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REPORT ON DUE DILIGENCE ASSESSMENT OF ENVIRONMENTAL CONCERNS FOR BUILDING 68 AREA NAS CECIL FIELD FL

1/1/1998

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REPORT ON

DUE DILIGENCE ASSESSMENT OF ENVIRONMENTAL CONCERNS: NORTHROP GRUMMAN CORPORATION CECIL FIELD PROJECT BUILDING NO. 68 AREA JACKSONVILLE, DUVAL COUNTY, FLORIDA

Submitted to:

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January 6, 1998 973-3778

Northrop Grumman Corporation
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Attn: Mr. Richard Doria, P.E.
Manager, Environmental Engineering

RE: ENVIRONMENTAL DUE DILIGENCE ASSESSMENT
NORTHROP GRUMMAN CORPORATION - CECIL FIELD PROJECT
BUILDING NO. 68 AREA
JACKSONVILLE, DUVAL COUNTY, FLORIDA

Dear Rick:

Golder Associates Inc. is pleased to present the attached Due Diligence Report regarding environmental concerns associated with the Building No. 68 area at Naval Air Station Cecil Field. The environmental due diligence evaluation was conducted by Golder Associates as part of a broader due diligence evaluation being performed by NGC in conjunction with evaluation of leasing options of certain facilities at NAS Cecil Field by NGC.

Please feel free to contact us with questions or comments concerning this correspondence or the attached report. Golder Associates appreciates the opportunity to provide professional services to Northrop Grumman Corporation.

Very truly yours,

GOLDER ASSOCIATES INC.

Mark J. Jordana, P.G.
Senior Project Manager

Attachment

pc: Ron Holliday -- Northrop Grumman Corporation

TABLE OF CONTENTS

Cover Letter

Table of Contents i

SECTION PAGE

1.0 SUMMARY 1

2.0 INTRODUCTION 8

2.1 Overview 8
2.2 Purpose and Scope 8
2.3 Special Terms and Conditions and Standard of Care 9
2.4 Limitations and Exceptions of Assessment 10
2.5 Limiting Conditions and Methodology Used 10

3.0 BACKGROUND INFORMATION 12

3.1 NAS Cecil Field Main Base Area - Overview 12
3.1.1 General Site Conditions 12
3.1.2 Geologic and Hydrogeologic Characteristics 12
3.2 Building No. 68 Complex 14
3.2.1 General Description of the Facility 14
3.2.2 Summary from the Environmental Baseline Survey Report 15
3.2.3 Summary of the Golder Associates Site Inspection 17
3.3.4 Summary of Aerial Photograph Review 18
3.2.6 Facilities Within 1,000-Feet with Potential Environmental Concerns 18

4.0 FIELD INVESTIGATIVE PROCEDURES 20

4.1 Overview 20
4.2 Deep Soil Borings 22
4.3 Soil Sampling 23
4.4 Sediment Sample Collection 24
4.5 Monitoring Well Installation 24
4.6 Groundwater Sampling and Analysis 25
4.7 Groundwater Elevations 26

5.0 INVESTIGATIVE FINDINGS 27

5.1 Site Geology in the Building No. 68 Area 27
5.2 Groundwater Flow in the Surficial Aquifer 27
5.2.1 Upper Surficial Aquifer Groundwater Flow 28
5.2.2 Lower Surficial Aquifer Groundwater Flow 28
5.3 Soil Analytical Results 29
5.4 Sediment Analytical Results 30
5.5 Groundwater Analytical Results 30

TABLE OF CONTENTS
(Cont'd)

SECTION PAGE

6.0 CONCLUSIONS AND RECOMMENDATIONS 33

REFERENCES 35

IN ORDER
FOLLOWING
PAGE 36

LIST OF TABLES

TABLE 1 Soil Sampling Program Summary
TABLE 2 Groundwater Sampling Program Summary
TABLE 3 Surficial Aquifer Groundwater Elevation Data
TABLE 4 Summary of Soil Laboratory Analytical Data - Detected Parameters
TABLE 5 Summary of Groundwater Laboratory Analytical Data - Detected Parameters

LIST OF FIGURES

FIGURE 1 Site Location Map
FIGURE 2 Site Map
FIGURE 3 Sample Location Map
FIGURE 4 Potentiometric Contour Map - Shallow Interval
FIGURE 5 Potentiometric Contour Map - Deep Interval
FIGURE 6 Detected Parameters in Soil
FIGURE 7 Detected Parameters in Shallow Groundwater
FIGURE 8 Detected Parameters in Deep Groundwater

LIST OF APPENDICES

APPENDIX A Field Documentation
APPENDIX A-1 Deep Soil Boring Field Records
APPENDIX A-2 Temporary Monitoring Well Installation Logs
APPENDIX A-3 Soil Sample Logs
APPENDIX A-4 Groundwater Sample Collection Records
APPENDIX A-5 Daily Equipment Calibration Records
APPENDIX A-6 Surveyor's Report of Monitoring Well and Soil Boring Locations and Elevations
APPENDIX B Laboratory Analytical Report
APPENDIX B-1 Positive Results Summary Report
APPENDIX B-2 Soil and Groundwater Analytical Data

1.0 SUMMARY

Northrop Grumman Corporation (NGC) retained Golder Associates Inc. to perform a focused environmental due diligence investigation at selected areas of Naval Air Station (NAS) Cecil Field located in Jacksonville, Duval County, Florida. NGC is currently evaluating the feasibility of establishing operations at NAS Cecil Field, which is presently in the Base Realignment and Closure (BRAC) Program being administered by the U.S. Navy. Reportedly, the U.S. Navy will turn over administration of the facility to the City of Jacksonville upon closure of U.S. Navy activities at the base.

NAS Cecil Field includes two main areas: the main base area (which is 9,516 acres) and the Yellow Water Weapons Compound area (which is 8,091 acres). The sites that are presently being considered by NGC are located in both of these areas of the base. This report addresses investigative activities performed by Golder Associates at the Building No. 68 area[1] of the main base. Specifically, existing environmental documentation and records for the Building No. 68 area were reviewed, and an inspection of this area of the base was conducted by Golder Associates. Based on the review of existing documents and the site inspection, Golder Associates developed and implemented a scope of work designed to characterize baseline soil and groundwater conditions in the vicinity of Building No. 68.

A Statement of Work for the baseline characterization investigation was prepared by Golder Associates and submitted to NGC in a November 11, 1997 correspondence. Information that was used to develop the Statement of Work included a preliminary review of the base-wide Environmental Baseline Survey (EBS) Report prepared by ABB Environmental Services, Inc. (ABB) during November 1994, a review of a preliminary NGC Environmental Summary Report for NAS Cecil Field included in an internal memorandum dated October 8, 1997, and site inspections conducted by Golder Associates' personnel on October 21 and 22, 1997.

[1] The Building No. 68 area includes Buildings No. 68 and No. 68A, which are warehouse structures, and Building No. 68B, which is an office building located between No. 68 and No. 68A. All three building are attached under one roof. Each building is discussed in more detail in Section 3.0. For purposes of consistency, all three buildings are referred to as Building No. 68 or the Building No. 68 area in this report.

The baseline characterization investigation conducted in the Building No. 68 area included installation of an 130-foot deep geotechnical boring on the main base approximately 2,000 feet north of the Building No. 68 area to characterize the lithology of the subsurface strata down to the first significant confining horizon underlying the site. In addition, shallow soil borings were installed and soil samples were collected from 17 locations in the Building No. 68 area. Soil samples collected from the 17 shallow borings were screened in the field for the presence of volatile organic compounds (VOCs) and/or submitted to Savannah Laboratories & Environmental Services, Inc. (Savannah Labs) for chemical analysis. In addition, one sediment sample was collected from a stormwater retention pond located west of the Building No. 68 area. The soil and sediment samples were analyzed by Savannah Labs for a broad list of parameters which included volatile and semi-volatile organic compounds, polycyclic aromatic hydrocarbons (PAHs), residual petroleum hydrocarbons, polychlorinated biphenyls (PCBs), and selected metals.

In addition, temporary monitoring wells were installed into two vertical intervals of the surficial aquifer at 13 locations in the Building No. 68 area, and groundwater samples were collected from the shallow (i.e., 15 feet) and deeper (i.e., 30 to 35 feet) temporary monitoring wells for laboratory analyses. The groundwater samples were analyzed by Savannah Labs for volatile and semi-volatile organic compounds, PAHs, PCBs, selected metals, residual petroleum hydrocarbons, and other inorganic constituents. The temporary monitoring wells were surveyed and groundwater elevation measurements were recorded in each well to characterize groundwater flow conditions at the Building No. 68 area.

Results of the deep soil borings and hydrogeologic characterization efforts indicate the NAS Cecil Field main base area is underlain by approximately 128 feet of sediments which comprise the surficial aquifer above the Hawthorn Group, which is a low permeability confining unit at the base of the surficial aquifer. The upper 100 feet of the surficial aquifer is comprised of fine to medium grained silty sand. From 100 to 128 feet below ground surface, the lower surficial aquifer is comprised of medium to coarse grained sand with some gravel size particles and shells with a trace of silt and clay. No sediment materials which were representative of the rock aquifer typically encountered at the base of the surficial aquifer system were identified in the deep soil boring. At 128 feet below ground surface, the surficial aquifer was underlain by marl with phosphatic material. This phosphatic marl typically represents the top of the Hawthorn Group,

which is the confining unit underlying the surficial aquifer. Groundwater flow in both the upper surficial aquifer (i.e., the upper 15 feet) and the 30-foot depth interval of the surficial aquifer was determined to be generally toward the south to southwest based on measurements recorded during the baseline characterization investigation.

Results of the baseline soil characterization indicate detectable concentrations of several metals in the samples collected in the Building No. 68 area. Specifically, barium, chromium, lead, and mercury were reported at concentrations which exceeded analytical method detection limits (MDLs). None of the reported metals in soil in the Building No. 68 area exceeded soil clean-up goals established by the Florida Department of Environmental Protection (FDEP). In addition to metals, benzene, toluene, xylenes, and acetone were reported in the duplicate soil sample collected at the TMW-13 location at concentrations which exceeded the analytical MDLs. Although benzene, toluene, xylenes, and acetone were detected in the duplicate sample, these constituents were not reported in the soil sample at the TMW-13 location. The reported concentrations of benzene, toluene, xylenes, and acetone in the duplicate sample were below the FDEP soil clean-up goals for industrial facilities. However, benzene was reported in the duplicate sample at a concentration of 16 micrograms per kilogram (μg/kg), which exceeds the Florida leachability-based clean-up goal for benzene of 3.0 μg/kg in soil. Bis(2-chloroethyl)ether was reported in one soil sample (TMW-7) at a concentration of 580 μg/kg, which is below the FDEP soil clean-up goal for industrial facilities but exceeds the Florida leachability-based clean-up goal of 5.0 μg/kg for bis(2-chloroethyl)ether in soil. Trichloroethene (TCE) was reported in one soil sample (TMW-10) at a concentration of 34 μg/kg, which is below the FDEP soil clean-up goal for industrial facilities but exceeds the Florida leachability-based clean-up goal for TCE of 10 μg/kg in soil. However, benzene, bis(2-chloroethyl)ether, and TCE were not detected in shallow groundwater at the respective locations where these constituents were reported in soil, and the leachability-based clean-up goals are applicable for sites with groundwater contamination or if there was a recent discharge; therefore, the leachability-based clean-up goals may not be currently applicable to the Building No. 68 area.

Results of the sediment sample collected from the stormwater retention pond located west of Building No. 68 indicated certain metals and semi-volatile organic compounds (SVOCs) were reported at concentrations exceeding laboratory MDLs. Specifically, arsenic, barium, chromium,

and lead were reported in the sediment sample. In addition, phenanthrene, fluoranthene, pyrene, bis(2-ethylhexyl)phthalate, chrysene, benzo (b) fluoranthene, and benzo (a) pyrene were reported in the sediment sample. None of these constituents were reported at concentrations which exceeded FDEP soil clean-up goals. No clean-up goals have been established by FDEP specifically for sediments for the parameters reported in the sediment sample collected from the stormwater retention pond located west of the Building No. 68 area.

Results of the baseline groundwater characterization in the Building No. 68 area indicate arsenic, barium, chromium, cadmium, lead, mercury, nickel, selenium, vanadium, and zinc were reported in groundwater at concentrations which exceeded analytical MDLs. Lead was reported in three shallow (i.e., 15-feet) and five deep (i.e., 30-feet) groundwater samples at concentrations which exceeded the Florida water quality standard maximum contaminant level (MCL) of 0.015 milligrams per liter (mg/l) for lead. The maximum concentration of lead reported in groundwater in the Building No. 68 area was 0.150 mg/l. Chromium was reported in two deep groundwater samples at concentrations which exceeded the Florida MCL of 0.1 mg/l for chromium. The maximum concentration of chromium reported in groundwater in the Building No. 68 area was 0.120 mg/l. No elevated chromium concentrations were reported for groundwater collected from shallow monitoring wells in the Building No. 68 area. Selenium was reported in one deep groundwater sample at a concentration which exceeded the Florida MCL of 0.050 mg/l for selenium. The maximum concentration of selenium reported in deep groundwater in the Building No. 68 area was 0.056 mg/l. No elevated selenium concentrations were reported for groundwater collected from shallow monitoring wells in the Building No. 68 area. No other metals were reported at concentrations exceeding Florida MCLs in groundwater samples collected in the Building No. 68 area.

Bromodichloromethane was reported in three deep groundwater samples collected from the Building No. 68 area at concentrations that ranged from 3.0 microgram per liter (μg/l) to 4.5 μg/l, which exceeded the Florida guidance concentration of 0.6 μg/l for bromodichloromethane. Dibromochloromethane was reported in three deep groundwater samples collected from the Building No. 68 area at concentrations that ranged from 1.5 μg/l to 1.8 μg/l, which exceeded the Florida guidance concentration of 1.0 μg/l for dibromochloromethane. Chloroform was reported in three deep groundwater samples collected from the Building No. 68

area at concentrations that ranged from 4.6 μg/l to 7.3 μg/l, which included two samples which exceeded the Florida guidance concentration of 6.0 μg/l for chloroform. Concentrations of all three of these constituents above Florida guidance concentrations were reported in deep groundwater samples collected from wells located west of the Building No. 68 area in the general vicinity of the Defense Reutilization and Marketing Organization (DRMO) storage facility and the hazardous materials storage area (Building No. 335).

No concentrations of bromodichloromethane, dibromochloromethane, or chloroform above laboratory MDLs were reported for groundwater collected from shallow monitoring wells in the Building No. 68 area.

Carbon disulfide was reported in 12 groundwater samples collected from the Building No. 68 area at concentrations that ranged from 1.2 μg/l to 48 μg/l, which is less than the Florida guidance concentration of 700 μg/l for carbon disulfide. Hexa CDD, a chlorinated dioxin, was reported in one deeper groundwater sample (TMW-3D) at the MDL of 0.005 μg/l. FDEP has not established a MCL or guidance concentration for Hexa CDD. No other targeted constituents were reported above the respective analytical MDL in groundwater samples collected from the Building No. 68 area.

Previous investigations performed by the U.S. Navy's contractors, ABB Environmental Services, Inc. (ABB) and Bechtel Environmental, Inc. (Bechtel), indicated that two USTs were formerly located in the Building No. 68 area. Specifically, two 1,000-gallon fuel oil USTs were installed during 1986 and removed during 1997; one adjacent to Building No. 68 and one adjacent to Building No. 68A. The former USTs were located on the east side of the buildings. During the tank closure and confirmatory sampling programs conducted during 1997, soil with elevated headspace VOC concentrations were reported at both former UST locations. Excessively contaminated soil (based on the FDEP definition[2] for contaminated soil in Chapter 62-770 F.A.C.) was identified at Building No. 68. No excessively contaminated soil was identified at Building No. 68A. One groundwater sample was collected in the vicinity

[2] Chapter 62-770 F.A.C. defines excessively contaminated soil as soil that causes a total corrected hydrocarbon measurement of 50 parts per million (ppm) or higher for the Kerosene Analytical Group (which includes fuel oil) based on organic vapor analyses with a flame ionization detector (FID) or photo ionization detector (PID).

of the former UST at Building No. 68, and methylene chloride was the only constituent reported in groundwater above laboratory MDLs. Reportedly, no groundwater sampling was performed by ABB at Building No. 68A.

Results of the preliminary baseline characterization investigation conducted by Golder Associates did not identify substantial soil or groundwater impacts in the vicinity of either former UST. Low concentrations of certain metals were reported in soil. Lead was reported at a concentration below the Florida MCL in the groundwater sample collected from the former UST location at Building No. 68. No petroleum constituents were reported in soil or groundwater in the samples collected from either former UST location.

Groundwater samples collected in the Building No. 68 area during the preliminary baseline characterization investigation recently completed by Golder Associates had elevated turbidity measurements, which may have resulted from suspended sediments in groundwater samples, potentially resulting in increased metals concentrations reported by the laboratory. Lead was reported in 7 of 13 shallow groundwater samples and 10 of 11 deep groundwater samples, and lead concentrations exceeded the Florida MCL of 0.015 mg/l for lead in eight wells. The elevated lead concentrations in groundwater samples may indicate groundwater impacts have occurred to the aquifer underlying the area from past activities at the base, or it may indicate elevated concentrations of lead are representative of background conditions in the Building No. 68 area. The elevated lead concentrations may have resulted from the effects of suspended sediments in the groundwater samples on laboratory analyses. It may be appropriate to collect confirmatory samples from selected monitoring wells which had MCL exceedences reported for metals, filter the samples in accordance with FDEP criteria, and reanalyze the samples for metals of concern.

Exceedences of Florida MCLs for bromodichloromethane, dibromochloromethane, and chloroform were reported for three deep groundwater samples, at locations that are west of the Building No. 68 area near the DRMO and hazardous materials storage areas. These substances may be associated with industrial activities; however, they may be artifacts of the sampling program or laboratory analyses. In addition, acetone was reported in one soil sample, which may also be an artifact of the sampling program or laboratory analyses. It may be appropriate to

perform confirmatory sampling and analysis to confirm the presence of these constituents in groundwater in the Building No. 68 area.

Benzene, toluene, xylenes, acetone, bis(2-chloroethyl)ether, and TCE were detected in one or more soil samples, include concentrations of benzene, bis(2-chloroethyl)ether, and TCE reported above the Florida leachability-based soil clean-up goals. These constituents were not reported in groundwater at the locations where the soil samples were collected, which suggests leaching may not be occurring. However, given that soil sampling was conducted at broad spacing throughout the Building No. 68 area, it is not possible to determine if the detection of benzene, bis(2-chloroethyl)ether, and TCE represents a small isolated release or whether the sample was collected from the outer perimeter of an area where a substantial release occurred.

2.0 INTRODUCTION

2.1 Overview

During October 1997, NGC retained Golder Associates to perform a focused environmental due diligence investigation at selected areas of NAS Cecil Field located in Jacksonville, Duval County, Florida. The investigations were performed as a component of a broader due diligence being performed by NGC associated with evaluation of the feasibility of taking over certain areas of the base, which is slated for closure. The purpose of the environmental due diligence evaluation was to review and summarize pre-existing information regarding the environmental status of the areas of the property which were under consideration by NGC, and use the information obtained during the records review to develop a soil and groundwater testing program to characterize baseline environmental conditions in the vicinity of the areas of the base NGC is evaluating. The preliminary information review was conducted during October and early November 1997, and a Statement of Work which defined the scope of the baseline characterization investigation was submitted by Golder Associates to NGC on November 11, 1997.

NGC is evaluating several areas of NAS Cecil Field for future NGC operations, and preliminary environmental due diligence evaluations have been initiated in several of the areas under consideration. This report details the investigative efforts which have been performed to date at the Building No. 68 area. The Building No. 68 complex is a former warehouse and office on the main base of NAS Cecil Field which is currently slated to be decommissioned by the U.S. Navy.

2.2 Purpose and Scope

The purpose of the environmental due diligence evaluation was to characterize baseline environmental conditions in the general vicinity of Building No. 68 on the main base of NAS Cecil Field. The evaluation at the Building No. 68 area was conducted in two phases. The first phase included a preliminary review of available information and a walk over inspection of the site. The second phase consisted of a field program which included soil and groundwater sample collection and analysis. The results of the first phase of work are reported in Section 3.0 of this

document and were used to develop the scope of work conducted for the second phase of the investigation. A description of the second phase of the investigation is provided in Section 4.0, and the investigative findings of the second phase of the investigation are described in Section 5.0 of this report. Section 6.0 of this report presents the conclusions and recommendations resulting from this study.

During the first phase of the evaluation, information was reviewed to evaluate the current level of understanding of site conditions in the Building No. 68 area of the site, and to develop a Statement of Work for the field investigation in this area. Information that was used to develop the Statement of Work included a preliminary review of the base-wide EBS Report prepared by ABB during November 1994, a review of a preliminary NGC Environmental Summary Report included in an internal memorandum dated October 8, 1997, and site inspections conducted by Golder Associates' personnel on October 21 and 22, 1997.

In addition, Golder Associates was provided with, and performed a preliminary review of, BRAC documents for NAS Cecil Field which had been loaded onto compact discs (CDs) by ABB. The version of CDs provided to Golder Associates was dated July and August 1995. More recent versions of BRAC documents were not reviewed by Golder Associates until after preparation of the Statement of Work. However, review of the most recent documents available through the BRAC office at NAS Cecil Field revealed that Sampling and Analysis Outlines (SAOs) were prepared by ABB during October 1995 for Buildings No. 68, No. 68A, and No. 68B, and Confirmatory Sampling Reports (CSRs) for the former underground storage tanks (USTs) at Buildings No. 68 and No. 68A were issued by ABB during October 1997. Tank Closure Assessments (TCAs) were prepared by Bechtel during June 1997 associated removal of the former USTs at Buildings No. 68 and No. 68A. The limited baseline environmental data available for the Building No. 68 area from the U.S. Navy are summarized in Section 3.2 of this report.

2.3 Special Terms and Conditions and Standard of Care

The environmental due diligence evaluation was performed in accordance with the scope of investigation presented in the Statement of Work developed for the Building No. 68 area of the

site presented in our November 11, 1997 correspondence to NGC. Given that negotiations were ongoing during November 1997 between NGC, the U.S. Navy, and the City of Jacksonville regarding which areas of the base would become available for use by NGC, the scope of our investigation was modified from the November 11, 1997 Statement of Work based on verbal communications with NGC.

