surface monuments and overhead power lines. • Once the site is set up provisions for adequate Emergency Access/Egress shall be maintained to allow emergency vehicles passage if required. Where this is not possible, efforts should be directed to establish alternate traffic control plans and meeting with responding agency dispatching units to ensure they are aware of temporary traffic restrictions. • The work area should be sufficient size to permit the completion of assigned tasks without creating hazards. In wooded area, vegetation should be adequately cleared to allow persons to move around the rig without entering the hazard zone. Site control boundaries for DPT operations are generally 35-foot surrounding the point of operation. – If the drilling activity is within populated or heavily travelled areas, a traffic control plan should be in place. Elements should include those specified in the Manual on Uniform Traffic Control Devices (MUTCD) 2009. This will include direction for establishing traffic control/diversion and buffer areas leading to the traffic restriction. The primary objective is to establish a safe work zone and to minimize potential vehicle hazards. These shall include o Use caution around heavy and/or fast-moving equipment. DO NOT place yourself between pieces of equipment or equipment and immovable objects. Spotters or other ground crew are responsible for positioning themselves in view of the operator (stay out of operators' blind spots) when positioning the drilling device. o Avoid activities in the street during peak times.

Task Steps	Hazards	Critical Safety Procedures and Controls
		o DO NOT place obstructions along the sides of the road that may cause pedestrians or your personnel to move into the flow of traffic to avoid your activities or equipment. **Provide a required Free Space of Travel!** Required "Free Space": Maintain at least 6-feet of space between you and moving traffic. Where this is not possible, use flaggers and/or signs to warn oncoming traffic of activities near or within the travel lanes. Face Traffic: Whenever feasible, if you must move within the 6-feet of required space, or into traffic attempt to face moving traffic at all times. Always leave yourself an escape route. o Wear High Visibility Vests to increase visual recognition by motorist or operating equipment. ❖ Do not rely on the operator's visibility, judgment, or ability. Make eye contact with the driver. Carefully and deliberately use hand signals so they will not startle or confuse motorists or be mistaken for a flagger's direction before moving into traffic. ❖ Move Deliberately: Do not make sudden movements that might confuse a motorist or operators. ❖ Avoid where possible Interrupting Traffic Flow: Minimize crossing traffic lanes. ❖ People can't stand it they have to look to see what is going on, what you are doing. As a result many fender benders occur within work areas. Where possible move traffic through the work area but keep them separated to the extent possible that they do not collide with the car in front of them. ❖ Maintain clear walking/working areas and good housekeeping to the extent possible. ❖ This is especially critical when moving the drilling device within existing FedEx traffic patterns.
2. Utility clearance	2. Striking/damaging a subsurface utility	2. To prevent potential utility damage during drilling operations the following measures will be employed: • Utility clearances contractor will be employed to locate and mark and abandoned steel line. There is no information to suggest this is a fuel line, but maybe the associated burn kettle pipe. The geophysics can and should be used to clear investigation points for subsurface sample locations/monitoring well installation points. • In addition, NAS Pensacola OLF Saufley Field has internal procedures that must be followed when applying for a Dig Permit. This should begin with contacting the facility contact/property owner to follow any internal procedures that may exist. The next step in obtaining utility clearance will be to contact the appropriate Sunshine State One Call of Florida 1-800-432-4770 or through contacting the national Clearing