Golder Associates' professional services were performed, findings obtained, and report prepared in accordance with standard professional principles and practices in the fields of environmental science and site assessment. This representation is in lieu of all other representations, either expressed or implied. Our services were performed in accordance with the terms and conditions of the Master Service Agreement between NGC and Golder Associates.

2.4 Limitations and Exceptions of Assessment

Findings presented in this correspondence are based on select publicly available information, information provided by representatives of the U.S. Navy and/or the City of Jacksonville, and on site conditions observed at the time of the site inspections and field investigations conducted during the period from October 1997 to December 1997. During the due diligence evaluation, Golder Associates relied on information provided by representatives of the U.S. Navy. Golder Associates cannot accept responsibility for any deficiencies, mis-statements, or inaccuracies contained in this report which have resulted from omission, misrepresentations, or fraudulent acts of the persons involved. This document has been prepared for the sole use by NGC, and Golder Associates is not responsible for independent conclusions, opinions, or recommendations made by others or otherwise based on the findings presented in this report.

2.5 Limiting Conditions and Methodology Used

During performance of the information review, Golder Associates was provided copies of records stored on CDs and were provided access to BRAC records on base. However, the CDs were over two years old, and the BRAC records on base were not organized such that Golder Associates developed a high level of confidence that we had identified and reviewed a

comprehensive listing of all information which has been generated by the U.S. Navy regarding environmental conditions at the Building No. 68 area. Consequently, certain information may exist for the Building No. 68 area which has not been reviewed by Golder Associates during performance of the current investigation.

During development and implementation of the scope for the field investigation, the goal of the investigation was to characterize baseline environmental conditions at selected areas near Building No. 68. A limited soil and groundwater investigation was conducted. Soil sample collection was restricted to near the ground surface (generally from 0 to 2 feet below ground surface); consequently, the investigation was not designed to characterize soil chemistry through an extensive vertical section of the soil column. In addition, given the large area encompassed by the Building No. 68 area, soil samples were collected at relatively broad spacing throughout the study area.

Groundwater samples were collected from temporary monitoring wells screened in the water table interval (i.e., roughly 15 feet below ground surface) and in a lower section of the surficial aquifer (i.e., roughly 30 feet below ground surface). Groundwater sample locations were selected to provide representative groundwater quality data in areas of interest at the site. However, the groundwater monitoring network was not designed to delineate the lateral and vertical extent of groundwater impacts at the property, if groundwater concerns were identified at the site.

There is no assurance that the soil and groundwater monitoring program conducted for the baseline environmental characterization has identified the location of all source areas for soil or groundwater impacts which may exist at the areas of interest at the property.

Additionally, the site inspections did not include evaluation of the potential for asbestos containing materials to be present in structures located on the inspected properties. No evaluations of the potential for radon, lead-based paint, or lead in drinking water were performed. No wetland surveys were conducted, and no ecological resources evaluations were performed.

3.0 BACKGROUND INFORMATION

3.1 NAS Cecil Field Main Base Area - Overview

3.1.1 General Site Conditions

The Building No. 68 area is located on the main base of NAS Cecil Field. The main base is located in the western portion of Duval County, Florida as shown on Figure 1 and consists of approximately 9,516 acres of land. The center of the Building No. 68 area is located at approximately 30°13'28" north latitude and 81°53'26" west longitude. A site plan is shown on Figure 2.

The NAS Cecil Field main base area presently consists of a number of buildings, roadways, flight lines, paved areas, and green space. Presently, the area has little topographic relief, with a typical elevation of approximately 75 feet above mean sea level (msl). Rowell Creek drains west of the area to Taylor Creek south of the Building No. 68 area to Yellow Water Creek, which is located south and west of the base.

3.1.2 Geologic and Hydrogeologic Characteristics

The main base is located within the western portion of Duval County. The regional geologic units in this area consist of three sedimentary deposits; undifferentiated sediments deposited since the mid-Miocene, the Miocene age Hawthorn Group, and Eocene limestone units. These sedimentary units dip eastward at approximately 4 to 8 feet per mile.

The undifferentiated sediments above the Hawthorn Group are Holocene, Pleistocene, Pliocene, and upper Miocene in age. The Holocene and Pleistocene sediments consist of fine to medium grained unconsolidated quartz sands with varying amounts of silt and clay. These units were deposited on marine terraces and beach ridges. The Pliocene and upper Miocene sediments consist of sand, shell, calcareous clay, and soft friable limestone, and were deposited in a shallow marine environment. The undifferentiated post-Hawthorn sediments vary in thickness from less than 10 feet along the coast to over 100 feet in western Duval County.

Unconformably underlying the surficial sediments is the Hawthorn Group of early to middle Miocene age. These sediments consist of sandy clay and clayey sand with layers of phosphatic sands, limestone and dolomite. The phosphatic sands are a distinguishing characteristic that is not seen in the overlying post-Hawthorn sediments. The Hawthorn Group is subdivided into four formations; the Statenville Formation, the Coosawhatchee Formation, the Marks Head Formation, and the Penny Farms Formation. Eocene limestone units unconformably underlie the Hawthorn Group.

The regional hydrogeologic system in northeast Florida is generally described in terms of a three-unit system. The three units are: the surficial aquifer system, the upper confining unit, and the Floridan aquifer system.

The surficial aquifer is comprised of two hydrogeologic zones, the upper surficial aquifer and the rock aquifer. These hydrogeologic zones correspond to the geologic post-Hawthorn sediments. The upper surficial aquifer consists of fine to medium grained sands and is principally recharged directly from precipitation. Discharge from the upper surficial aquifer is from evapotranspiration, downward leakage, pumping and seepage into surface water bodies. The rock aquifer is the principal water-bearing zone of the surficial aquifer system in Duval County, and consists of a permeable limestone that grades into a medium to coarse sand and shell deposit. The rock aquifer is located at the base of the post-Hawthorn sediments. The rock aquifer may be locally discontinuous or absent in western Duval County.

The potentiometric surface for the surficial aquifer system is generally less than 5 to 10 feet below ground surface. Regional groundwater flow in the surficial aquifer is towards the major discharge areas; the St. Johns River and the Atlantic Ocean. However, local groundwater flow patterns are greatly influenced by local topography and nearby surface water features.

The Hawthorn Group acts as the upper confining unit to the Floridan aquifer system. The clayey sand and sandy clay act as an aquiclude and greatly inhibit the flow of groundwater from the surficial aquifer system to the Floridan aquifer system.

The Florida aquifer system is the major source of potable water in northeast Florida. The geologic units that comprise the Floridan aquifer are the Ocala Group, The Avon Park Limestone, the Lake City Limestone and the Oldsmar Limestone. These four units consist mainly of massive limestone and dolomite. The Floridan aquifer system is approximately 300 to 330 feet below msl and is estimated to be between 1,000 to 1,800 feet thick in western Duval County. Recharge of the Floridan aquifer is in western Putnam County, southwestern Clay County, eastern Alachua County, and Bradford County west of Duval County. The upper confining unit in these areas is usually thin or absent and allows downward recharge from the surficial aquifer. An average estimated transmissivity for the upper permeable zone of the Floridan aquifer in Duval County is on the order of 8×10^4 ft^2/day.

3.2 Building No. 68 Complex

3.2.1 General Description of the Facility

The Building No. 68 complex consists of three buildings which are attached under one roof: Building No. 68, Building No. 68A, and Building No. 68B. All three buildings are located west of the 3rd Street and Avenue D intersection. Building No. 68 is a warehouse about 300 feet x 200 feet in size, which was constructed in 1953 of brick and concrete block on top of a concrete slab with a flat tar and gravel roof. At the time the EBS Report was being prepared in 1994, Building No. 68 was being leased from the Navy by Logistical Services, Inc. All items ordered by various departments of the base are received, staged, and delivered from this building. At the time of the EBS, Building No. 68 contained office supplies, furniture, tires, tools, and other general purpose items.

Building No. 68A is a warehouse about 300 feet x 200 feet in size, which was constructed in 1957 of brick and concrete block on a concrete slab with a flat metal roof. Reportedly, it is currently used by the base as a general warehouse for uniforms, personal protective equipment, tools, etc. Lockheed and McDonnell Douglas reportedly leased parts of the warehouse between 1984 and 1991. Building No. 68A has been used as a warehouse since its construction.

Building No. 68B is an office building about 202 feet x 129 feet in size, which was constructed in 1985 of brick and concrete block on a concrete slab with a flat metal roof. Reportedly, the building is used as offices for the Supply Department and also to store non-hazardous items.

3.2.2 Summary from the Environmental Baseline Survey Report

Building No. 68

Environmental issues identified at this building included a 1,000-gallon UST on the eastern side of the building that was used to store fuel oil for the building's boiler. Reportedly, the UST was a double walled steel tank which was installed during 1986. No information was provided in the EBS regarding storage of fuel oil for the boiler at this building prior to 1986. The EBS Report indicated the UST appeared inactive and was scheduled to be removed or closed in-place by 1998. A transformer on the property that contained more than 50 parts per million (ppm) of PCBs was replaced in 1993. Three ASTs were reportedly removed; however, the date of removal was listed as unknown.

The SAO prepared by ABB during October 1995 for Building No. 68 indicated a 1,000-gallon UST was located on the east side of the building which was used to store diesel fuel. The SAO also reported a transformer containing more than 50 ppm of PCBs was removed during 1993, and indicated three ASTs were removed from the building, but the date of removal was unknown. However, the SAO reported no Phase II assessment sampling was required for Building No. 68.

A TCA report issued by Bechtel during June 1997 indicated excessively contaminated soil was reported in the excavation during UST removal, which reportedly occurred during April 1997. Soil headspace VOC concentrations ranged up to 900 ppm in the excavation. Reportedly, a Discharge Reporting Form was submitted to FDEP on June 26, 1997. No soil was removed from the site during the tank closure performed by Bechtel.

ABB issued a CSR for Building No. 68 during October 1997 which reported excessively contaminated soil was detected in all three soil borings installed, with the highest reported soil

headspace VOC concentration of 800 ppm. Soil headspace VOC concentrations were highest in samples collected at the water table at depths from 5 to 7 feet below ground surface, which indicates impacts to groundwater quality from petroleum hydrocarbons may have occurred at the site. Results from one groundwater sample collected by ABB during March 1997 indicated methylene chloride was reported at a concentration of 1.9 μg/l in the groundwater sample. All other analyzed parameters were reported below detection limits.

Building No. 68A

Environmental issues identified at this building included a 1,000-gallon UST on the eastern side of the building that was used to store fuel oil for the building's boiler. Reportedly, the UST was a double walled steel tank which was installed during 1986. No information was provided in the EBS regarding storage of fuel oil for the boiler at this building prior to 1986. The EBS Report indicated the UST appeared active; however, it was scheduled to be removed or closed in-place by 1998. The EBS Report indicated a July 1993 memorandum reported the UST was suspected of leaking; however, no additional supporting documentation was provided.

The SAO prepared by ABB during October 1995 for Building No. 68A indicated a 1,000-gallon UST was located on the east side of the building which was used to store diesel fuel. The SAO noted black staining on the ground surface in the vicinity of the UST, and suggested any spillage from the UST would drain to the stormwater retention pond near the building. With the exception of sampling the stormwater pond as part of a comprehensive base-wide stormwater assessment program, no Phase II assessment sampling was recommended for Building No. 68A in the SAO.

A TCA report issued by Bechtel during June 1997 indicated contaminated soil was reported in the excavation during UST removal, which reportedly occurred during May 1997. Soil headspace VOC concentrations ranged up to 30 ppm in the excavation. Reportedly, a Discharge Reporting Form was submitted to FDEP on June 26, 1997. No soil was removed from the site during the tank closure.

ABB issued a CSR for Building No. 68A during October 1997. Reportedly, only one soil boring was advanced by ABB during the CSR investigation, and no groundwater sampling was performed. The CSR indicated no excessively contaminated soil was detected in the soil boring.

Building No. 68B

Environmental issues identified in the EBS were limited to the potential leaking UST reported at Building No. 68A. The SAO issued by ABB during October 1995 did not recommend Phase II assessment sampling at Building No. 68B.

3.2.3 Summary of the Golder Associates Site Inspection

Golder Associates conducted an inspection of the Building No. 68 area during October 1997. On the eastern side of Building No. 68, a dark patch of asphalt was observed, which appeared to be the former location of the UST which was reportedly removed during April 1997. A one-inch diameter pipe, which may be the vent pipe for the former UST, is located adjacent to the side of the building and extends upward through the canopy for the loading dock. This potential vent pipe is located adjacent to a double door which appears to lead into the boiler room. Stormwater conveyance piping was observed on the east, north, and west sides of the building.

At the eastern side of Building No. 68A (on the raised loading dock), a patch of new concrete was observed adjacent to the warehouse wall which appeared to be the former location of the UST which was reportedly removed during May 1997. Directly east of the concrete patch, a patched hole was observed in the asphalt parking area, which could have resulted from monitoring activities associated with tank closure. Stormwater conveyance piping was observed on the east, south, and west sides of the building.

A stormwater retention basin was located behind the Building No. 68 complex, which included pond water with vegetation at the south end of the basin and a gravel infiltration area at the north end of the basin.

The Hazardous Materials Minimization Building (Building No. 335) is located immediately west of Building No. 68A. The DRMO storage area is located further west, and a considerable amount of equipment is stored on paved and unpaved surfaces in this area. To the southeast of Building No. 68A south of 2nd Street and behind Building No. 179, an AST was observed along with two monitoring wells.

3.3.4 Summary of Aerial Photograph Review

Aerial photographs were reviewed for the following years: 1968, 1977, 1988, 1993, and 1995. Buildings No. 68 and No. 68A had been constructed by 1968, and the area between the two buildings was cleared. Buildings No. 179 and No. 335 near the southwest corner of No. 68A were completed, and the post office near the northwest corner of Building No. 68 was also in place. An area of disturbed land is visible immediately south of Building No. 68A and east of Building No. 179. The area west of the Building No. 68 complex was cleared, and the area may have been in use by DRMO for storage of miscellaneous equipment. The remnants of a rail line which came in from the north and apparently extended behind the Building No. 68 complex could be observed on the 1968 photograph. The surrounding land had sparse tree coverage and low lying vegetation.

Several more buildings had been constructed south of Building No. 68A in the 1977 photograph. The aerial photograph from 1988 indicates that Building No. 68B had been completed. The 1993 aerial photograph indicates continued development in the general vicinity of the Building No. 68 complex, as does the 1995 photograph.

3.2.6 Facilities Within 1,000-Feet with Potential Environmental Concerns

Based on information presented in the EBS Report, the following buildings were identified which stored hazardous materials or hazardous wastes or petroleum products within 1,000 feet of the Building No. 68 complex.

Building No.	Building Identification (year built)	Recognized Environmental Condition
1A	Environmental Works (1945)	Hazardous waste storage
4	Administration Building (1941)	Hazardous materials storage
8	Administration Building (1942)	Hazardous materials storage
11	Steam Generating Plant (1941)	Hazardous materials; UST; ASTs (3)
13	Corrosion Control Hangar (1941)	Hazardous materials and waste storage
14	Maintenance Hangar (1941)	Hazardous materials and waste storage
46	Former Gas Station	USTs (4)
48	Maintenance Aircraft Spare Storage (1942)	Hazardous materials storage
52A	Operations Storage Building (1949)	Hazardous materials storage
53	Operations Storage Building (1949)	Hazardous materials storage
54	Operations Storage Building (1949)	Hazardous materials storage
179	DRMO (1961)	Hazardous materials storage
325	Hazardous Materials Storage Area (1988)	Hazardous materials storage
331	BOQ	PCBs
335	Hazardous Materials Warehouse (1957)	Hazardous materials storage
396	Operational Storage Building (1993)	Hazardous materials storage
547	FASO Building (1982)	Hazardous waste storage
859	Anti-Submarine Warfare Center (1975)	UST
860	Aircraft Hangar (1976)	Haz. materials & waste; UST; ASTs (4)
860A	Hazardous Materials Storage (1976)	Hazardous materials storage
860B	Hazardous Materials Storage (1976)	Hazardous materials storage
863	Electrical Distribution Building (1975)	UST
867LN	Line Shack (1978)	Hazardous waste storage
868LN	Line Maintenance Building	Hazardous materials and waste storage
869	Hazardous and Flammable Storage (1980)	Hazardous materials and waste storage
3090	Naval Air Reserve Administration (1977)	Hazardous materials storage
AOI-32	Hazmat Warehouse Storage Area	IR Program
AOI-33	DRMO Storage Area	IR Program
IR-7	Old Fire Fighting Training Area	CERCLA site 1,200 feet SW of Bldg. 68A

Of the off-site facilities located within 1,000-feet of the Building No. 68 area listed above, the locations which represent the greatest potential concern are the DRMO storage area and hazardous materials storage area (Building No. 335), which have been identified as Areas of Interest associated with the Installation Restoration Program. However, based on groundwater flow conditions identified during the environmental baseline characterization investigation, it does not appear that these areas are upgradient from the Building No. 68 area. Based on the southern groundwater flow direction identified in both the 15-foot and 30-foot intervals, a former fueling area at Building No. 46, located approximately 1,000 feet north of the Building No. 68 area, represents the greatest potential off-site, upgradient contaminant source.

4.0 FIELD INVESTIGATIVE PROCEDURES

4.1 Overview

As a result of the site inspection and information reviewed, a field investigation program was undertaken in the Building No. 68 area. In general, the program included collection of soil and groundwater samples for chemical analyses to determine potential impacts of past operational practices at the facility. Specifics of the field program are highlighted below.

- One deep soil boring was drilled at the main base area and one deep soil boring was drilled at the Yellow Water Weapons area. Both borings were drilled to the top of the Hawthorn Group to establish the stratigraphy in the two areas of the site and were used to refine details of the subsequent sampling program.

- Two soil borings were installed at the UST location at Building No. 68 and two soil borings were installed at the UST location at Building No. 68A to evaluate the potential for impacts to soil from the storage of petroleum products at the site. The borings were advanced to a depth of 6 feet, and a soil sample was collected from the 1.0-foot interval with the highest headspace concentration of VOCs recorded on the PID instrument. Each soil sample was analyzed for petroleum constituents identified in Chapter 62-770 F.A.C.; specifically, EPA Method 8020, EPA Method 8100, and petroleum range organics by the FL-PRO method. In addition, appropriate QA samples were collected and analyzed.

- Originally, one composite soil sample was to be collected in the vicinity of the former PCB-containing transformer which was reportedly removed in 1993. However, during field inspection it was noted that the transformer was located in an area on the loading dock which was unlikely to impact soil at the site even in the event of a release. Consequently, no soil sample was collected at this location, and a sediment sample was substituted into the sampling program. The sediment sample was collected from the stormwater retention pond located west of the Building No. 68 area, and analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, and the eight RCRA metals by EPA Method 6010/7470.

- One shallow temporary monitoring well was installed at the UST location at Building No. 68 and one shallow temporary monitoring well was installed at the UST location at Building No. 68A to evaluate the potential for impacts to groundwater from the storage of petroleum products at the site. Each groundwater sample was analyzed for petroleum constituents and lead identified in Chapter 62-770 F.A.C.; specifically, EPA Method 8010, EPA Method 8020, EPA Method 8100, EPA Method 200.7, and petroleum range organics by the FL-PRO method. In addition, appropriate QA samples were collected and analyzed.

- Surface soil samples (to depths of approximately 2 feet) were collected from each temporary monitoring well at the two UST locations. The samples were initially tested with a organic vapor analyzer (OVA) equipped with a photoionization detector (PID) to measure soil headspace concentrations of VOCs. The sample from the interval with the highest OVA reading was collected and analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, and the eight RCRA metals by EPA Method 6010/7470.

- Six pairs of temporary monitoring wells (one located approximately at each of the four corners of the property and two additional locations along the west side of the warehouse buildings) were installed to evaluate the potential for groundwater impacts from adjacent facilities. One shallow and one deep groundwater sample were collected from the well pairs at TMW-4, TMW-5, TMW-7, and TMW-8 and analyzed for a broad range of constituents, including volatile organic compounds by EPA Method 8260, SVOCs by EPA Method 8270, PCBs by EPA Method 8080, and the eight RCRA metals by EPA Method 6010/7470. One shallow and one deep groundwater sample were collected from the well pairs at TMW-3 and TMW-6 and analyzed for the Constituents listed in 40 CFR, Part 264, Appendix IX. In addition, appropriate QA samples were collected and analyzed.

- Five temporary monitoring well pairs were installed west of Building No. 68 to assess the potential for impacts from the DRMO and hazardous materials storage areas. Shallow and deep groundwater samples were collected from each well pair and analyzed for a broad range of constituents, including volatile organic compounds by EPA Method 8260, SVOCs by EPA Method 8270, PCBs by EPA Method 8080, and eight RCRA metals by EPA Method 6010/7470. In addition, appropriate QA samples were collected and analyzed.

- Surface soil samples (to depths of approximately 2 feet) were collected from the locations of the 11 pairs of temporary monitoring wells. The samples were screened with the OVA for soil headspace concentrations of VOCs. The sample from the interval with the highest OVA reading at each location was collected and analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, and eight RCRA metals by EPA Method 6010/7470. If no readings or the same readings were detected using the OVA, then a composite soil sample was collected and analyzed.

A more comprehensive description of the investigative procedures is presented in the sections that follow. Sampling locations are shown on Figure 3. A summary of the soil sampling program is presented in Table 1. A summary of the groundwater sampling program is presented in Table 2. Sampling forms, boring logs, and other field documentation are provided in Appendix A. All field sampling work was performed in general accordance with the Golder Associates FDEP-approved Comprehensive Quality Assurance Plan (CompQAP). The laboratory contractor, Savannah Labs, is under a general services contract with NGC and performed their portion of the work under their own FDEP-approved CompQAP. The laboratory analytical reports are presented in Appendix B.

4.2 Deep Soil Borings

Two deep soil borings were drilled at NAS Cecil Field to characterize the lithology of the surficial aquifer underlying the site. The two borings were advanced from the ground surface through the subsurface soils until reaching the underlying marl layer, which represents the base of the surficial aquifer. The location of the boring advanced in the main base area is shown on Figure 3, and the boring log is included in Appendix A.