Task Steps	Hazards	Critical Safety Procedures and Controls
		House at 811. Generally, the time line for military bases is 10-14 days to accomplish the clearance. The timeline for Statewide and National One Call Systems is 2-3 days depending on the complexity but could be up to 10 days. It is helpful when the following information is provided – Drawings or coordinates where the excavation will take place. – Have the intended areas marked out in white paint when possible. Identify a person that will be available to answer questions pertaining to the excavation to be completed. • The driller/excavator will be responsible for reviewing the received dig permit to ensure all identified utility owners responded to the utility clearance request. These utility owners who did not respond should be contacted to confirm that they have no subsurface structures in the area. This is critical when dealing with high hazard utilities such as electrical, gas, flammable liquids, etc. • The excavator along with the FOL and SSO will be responsible for conducting a surface walkover of the area where the soil borings and/or wells will be installed. This should be done with the FOL and/or the SSO to look for and identify surface monuments indicating the existence of subsurface utilities. • If once utility owners make the placement of their utilities owners, caution should be exercised if working within 5-feet of the structure(s) and support utilities (Remember - Private lines will not have been identified through One Call). Passive methods should also be employed such as hand augering the first four to five feet to ensure utility clearance or using this method to find and locate the utility to ensure its location. Should obstructions be encountered follow passive utility avoidance methods. See Section 7.0 of the HSGM, Utility Locating and Excavation Clearance direction. • The FOL and/or the SSO should update maps and collect coordinates of utilities identified in the area of investigation. • DPT operations will be conducted at a safe distance from overhead power lines as well as guy wires (Minimum 20-feet) – See Section 7.0 of the HSGM, Safe Distances from overhead lines.
3. Movement of drill rig and support vehicles into place.	3. Roll over - Flipping the unit over. This potential hazard may exist when traveling over uneven ground or soft shoulders or uneven ground.	3. Roll Over – This is considered a low hazard as significant hills or grades are not anticipated unless movement up berms are to be conducted. However • The operator should select the best possible approach vantages to move the unit up the slope or over minor terrain challenges to the selected boring location. • Slope angles greater than 35 degrees should be avoided or regraded to provide a shallower angle on the approach. • The unit should be moved straight up and down the grade, not across to avoid tipping. • Preview travel paths for holes, soft spots, curbs, etc. that may cause potential tipping. Where necessary grade access routes to fill in holes and compact soft spots within the selected travel lane.

Task Steps	Hazards	Critical Safety Procedures and Controls
		• Operate the unit at a suitable rpm for the terrain and conditions. • Do not move the unit to close to drop offs or embankments due to the potential for collapse.
4. Soil Boring and Monitoring Well Installation – The initial borehole is accomplished using hydraulic actuated pressure and hammering to advance the Dual Tube into the subsurface soils. Sections of tube are added on until the desired depth is achieved. The discreet soil sampling during the advancement of the outer tubes are accomplished by the utilization of the inner tube string that captures soils in an acetate liner. The liner allows samples to be collected at discreet depths or continuously. In addition, decontamination and IDW management has been added to this activity.	4A. Site Set-up/Site Control – Vehicle hazards and controls • Emergency Access/Egress • Adequate work area Time and effort spent properly preparing a site will aid in the operations being conducted smoothly and safe manner. 4B. Equipment Hazards – This includes: • Structural failure – Inadequate lifting capabilities; Broken welds • Operational failure • Training	4A. With site preparation completed, the next step is to ensure the equipment and personnel are ready for the tasks to be completed. Therefore, the FOL, SSO, or a "Qualified Person" will be responsible for conducting an equipment inspection to ensure the equipment to be used is in proper working order and will not through its failure injure personnel or create property damage. This will be accomplished using the Equipment Inspection Checklist for Drill Rigs during mobilization/demobilization. This Checklist is found in Attachment IV of this HASP. • The Tetra Tech FOL, the SSO, or a designated "Qualified Person" will be responsible for evaluating the skill and capability of the operator/driller. In situations where the operator does not exhibit suitable skills to safely operate the unit, the subcontractor management should be contacted regarding obtaining a replacement operator/driller. 4B. Equipment hazards - • The potential hazards of the operation, selected control measures will be addressed and evaluated through site specific training, tailgate training sessions, and periodic reviews of site assessment/site surveys including operational considerations and adherence to planning documents. These surveys will be conducted by the FOL and/or the SSO to ensure a high degree of operating proficiency and to prevent potential hazards and to ensure preventative measures are working as intended. – The DPT Rig is hydraulically operated unit. When hydraulic lines rupture it happens all at once. Have at the ready oil spill pads. It is a good practice to back or pull the rig onto visqueen in the unlikely event of a line rupture. Care should be taken not to extend the visqueen out into the working areas of the driller and helper in which you would create slip, trip, and fall hazards. High pressure lines, connections shall be evaluated to ensure no leaks exist or develop as elements of the system heat up. Equipment inspection will indicate through outer rubber friction surfaces (if deteriorated and exposed steel if the lines have been overheating. The key is to inspect, plan for, and not have to use spill prevention measures. – Periodically evaluate various appliances used with the DPT unit including attachments for hammering should be inspected for mushrooming or other physical deformity and be replaced as necessary. Chains, hooks or other similar hoisting devices used for extraction shall be examined closely upon entering the site. An initial measurement of chains and hooks should be collected as well as examining casted indicators. That way subsequent measurements collected can be compared to a baseline. High quality chains will have indicators that indicate potential deformation.