The borings were advanced using a CME-55 drill rig, mounted on an All Terrain Vehicle (ATV), supplied and operated by Wolff Drilling, Inc. of Jacksonville, Florida. The rig was equipped with an automatic drop hammer to perform Standard Penetration Testing (SPT) in accordance with ASTM Standard D 1586. The borings were advanced using mud rotary drilling with split spoon sampling from the ground surface until boring termination.

The field activities were documented by personnel from Golder Associates' staff who also located the borings in the field, logged the observed soil and groundwater conditions, recorded the results of the field testing, and cared for the samples obtained.

In boring B-1 (on the Yellow Water Weapons Compound area), SPT and split spoon sampling was performed at 2.5-foot intervals until boring termination at 85 feet below ground surface. In boring B-2 (in the main base area), SPT and split spoon sampling was performed at 2.5-foot intervals until about 115 feet below ground surface, and at 5-foot intervals thereafter until boring termination at a depth of 130 feet below ground surface. After completion of each boring, the borehole was grouted with a cement grout up to the ground surface.

The borings were drilled in areas believed to be unimpacted by previous site activity. Consequently, the drilling equipment was not decontaminated between soil borings. Additionally, given that the deep soil borings were installed in remote, reportedly unimpacted areas of the base, soil cuttings and drilling mud were placed directly onto the ground surface in the general vicinity of each soil boring at the completion of drilling activities.

4.3 Soil Sampling

Four soil samples (68-SB-1 through 68-SB-4) were collected for chemical analyses in the Building No. 68 area at the locations shown on Figure 3. All four samples were collected adjacent to the two former UST locations east of Building No. 68 and Building No. 68A. These samples were collected from a depth range of 2 to 4 feet below ground surface and were analyzed for petroleum constituents in Chapter 62-770 F.A.C. by EPA Method 8020, EPA Method 8100, and petroleum range organics by the FL-PRO method. The soil borings were advanced with a stainless steel hand auger. The soil samples collected from the soil borings were packaged on ice and shipped to Savannah Labs to be analyzed.

Thirteen soil samples (68-TMW-1-SL through 68-TMW-13-SL) were collected for chemical analyses at the temporary well locations in the Building No. 68 area shown on Figure 3. At each of the sample locations, the soil borings were advanced, and the soil samples were collected with a stainless steel hand auger. Soil samples were generally collected from two depths (ground surface to 1.0 feet below ground surface, and 1.0 to 2.0 feet below ground surface) at each location. The samples were placed in glass jars and VOC concentrations in the sample container headspace were recorded using an OVA. At each location, soil from the interval with the highest headspace VOC concentration was collected and shipped to Savannah Labs to be analyzed for VOCs by EPA Method 8260, SVOCs by EPA Method 8270, and the eight RCRA metals by EPA Method 6010/7470. If no readings or the same readings were detected using the OVA, then a composite soil sample was collected and analyzed. Sample collection logs for each of the soils samples are presented in Appendix A. The analytical results are presented in Appendix B.

All tools potentially contacting the soil samples were decontaminated prior to the initiation of each soil boring. The decontamination process included a rinse with tap water, a scrubbing with laboratory-grade detergent (Alconox), and a deionized (DI) water rinse. An isopropanol rinse was used following the DI water rinse on the stainless steel equipment. The equipment was allowed to air dry, if practical, otherwise a final DI water rinse was performed. Soil cuttings generated from the boreholes, which were not retained as sample materials, were returned to the borehole. No containerization of soil cuttings was performed.

4.4 Sediment Sample Collection

One sediment sample was collected near the outfall of a stormwater retention pond located west of the Building No. 68 area at the location shown on Figure 3. The sample was collected using a stainless steel auger and was obtained from the upper 1.0-foot of sediment in the pond. The sample was packaged on ice and shipped to Savannah Labs for analysis.

All tools potentially contacting the sediment sample was decontaminated prior to the initiation of sampling. The decontamination process included a rinse with tap water, a scrubbing with laboratory-grade detergent (Alconox), and a DI water rinse. An isopropanol rinse was used following the DI water rinse on the stainless steel equipment. The equipment was allowed to air dry, if practical, otherwise a final DI water rinse was performed.

4.5 Monitoring Well Installation

Eleven temporary monitoring well pairs and two individual temporary monitoring wells were installed with a DPT rig operated by Probe Domain of Jacksonville, Florida at the locations shown on Figure 3. The temporary well pairs were generally completed at two depths (generally 15 feet below ground surface and 30 feet below ground surface) at each location. The individual temporary monitoring wells were generally completed at 15 feet below ground surface. The DPT rig encountered a dense, compacted layer around 30 feet in each boring, and advancement of the DPT tooling below this depth interval was difficult. Consequently, deep temporary wells were generally set to a depth of 30 feet, with 5-foot screened intervals set from 25 to 30 feet below ground surface.

Installation of the temporary monitoring wells was conducted by advancing a nominal 2-inch diameter decontaminated steel probe with hollow rods and an expendable tip, using a Geoprobe DPT rig to push and pneumatically hammer to a targeted depth. The 1.25-inch diameter PVC well (0.10-inch slot screen and Schedule 40 flush threaded casing) was assembled and lowered through the center of the rods to the bottom of the probe. As the steel rods were retracted, the steel expendable tip was expelled by force of the PVC temporary well. The rods were slowly removed, leaving the PVC temporary well in the ground at the targeted depth. As the rods

were withdrawn, the formation collapsed around the screen and riser, such that no sand pack or bentonite seal were installed.

All DPT tools potentially contacting the groundwater sample were decontaminated prior to the initiation of each well. The decontamination process included a rinse with tap water, a scrubbing with laboratory-grade detergent (Alconox), and a DI water rinse. An isopropanol rinse was used following the DI water rinse. The equipment was allowed to air dry, if practical, otherwise a final DI water rinse was performed.

4.6 Groundwater Sampling and Analysis

Following installation of each temporary monitoring well, dedicated polyethylene tubing was installed inside the well to the screened interval, and a peristaltic pump was connected to the discharge end of the tubing. The temporary well point was purged under low flow conditions for 15 minutes, or until a minimum of three well volumes had been removed, to attempt to remove fine-grained sediment materials from the screened interval and assure representative formational groundwater was sampled. During purging, pH, specific conductance, temperature, and turbidity of the purge water was measured and recorded. After the field parameters stabilized, the flow rate of the pump was adjusted down and the sample aliquots for SVOCs, pesticides/PCBs, and inorganic parameters were collected. The pump was then turned off and the tubing removed. The sample aliquot for VOCs was collected using a dedicated disposable bailer. Following sample collection, the sample aliquots were placed in a laboratory shuttle and cooled with ice in plastic bags.

A total of 24 temporary well points were sampled during the groundwater sampling event. Additionally, quality assurance sampling (i.e., one duplicate sample, one equipment blank, matrix spike and matrix spike duplicate (MS/MSD) samples, trip blanks) was performed during the sampling event. Groundwater and quality assurance samples were shipped to the contract laboratory to be analyzed for a wide variety of analytical parameters. Specific sample identification along with a summary of the analyses performed is provided in Table 2. The groundwater analytical results are included in Appendix B.

4.7 Groundwater Elevations

The positions of the temporary monitoring wells were surveyed by Holland & Bassett Surveyors, Inc. of Jacksonville, Florida, a licensed surveyor in the State of Florida. The horizontal locations were surveyed to an accuracy of 1.0 feet and were tied into the State Planar Coordinate system. The vertical locations (ground surface and top of casing elevations) were surveyed to an accuracy of 0.01 feet referenced to msl. Given that temporary monitoring wells TMW-10(D) and TMW-13(S) had not been completed at the time surveying was conducted, no elevations were surveyed at these two locations.

Water level measurements were recorded from the monitoring wells following well completion and prior to the groundwater sampling event. In addition, a complete circuit of water level measurements was made on December 20, 1997. Water level measurements were recorded to an accuracy of 0.01 feet and groundwater elevations were calculated to an accuracy of 0.01 feet referenced to msl. Table 3 presents the water level measurements made on December 20, 1997 and corresponding groundwater elevations recorded from each temporary monitoring well.

5.0 INVESTIGATIVE FINDINGS

5.1 Site Geology in the Building No. 68 Area

Results of the deep soil borings indicate the Building No. 68 area is underlain by approximately 128 feet of sediments which comprise the surficial aquifer above the Hawthorn Group, which is a low permeability confining unit at the base of the surficial aquifer. In general, the upper 100 feet of the surficial aquifer is comprised of fine to medium grained silty sand. From 100 to 128 feet below ground surface, the lower surficial aquifer is comprised of medium to coarse grained sand with some gravel size particles and shells with a trace of silt and clay. No sediment materials consistent with the lithology typically representative of the rock aquifer, locally present at the base of the surficial aquifer system, were encountered. At 128 feet below ground surface, the surficial aquifer was underlain by marl with phosphatic material. This phosphatic marl typically represents the top of the Hawthorn Group, which is the confining unit underlying the surficial aquifer.

Lithology encountered in the deep boring on the main base area differed substantially from the boring installed in the Yellow Water Weapons Compound area, where the surficial aquifer extended to a depth of 81 feet below ground surface and was underlain by the Hawthorn Group. The rock aquifer was encountered at a depth from approximately 74 to 81 feet below ground surface in the Yellow Water Weapons Compound area. The elevation of the ground surface in the two areas is roughly the same. The increased depth to the top of the Hawthorn Group at the main base area, and the absence of the rock aquifer, may indicate the presence of a post-Miocene erosional channel which incised the top of the Hawthorn Group prior to deposition of the sediments of the surficial aquifer.

5.2 Groundwater Flow in the Surficial Aquifer

A total of 11 monitoring well clusters and two individual monitoring wells were installed in the Building No. 68 area during the baseline characterization investigation. At each well cluster, one well was installed to a depth of approximately 15 feet below ground surface in the upper surficial aquifer and one well was installed to a depth of approximately 30 feet below ground surface in the surficial aquifer. At the individual monitoring well locations, the wells were

installed to a depth of approximately 15 feet. Each well was surveyed to determine the horizontal coordinates to an accuracy of 1.0 foot and the elevation to an accuracy of 0.01 foot relative to msl. Groundwater elevations were measured in each well on December 20, 1997. Groundwater elevation data are presented in Table 3. A potentiometric map for the upper surficial aquifer is shown on Figure 4, and a potentiometric map for the lower surficial aquifer is shown on Figure 5. The potentiometric maps were used to characterize the direction of groundwater flow underlying the Building No. 68 area.

5.2.1 Upper Surficial Aquifer Groundwater Flow

In the upper surficial aquifer, groundwater elevations were generally highest north of the Building No. 68 area, with shallow groundwater flow toward the south as shown on Figure 4. There is a southwestern component of groundwater flow in the southern portion of the Building No. 68 area. Groundwater elevations descended by approximately 3.5 feet from north to south across an area of approximately 800 feet underlying the Building No. 68 area at a horizontal hydraulic gradient of approximately 4.3×10^{-3}. A southward groundwater flow of the upper surficial aquifer is consistent with surface water drainage in the area to the south and west toward Lake Rowell.

5.2.2 Lower Surficial Aquifer Groundwater Flow

In the 30 feet below ground surface interval of the surficial aquifer, groundwater flow is generally toward the south to southwest as shown on Figure 5. The highest groundwater elevations in this interval were measured along the northern boundary of the Building No. 68 area. Groundwater elevations descended by approximately 3.5 feet from north to south at a horizontal hydraulic gradient of approximately 4.3×10^{-3}.

Vertical hydraulic gradients between the upper and lower units of the surficial aquifer were not pronounced, with groundwater elevation differences between the two intervals generally on the order of 0.1 foot or less at most well cluster locations.

5.3 Soil Analytical Results

Soil analytical results for the Building No. 68 area are summarized in Table 4 and shown on Figure 6. Results of the baseline soil characterization indicate detectable concentrations of several metals in the samples collected in the Building No. 68 area. Specifically, barium, chromium, lead, and mercury were reported at concentrations which exceeded analytical MDLs. None of the reported metals in soil in the Building No. 68 area exceeded soil clean-up goals established by FDEP.

In addition to metals, benzene, toluene, xylenes, and acetone were reported in the duplicate soil sample collected at the TMW-13 location at concentrations which exceeded the analytical MDLs. Although benzene, toluene, xylenes, and acetone were detected in the duplicate sample, these constituents were not reported in the soil sample at the TMW-13 location. The reported concentrations of benzene, toluene, xylenes, and acetone in the duplicate sample were below the FDEP soil clean-up goals for industrial facilities.

Benzene was reported in the duplicate sample from the TMW-13 location at a concentration of 16 μg/kg, which exceeds the Florida leachability-based clean-up goal for benzene of 3.0 μg/kg in soil. Bis(2-chloroethyl)ether was reported in one soil sample (TMW-7) at a concentration of 580 μg/kg, which is below the FDEP soil clean-up goal for industrial facilities but exceeds the Florida leachability-based clean-up goal of 5.0 μg/kg for bis(2-chloroethyl)ether in soil. TCE was reported in one soil sample (TMW-10) at a concentration of 34 μg/kg, which is below the FDEP soil clean-up goal for industrial facilities but exceeds the Florida leachability-based clean-up goal for TCE of 10 μg/kg in soil. However, benzene, bis(2-chloroethyl)ether, and TCE were not detected in shallow groundwater at the respective locations where these constituents were reported in soil, and the leachability-based clean-up goals are applicable for sites with groundwater contamination or if there was a recent discharge; therefore, the leachability-based clean-up goals may not be currently applicable to the Building No. 68 area.

5.4 Sediment Analytical Results

Sediment analytical results for the sample collected from the stormwater retention pond located west of the Building No. 68 area are summarized in Table 4 and shown on Figure 6. Results of the baseline sediment characterization indicate arsenic, barium, chromium, and lead were reported in the sediment sample. In addition, phenanthrene, fluoranthene, pyrene, bis(2-ethylhexyl)phthalate, chrysene, benzo (b) fluoranthene, and benzo (a) pyrene were reported in the sediment sample. None of these constituents were reported at concentrations which exceeded FDEP soil clean-up goals for industrial facilities. No clean-up goals have been established by FDEP specifically for sediments for the parameters reported in the sediment sample collected from the stormwater retention pond located west of the Building No. 68 area.

5.5 Groundwater Analytical Results

Groundwater analytical results for the Building No. 68 area are summarized in Table 5 and shown on Figure 7 for the shallow surficial aquifer and on Figure 8 for the deeper surficial aquifer. Results of the baseline groundwater characterization in the Building No. 68 area indicate arsenic, barium, chromium, cadmium, lead, mercury, nickel, selenium, vanadium, and zinc were reported in groundwater at concentrations which exceeded analytical MDLs. Lead was reported in three shallow (i.e., 15-feet) and five deep (i.e., 30-feet) groundwater samples at concentrations which exceeded the Florida MCL of 0.015 mg/l for lead. The maximum concentration of lead reported in groundwater in the Building No. 68 area was 0.150 mg/l.

Chromium was reported in two deep groundwater samples at concentrations which exceeded the Florida MCL of 0.1 mg/l for chromium. The maximum concentration of chromium reported in groundwater in the Building No. 68 area was 0.120 mg/l. No elevated chromium concentrations were reported for groundwater collected from shallow monitoring wells in the Building No. 68 area.

Selenium was reported in one deep groundwater sample at a concentration which exceeded the Florida MCL of 0.050 mg/l for selenium. The maximum concentration of selenium reported in deep groundwater in the Building No. 68 area was 0.056 mg/l. No elevated selenium

concentrations were reported for groundwater collected from shallow monitoring wells in the Building No. 68 area.

No other metals were reported at concentrations exceeding Florida MCLs in groundwater samples collected in the Building No. 68 area.

Bromodichloromethane was reported in three deep groundwater samples collected from the Building No. 68 area at concentrations that ranged from 3.0 μg/l to 4.5 μg/l, which exceeded the Florida guidance concentration of 0.6 μg/l for bromodichloromethane. Dibromochloromethane was reported in three deep groundwater samples collected from the Building No. 68 area at concentrations that ranged from 1.5 μg/l to 1.8 μg/l, which exceeded the Florida guidance concentration of 1.0 μg/l for dibromochloromethane. Chloroform was reported in three deep groundwater samples collected from the Building No. 68 area at concentrations that ranged from 4.6 μg/l to 7.3 μg/l, which included two samples which exceeded the Florida guidance concentration of 6.0 μg/l for chloroform. Concentrations of all three of these constituents above Florida guidance concentrations were reported in deep groundwater samples collected from wells located west of the Building No. 68 area in the general vicinity of the DRMO storage facility and the hazardous materials storage area (Building No. 335).

No concentrations of bromodichloromethane, dibromochloromethane, or chloroform above laboratory MDLs were reported for groundwater collected from shallow monitoring wells in the Building No. 68 area.

Carbon disulfide was reported in 12 groundwater samples collected from the Building No. 68 area at concentrations that ranged from 1.2 μg/l to 48 μg/l, which is less than the Florida guidance concentration of 700 μg/l for carbon disulfide.

Hexa CDD, a chlorinated dioxin, was reported in one deeper groundwater sample (TMW-3D) at the MDL of 0.005 μg/l. This well location, near the northeast corner of the Building No. 68 area, is located at the upgradient boundary of this area based on groundwater flow information obtained during this preliminary environmental baseline characterization investigation. FDEP has not established a MCL or guidance concentration for Hexa CDD. No other targeted constituents

were reported above the respective analytical MDL in groundwater samples collected from the Building No. 68 area.

6.0 CONCLUSIONS AND RECOMMENDATIONS

Previous investigations performed by the U.S. Navy's contractors, ABB and Bechtel, indicated that two USTs were formerly located in the Building No. 68 area. Specifically, two 1,000-gallon fuel oil USTs were installed during 1986 and removed during 1997; one adjacent to Building No. 68 and one adjacent to Building No. 68A. The former USTs were located on the east side of the buildings. During the tank closure and confirmatory sampling programs conducted during 1997, soil with elevated headspace VOC concentrations were reported at both former UST locations. Excessively contaminated soil (based on the FDEP definition for contaminated soil in Chapter 62-770 F.A.C.) was identified at Building No. 68. No excessively contaminated soil was identified at Building No. 68A. One groundwater sample was collected in the vicinity of the former UST at Building No. 68, and methylene chloride was the only constituent reported in groundwater above laboratory MDLs. Reportedly, no groundwater sampling was performed by ABB at Building No. 68A.

Results of the preliminary baseline characterization investigation conducted by Golder Associates did not identify substantial soil or groundwater impacts in the vicinity of either former UST. Low concentrations of certain metals were reported in soil. Lead was reported at a concentration below the Florida MCL in the groundwater sample collected from the former UST location at Building No. 68. No petroleum constituents were reported in soil or groundwater in the samples collected from either former UST location.

Groundwater samples collected in the Building No. 68 area during the preliminary baseline characterization investigation recently completed by Golder Associates had elevated turbidity measurements, which may have resulted from suspended sediments from groundwater samples, potentially resulting in increased metals concentrations reported by the laboratory. Lead was reported in 7 of 13 shallow groundwater samples and 10 of 11 deep groundwater samples, and lead concentrations exceeded the Florida MCL of 0.015 mg/l for lead in eight wells. The elevated lead concentrations in groundwater samples may indicate groundwater impacts have occurred to the aquifer underlying the area from past activities at the base, or it may indicate elevated concentrations of lead are representative of background conditions in the Building No. 68 area. The elevated lead concentrations may have resulted from the effects of suspended sediments

in the groundwater samples on laboratory analyses. It may be appropriate to collect confirmatory samples from selected monitoring wells which had MCL exceedences reported for metals, filter the samples in accordance with FDEP criteria, and reanalyze the samples for metals of concern.

Exceedences of Florida MCLs for bromodichloromethane, dibromochloromethane, and chloroform were reported for three deep groundwater samples, at locations that are west of the Building No. 68 area near the DRMO and hazardous materials storage areas. These substances may be associated with industrial activities; however, they may be artifacts of the sampling program or laboratory analyses. It may be appropriate to perform confirmatory sampling and analysis to confirm the presence of these constituents in groundwater in the Building No. 68 area.

Benzene, toluene, xylenes, acetone, bis(2-chloroethyl)ether, and TCE were detected in one or more soil samples, include concentrations of benzene, bis(2-chloroethyl)ether, and TCE reported above the Florida leachability-based soil clean-up goals. These constituents were not reported in groundwater at the locations where the soil samples were collected, which suggests leaching may not be occurring. However, given that soil sampling was conducted at broad spacing throughout the Building No. 68 area, it is not possible to determine if the detection of benzene, bis(2-chloroethyl)ether, and TCE represents a small isolated release or whether the sample was collected from the outer perimeter of an area where a substantial release occurred.

GOLDER ASSOCIATES INC.

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Table 1
Soil Sampling Program Summary
Main Base Area - Building No. 68
Northrop Grumman Corporation - NAS Cecil Field Project
Jacksonville, Florida

Sample Point ID	Depth of Boring (ft)	Sample Interval[1]	Analytical Parameters						
			Head Space VOCs	Method 8260	Method 8020	Method 6010/7470	Method 8270	Method 8100	Method FL-PRO
68-SB-1	4	3 - 4 ft	X		X			X	X
68-SB-2	4	3 - 4 ft	X		X			X	X
68-SB-3	4	1 - 3 ft	X		X			X	X
68-SB-4	4	1 - 3 ft	X		X			X	X
68-SED-1	1	0 - 1 ft		X		X	X		
68-TMW-1-SL	4	3 - 4 ft	X	X		X	X		
68-TMW-2-SL	4	1 -2 ft	X	X		X	X		
68-TMW-3-SL	2	0 - 2 ft	X	X		X	X		
68-TMW-4-SL	2	0.5 - 2 ft	X	X		X	X		
68-TMW-5-SL	2	0 - 2 ft	X	X		X	X		
68-TMW-6-SL	2	0 - 2 ft	X	X		X	X		
68-TMW-7-SL	2	0 - 2 ft	X	X		X	X		
68-TMW-8-SL	2	0.5 - 2 ft	X	X		X	X		
68-TMW-9-SL	2	0 - 2 ft	X	X		X	X		
68-TMW-10-SL	2	0 - 2 ft	X	X		X	X		
68-TMW-11-SL	2	0 - 2 ft	X	X		X	X		
68-TMW-12-SL	2	0 - 2 ft	X	X		X	X		
68-TMW-13-SL	2	0 - 2 ft	X	X		X	X		
68-TMW-13-SL (2)[2]	2	0 - 2 ft	X	X		X	X		

Note: (1) Soil samples were composited from the referenced interval.
No mixing or stirring of the VOC fraction was performed.
(2) TMW-13-SL (2) is a duplicate sample of TMW-13-SL.

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Table 2
Groundwater Sampling Program Summary
Main Base Area - Building No. 68
Northrop Grumman Corporation - NAS Cecil Field Project
Jacksonville, Florida

		Field Parameters					Analytical Parameters									
Sample Point ID	Date Sampled	Volume Purged (gallons)	pH	Temp. °F	Specific Conductivity (mmho)	Turbidity (NTU)	Method 8260	Method 8010	Method FL-PRO	Method 8080	Method 6010/7470	Method 8020	Method 200.7	Method Appendix IX	Method 8270	Method 8100
68-TMW-1S	5-Dec-97	4	5.3	79	99	15		X	X			X	X			X
68-TMW-2S	4-Dec-97	4	5.19	81	76	27		X	X			X	X			X
68-TMW-3S	5-Dec-97	4	4.76	78	67	19								X		
68-TMW-3D	5-Dec-97	7	5.89	78	107	159								X		
68-TMW-4S	8-Dec-97	2	4.98	80	80	169	X			X	X				X	
68-TMW-4D	8-Dec-97	7	5.44	82	97	166	X			X	X				X	
68-TMW-5S	8-Dec-97	6	5.35	80	83	162	X			X	X				X	
68-TMW-5D	8-Dec-97	7	5.61	78	73	31	X			X	X				X	
68-TMW-6S	4-Dec-97	3	5.88	78	197	65								X		
68-TMW-6D	4-Dec-97	9	5.18	78	105	164								X		
68-TMW-7S	4-Dec-97	3	5.38	79	69	118	X			X	X				X	
68-TMW-7D	4-Dec-97	8	4.7	79	45	>200	X			X	X				X	
68-TMW-8S	5-Dec-97	10	5.37	77	97	158	X			X	X				X	
68-TMW-8D	5-Dec-97	9	4.96	78	86	160	X			X	X				X	
68-TMW-9S	8-Dec-97	4	5.87	83	176	90	X			X	X				X	
68-TMW-9D	8-Dec-97	8	4.2	80	118	140	X			X	X				X	
68-TMW-10S	5-Dec-97	5	5.71	78	140	30	X			X	X				X	
68-TMW-10D	5-Dec-97	5	5.73	78	95	162	X			X	X				X	
68-TMW-11S	8-Dec-97	4	5.06	84	74	>170	X			X	X				X	
68-TMW-11D	8-Dec-97	6	5.32	85	102	163	X			X	X				X	
68-TMW-12S	8-Dec-97	4	5.49	81	78	17	X			X	X				X	
68-TMW-12D	8-Dec-97	10	4.78	86	76	99	X			X	X				X	
68-TMW-13S	5-Dec-97	2	6.39	78	396	160	X			X	X				X	
68-TMW-13D	5-Dec-97	5	5.89	80	175	161	X			X	X				X	

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Table 3
Surficial Aquifer Groundwater Elevation Data
Main Base Area - Building No. 68
Northrop Grumman Corporation - NAS Cecil Field Project
Jacksonville, Florida

Sample Point ID	Date Sampled	Shallow Monitoring Wells					Deep Monitoring Wells				
		Well Elevation (ft)	Distance Above Ground Level (ft)	Depth to Water (ft)	Ground Water Elevation (ft)	Total Depth of Well (ft)	Well Elevation (ft)	Distance Above Ground Level (ft)	Depth to Water (ft)	Ground Water Elevation (ft)	Total Depth of Well (ft)
68-TMW-1S	20-Dec-97	76.46	-0.09	5.49	70.97	14.81	-	-	-	-	-
68-TMW-1D	20-Dec-97	-	-	-	-	-	-	-	-	-	-
68-TMW-2S	20-Dec-97	76.47	-0.04	3.08	73.39	14.80	-	-	-	-	-
68-TMW-2D	20-Dec-97	-	-	-	-	-	-	-	-	-	-
68-TMW-3S	20-Dec-97	76.32	-0.07	2.15	74.17	14.83	-	-	-	-	-
68-TMW-3D	20-Dec-97	-	-	-	-	-	76.34	-0.05	2.57	73.77	29.20
68-TMW-4S	20-Dec-97	75.75	0.00	4.14	71.61	14.78	-	-	-	-	-
68-TMW-4D	20-Dec-97	-	-	-	-	-	75.73	0.13	3.79	71.94	29.03
68-TMW-5S	20-Dec-97	75.97	-0.06	5.10	70.87	14.28	-	-	-	-	-
68-TMW-5D	20-Dec-97	-	-	-	-	-	75.99	0.00	5.10	70.89	29.51
68-TMW-6S	20-Dec-97	75.18	-0.06	4.44	70.74	14.78	-	-	-	-	-
68-TMW-6D	20-Dec-97	-	-	-	-	-	75.25	0.09	4.52	70.73	29.63
68-TMW-7S	20-Dec-97	76.08	-0.05	4.46	71.62	14.84	-	-	-	-	-
68-TMW-7D	20-Dec-97	-	-	-	-	-	75.94	-0.06	4.04	71.90	29.64
68-TMW-8S	20-Dec-97	76.42	0.00	2.21	74.21	14.80	-		-	-	-
68-TMW-8D	20-Dec-97	-	-	-	-	-	76.51	-0.04	2.27	74.24	29.73
68-TMW-9S	20-Dec-97	75.15	-0.08	2.97	72.18	14.83	-	-	-	-	-
68-TMW-9D	20-Dec-97	-	-	-	-	-	75.21	0.10	3.00	72.21	29.65
68-TMW-10S	20-Dec-97	76.20	-0.06	3.24	72.96	14.78	-	-	-	-	-
68-TMW-10D	20-Dec-97	-	-	-	-	-	NS	NS	6.58	NS	34.26
68-TMW-11S	20-Dec-97	74.73	-0.04	3.24	71.49	14.53	-	-	-	-	-
68-TMW-11D	20-Dec-97	-	-	-	-	-	74.80	0.03	3.14	71.66	29.67
68-TMW-12S	20-Dec-97	74.40	-0.06	3.98	70.42	14.65	-	-	-	-	-
68-TMW-12D	20-Dec-97	-	-	-	-	-	74.41	-0.03	4.00	70.41	29.62
68-TMW-13S	20-Dec-97	NS	NS	6.25	NS	14.54	-	-	-	-	-
68-TMW-13D	20-Dec-97	-	-	-	-	-	76.19	-0.03	3.73	72.46	29.62

Note: (1) All elevation data referenced to Mean Sea Level (MSL).
NS = Not Surveyed

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Table 4
Summary of Soil Laboratory Analytical Data - Detected Parameters
Main Base - Building No. 68
Northrop Grumman Corporation - NAS Cecil Field Project
Jacksonville, Florida

Analyte	FDEP Goals (1) (IND)	FDEP Goals (1) (Leach)	RL (2)	Location 68-SED-1 (0 - 1 ft)	68-SB-1 (3 - 4 ft)	68-SB-2 (3 - 4 ft)	68-SB-3 (1 - 3 ft)	68-SB-4 (1 - 3 ft)	68-TMW 1-SL (3 - 4 ft)	Duplicate 68-SS-3 (3 - 4 ft)	68-TMW 2-SL (1 - 2 ft)	68-TMW 3-SL (0 - 2 ft)	Duplicate 68-SS-2 (0 - 2 ft)	68-TMW 4-SL (0.5 - 2 ft)
Inorganics (mg/kg)														
Arsenic	3.1	NC (3)	1.0	1.1	--	--	--	--	--	--	--	--	--	--
Barium	84,000	NC	1.0	2.2	--	--	--	--	2.8	1.8	5.1	2.7	1.6	3.8
Chromium	430 (4)	NC	1.0	12	--	--	--	--	1.9	1.4	2.2	3.7	2.1	2.4
Lead	1,000	NC	0.50	34	--	--	--	--	3.4	2.1	2.1	3.0	2.2	20
Mercury	480	NC	0.010	--	--	--	--	--	--	--	--	0.04	0.02	0.014
Semi-Volatile Organics (µg/kg)														
Pyrene	41,000,000	290,000	430	1,000	--	--	--	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate	110,000	11,000	430	1,100	--	--	--	--	--	--	--	--	--	--
Chrysene	500,000	31,000	430	730	--	--	--	--	--	--	--	--	--	--
Benzo (b) fluoranthene	5,000	71,000	430	780	--	--	--	--	--	--	--	--	--	--
Benzo (a) pyrene	500	3,700	430	440	--	--	--	--	--	--	--	--	--	--
Phenanthrene	21,000	2.8	430	480	--	--	--	--	--	--	--	--	--	--
Fluoranthene	48,000	280	430	1200	--	--	--	--	--	--	--	--	--	--

Analyte	FDEP Goals (1) (IND)	FDEP Goals (1) (Leach)	RL (2)	Location 68-TMW 5-SL (0 - 2 ft)	68-TMW 6-SL (0 - 2 ft)	68-TMW 7-SL (0 - 2 ft)	68-TMW 8-SL (0.5 - 2 ft)	68-TMW 9-SL (0 - 2 ft)	68-TMW 10-SL (0 - 2 ft)	68-TMW 11-SL (0 - 2 ft)	68-TMW 12-SL (0 - 2 ft)	68-TMW 13-SL (0 - 2 ft)	Duplicate 68-SS-4 (0 - 2 ft)
Inorganics (mg/kg)													
Barium	84,000	NC (3)	1.0	2.5	3.3	7.1	7.7	2.5	1.9	4.3	5.1	8.2	3.1
Chromium	430 (4)	NC	1.0	1.5	2.9	1.5	1.8	1.6	1.8	2.2	1.4	--	--
Lead	1,000	NC	0.50	2.1	7.8	1.7	6.3	1.9	1.7	2.7	1.6	1.8	1.4
Mercury	480	NC	0.010	0.012	0.014	0.016	--	--	--	0.017	0.014	--	--
Volatile Organics (µg/kg)													
Benzene	2,000	3	6	--	--	--	--	--	--	--	--	--	16
Toluene	3,500,000	200	6	--	--	--	--	--	--	--	--	--	15
Xylene	92,000,000	100	6	--	--	--	--	--	--	--	--	--	13
bis(2-Chloroethyl) Ether	900	5	330	--	--	580	--	--	--	--	--	--	--
Trichloroethene	9300.0	10	6	--	--	--	--	--	34	--	--	--	--
Acetone	1,800,000	1,400	6	--	--	--	--	--	--	70	--	--	190

Notes:
(1) FDEP Goals = Soil clean-up goals per FDEP memorandum dated Sept. 29, 1995.
Industrial (IND) and Leaching (Leach) goals are shown.
(2) RL = Reportable Limit, as defined by the laboratory for specific analytical methods.
(3) NC = Leaching goal not calculated by FDEP for inorganic and some organic parameters.
(4) Clean-up goal for hexavalent chromium.
(5) -- indicated parameter not detected above laboratory reporting limit.

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Table 5 (page 1 of 2)
Summary of Groundwater Laboratory Analytical Data - Detected Parameters
Main Base - Building No. 68
Northrop Grumman Corporation - NAS Cecil Field Project
Jacksonville, Florida

Analyte	Regulatory Standard	RL (4)	Location									
			68-TMW 1(S)	68-TMW 2(S)	EQ Blank 68-8	68-TMW 3(S)	Duplicate 68-7	68-TMW 3(D)	68-TMW 4(S)	68-TMW 4(D)	68-TMW 5(S)	68-TMW 5(D)
Inorganics (mg/l)												
Barium	2 (1)	0.0	--	--	--	0.013	0.013	0.057	0.12	0.052	0.06	0.029
Chromium	0.1 (1)	0.0	--	--	--	--	--	0.046	0.036	0.067	0.015	--
Lead	0.015 (1)	0.0	--	0.0072	0.007	--	--	0.011	0.055	0.013	0.031	--
Mercury	0.002 (1)	0.0	--	--	--	--	--	--	0.00036	--	--	--
Selenium	0.05 (1)	0.01	--	--	--	--	--	--	--	--	--	--
Vanadium	0.049 (3)	0.0	--	--	--	--	--	0.011	--	--	--	--
Zinc	5 (2)	0.0	--	--	--	0.031	--	0.028	--	--	--	--
Volatile Organics (ug/l)												
Carbon Disulfide	700 (3)	1.0	--	--	--	3.4	26	12	--	--	--	--
Chlorinated Dioxins (ug/l)												
Hexa CDD	Not regulated	0.0050	--	--	--	--	--	0.005	--	--	--	--

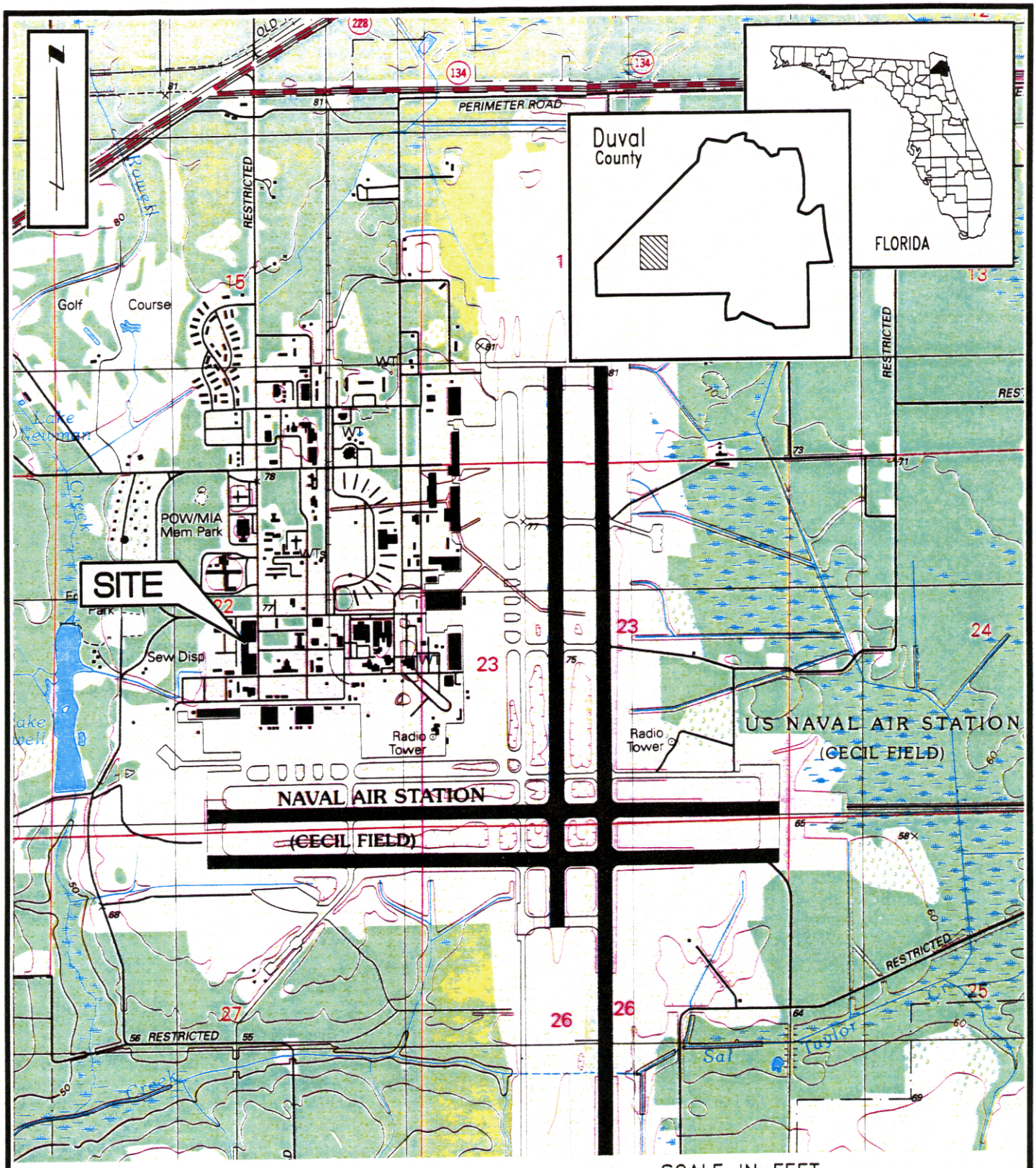
Analyte	Regulatory Standard	RL (4)	Location									
			68-TMW 6(S)	EQ Blank 68-6	68-TMW 6(D)	Duplicate 68-5	68-TMW 7(S)	68-TMW 7(D)	Duplicate 68-6	68-TMW 8(S)	68-TMW 8(D)	68-TMW 9(S)
Inorganics (mg/l)												
Arsenic	0.05 (1)	0.010	--	--	--	--	--	0.018	0.02	--	0.014	--
Barium	2 (1)	0.010	0.019	--	0.073	0.076	0.042	0.18	0.16	0.019	0.041	0.013
Chromium	0.1 (1)	0.010	--	--	0.028	0.028	--	0.12	0.10	--	0.055	--
Cadmium	5 (1)	0.0050	--	--	--	--	--	0.0054	0.0052	--	0.011	--
Lead	0.015 (1)	0.0050	--	--	0.018	0.017	0.0088	0.074	0.069	0.012	0.062	--
Mercury	0.002 (1)	0.00020	--	--	--	--	--	--	--	--	0.00022	--
Selenium	0.05 (1)	0.01	--	--	--	--	--	--	--	--	0.056	--
Vanadium	0.049 (3)	0.010	--	--	0.013	0.012	--	--	--	--	--	--
Zinc	5 (2)	0.020	--	0.027	--	--	--	--	--	--	--	--
Volatile Organics (ug/l)												
Bromodichloromethane	0.6 (3)	1.0	--	--	2.9	4.5	--	--	--	--	--	--
Carbon Disulfide	700 (3)	1.0	19	--	4.3	3.7	16	10	48	7.4	14	--
Chloroform	6 (3)	1.0	--	--	7.3	10.0	--	--	--	--	--	--
Dibromochloromethane	1 (3)	1.0	--	--	1.5	2.0	--	--	--	--	--	--

Table 5 (page 2 of 2)
Summary of Groundwater Laboratory Analytical Data - Detected Parameters
Main Base - Building No. 68
Northrop Grumman Corporation - NAS Cecil Field Project
Jacksonville, Florida

Analyte	Regulatory Standard	RL (4)	Location									
			68-TMW 9(D)	68-TMW 10(S)	Duplicate 68-8	68-TMW 10(D)	68-TMW 11(S)	68-TMW 11(D)	68-TMW 12(S)	68-TMW 12(D)	68-TMW 13(S)	68-TMW 13(D)
Inorganics (mg/l)												
Arsenic	0.05 (1)	0.01	--	--	--	0.015	--	--	--	--	--	--
Barium	2 (1)	0.01	0.038	--	--	0.058	0.38	0.034	0.027	0.046	0.021	0.051
Chromium	0.1 (1)	0.01	0.014	--	--	**0.12**	0.08	0.033	--	0.012	0.016	0.12
Cadmium	5 (1)	0.005	--	--	--	--	--	--	--	--	--	--
Lead	0.015 (1)	0.005	**0.023**	--	--	**0.096**	**0.15**	0.014	--	0.0068	0.014	0.009
Mercury	0.002 (1)	0.0002	--	--	--	0.00036	0.00023	--	--	--	--	--
Nickel	0.1(1)	0.04	--	--	--	--	--	--	--	--	--	--
Selenium	0.05 (1)	0.01	--	--	--	0.14	--	--	--	--	--	--
Vanadium	0.049 (3)	0.01	--	--	--	--	--	--	--	--	--	--
Zinc	5 (2)	0.02		--	--	--	--	--	--	--	--	--
Volatile Organics (ug/l)			--									
Bromodichloromethane	0.6 (3)	1.0	--	--	--	**3.0**	--	--	--	--	--	**3.1**
Carbon Disulfide	700 (3)	1.0	--	--	1.9	10	--	--	--	--	1.2	8.4
Chloroform	6 (3)	1.0	--	--	--	**6.1**	--	--	--	--	--	4.6
Dibromochloromethane	1 (3)	1.0	--	--	--	**1.5**	--	--	--	--	--	**1.8**

Notes:
(1) Primary Drinking Water Standard.
(2) Secondary Drinking Water Standard.
(3) Guidance Standard
(4) RL = Reportable Limit, as defined by the laboratory for a specific analytical method.
(5) Duplicate-68-5 is a duplicate sample from 68-TMW-6D.
(6) Duplicate-68-6 is a duplicate sample from 68-TMW-7D.
(7) Duplicate-68-7 is a duplicate sample from 68-TMW-3S.
(8) Duplicate-68-8 is a duplicate sample from 68-TMW-10S.
(9) -- indicates parameter not detected above laboratory reportable limit.
(10) Bold, highlighted concentrations indicate reported detection is above the Florida Regulatory Standard.