Task Steps	Hazards	Critical Safety Procedures and Controls
5. Hammering – Advancement of tooling	5A. Excessive Noise – Data accumulated indicates DPT units operate at 92-97dBA with impact levels exceeding 140dBA at the source (during percussion hammering).	5A. Given the nature of this activity, PPE is the most suitable solution for the driller and driller helper to controlling exposure to excessive noise levels. Hearing protection (plugs or muffs with NRR of at least 25 dB) should be employed during boring operation activities within the specified site control boundary which is 25-feet from the point of operation to control noise exposure. *As a general rule of thumb - Excessive noise levels (>85dBA) are being approached when you have to raise your voice to talk to someone within 2 feet of your location.* The FOL and/or the SSO will be responsible for implementing the Site Specific Hearing Conservation Program found in Section 6.0 of the HSGM. This will also include reviewing training elements pertinent to the hearing protection used and posting the standard (1910.95) so all have access. Personnel at the screening station, will employ distance from the noise source to control exposure as well as employing the general rule of thumb to determine the necessity for them to employ hearing protection.
	5B. Flying projectiles caused by hydraulic pressure and hammering.	5B. Flying Projectile during tooling advancement • Restrict non-essential personnel from operating area. Due to hazards associated with noise and the potential for flying projectiles, high pressure lines rupturing, a 35-foot site control boundary will be established around the point of operation. • PPE – Personnel working inside the site control boundary will wear safety impact eye protection. Protective eye and face protection shall comply with the performance requirements established in ANSI Z87.1-2003. This will be indicated on the protective device. Noise levels associated with DPT operation are in the upper 90's to 110 dBA. Therefore, hearing protection is required when working within 35-feet of this operation. – To avoid over stressing the hydraulic pump, connections or lines, operate the DPT at a moderate to high rpm as not to stress or overheat hydraulic components causing potential failure. Operating at an extremely slow, extremely high rate or with insufficient hydraulic fluid will cause overheating, potential; damage and failure.
	5C. Struck by • Pinch/compression Points The potential exists during the soil boring and temporary well installation when adding and subtracting tube extensions to get fingers caught within pinch points during the hydraulic driving unit as well as between	5C. Struck by • Insure adequate work area to move rods to avoid striking another worker. Hard hats and safety glasses will be worn to offer minimal protection. • Wrenches will be inspected to ensure they have adequate teeth to grip the work piece. In cases where they are not, they will be replaced. All hand and portable power tools will be initially inspected and approved for use by the SSO. These devices will have green electrical tape to indicate approved for use. The tape will be initialed and dated (date of inspection). In all cases, the users will inspect tools prior to each use and notify the SSO of deficiencies noted.