FN:DISK\973-3778\68\68_GW.XLS



REFERENCE:

USGS TOPOGRAPHIC MAP, 7.5 MIN. SERIES, QUADRANGLE MAP:
JACKSONVILLE HEIGHTS QUADRANGLE, DUVAL COUNTY, FLORIDA
FIFTONE QUADRANGLE, DUVAL COUNTY, FLORIDA

SCALE IN FEET

0 2000 4000

JACKSONVILLE, FLORIDA

Golder Associates

TITLE

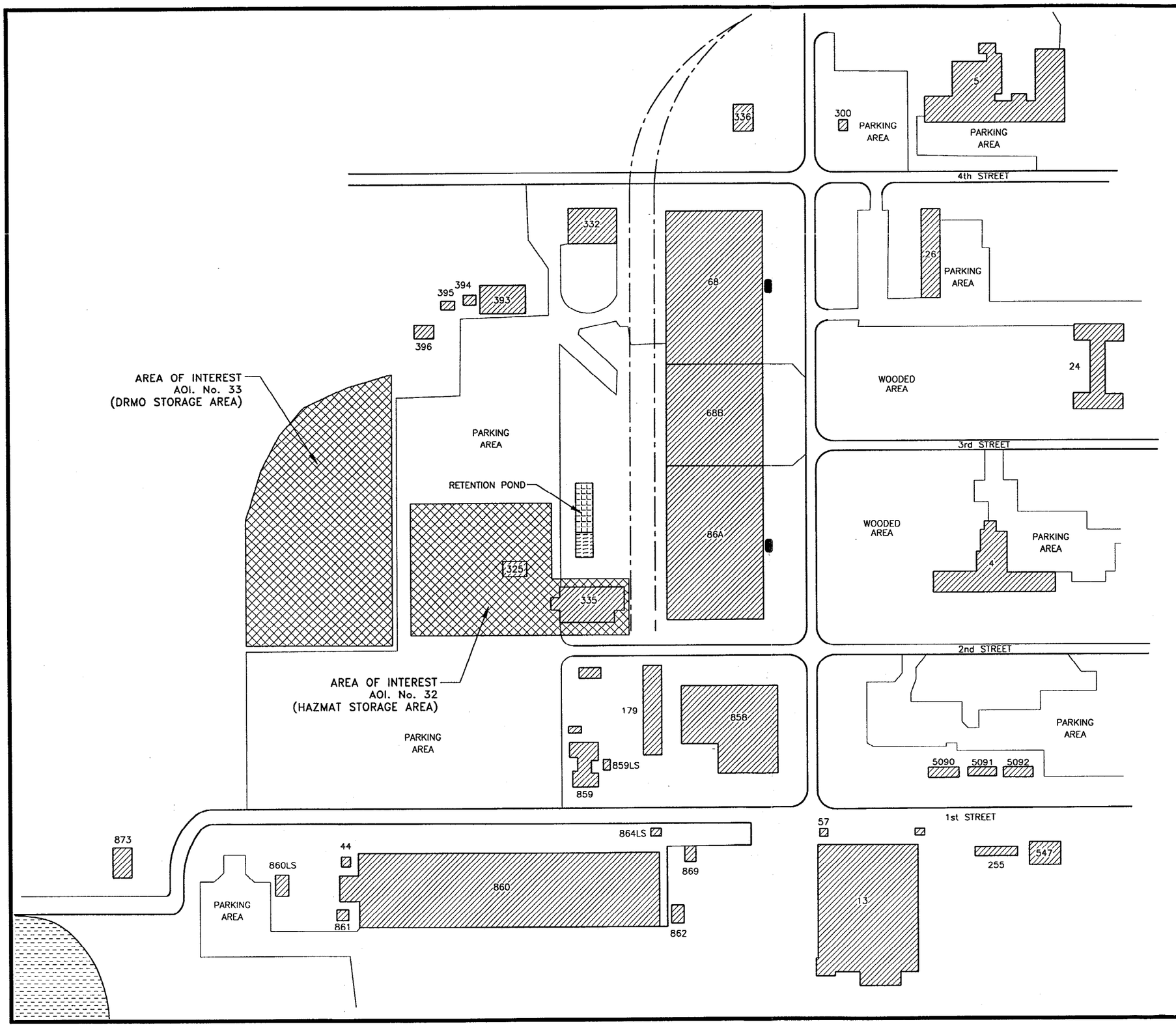
BUILDING NO. 68/68A/68B
SITE LOCATION MAP

CLIENT/PROJECT

NGC/CECIL FIELD/FL

DRAWN	TRG	DATE	12/19/97	JOB NO.	973-3778
CHECKED	MJJ	SCALE	AS SHOWN	DWG NO. 3778X	REV. NO.
REVIEWED	DTM	FILE NO.	973-3778	SUBTITLE	FIGURE NO. 1

04793101Y



LEGEND

- UNDERGROUND STORAGE TANK
- FORMER RAILROAD TRACKS
- BUILDING
- AREA OF INTEREST IDENTIFIED FROM INSTALLATION RESTORATION PROGRAM
- CERCLA SITE IR-7 (FORMER FIREFIGHTING TRAINING AREA)
- RETENTION POND RECHARGE AREA
- RETENTION POND SURFACE WATER

NOTES:

1. BUILDING No. 325 AND No. 335 ARE THE HAZARDOUS MATERIALS STORAGE AREA.

SCALE IN FEET

0 200 400

Golder Associates

JACKSONVILLE, FLORIDA

CLIENT/PROJECT

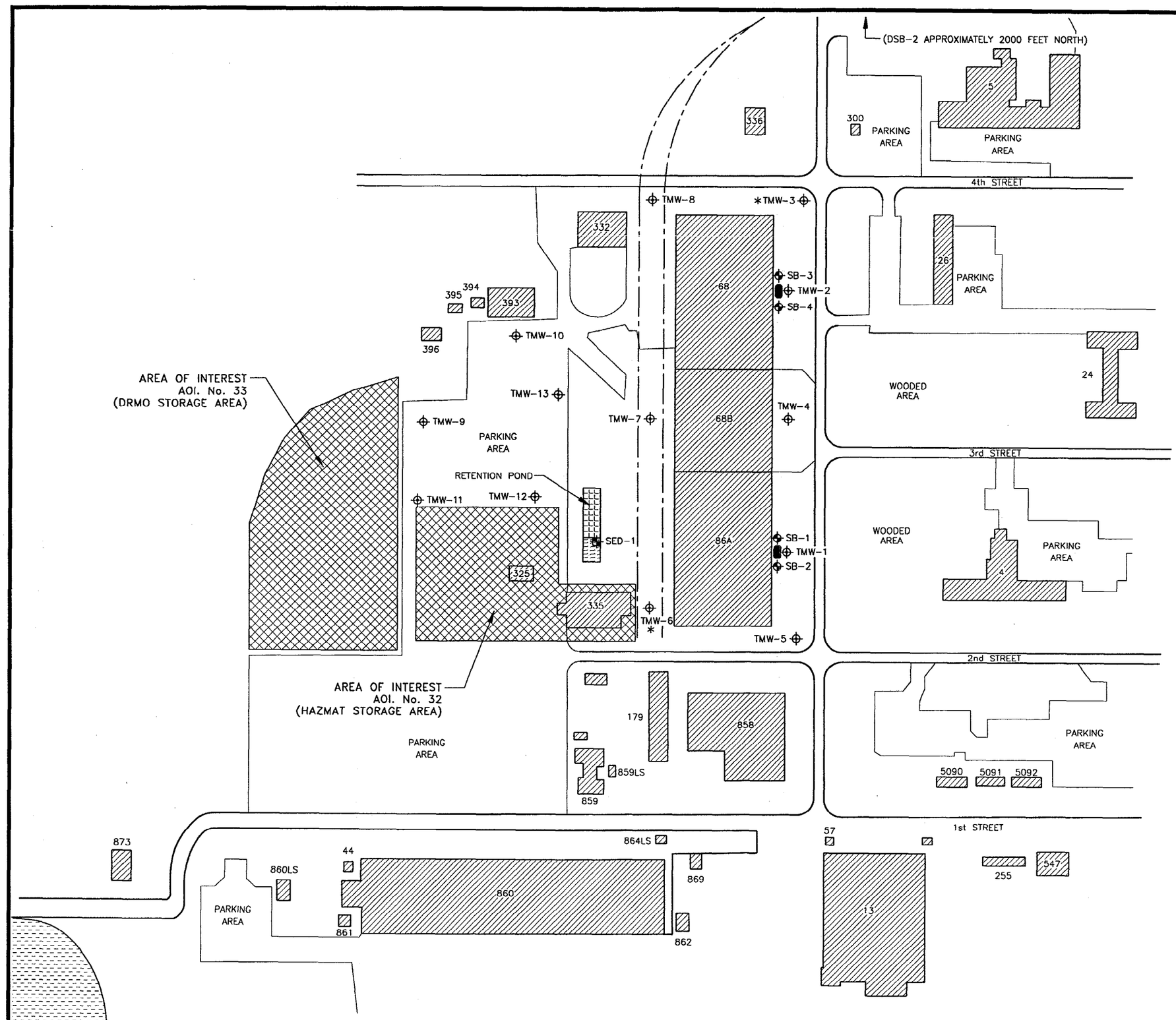
NGC/CECIL FIELD/FL

TITLE

BUILDING NO. 68/68A/68B
SITE MAP

DRAWN	TRG	DATE	1/5/98	JOB NO.	973-3778
CHECKED	MJJ	SCALE	AS SHOWN	DWG. NO. 3778Y	REV. NO.
REVIEWED	DAM	FILE NO.	973-3778	SUBTITLE	FIGURE NO. 2

04793LB22



LEGEND

- TMW-1 — TEMPORARY MONITORING WELL LOCATION
- SB-1 — SOIL BORING LOCATION
- SED-1 — SEDIMENT SAMPLING LOCATION
- UNDERGROUND STORAGE TANK
- FORMER RAILROAD TRACKS
- BUILDING
- AREA OF INTEREST IDENTIFIED FROM INSTALLATION RESTORATION PROGRAM
- CERCLA SITE IR-7 (FORMER FIREFIGHTING TRAINING AREA)
- RETENTION POND RECHARGE AREA
- RETENTION POND SURFACE WATER

NOTES:

1. BUILDING No. 325 AND No. 335 ARE THE HAZARDOUS MATERIALS STORAGE AREA.
2. THE LOCATION FOR SB-5 WAS SELECTED FOLLOWING DETERMINATION OF THE LOCATION OF THE TRANSFORMER WHICH WAS REMOVED DURING 1993.
3. * = SAMPLES ANALYZED FOR PARAMETERS LISTED IN 40 CFR, PART 264, APPENDIX IX.
4. ONE SHALLOW SOIL SAMPLE WAS COLLECTED AT EACH TEMPORARY MONITORING WELL LOCATION.
5. DEEP SOIL BORING DSB-2 WAS INSTALLED TO A DEPTH OF 130 FEET TO CHARACTERIZE THE SURFICIAL AQUIFER UNDERLYING THE SITE.

SCALE IN FEET

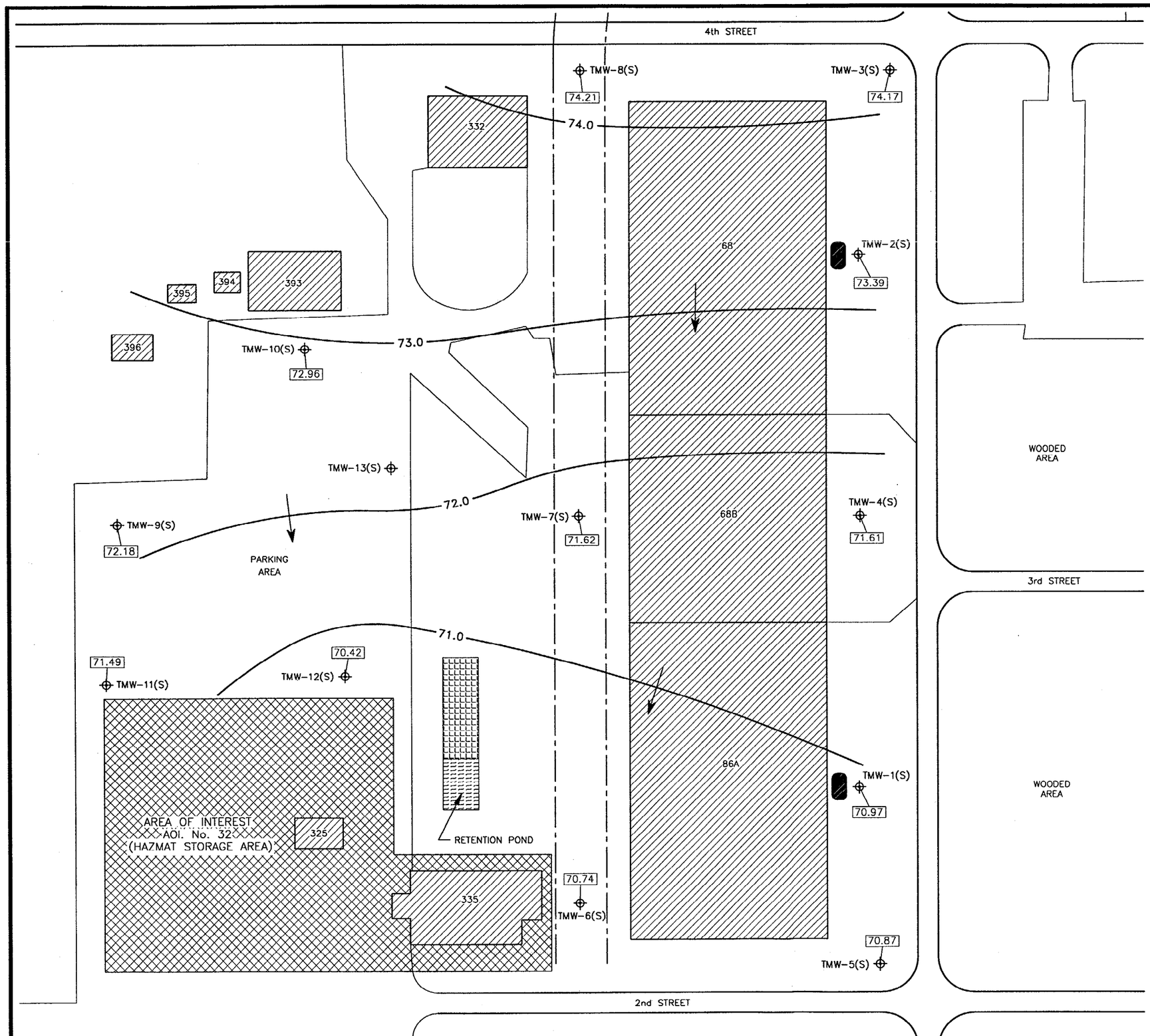
0 200 400

Golder Associates — JACKSONVILLE, FLORIDA

CLIENT/PROJECT: NGC/CECIL FIELD/FL

TITLE: BUILDING NO. 68/68A/68B SAMPLING LOCATION MAP

DRAWN	TRG	DATE	1/5/98	JOB NO.	973-3778		
CHECKED	MJJ	SCALE	AS SHOWN	DWG. NO.	3778Z	REV. NO.	
REVIEWED	DJM	FILE NO.	973-3778	SUBTITLE		FIGURE NO.	3



MONITORING WELLS	GROUNDWATER ELEVATIONS (ft. msl)
TMW-1(S)	70.97
TMW-2(S)	73.39
TMW-3(S)	74.17
TMW-4(S)	71.61
TMW-5(S)	70.87
TMW-6(S)	70.74
TMW-7(S)	71.62
TMW-8(S)	74.21
TMW-9(S)	72.18
TMW-10(S)	72.96
TMW-11(S)	71.49
TMW-12(S)	70.42

LEGEND

- TMW-1(S) — TEMPORARY SHALLOW MONITORING WELL LOCATION
- 70.97 — GROUNDWATER ELEVATION (ft. msl)
- 72.0 — POTENTIOMETRIC CONTOUR LINE
- GROUNDWATER FLOW DIRECTION
- UNDERGROUND STORAGE TANK
- FORMER RAILROAD TRACKS
- BUILDING
- AREA OF INTEREST IDENTIFIED FROM INSTALLATION RESTORATION PROGRAM
- RETENTION POND RECHARGE AREA
- RETENTION POND SURFACE WATER

NOTES:

1. BUILDING No. 325 AND No. 335 ARE THE HAZARDOUS MATERIALS STORAGE AREA.
2. NO ELEVATION MEASUREMENT WAS SURVEYED FOR MONITORING WELL TMW-13(S).
3. SHALLOW INTERVAL WELLS ARE SCREENED FROM 5 TO 15 FEET BELOW GROUND SURFACE.

SCALE IN FEET

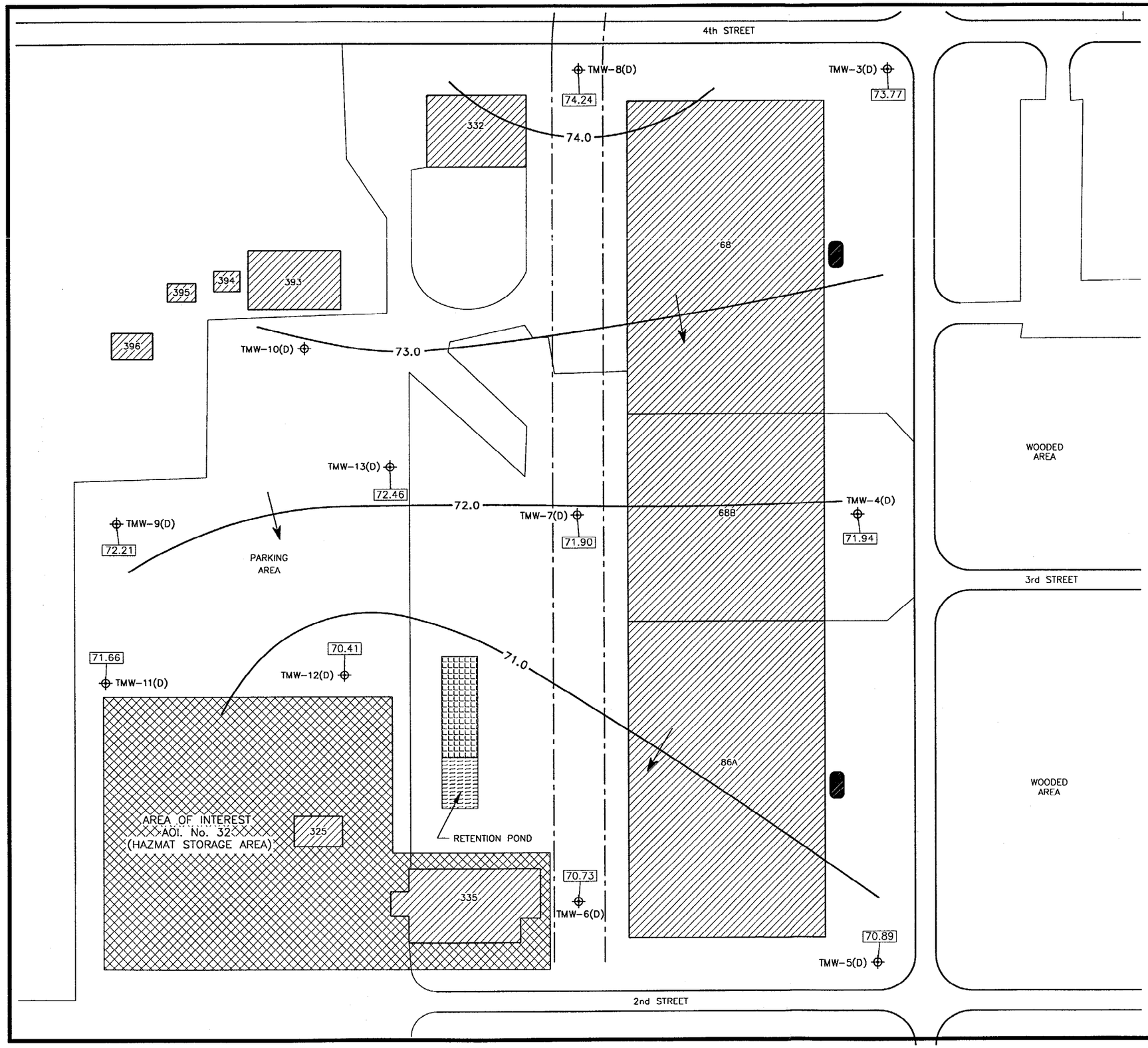
0 100 200

Golder Associates — JACKSONVILLE, FLORIDA

CLIENT/PROJECT: NGC/CECIL FIELD/FL

TITLE: BUILDING NO. 68/68A/68B POTENTIOMETRIC CONTOUR SHALLOW INTERVAL 12/20/97

DRAWN	TRG	DATE	1/5/98	JOB NO.	973-3778		
CHECKED	MJJ	SCALE	AS SHOWN	DWG. NO.	3778A1	REV. NO.	
REVIEWED	DJM	FILE NO.	973-3778	SUBTITLE		FIGURE NO.	4



MONITORING WELLS	GROUNDWATER ELEVATIONS (ft. msl)
TMW-3(D)	73.77
TMW-4(D)	71.94
TMW-5(D)	70.89
TMW-6(D)	70.73
TMW-7(D)	71.90
TMW-8(D)	74.24
TMW-9(D)	72.21
TMW-11(D)	71.66
TMW-12(D)	70.41
TMW-13(D)	72.46

LEGEND

- TMW-1(D) — TEMPORARY DEEP MONITORING WELL LOCATION
- 73.77 — GROUNDWATER ELEVATION (ft. msl)
- 72.0 — POTENTIOMETRIC CONTOUR LINE
- GROUNDWATER FLOW DIRECTION
- UNDERGROUND STORAGE TANK
- FORMER RAILROAD TRACKS
- BUILDING
- AREA OF INTEREST IDENTIFIED FROM INSTALLATION RESTORATION PROGRAM
- RETENTION POND RECHARGE AREA
- RETENTION POND SURFACE WATER

NOTES:

1. BUILDING No. 325 AND No. 335 ARE THE HAZARDOUS MATERIALS STORAGE AREA.
2. NO WELLS WERE INSTALLED AT THE TMW-1(D) AND TMW-2(D) LOCATIONS. NO ELEVATION MEASUREMENT WAS SURVEYED FOR MONITORING WELL TMW-10(D).
3. DEEP INTERVAL WELLS ARE SCREENED FROM 25 TO 30 FEET BELOW GROUND SURFACE.