Task Steps	Hazards	Critical Safety Procedures and Controls
	wrenches and hard surfaces when opening the tube segments. • Traffic • Drive rods	• Exercise caution when opening dual or macrocore samplers that you provide an open area should the wrench slip. • DO NOT over compromise yourself when attempting to open these components. A slip of the wrench could result in a fall and strike. If the threads on the sampling tools are becoming worn and loose they will become difficult to assemble or disassemble. In these cases, replace the sampling device. • Traffic hazards and controls – See Item 1. In general controlling traffic and wearing high visibility vests will be the primary control measures.
6. Movement over terrain, around drill rig	6A. Slips/tips/falls	6A. Footwear employed should have an adequate traction lug for rough or uneven terrain. Lace up work boots are preferred, where possible, as these provide better ankle support moving over uneven terrain. To control these hazards • Select the best paths to access the work area. • Level and grade the area around the back of the rig to control tripping. Remove or flag & paint stumps and other trip hazards. • Maintain good housekeeping. Keep work area free of ground clutter. • The tubes, drive rods, assembled MacroCore or Dual tube Samplers are cylindrical. If these are laid on hard surfaces and stepped on loss of footing will occur. Storage racks should be used to keep these off of the ground and not create a trip or slip hazard.
7. Removing samples from acetate liners; cutting PVC well risers.	7. Cuts and lacerations – This hazard has been largely recognized when cutting acetate liners without the proper material handling devices.	7. **Cuts and Lacerations** - To prevent cuts and lacerations, the following provisions are required: • Always cut away from yourself and others, then, if a knife/saw slips, you will not impale yourself or others. • Do not place items to be cut in your hand or on your knee. • Change out blades as necessary to maintain a sharp cutting edge. Many accidents result from struggling with dull cutting attachments. • Wear cut-resistant gloves (leather or heavy cotton) at least on the non-knife/saw hand, where possible. • When cutting acetate liners use the tubing retention tub to secure the tube. Use the knife intended for that purpose. Geoprobe® makes a kit for this purpose to open the acetate liner.
8. Soil sampling using a hand auger. This entails • Twisting (clockwise) a core bucket into the ground	8. Hand augering - Muscle tendon, ligament strain and sprain.	8. **Physical strain (muscle pulls/strains, etc.)/Slips, trips and falls**- This activity can be physically demanding based on the type of geology and subsurface encumbrances encountered (roots, etc.). To reduce the potential for muscle strain and damage the following practices will be employed

Task Steps	Hazards	Critical Safety Procedures and Controls
using an extended T-handle. • As the handle is twisted, the bucket fills. • The bucket is extracted and up ended to dump the contents into a ziplock bag for examination and mixing when directed. • Samples are collected from designated intervals.		• Stretch and limber your muscles before heavy exertion. This hazard becomes more predominant in the early morning hours (prior to muscles becoming limber) and later in the day (as a result of fatigue). • Job rotation – Share the duties so that repetitive actions do not result in fatigue and injury. • Increase break frequencies as needed especially as ambient conditions may dictate. • Do not force the hand tool or use cheater pipes or similar devices to bypass an obstruction. Move to another location near the sampling point. Exerting additional forces on the sampling devices can result in damage and/or failure which could potentially injure someone in the immediate vicinity. • Do not over compromise yourself when applying force to the hand auger. If there is a sudden release this could result in a fall or muscle injury due to strain.
9. Work Outdoors in areas not regularly maintained.	***Natural Hazards*** 9A. Inclement weather/temperature extremes	***Natural hazards:*** **9A. Inclement Weather** – To minimize hazards of this nature, the following provisions shall be employed: - Electrical storms/high winds - Suspend or terminate operations until directed otherwise by SSO. Follow the 30/30 rule. *If there is less than 30 seconds between thunder and lightning seek shelter for at least 30 minutes from the last thunder.* Follow the provisions as specified in Section 4.0 of the Tetra Tech NUS, Inc. Health and Safety Guidance Manual regarding the identification and evaluation of heat/cold stress related conditions. To combat heat stress: • Personnel are directed to wear adequate clothing sufficient to provide protection from ambient temperature extremes. • Keep hydrated – There is no universal recommended rate that works for all. However some tips in combating dehydration and heat illness o Monitor your urine – If it is dark in color, drink more. o If elevated temperatures are anticipated the SSO should have a scale on the job for weighing yourself – Greater than 2% body weight loss due to sweat – Drink more o Contrary to popular belief, water is the best drink for rehydration. • Take breaks and allow cooling. • Have an established break area to allow cooling. • Monitor vitals for persons exhibiting signs of heat stress – See Section 4.6 of the HSGM for additional information.
	9B. Plants – Contact	9B/C. Seemingly there is poison ivy, poison oak, and poison sumac most places where

Task Steps	Hazards	Critical Safety Procedures and Controls

	allergens
	
	9C. Insect bites/stings
		you work. In addition, there are species such as Brazilian Cherry in Florida that can also result in a contact allergic reaction. To control the affects of these plants
		• Educate all site workers so they can identify these species.
		• If you must clear areas where these plants exist, where protective clothing to protect direct contact. Where possible use machinery to avoid direct interaction.
		• The SSO shall review the Medical Data Sheets for all personnel to determine various levels of sensitization. Certain personnel's reaction is more severe than other. These persons should be restricted from participating in these activities if possible where an increased potential exists. In situations where personnel reaction is severe and they are required to carry Doctor recommended antidotes, the following will apply
		  o Prescription is current and the antidote is not expired.
		  o Personnel are provided direction in its administration.