SCALE IN FEET

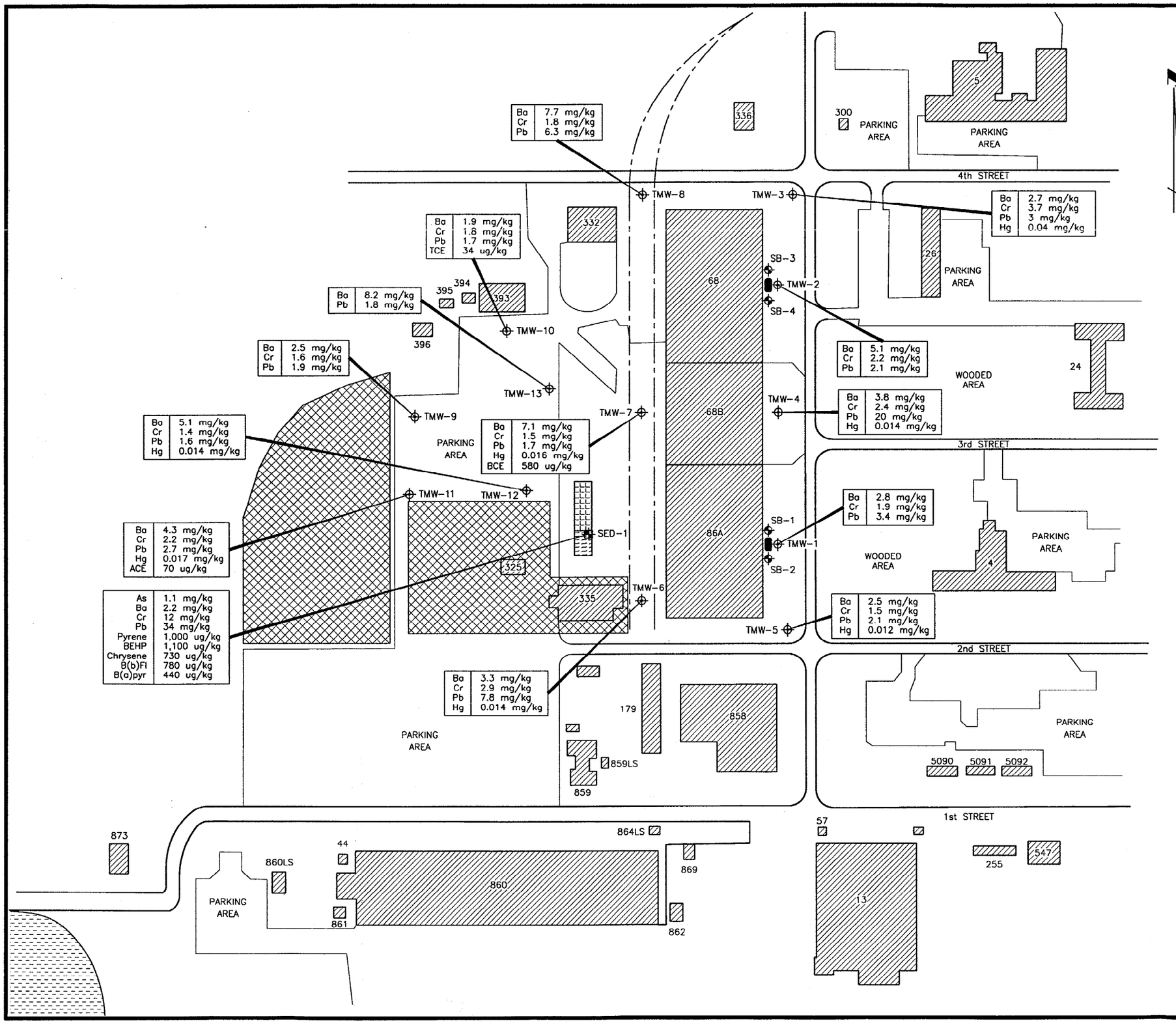
0 100 200

Golder Associates — JACKSONVILLE, FLORIDA

CLIENT/PROJECT: NGC/CECIL FIELD/FL

TITLE: BUILDING NO. 68/68A/68B POTENTIOMETRIC CONTOUR DEEP INTERVAL 12/20/97

DRAWN	TRG	DATE	1/5/98	JOB NO.	973-3778
CHECKED	MJJ	SCALE	AS SHOWN	DWG. NO. 3778B1	REV. NO.
REVIEWED	DJM	FILE NO.	973-3778	SUBTITLE	FIGURE NO. 5



KEY FOR PARAMETERS

As	–	ARSENIC
Ba	–	BARIUM
Cr	–	CHROMIUM
Pb	–	LEAD
Hg	–	MERCURY
ACE	–	ACETONE
TCE	–	TRICHLOROETHENE
BCE	–	BIS (2-CHLOROETHYL) ETHER
Pyrene	–	PYRENE
BEHP	–	BIS (2-ETHYLHEXYL) PHTHALATE
Chrysene	–	CHRYSENE
B(b)Fl	–	BENZO (b) FLUORANTHENE
B(a)pyr	–	BENZO (a) PYRENE

LEGEND

- TMW-1 — TEMPORARY MONITORING WELL LOCATION
- SB-1 — SOIL BORING LOCATION
- SED-1 — SEDIMENT SAMPLING LOCATION
- UNDERGROUND STORAGE TANK
- FORMER RAILROAD TRACKS
- BUILDING
- AREA OF INTEREST IDENTIFIED FROM INSTALLATION RESTORATION PROGRAM
- CERCLA SITE IR-7 (FORMER FIREFIGHTING TRAINING AREA)
- RETENTION POND RECHARGE AREA
- RETENTION POND SURFACE WATER

NOTES:

1. BUILDING No. 325 AND No. 335 ARE THE HAZARDOUS MATERIALS STORAGE AREA.
2. ONE SHALLOW SOIL SAMPLE WAS COLLECTED AT EACH TEMPORARY MONITORING WELL LOCATION.

SCALE IN FEET

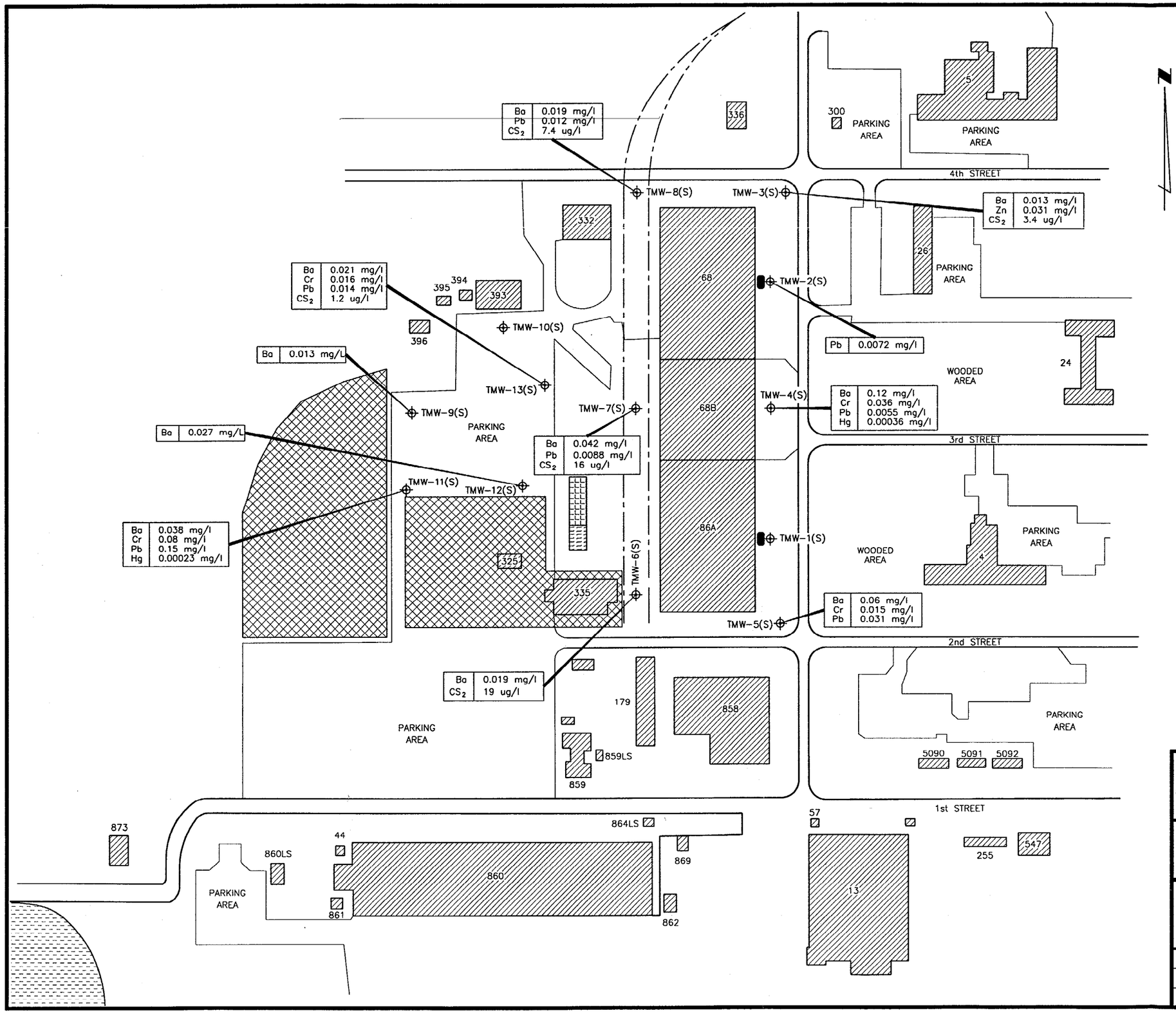
0 200 400

Golder Associates — JACKSONVILLE, FLORIDA

CLIENT/PROJECT: NGC/CECIL FIELD/FL

TITLE: BUILDING NO. 68/68A/68B DETECTED PARAMETERS IN SOIL

DRAWN	TRG	DATE	1/5/97	JOB NO.	973-3778
CHECKED	MJJ	SCALE	AS SHOWN	DWG. NO. 3778C1	REV. NO.
REVIEWED	DJM	FILE NO.	973-3778	SUBTITLE	FIGURE NO. 6



KEY FOR PARAMETERS		
Ba	–	BARIUM
Cr	–	CHROMIUM
Pb	–	LEAD
Hg	–	MERCURY
Zn	–	ZINC
CS_2	–	CARBON DISULFIDE

LEGEND

- TMW-1(S) — TEMPORARY SHALLOW MONITORING WELL LOCATION
- UNDERGROUND STORAGE TANK
- FORMER RAILROAD TRACKS
- BUILDING
- AREA OF INTEREST IDENTIFIED FROM INSTALLATION RESTORATION PROGRAM
- CERCLA SITE IR-7 (FORMER FIREFIGHTING TRAINING AREA)
- RETENTION POND RECHARGE AREA
- RETENTION POND SURFACE WATER

NOTES:

1. BUILDING No. 325 AND No. 335 ARE THE HAZARDOUS MATERIALS STORAGE AREA.
2. NO TARGETED PARAMETERS WERE DETECTED AT MONITORING WELLS TMW-1(S) AND TMW-10(S).

SCALE IN FEET

0 200 400

Golder Associates

JACKSONVILLE, FLORIDA

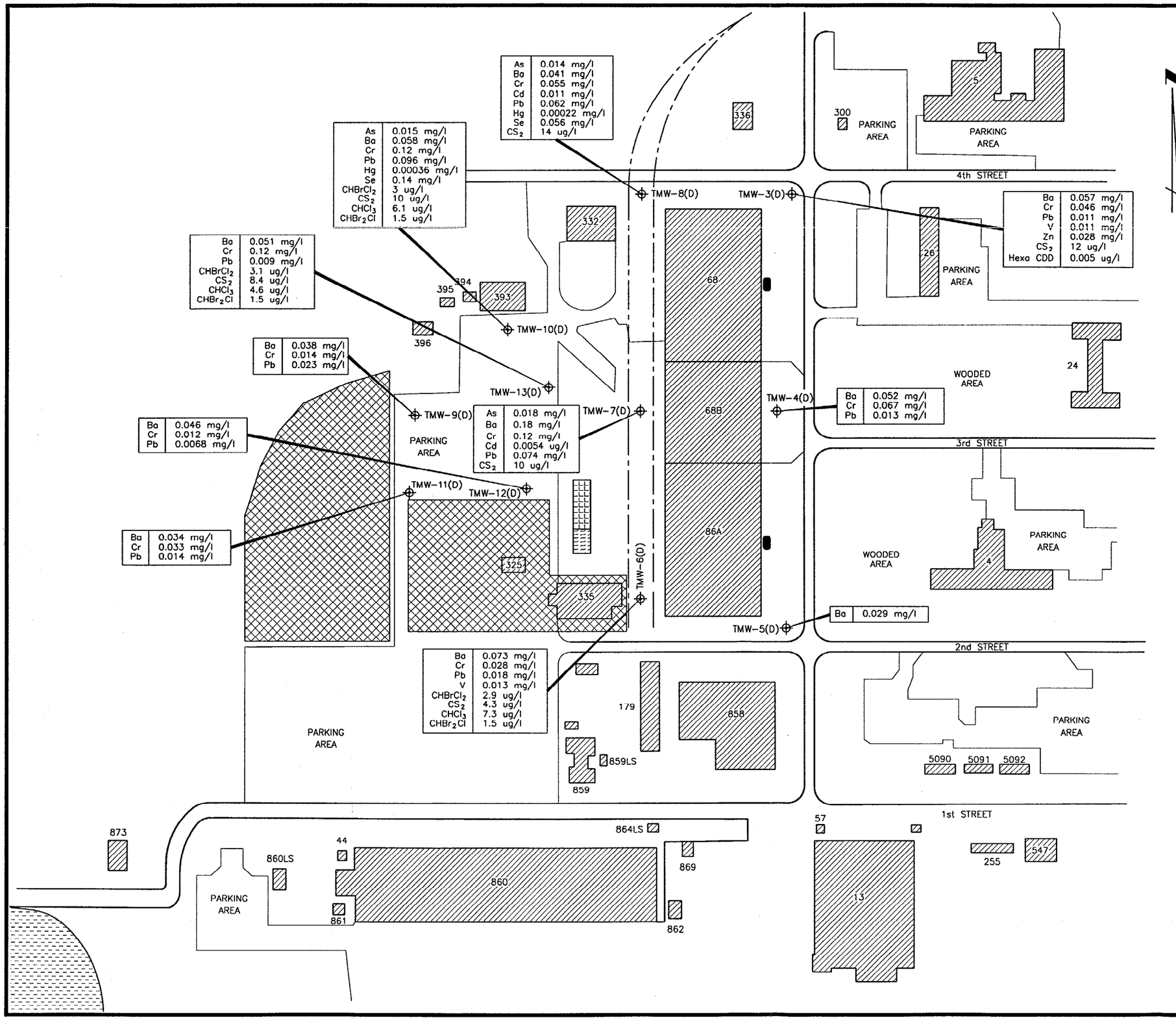
CLIENT/PROJECT

NGC/CECIL FIELD/FL

TITLE

BUILDING NO. 68/68A/68B
DETECTED PARAMETERS IN SHALLOW GROUNDWATER
(15-FOOT DEPTH)

DRAWN	TRG	DATE	1/5/98	JOB NO.	973-3778
CHECKED	MJJ	SCALE	AS SHOWN	DWG. NO. 3778D1	REV. NO.
REVIEWED	DJM	FILE NO.	973-3778	SUBTITLE	FIGURE NO. 7



KEY FOR PARAMETERS

As	–	ARSENIC
Ba	–	BARIUM
Cd	–	CADMIUM
Cr	–	CHROMIUM
Pb	–	LEAD
Hg	–	MERCURY
Se	–	SELENIUM
V	–	VANADIUM
Zn	–	ZINC
$CHBrCl_2$	–	BROMODICHLOROMETHANE
CS_2	–	CARBON DISULFIDE
$CHCl_3$	–	CHLOROFORM
$CHBr_3Cl$	–	DIBROMOCHLOROMETHANE
Hexa CDD	–	Hexa CDD

LEGEND

- TMW-1(D) — TEMPORARY DEEP MONITORING WELL LOCATION
- UNDERGROUND STORAGE TANK
- FORMER RAILROAD TRACKS
- BUILDING
- AREA OF INTEREST IDENTIFIED FROM INSTALLATION RESTORATION PROGRAM
- CERCLA SITE IR-7 (FORMER FIREFIGHTING TRAINING AREA)
- RETENTION POND RECHARGE AREA
- RETENTION POND SURFACE WATER

NOTES:

1. BUILDING No. 325 AND No. 335 ARE THE HAZARDOUS MATERIALS STORAGE AREA.

SCALE IN FEET

0 200 400

Golder Associates — JACKSONVILLE, FLORIDA

CLIENT/PROJECT: NGC/CECIL FIELD/FL

TITLE: BUILDING NO. 68/68A/68B DETECTED PARAMETERS IN DEEP GROUNDWATER (30-FOOT DEPTH)

DRAWN	TRG	DATE	1/5/97	JOB NO.	973-3778
CHECKED	MJJ	SCALE	AS SHOWN	DWG. NO. 3778E1	REV. NO.
REVIEWED	DJM	FILE NO.	973-3778	SUBTITLE	FIGURE NO. 8

APPENDIX A

Field Documentation

APPENDIX A-1

Deep Soil Boring Field Records

Field Boring Log

DEPTH HOLE 130'	JOB NO. 973-3778	PROJECT Cecil Field - NGC/NAS Cecil Field / FL	BORING NO. B-2
DEPTH SOIL DRILL	GA INSP. Samir Ithani	DRILLING METHOD Auger & Mud Drilling with SPT	SHEET 1 OF 3
DEPTH ROCK CORE	WEATHER Sunny/pr. cloudy	DRILLING COMPANY Wolf Drilling Inc.	SURFACE ELEV.
NO. DIST. SA. UD. SA.	TEMP. ~ 60°	DRILL RIG ATV - CME 550 DRILLER Mike Hazelton	DATUM
DEPTH WL.	HRS. PROD.	WT. SAMPLER HAMMER 140# DROP 18"	STARTED 11:05 / 11/18/97 (TIME / DATE)
TIME WL.	HRS. DELAYED	WT. CASING HAMMER DROP	COMPLETED 13:55 / 11/19/97

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	Y	YELLOW
LI	LITTLE	RX	ROCK		

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0 - 5% "SOME" 12 - 30%
"LITTLE" - 5 - 12% "AND" 30-50%

RELATIVE DENSITY		BLOWS	CONSISTENCY		FINGER PRESSURE
VERY LOOSE	VLS	0 4	VERY SOFT	VS	EXTRUDES
LOOSE	LS	4 10	SOFT	S	MOLDS EASILY
COMPACT	CP	10-30	FIRM	FM	MOLDS
DENSE	DN	30-50	STIFF	ST	THUMB INDENTS
VERY DENSE	VDN	50	VERY STIFF	VST	THUMBNAIL INDENT
			HARD	H	RESISTS THUMBNAIL

ELEV. / DEPTH	DESCRIPTION	BLOWS / FT		SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN (FORCE)	REC / ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
									Started @ Ground surface @ 11:05 AM
0	Ground surface								
		(5)	1.5	S-1	D.O	1, 3, 2	14/18		SPT from 0 → 1.5', 1, 3, 2 recovery 18/18
									Sample S-1: upper 8" topsoil with roots, lower 10": brown medium to fine silty sand (loose)
	2' 11" water level	(5)	3 / 3.5	S-2	D.O	3, 4, 5	18/18		SPT from 1.5' → 3.0', 3, 4, 15 (14/18)
	@ ~ 11:15								Sample S-2: loose Brown medium to fine silty sand
5	very loose to very dense Brown and greyish green medium to fine silty sand trace of clay, trace of light brown and grey marl	(8)	5	S-3	D.O	2, 4, 4	16/18		Auger drilling to 3.5', SPT 3.5 → 5', (2, 4, 4) 16/18
			6						Sample S-3: loose Dk. Brown medium to fine silty sand, saturated
		(12)	7.5	S-4	D.O	3, 6, 6,	12/18		started mud drilling from 5 → 6', SPT 6 → 7.5', (3, 6, 6), 12/18
			8.5						Sample S-4: Compact Brown fine silty sand trace clay
		(7)	10	S-5	D.O	4, 5, 4	13/18		Advance mud drilling to 8.5', SPT 8.5-10', (4, 5, 4) 13/18
10			11						Sample S-4: loose light Brown medium to fine silty sand
		(10)	12.5	S-6	D.O	3, 5, 5	13/18		Advance mud drilling to 11', SPT 11 → 12.5', (3, 5, 5), 13/18
			13.5						Sample S-6: Loose light Brown fine silty sand - saturated
		(5)	15	S-7	D.O	4, 5, 4	12/18		Advance mud drilling to 13.5', SPT 13.5 → 15', (4, 5, 4) 12/18
15									Sample S-7: loose light brown medium to fine silty sand
			16						Mud drilling to 16', SPT 16 → 17.5', (3, 4, 4), 13/18
		(8)	17.5	S-8	D.O	3, 4, 4	13/18		Sample S-8: loose light Brown fine silty sand
			18.5						advance mud drilling to 18.5', SPT 18.5 → 20', (3, 3, 2) 12/18
		(5)	20	S-9	D.O	3, 3, 2	12/18		Sample S-9: loose light Brown fine silty sand - saturated
20			21						Advance mud drilling to 21', SPT 21 - 22.5', (1, 2, 1) 12/18
		(3)	22.5	S-10	D.O	1, 2, 1	12/18		Sample S-10: very loose yellowish light Brown fine silty sand
			23.5						Advance mud drilling to 23.5', SPT 23.5' → 25' (3, 6, 5), 12/18
									Sample S-11: Compact yellow and grey med. to fine silty sand
		(11)	25	S-11	D.O	3, 6, 5	12/18		Advance mud drilling to 26', SPT 26 - 27.5', (8, 13, 13), 10/18
25			26						Sample S-12: compact light grey to yellow medium to fine silty sand
		(26)	27.5	S-12	D.O	8, 13, 13	10/18		Advance mud drilling to 28.5', SPT 28.5' → 30' (1, 1, 1) 18/18
									Sample S-13: very loose (soft) greyish green clayey sand - saturated
			28.5						
		(2)	30	S-13	D.O	1, 1, 1	18/18		Advance mud drilling to 31', SPT 31 → 32.5', (2, 2, 2), 18/18
30									Sample S-14: very loose/soft greyish green fine silty sand
		(4)	31						
			32.5	S-14	D.O	2, 2, 2	18/18		Advance mud drilling to 33.5', SPT 33.5 → 35' (3, 1, 2) 18/18
			33.5						Sample S-15: very loose greyish green medium to fine silty sand
		(3)	35	S-15	D.O	3, 1, 2	18/18		
35									Advance mud drilling to 36', SPT 36 → 37.5' (4, 5, 5) 13/18
			36						Sample S-16: loose greyish green medium to fine sand, little silt
		(10)	37.5	S-16	D.O	4, 5, 5	13/18		
			38.5						Mud drilling advance to 38.5', SPT 38.5-40' (5, 9, 14)
		(23)	40	S-17	D.O	5, 9, 14	10/18		Recovery = 10/18
40									Sample S-17: compact medium to fine sand trace of silt greenish in color some brown.
			41						
		(21)	42.5	S-18	D.O	6, 8, 13	12/18		Advance mud drilling to 41', SPT 41-42.5', (6, 8, 13) 12/18
			43.5						Sample S-18: Compact greyish and brown medium to fine sand, trace silt
		(22)	45	S-19	D.O	8, 11, 11	14/18		Advance mud drilling to 43.5', SPT 43.5-45', (8, 11, 11) 14/18
45									Sample S-19: compact brown to green medium sand trace silt
			46						
		(28)	47.5	S-20	D.O	6, 11, 17	10/18		Advance drilling to 46', SPT 46 - 47.5', (6, 11, 17), 10/18
			48.5						Sample S-20: compact brown to greyish medium to fine sand
		(38)	50	S-21	D.O	10, 18, 20	18/18		
50									Advance mud drilling to 48.5', SPT 48.5 - 50', (10, 18, 20)
									Sample S-21: Dense brown and grey medium sand trace silt

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Field Boring Log

DEPTH HOLE 130'	JOB NO. 973-3778	PROJECT NGC/NAS Cecil field FL		BORING NO. B-2	
DEPTH SOIL DRILL	GA INSP. SYE	DRILLING METHOD mud drilling		SHEET 2 OF 3	
DEPTH ROCK CORE	WEATHER cloudy (afternoon)	DRILLING COMPANY Wolf Drilling Inc.		SURFACE ELEV.	
NO. DIST. SA. ___ UD. SA. ___	TEMP. ~ 60°	DRILL RIG ATV-550 CME	DRILLER Mike Hazelton	DATUM	
DEPTH WL.	HRS. PROD.	WT. SAMPLER HAMMER 140 lbs	DROP 18"	STARTED 11:05 / 11/18/97 (TIME / DATE)	
TIME WL.	HRS. DELAYED	WT. CASING HAMMER	DROP	COMPLETED 13:55 / 11/19/97	

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	Y	YELLOW
LI	LITTLE	RX	ROCK		

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0 - 5% "SOME" 12 - 30%
"LITTLE" - 5 - 12% "AND" 30-50%

RELATIVE DENSITY		BLOWS	CONSISTENCY		FINGER PRESSURE
VERY LOOSE	VLS	0 4	VERY SOFT	VS	EXTRUDES
LOOSE	LS	4 10	SOFT	S	MOLDS EASILY
COMPACT	CP	10-30	FIRM	FM	MOLDS
DENSE	DN	30-50	STIFF	ST	THUMB INDENTS
VERY DENSE	VDN	50	VERY STIFF	VST	THUMBNAIL INDENT
			HARD	H	RESISTS THUMBNAIL

ELEV. / DEPTH	DESCRIPTION	BLOWS / FT		SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN (FORCE)	REC / ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
50									Advance Drilling to 51', SPT 51-52.5' (11,14,16) 12/18 Sample S-22: compact Brown & grey medium Sand, trace of silt.
		(30)	51 52.5	S-22	D.O	11,14,16	12/18		Advance mud drilling to 53.5', SPT 53.5-55', (11,14,15) Recovery - 12/18
		(29)	53.5 55	S-23	D.O	11,14,15	12/18		Sample S-23: Compact Brown and grey medium Sand trace of silt.
55		(49)	56 57.5	S-24	D.O	12,18,26	13/18		Advance mud drilling to 56', SPT 56-57.5', (12,18,26) 13/18 Sample S-24: Dense brown to greyish white medium to fine Sand, trace silt.
		(35)	58.5 60	S-25	D.O	15,19,16	12/18		Advance drilling to 58.5', SPT 58.5-60', (15,19,16) 12/18 Sample S-25: Dense brown and light grey medium to fine San
60		(9)	61 62.5	S-26	D.O	5,4,5	18/18		Mud drilling advance to 61', SPT 61-62.5', (5,4,5) 18/18 Sample S-26: loose greyish green medium to fine silty Sand
		(14)	63.5 65	S-27	D.O	5,8,6	18/18		Mud drilling Continue to 63.5', SPT 63.5-65', (5,8,6), 18/18 Sample S-27: compact greyish green medium to fine silty Sand
65		(12)	66 67.5	S-28	D.O	5,6,6	18/18		Advance mud drilling to 66', SPT 66-67.5', (5,6,6), 18/18 Sample S-28: greyish green medium to fine silty Sand, material is compact.
		(9)	68.5 70	S-29	D.O	5,5,4	18/18		Advance mud drilling to 68.5', SPT 68.5-70', (5,5,4) 18/18 Sample S-29: loose greyish green medium to fine Sand
70		(8)	71 72.5	S-30	D.O	5,4,4	18/18		Advance mud drilling to 71', SPT 71-72.5', (5,4,4), 18/18 sample S-30: loose greyish green medium to fine silty Sand
		(21)	73.5 75	S-31	D.O	8,9,12	16/18		Advance mud drilling to 73.5', SPT 73.5-75', (8,9,12), 16/18 Sample S-31: compact brown and grey medium to fine silty Sand.
75		(34)	76 77.5	S-32	D.O	7,16,18	16/18		Advance mud drilling to 76', SPT 76-77.5' (7,16,18) Recovery: 16/18
		(42)	78.5 80	S-33	D.O	9,20,22	14/18		Sample S-32: Dense brown and grey medium to fine Sand Mud drilling advance to 78.5', SPT 78.5-80', (20,22) 14/18
80		(36)	81 82.5	S-34	D.O	10,14,22	12/18		Sample 33: Dense brown and grey medium to fine Sand, trace silt Mud drilling advance to 81', SPT 81-82.5', (10,14,22) 12/18
		(59)	83.5 85	S-35	D.O	16,24,35	10/18		Sample S-34: Dense grey medium to fine silty Sand. Advance mud drilling to 83.5', SPT 83.5-85', (16,24,35) 10/18
85		(34)	86 87.5	S-36	D.O	12,15,19	10/18		Sample S-35: mix grey and brown medium to fine Sand Advance Drilling to 86', SPT 86-87.5', (12,15,19), 10/18
		(27)	88.5 90	S-37	D.O	15,16,11	12/18		Sample S-36: grey and brown medium to fine silty Sand Advance Mud drilling to 88.5', SPT 88.5-90', (15,16,11), 12/18 Sample S-37: Brown and grey medium to fine sand, trace of silt.
90		(5)	91 92.5	S-38	D.O	1,2,3	18/18		Stopped drilling for the day @ 4:45 - Resume Drilling on 11/19/97 @ 8:05. Mud drilling to 91', SPT 91-92.5', (1,2,3), 18/18
		(10)	93.5 95	S-39	D.O	4,4,6	18/18		Sample S-38: loose greenish clayey Sand Advance drilling to depth 93.5', SPT 93.5-95', (4,4,6) Recovery = 18/18
95		(23)	96 97.5	S-40	D.O	8,10,10	18/18		Sample S-39: loose green medium to fine sand some clay (clayey Sa) trace of phosphatic black spots
		(9)	98.5 100	S-41	D.O	3,2,7	18/18		Advance mud drilling to 96', SPT 96-97.5', (8,10,10) Recovery = 18/18 Sample S-40: Compact greenish medium to fine silty Sand, trace clay
100									Advance mud drilling to 98.5', SPT 98.5-100', (3,2,7) Recovery = 18/18 Sample S-41: loose combination of coarse to fine sand (greenish), below it about 8" of green sandy clay and lower 3-4" of sample hit a marl with phospate black spots, light grey

Field Boring Log

DEPTH HOLE 130 feet	JOB NO. 272-3778	PROJECT NGC / NAS Cecil field / FL	BORING NO. B-2
DEPTH SOIL DRILL	GA INSP. SYE	DRILLING METHOD Wolf Drilling Inc.	SHEET 3 OF 3
DEPTH ROCK CORE	WEATHER cloudy	DRILLING COMPANY Mud drilling	SURFACE ELEV.
NO. DIST. SA. UD. SA.	TEMP. ~ 60°	DRILL RIG ATV - 550 CME / DRILLER Mike Hazelton	DATUM
DEPTH WL.	HRS. PROD.	WT. SAMPLER HAMMER 140# / DROP 18"	STARTED 11:05 (TIME) / 11/18/97 (DATE)
TIME WL.	HRS. DELAYED	WT. CASING HAMMER / DROP	COMPLETED 13:55 / 11/19/97

SAMPLE TYPES

A.S.	AUGER SAMPLE
C.S.	CHUNK SAMPLE
D.O.	DRIVE OPEN
D.S.	DENISON SAMPLE
P.S.	PITCHER SAMPLE
R.C.	ROCK CORE
S.T.	SLOTTED TUBE
T.O.	THIN-WALLED, OPEN
T.P.	THIN-WALLED, PISTON
W.S.	WASH SAMPLE

ABBREVIATIONS

BL	BLACK	M	MEDIUM	SA	SAMPLE
BR	BROWN	MIC	MICACEOUS	SAT	SATURATED
C	COARSE	MOT	MOTTLED	SD	SAND
CA	CASING	NP	NON-PLASTIC	SI	SILT
CL	CLAY	OG	ORANGE	SIY	SILTY
CLY	CLAYEY	ORG	ORGANIC	SM	SOME
F	FINE	PH	PRESSURE-HYDRAULIC	TR	TRACE
FRAG	FRAGMENTS	PM	PRESSURE-MANUAL	WL	WATER LEVEL
GL	GRAVEL	R	RED	WH	WEIGHT OF HAMMER
LYD	LAYERED	RES	RESIDUAL	Y	YELLOW
LI	LITTLE	RX	ROCK		

SOIL DESCRIPTION - RANGE OF PROPORTION

"TRACE" - 0 - 5% "SOME" 12 - 30%
"LITTLE" - 5 - 12% "AND" 30-50%

RELATIVE DENSITY		BLOWS	CONSISTENCY		FINGER PRESSURE
VERY LOOSE	VLS	0 4	VERY SOFT	VS	EXTRUDES
LOOSE	LS	4 10	SOFT	S	MOLDS EASILY
COMPACT	CP	10-30	FIRM	FM	MOLDS
DENSE	DN	30-50	STIFF	ST	THUMB INDENTS
VERY DENSE	VDN	50	VERY STIFF	VST	THUMBNAIL INDENT
			HARD	H	RESISTS THUMBNAIL

ELEV. / DEPTH	DESCRIPTION	BLOWS / FT	SAMPLES NO.	TYPE	HAMM. BLOWS PER 6 IN (FORCE)	REC / ATT	DEPTH	SAMPLE DESCRIPTION AND BORING NOTES
100								Advance mud drilling to 101', SPT, 101-102.5' (10,15,17) recovery = 18/18
101	Compact to very dense Brown and grey Coarse to medium sand, some gravel size aggregate of crushed lime rock, trace of shell, trace of light greyish brown marl trace of silt and clay.	32	S-42	D.O	10,15,17	14/18	101 102.5	Sample S-42, Dense greyish crushed lime stone - sample contains coarse particles some aggregates, upper 4" greyish marl - fine sand. Sample ~~bes~~ contains some clay.
		12	S-43	D.O	8,6,6	16/18	103.5 105	Advance mud drilling to 103.5', SPT 103.5-105', (8,6,6) Recovery = 16/18 Sample S-43: compact crushed grey and brown lime stones (sand size) material coarse to medium sand with aggregate size particles, trace silt.
105		30	S-44	D.O	6,8,22	18/18	106 107.5	Advance mud drilling to 106', SPT 106-107.5', (6,8,22) Recovery = 18/18 Sample S-44: Dense crushed lime rock sample contains coarse to medium sand, some large aggregates, little shells - trace silt. material is grey and brown in color. trace of phosphate black spots
		32	S-45	D.O	7,24,8	12/18	108.5 110	Advance mud drilling to 108.5', SPT 108.5-110', (7,24,8) Recovery: 12/18 Sample S-45: Dense mix of crushed lime rock and coarse marl material. Material has phosphate black spot with coarse to aggregate size particles. sample greyish brown ranging from coarse aggregate to fine silty sand.
110		15	S-46	D.O	10,6,9	14/18	111 112.5	Mud drilling continues to 111', SPT 111-112.5', (10,6,9) Recovery = 14/18 Sample S-46: Brown to light grey compact lime stone sample has coarse to medium sand, some aggregate trace silt.
		19	S-47	D.O	5,9,10	14/18	113.5 115	Advance mud drilling to 113.5', SPT 113.5-115' (5,9,10) 14/18 Sample S-47: greyish Brown crushed lime rock. material range from Coarse to Medium Sand with some large aggregates, trace shells and silt.
115							116 117.5 118.5	
		24	S-48	D.O	9,13,11	12/18	120	Mud drilling continues to 118.5', SPT 118.5'-120', (9,13,11) Recovery = 12/18 Sample S-48: compact greyish and brown Coarse to medium sand, few large aggregate lime stone, trace shells.
120		>100	S-49	D.O	27,50/5"	11/11	123.5 125 ~124.5	mud drilling continues to 123.5', SPT 123.5-~~124.5~~ 124.5 recovery = 11/11 Sample S-49: very dense (27,50/5') mix of brown (grey) sand with coarse marl some shells material ranges from coarse particles to trace of silt, some large particles, material has phosphate black spots.
125								
128.5	greyish brown medium to fine sand with phosphate mineral - Marl layer	26	S-50	D.O	8,12,14	18/18	128.5 130	Mud drilling continues to 128.5', SPT 128.5 → 130', (8,12,14) Recovery = 18/18 Sample S-50: greyish brown marl, medium to fine sand texture with black phosphate spots.
130			Boring terminated					Boring terminated at 130' Below ground surface. Boring terminated at ~ 13:55 Boring was grouted with Cement till ground surface.

APPENDIX A-2

Temporary Monitoring Well Installation Logs

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WEATHER CONDITIONS

Temperature: 60-70
Wind: light
Precipitation: None

WELL DESCRIPTION

Area of Investigation: Bldg. No. 68

Well No.: TMW-1S
Date of Well Installation: 12/12/97
Total Depth: 15
Screen Length: 10'
Time Started / Completed: —

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow Screened ~~15-20 ft~~ 5-15 ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL

TOC relative to Ground Surface:	0	feet
TOC Elevation:		feet MSL
Total Depth of Well :	15	feet BGS
Total Depth of Well :	15	feet TOC
Depth to Water:	NM	feet TOC
Column of Water in Well:	<15	feet TOC

PURGE VOLUME CALCULATION

Casing Inside Diameter:	1	inches
Casing Volume:	0.045	gal./ft.
Column of Water in Well:	15	feet
Volume of Water in Well:	0.675	gallons
Purge Method:	PERISTALTIC PUMP	
Volume to Purge:	2.02	

Well Pumped Dry? Yes (No)

NOTES:

BLDG 68, TMW-1S

NOTE - GW DATA COLLECTED DURING SAMPLING

Field Team Leader: R. Keenen

Signature:

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WEATHER CONDITIONS

Temperature: 60-70
Wind: light
Precipitation: None

WELL DESCRIPTION

Area of Investigation: Bld. 68

Well No.: TMW-2S
Date of Well Installation: 12/26/97
Total Depth: 15
Screen Length: 10'
Time Started / Completed: —

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow screened ~~15-20 ft~~ 5-15 ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL

TOC relative to Ground Surface:	flush	feet
TOC Elevation:		feet MSL
Total Depth of Well :	15	feet BGS
Total Depth of Well :	15	feet TOC
Depth to Water:	3.91	feet TOC
Column of Water in Well:	11.09	feet TOC

PURGE VOLUME CALCULATION

Casing Inside Diameter:	1	inches
Casing Volume:	0.045	gal./ft.
Column of Water in Well:	11.09	feet
Volume of Water in Well:	0.5	gallons
Purge Method:	Peristalic Pump	
Volume to Purge:	1.5 gal	

Well Pumped Dry? Yes (No)

NOTES:

BLDG 68, TMW-2S

- GW DATA COLLECTED DURING SAMPLING

Field Team Leader: R. Keenen

Signature: [signature]

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WEATHER CONDITIONS

Temperature: 60-70
Wind: light
Precipitation: None

WELL DESCRIPTION

Area of Investigation: Bld 68

Well No.: TMW-3S & D
Date of Well Installation: 12/2 & 12/4
Total Depth: 15' & 30'
Screen Length: 10' & 5'
Time Started / Completed: —

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow screened ~~15-20 ft~~ 5-15 FT Deep screened 25-30 ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL	Shallow		Deep
TOC relative to Ground Surface:	—	feet	—
TOC Elevation:		feet MSL	
Total Depth of Well :	15	feet BGS	30 ft
Total Depth of Well :	15	feet TOC	30 ft
Depth to Water:	3.09	feet TOC	3.47 ft
Column of Water in Well:	11.91	feet TOC	26.53 ft

PURGE VOLUME CALCULATION	Shallow		Deep
Casing Inside Diameter:	1	inches	1
Casing Volume:	0.045	gal./ft.	0.45
Column of Water in Well:	11.91	feet	26.53
Volume of Water in Well:	0.5	gallons	1.19
Purge Method:	Peristalic Pump		→
Volume to Purge:	1.5		3.58
Well Pumped Dry? Yes (No)			(No)

NOTES:

TMW-3S & TMW-3D @ BLDG 68

- GW DATA COLLECTED DURING SAMPLING

Field Team Leader: R. Keenen

Signature: [signature]

DPTLOG.XLS

GOLDER ASSOCIATES INC.

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WEATHER CONDITIONS

Temperature: 60 - 70
Wind: light
Precipitation: none

WELL DESCRIPTION

Area of Investigation: Bld. 68

Well No.: TMW-4S & D
Date of Well Installation: 12/26 & 12/4
Total Depth: 15' & 30'
Screen Length: 10' & 5'
Time Started / Completed: —

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow screened ~~15-20 ft~~ 5-15 ft Deep screened 25-30 ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL

	Shallow		Deep
TOC relative to Ground Surface:	—	feet	0.20 MB
TOC Elevation:		feet MSL	
Total Depth of Well :	15	feet BGS	30
Total Depth of Well :	15	feet TOC	30.2
Depth to Water:	4.85	feet TOC	4.64
Column of Water in Well:	10.15	feet TOC	25.36

PURGE VOLUME CALCULATION

	Shallow		Deep
Casing Inside Diameter:	~~0.045~~ 1	inches	1
Casing Volume:	0.045	gal./ft.	0.04
Column of Water in Well:	10.15	feet	25.3
Volume of Water in Well:	0.46	gallons	MP: 1.14
Purge Method:	Peristalic Pump →		
Volume to Purge:	1.4		3.4
Well Pumped Dry?	(Yes) No		(NO)

NOTES:

BLDG 68, TMW-4S & TMW-4D

- GW DATA COLLECTED DURING SAMPLING

Field Team Leader: R. Keenen

Signature: [signature]

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WEATHER CONDITIONS

Temperature: 70s
Wind: light
Precipitation: ~~MDOV~~ ~~MO~~ overcast

WELL DESCRIPTION

Area of Investigation: Bld. 68

Well No.: TMW-5SD
Date of Well Installation: 11/26/14
Total Depth: 15' & 30'
Screen Length: 10' & 5'
Time Started / Completed: —

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow screened ~~15-20ft~~ 5-15ft Deep screen 25-30ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL

	Shallow		Deep
TOC relative to Ground Surface:	0.10	feet	—
TOC Elevation:		feet MSL	
Total Depth of Well :	15	feet BGS	30
Total Depth of Well :	15.10	feet TOC	30
Depth to Water:	5.75	feet TOC	~~24.24~~ MD 5.76
Column of Water in Well:	9.25	feet TOC	24.24

PURGE VOLUME CALCULATION

	Shallow		Deep
Casing Inside Diameter:	1	inches	1
Casing Volume:	0.045	gal./ft.	0.045
Column of Water in Well:	9.25	feet	24.24
Volume of Water in Well:	0.42	gallons	1.1
Purge Method:	Pristalic Pump →		
Volume to Purge:	1.25		3.3
Well Pumped Dry?	Yes (No)		(No)

NOTES:

BLDG 68, TMW-5S & TMW-5D

- GW DATA COLLECTED DURING SAMPLING

Field Team Leader: R. Keenen

Signature:

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WELL DESCRIPTION

Area of Investigation: Bld. 68

Well No.: TMW-6S&D
Date of Well Installation: 11/26 & 12/3
Total Depth: 15' & 30'
Screen Length: 10' & 5'
Time Started / Completed: —

WEATHER CONDITIONS

Temperature: 70
Wind: light
Precipitation: none

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow screened ~~15-20ft~~ 5-15FT Deep Screened 25-30ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL

			Shallow	Deep
TOC relative to Ground Surface:	—	feet		0.15
TOC Elevation:		feet MSL		
Total Depth of Well :	15	feet BGS	30	
Total Depth of Well :	15	feet TOC	30.15	
Depth to Water:	4.92	feet TOC	5	
Column of Water in Well:	10.08	feet TOC	25.15 mo	

PURGE VOLUME CALCULATION

			Shallow	Deep
Casing Inside Diameter:	1	inches	1	
Casing Volume:	0.045	gal./ft.	0.04	
Column of Water in Well:	10.08	feet	25.1	
Volume of Water in Well:	0.45	gallons	1.13	
Purge Method:	Peristalic Pump			
Volume to Purge:	1.4		3.4	
Well Pumped Dry?	(Yes) No		(NO)	

NOTES:

BLDG 68, TMW-6S, & TMW-6D

- GW DATA COLLECTED DURING SAMPLING

Field Team Leader: J. Peace

Signature: [signature]

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WEATHER CONDITIONS

Temperature: 70s
Wind: light
Precipitation: None

WELL DESCRIPTION

Area of Investigation: Bld. 68

Well No.: TMW-7S&D
Date of Well Installation: 11/26 & 12/3
Total Depth: 15' & 30'
Screen Length: 10' & 5'
Time Started / Completed: —

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow Screened ~~15-20 ft~~ 5-15 FT Deep screened 25-30 ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL

	Shallow		Deep
TOC relative to Ground Surface:	—	feet	—
TOC Elevation:		feet MSL	
Total Depth of Well :	15	feet BGS	30
Total Depth of Well :	15	feet TOC	30
Depth to Water:	5.16	feet TOC	5.26
Column of Water in Well:	9.84	feet TOC	24.7