10. Drilling sample collection	***Chemical Hazards*** 10A. Given the activities to be conducted (DPT and hand augering) it is unlikely that sufficient particulate contaminants will be mechanically disturbed to create an airborne threat. Minimize hand to mouth and glove to mouth or face as this may facilitate exposure. Well construction materials – inhalation and contact exposure	10A. **Particulate or particulate bound materials** – Protective measures include: • Safe work practices found in Section 13.0 of the HSGM. • Much of the contaminants are described as a solid or are bound to particulates. PPE such as gloves will be employed to minimize direct contact. In situations where liquids are encountered they will be avoided to the extent possible. • Good work hygiene practices including avoiding hand-to-mouth contact to the extent possible, washing hands and face or using hygienic wipes to remove potential contaminants from hands and face prior to breaks or lunch or other hand to mouth activities will restrict the most predominant route of exposure. **If you experience any of these signs or symptoms report to the FOL immediately.** It should be noted that the potential for exposure are considered minimal based on • DPT sample acquisition occupies a small foot print and therefore small surface area. Significant vapor emissions are not anticipated, especially in an open air environment. • Contaminants is question are bound to solids/particulates Well Construction - • Personnel should read the MSDSs and be aware of the hazards associated with these materials. • Sands should be applied slowly to control dust evolution. • When mixing grout or cement • Dump from the bag slowly into the prescribed water volume to minimize dust generation. • Contact with grout should be minimized. Wear rubber gloves, remove wet materials that have contacted the skin. Wash with water. If the skin becomes irritated use a 10% Vinegar/water spray to neutralize.

Task Steps	Hazards	Critical Safety Procedures and Controls
1. Decontamination of the Dual Tube System and/or the MacroCore Sampler will take place at the boring/well location. These items will be washed and rinse in a series of 5-gallon buckets and low pressure sprayers.	Hazards associated with this activity are considered minimal. 1A. Struck by – items falling; disassembly of the samplers; compressing fingers between wrenches and immovable objects	1. Material handling devices including pipe and chain vises are invaluable in securing the work piece during disassembly. 2. Inspect wrenches before use to ensure they have adequate teeth to grip the work piece. Avoid trying to loosen the drive head or rods and or the cutting shoe by pushing the wrench towards and immovable object. 3. Do not use cheater pipes or similar devices that could cause a wrench failure. 4. Provide drying racks or similar device to secure wash parts from falling during the drying process.
2. Hand washing drilling string These strings are generally washed and rinsed in 5-gallon buckets near the rig. The procedure is as follows: a) Remove visible soils b) Wash with soap solution until visibly clean. Rinse with potable water. c) Light spray of isopropanol d) Deionized water rinse e) Air dry	2. Contaminant/chemical contact	2. Wear prescribed PPE - Rubber gloves, apron for cleaning and handling contaminated equipment. • Review MSDS for decontamination solution – Liquinox and/. The FOL and/or the SSO will be responsible for completing the Section 5.0 of the HSGM, Onsite Hazard Communication Program including completing the Chemical Inventory List, collecting and reviewing the MSDS; insuring all containers are adequately labeled. **Note:** Liquinox is a suitable decontamination solvent to remove residual materials. The removal of any tar like substances or liquids will require solvents to be employed to cut the tar prior to washing. Isopropanol would be the solvent employed. This is not anticipated based on information provided but not fully determined. • The FOL and/or the SSO will be responsible recording the IDW collected per Section 11.0 of the HSGM. Additional measures include • Change out the wash waters frequently • Keep wash and rinse buckets in mortar tubs or similar containment to capture spills. • Secure pieces while drying to avoid them falling and striking someone.

Task Steps	Hazards	Critical Safety Procedures and Controls
3. Moving handling tooling to decontaminate; store	3. Lifting hazards	3. To minimize lifting associated hazards: • Wash buckets and subsequently the 55-gallon drums should be filled only to 80% capacity to limit the amount of weight carried to and from the wash area or moved in the storage area. This is especially critical in situations where these containers must be moved over uneven ground and steep terrain. • Use machinery or multiple persons for heavy lifts. • See Section 4.4 of the HSGM for additional information concerning proper lifting techniques.
4. IDW Management – 5 gallon buckets of wash/rinse waters will be transported to the centralized wash area and dumped into 55-gallon storage containers.	4. Compression hazards – Placing drums	4. Compression hazards control 5. It is generally best to place the drums on pallets (4 to a pallet); segregate media types (to support leak monitoring and response) keeping the ring bolt and label to the outside. 6. Carrying small containers to the drums already placed on the pallet will minimize potential for compression injury. 7. Wear leather work gloves for moving drums. Steel toed work boots should also be worn to protect the feet. 8. Do not place hands/fingers between drums when placing.

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
DPT Unit, Hand augers	SSO to inspect the DPT Unit prior to use. Use the Equipment Inspection Checklists provided in Attachment IV	General operating/demonstrated skill for the DPT Unit and associated support equipment.
Personal Protective Equipment: Minimum: Hard hat, Safety Glasses; footwear with adequate Lug and ankle support/steel toes; leather/canvas work gloves. Nitrile surgeons or nitrile outer gloves will be utilized when handling contaminated tooling. Nitrile surgeon's gloves will be used for all sample collection	None required	All personnel • 40-Hour General Site Worker Training [OSHA 29 CFR 1910.120 (e)] • 8-Hour General Site Worker Refresher Training [OSHA 29 CFR 1910.120 (e)(8)] • Site Specific Training – All personnel shall be instructed and attest to the review and understanding of this HASP prior to the commencement of on-site activity. • Periodically, Tailgate Training Sessions will be conducted to review activities in progress, results of site surveys, and upcoming tasks. It is recommended that AHAs be reviewed prior to conducting the identified task. • Participate in a Medical Clearance/Surveillance Program as described in OSHA 29 CFR 1910.120 (f). • Complete a Medical Data Sheet • Review applicable MSDSs if you are unaware of the hazards and recommended

EQUIPMENT TO BE USED	INSPECTION REQUIREMENTS	TRAINING REQUIREMENTS
Optional items: High visibility vests are recommended for these activities in high traffic areas.		control measures for diesel fuel and grout. Supervisory personnel: 8-Hour General Site Worker Supervisory Training [OSHA 29 CFR 1910.120 (e)(4)] Documentation attesting to applicable training and medical clearance will be collected by the FOI, and maintained on site.

All persons working within the operational will sign this AHA indicating that they have reviewed the document and are aware of their responsibilities as stated in the AHA. All persons in the operational zone during this activity will have signed off this AHA. It is preferred that the sign off take place once any additional site specific information has been incorporated immediately prior during the review

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Patrick Burger	Patrick B. Burger	Driller	10 9 12
KEN BRADLEY	Ken Bradley	RP	10/9/12
Dave Spencer	Dave Spencer	AWS RP	10/9/12
K. ALEX Murphy	[illegible]	TT ENGINEER	10/10/12
Amber Fox	[illegible]	FOI/SSO	10/9/12

LAMOTTE TURBIDITY METER CALIBRATION LOG

Tetra Tech NUS, Inc.

PROJECT NAME : NAS Pensacola

INSTRUMENT NAME/MODEL: Lamotte 2020 Turbidimeter

SITE NAME: Sawfley Site 1

MANUFACTURER: Lamotte

PROJECT No.: N62467-60

SERIAL NUMBER: 10051

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-Calibration	Post-Calibration	Pre-Calibration	Post-Calibration		
(mm/dd/yy)	(Number)	(Name)	Nephelometric Turbidity Units (NTUs)				(Number)	
10/13/12	10051	A. Murphy	1.0	1.0	1.06		0.0 NTU LR51233 EXP 9/13	
			10.0	10.0	10.01		1.0 NTU CH91725 EXP 6/13	
							10.0 NTU EO3490,040 EXP 12/12	
		AI	1.0	1.0	1.20			
			10.0	10.0	9.66			GOO
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				

YSI 556 EQUIPMENT CALIBRATION SHEET

Tetra Tech, Inc.

PROJECT NAME : NAS Pensacola

INSTRUMENT NAME/MODEL: YSI 556 MPS

SITE NAME: Smiley Site1

MANUFACTURER: YSI

PROJECT No.: 112G02760

SERIAL NUMBER: 06M538AG

Date of Calibration	Person Performing Calibration	pH PRE CAL / POST CAL			Cond.	Temp.	Dissolved Oxyden	ORP	Calibration Standard (Lot#/Expiration Date)	Comments
(mm/dd/yy)	(Name)	(S.U.)			(µS/cm)	(Celsius)	(%)	(mV)		
10/13/12	A.Murphy	3.88 / 4.0	7.19 / 7.0	10.36 / 10.0	962 / 1003	21.19	98.7 / 100.8	234.5 / 234.5	Lot# NOT PROVIDED Exp.Date: NOT PROVIDED	Ph 4.0
10/13/12 EOD	A.Tu	3.72 / 4.0	6.98 / 7.0	10.10 / 10.0	1013				Lot# NOT PROVIDED Exp.Date: NOT PROVIDED	Ph 7.0
"	EOD	4.0	7.0	10.0					Lot# NOT PROVIDED Exp.Date: NOT PROVIDED	Ph 10.0
		4.0	7.0	10.0					Lot# ~~NOT PROVIDED~~ Exp.Date: ~~NOT PROVIDED~~	12B10052 ORP 02/2014
		4.0	7.0	10.0					Lot# NOT PROVIDED Exp.Date: NOT PROVIDED	Conductivity 1000µS/cm Standard
		4.0	7.0	10.0						
		4.0	7.0	10.0						
		4.0	7.0	10.0						
		4.0	7.0	10.0						
		4.0	7.0	10.0						
		4.0	7.0	10.0						
		4.0	7.0	10.0						
		4.0	7.0	10.0						
		4.0	7.0	10.0						
		4.0	7.0	10.0						

Tetra Tech

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: Sanfly Field Site 1
Project No.: 112G02760
Location: Pensacola FL
Personnel: Amber Igoe / Alex Murphy
Weather Conditions: Sunny high 55
Measuring Device: Solinst
Tidally Influenced: Yes ___ No X
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
Sf-1-mw01	10/16/12	0900	41.31	42.45	27.06	NA	14.25	
Sf-1-mw02	↓	1120	44.06	44.20	29.65	↓	14.41	
Sf-1-mw03	↓	1447	49.91	45.15	34.80	↓	15.11	

* All measurements to the nearest 0.01 foot

Tetra Tech

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: Sandy Field Site 1 **Project No.:**
Location: Pensacola FL **Personnel:**
Weather Conditions: **Measuring Device:**
Tidally Influenced: Yes ___ No ___ **Remarks:**

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
SF-1-MW01	10/16/12	0800	~~[illegible]~~ 14.25	42.45	27.06	NA	14.25 ~~22.85~~	
SF-1-MW02	↓	1120	44.06	44.20	29.65	↓	14.41	
SF-1-MW03	↓	1447	~~44.37~~ 44.41	45.15	34.80	↓	15.11 ~~6.57~~	

* All measurements to the nearest 0.01 foot

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Tetra Tech

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: Saufley Field Site 1 **Project No.:**
Location: Pensacola FL **Personnel:**
Weather Conditions: **Measuring Device:**
Tidally Influenced: Yes ___ No ___ **Remarks:**

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
SF-1-mw01	10/16/12	0800	NA	42.45	27.06			
SF-1-mw02	↓	1120	↓	44.20	29.65			
SF-1-mw03	↓	1447	↓	45.15	34.00			

* All measurements to the nearest 0.01 foot

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Tetra Tech

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: Saufley Field Site 1
Project No.: 112G02760
Location: Pensacola FL
Personnel: Ambe Igoe
Weather Conditions: cloudy high 63°
Measuring Device: Solinst we meter
Tidally Influenced: Yes ___ No ___
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
SF-1-MW03	1/10/13	1016	50.16	45.10	36.80	NA	13.36	
SF-1-MW02	↓	1019	44.41	44.18	31.54	↓	12.87	
SF-1-MW01	↓	1022	41.56	42.59	28.94	↓	12.62	

* All measurements to the nearest 0.01 foot

APPENDIX E

VALIDATED LABORATORY ANALYTICAL RESULTS

(provided on compact disc)