PURGE VOLUME CALCULATION

	Shallow		Deep
Casing Inside Diameter:	1	inches	1
Casing Volume:	0.045	gal./ft.	0.045
Column of Water in Well:	9.84	feet	24.7
Volume of Water in Well:	0.4	gallons	1.1
Purge Method:	Peristalic Pump		
Volume to Purge:	1.3		3.3
Well Pumped Dry?	(Yes) No		(NO)

NOTES:

BLDG 68. TMW-7S & TMW-7D

- GW DATA COLLECTED DURING SAMPLING

Field Team Leader: R. Keenan

Signature: [signature]

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WEATHER CONDITIONS

Temperature: 70s
Wind: light
Precipitation: None

WELL DESCRIPTION

Area of Investigation: Bld. 68

Well No.: TMW-8S&D
Date of Well Installation: 11/26 & 12/3
Total Depth: 15' & 30'
Screen Length: 10' & 5'
Time Started / Completed: —

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow screened ~~15-20ft~~ 5-15 FT Deep screened 25-30 ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL

			Shallow	Deep
TOC relative to Ground Surface:	—	feet		—
TOC Elevation:		feet MSL		
Total Depth of Well :	15	feet BGS	30	
Total Depth of Well :	15	feet TOC	30	
Depth to Water:	3.45	feet TOC	3.65	
Column of Water in Well:	11.6	feet TOC	26.4	

PURGE VOLUME CALCULATION

			Shallow	Deep
Casing Inside Diameter:	1	inches		1
Casing Volume:	0.045	gal./ft.		0.04
Column of Water in Well:	11.6	feet		26.4
Volume of Water in Well:	0.5	gallons		1.2
Purge Method:	Peristaltic Pump			
Volume to Purge:	1.5			3.6
Well Pumped Dry?	Yes	No		No

NOTES:

BLDG 68, TMW-8S & TMW-8D

- GW DATA COLLECTED DURING SAMPLING

Field Team Leader: R. Keenen

Signature: [signature]

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WEATHER CONDITIONS

Temperature: 70s
Wind: light
Precipitation: None

WELL DESCRIPTION

Area of Investigation: Bld. 68

Well No.: TMW-9S&D
Date of Well Installation: 11/26 & [redacted] 12/5
Total Depth: 16' & 30'
Screen Length: 10' & 5'
Time Started / Completed: —

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow screened ~~15-20ft~~ 5-15FT Deep screened 25-30ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL

	Shallow		Deep
TOC relative to Ground Surface:	0.10	feet	0.07
TOC Elevation:		feet MSL	
Total Depth of Well :	15	feet BGS	30
Total Depth of Well :	15.1	feet TOC	30.07
Depth to Water:	4.22	feet TOC	~~4.3~~ ~~4.37~~ 4.3 ok
Column of Water in Well:	10.88	feet TOC	~~25.8~~ ~~20.7~~ 25.8

PURGE VOLUME CALCULATION

	Shallow		Deep
Casing Inside Diameter:	1	inches	1
Casing Volume:	0.045	gal./ft.	0.045
Column of Water in Well:	10.88	feet	~~25.8~~ ~~20.7~~
Volume of Water in Well:	0.5	gallons	~~1.16~~ 1.16 ok
Purge Method:	Peristalic Pump		
Volume to Purge:	1.5		~~3.5~~
Well Pumped Dry?	(Yes) No		(NO)

NOTES:

BLDG 68. TMW-9S & TMW-9D

- GW DATA COLLECTED DURING SAMPLING
- CHANGES BY RSK GIVEN REVIEW OF FIELD DATA RSK

Field Team Leader: R. Keenen

Signature: [signature]

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WEATHER CONDITIONS

Temperature: 70s
Wind: light
Precipitation: None

WELL DESCRIPTION

Area of Investigation: Bldg 68

Well No.: TMW-10 SRD
Date of Well Installation: 11/26 & 11/26
Total Depth: 15' & 30'
Screen Length: 10' & 5'
Time Started / Completed: —

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow screened ~~15-20ft~~ 5-15 FT Deep screened 25-30 ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL

			Shallow	Deep
TOC relative to Ground Surface:	—	feet		4.8
TOC Elevation:		feet MSL		
Total Depth of Well :	15	feet BGS		30 ~~38~~
Total Depth of Well :	15	feet TOC		~~34.8~~
Depth to Water:	4.35	feet TOC		9.34
Column of Water in Well:	10.7	feet TOC		~~25.46~~ 20.7

PURGE VOLUME CALCULATION

			Shallow	Deep
Casing Inside Diameter:	1	inches		1
Casing Volume:	0.045	gal./ft.		0.04
Column of Water in Well:	10.7	feet		20.7 ~~25.7~~
Volume of Water in Well:	0.5	gallons		~~1.15~~ 0.9
Purge Method:	Peristalic Pump			
Volume to Purge:	1.5			~~3.4~~ 2.7
Well Pumped Dry?	Yes	No		No

NOTES:

BLDG 68. TMW-10S & TMW-10D

- GW DATA COLLECTED DURING SAMPLING
- CHANGES BY RSK GIVEN REVIEW OF FIELD DATA

Field Team Leader: R. Keenen

Signature:

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WEATHER CONDITIONS

Temperature: 70s
Wind: light
Precipitation: None

WELL DESCRIPTION

Area of Investigation: Bld. 68

Well No.: TMW-11S&D
Date of Well Installation: 12/2 & 12/5
Total Depth: 15' & 30'
Screen Length: 10' & 5'
Time Started / Completed: —

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow screened ~~15-30 ft~~ 5-15 ft Deep screened 25-30ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL

			Shallow	Deep
TOC relative to Ground Surface:	—	feet		—
TOC Elevation:		feet MSL		
Total Depth of Well :	15	feet BGS		30
Total Depth of Well :	15	feet TOC		30
Depth to Water:	4.13	feet TOC		4.12
Column of Water in Well:	10.87	feet TOC		25.88

PURGE VOLUME CALCULATION

			Shallow	Deep
Casing Inside Diameter:	1	inches		1
Casing Volume:	0.045	gal./ft.		0.045
Column of Water in Well:	10.87	feet		25.88
Volume of Water in Well:	0.5	gallons		1.16
Purge Method:	Peristaltic Pump			
Volume to Purge:	1.5			3.5
Well Pumped Dry?	Yes	NO		NO

NOTES:

BLDG 68, TMW-11S & TMW-11D

- GW DATA COLLECTED DURING SAMPLING

Field Team Leader: R. Keenen

Signature: [signature]

DPTLOG.XLS

GOLDER ASSOCIATES INC.

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WEATHER CONDITIONS

Temperature: 70s
Wind: light
Precipitation: None

WELL DESCRIPTION

Area of Investigation: Bld. 68

Well No.: TMW-12S&D
Date of Well Installation: 12/1 & 12/4
Total Depth: 15' & 30'
Screen Length: 10' & 5'
Time Started / Completed: —

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow screened ~~15-20 ft~~ 5-15 ft Deep screened 25-30 ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL

	Shallow		Deep
TOC relative to Ground Surface:	—	feet	—
TOC Elevation:		feet MSL	
Total Depth of Well :	15	feet BGS	30
Total Depth of Well :	15	feet TOC	30
Depth to Water:	4.82	feet TOC	4.94
Column of Water in Well:	10.18	feet TOC	25.06

PURGE VOLUME CALCULATION

	Shallow		Deep
Casing Inside Diameter:	1	inches	1
Casing Volume:	0.045	gal./ft.	0.04
Column of Water in Well:	10.18	feet	25.
Volume of Water in Well:	0.5	gallons	1.1
Purge Method:	Peristalic Pump		
Volume to Purge:	1.5		3.38
Well Pumped Dry?	(Yes) No		(NO)

NOTES:

BLDG 68, TMW-12S & TMW-12D

- GW DATA COLLECTED DURING SAMPLING

Field Team Leader: J. Peace

Signature: [signature]

TEMPORARY WELL POINT INSTALLATION RECORD

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Location: NAS - Cecil Field

WEATHER CONDITIONS

Temperature: 70s
Wind: light
Precipitation: None

WELL DESCRIPTION

Area of Investigation: Bld. 68

Well No.: TMW-13 S&D
Date of Well Installation: 12/2 & 12/5
Total Depth: 18' & 30'
Screen Length: 10' & 5'
Time Started / Completed: —

DPT Contractor: Probe Domain
Type of Rig: Geoprobe with GH-40 hammer
Operator: James Laymon
Type of Water Sampler: PVC Temporary Well Point

Interval: Shallow screened ~~15-20 ft~~ 5-15 ft Deep screened 25-30 ft
Type of Soil Samples: Stainless Steel Hand Auger

Interval:

COLUMN OF WATER IN WELL

			Shallow	Deep
TOC relative to Ground Surface:	2.40	feet		—
TOC Elevation:		feet MSL		
Total Depth of Well :	15	feet BGS	30	
Total Depth of Well :	17.40	feet TOC	30	
Depth to Water:	7.21	feet TOC	4.65	
Column of Water in Well:	10.19	feet TOC	25.35	

PURGE VOLUME CALCULATION

			Shallow	Deep
Casing Inside Diameter:	1	inches		1
Casing Volume:	0.045	gal./ft.		0.0
Column of Water in Well:	~~0.45 mg~~	feet	10.19	25.
Volume of Water in Well:	0.45	gallons		1.
Purge Method:	Peristaltic Pump			
Volume to Purge:	1.4			3.4
Well Pumped Dry?	Yes / No			NO

NOTES:

BLDG 68, TMW-13S & TMW-13D

-GW DATA COLLECTED DURING SAMPLING

Field Team Leader: J. Peace

Signature:

APPENDIX A-3

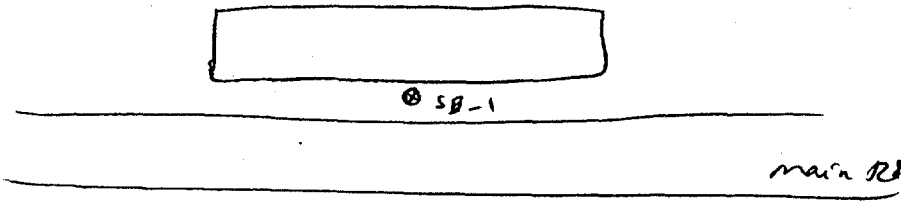
Soil Sample Logs

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68: SB-1 @ BLDG 68A UST PIT - N
Collected by: SYI / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)

SKETCH



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
SB-1 A	13:10 SYI	0 - 1'	mix of limestone and black silty sand, PID = 3.4 ppm
SYI SB-1 B	13:10	1 - 2	Brown to black silty sand PID = 4.1 ppm
SB-1 C	13:10	2' - 3'	Brown and black silty sand PID = 4.7
SB-1	13:10	3' - 4'	Brown silty sand PID = 6.6 ppm

Composite Sample? No
Composite Sample ID Number
Describe Compositing:

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8020		YES	NO	YES	NO
8100		YES	NO	YES	NO
FL-PRO		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3
Date Received by Lab:
Laboratory: SAVANNAH LABS
Weather Conditions: cloudy

Remarks: water table ~ 3' BGS, sample collected from 3-4' interval
collection time = 13:25

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

(**) Metals, VOA, Organics, Etc.

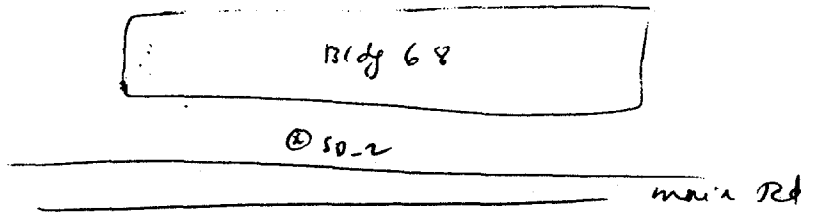
SAMPLEFRM.WK1\FA\grd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68: SB-2 @ BLDG 68A - UST PIT - SOUTH
Collected by: SYI / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)

SKETCH



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
SB-2 A	12:05	0-1'	lime Rock material PID = 3.8 ppm
SB-2 B	12:05	1-2'	light Brown silty sand PID = 9.6 ppm
SB-2 C	12:05	2-3'	DK Brown silty sand PID = 6.0 ppm
SB-2 D	12:05	3-4'	DK-light Brown silty sand PID = 9.9 ppm

Composite Sample? (No) Composite Sample ID Number

Describe Compositing:

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8020		(YES)	NO	YES	NO
8100		YES	NO	YES	NO
FL-PRO		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers:

Date Received by Lab: Laboratory: SAVANNAH LABS

Weather Conditions: cloudy

Remarks: water level is ~ 3' BGS
Collected equipment blank QA/QC sample for EPA 8020, 8100, FL-PRO
sample ID: EQ. Blank - SS-5/68 @ SB-2
sample collected from 3-4' interval
time collected 12:45

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1/VA\gd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL

Project Number: 973-3778

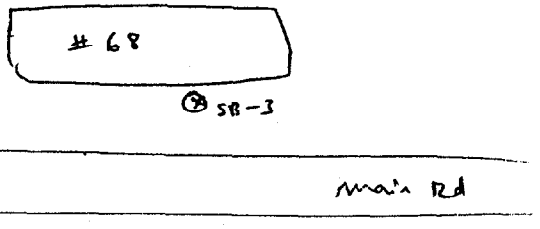
Date Collected: 12/4/97

Sample Location: BLDG 68: SB-3 @ BLDG 68 UST PIT - NORTH

Collected by: SYI / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)

SKETCH



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
SB-3 A	13:40	0-1'	mix of lime stone + black topsoil PID = 4.4 ppm
SB-3 B	13:40	1-2'	Brown silty sand PID = 3.0 ppm
SB-3 C	13:40	2-3	Dark Brown silty sand PID = 3.1 ppm
SB-3 D	13:40	3-4'	mix of light and Dark Brown silty sand, PID = 3

Composite Sample? Yes No Composite Sample ID Number

Describe Compositing:

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8020		YES	NO	YES	NO
8100		YES	NO	YES	NO
FL-PRO		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3

Date Received by Lab:

Laboratory: SAVANNAH LABS

Weather Conditions: cloudy

Remarks: GrW ≈ 3' BGS

Sample Collected @ 14:30 - Collected Sample from 1' → 3' BGS

upper layer may be affected by asphalt

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

(**) Metals, VOA, Organics, Etc.

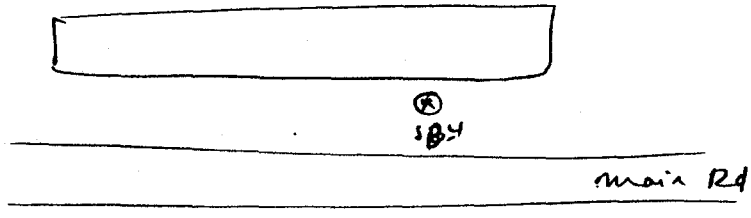
SAMPLEFRM.WK1\VA\GN

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68: SB-4 @ BLDG 68 UST PIT - SOUTH
Collected by: SYE / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)

SKETCH



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
SB-4 A	13:30	0-1	lime stone PID = 3.8 ppm
SB-4 B		1-2	Brown silty sand PID = 3.2 ppm
SB-4 C		2-3	light Brown silty sand PID = 3.2 ppm
SB-4 D		3-4	Black to light Brown silty sand PID = 3.0 ppm

Composite Sample? yes No Composite Sample ID Number

Describe Compositing:

composite sample from 1'-3'

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8020		(YES)	NO	YES	NO
8100		YES	NO	YES	NO
FL-PRO		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3

Date Received by Lab: Laboratory: SAVANNAH LABS

Weather Conditions: cloudy

Remarks: G.W ~ 3' BGS
Sample collected from 1'→3' composite, time: 14:10

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

(**) Metals, VOA, Organics, Etc.

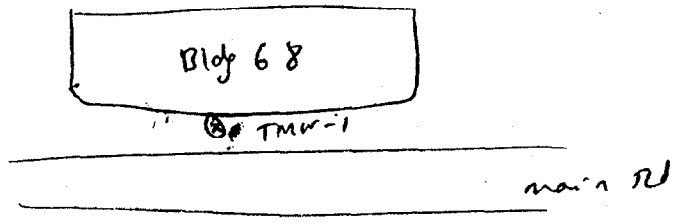
SAMPLEFRM.WK1\VA\gd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68: TMW-1 @ TMW-1 (BLDG 68A)
Collected by: SYE / MW

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)

SKETCH



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-1 A	12:50	0-1	lime stone, PID = 2.3 ppm
TMW-1 B		1-2	light Brown silty sand, PID = 3.5 ppm
TMW-1 C		2-3	Dark Brown silty sand, PID = 3.9 ppm
TMW-1 D		3-4	Light Brown medium sand, PID = 4.2 ppm

Composite Sample? (No) Composite Sample ID Number

Describe Compositing:

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		(YES)	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3 + a duplicate sample, total 6 containers

Date Received by Lab: Laboratory: SAVANNAH LABS

Weather Conditions: cloudy

G. water is ~3' BGS.

Remarks: Dup. To be analyzed for 6010/7470, 8270, and 8260, sample labelled as Duplicate - SS-3/68

Sample Collection time: 13:15 - collected from 3'-4' BGS interval

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1\VA\jd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL

Project Number: 973-3778

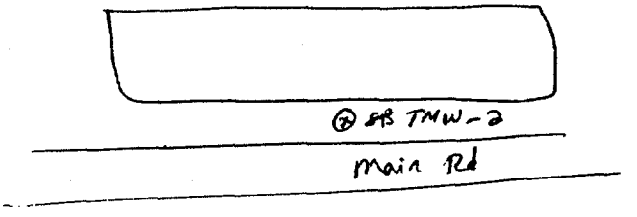
Date Collected: 12/4/97

Sample Location: BLDG 68: TMW-2
@ BLDG 68 - TMW-2

Collected by: SYT / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)

SKETCH



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-2A	13:40	0-1	lime stone PID = 3.5 ppm
TMW-2B		1-2	Brown silty sand PID = 3.1 ppm
TMW-2C		2-3	light Brown silty sand PID = 2.8 ppm
TMW-2D		3-4	Black to Brown silty sand PID = 2.6 ppm

Composite Sample? No

Composite Sample ID Number

Describe Compositing:

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		YES	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3

Date Received by Lab:

Laboratory: SAVANNAH LABS

Weather Conditions: cloudy

Remarks: G.W = 3' BGS
sample collected from 1'-2' interval
time = 14:20

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

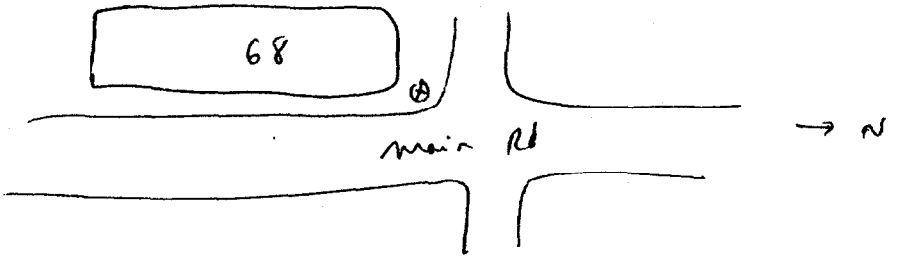
(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1\SA\gd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68 : TMW-3
NE CORNER BLDG 68
Collected by: S / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-3A	14:40	0-1	Light Brown to grey silty sand, PID = 2.3 ppm
TMW-3B	14:40	1-2	" " " " PID = 2.4 ppm

Composite Sample? yes No Composite Sample ID Number

Describe Compositing:

Composite from 0 → 2' BGS

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		YES	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3 plus 3 for duplicate = total 6 jars

Date Received by Lab: Laboratory: SAVANNAH LABS

Weather Conditions: cloudy

Remarks: Duplicate ID: Duplicate - SS-2/68 @ TMW3 - collected @ 15:00

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

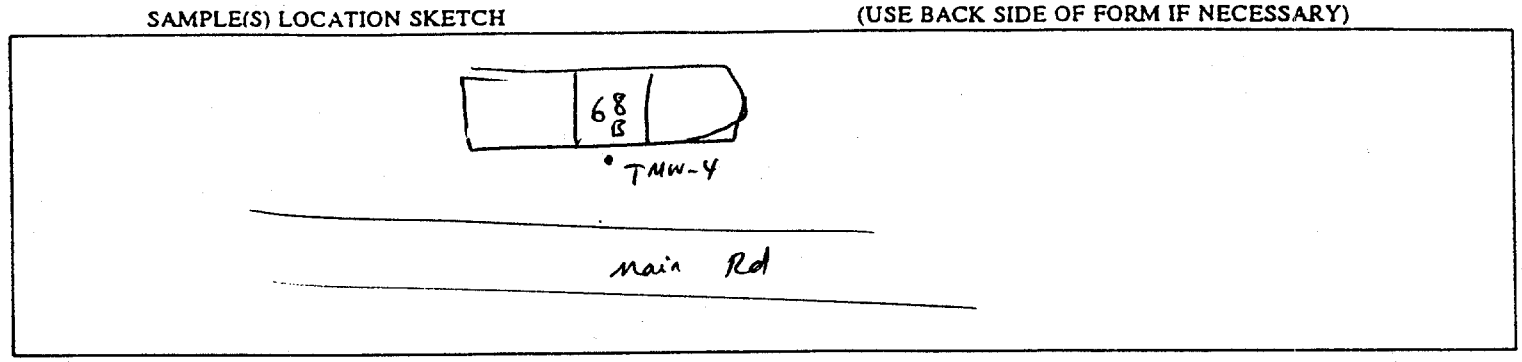
(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1/VA\JH

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68: TMW-4
EAST-CENTRAL BLDG 68B
Collected by: SYT / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-4 A	15:00	0 – 1'	DK. Brown silty sand, PID = 2.6 ppm
TMW-4 B	15:00	1 – 2'	DK. Brown silty sand, PID = 2.5 ppm

Composite Sample? Yes No Composite Sample ID Number

Describe Compositing:

Sample Collected from 0.5 → 2' (upper ½' grass roots / Topsoil)

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		YES	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3
Date Received by Lab:
Laboratory: SAVANNAH LABS
Weather Conditions: cloudy

Remarks: Sample collected @ 15:15 – composite from ½ → 2' BGS

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1\WA\grd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68: TMW-5 SE CORNER - BLDG 68A
Collected by: SYE / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)

SEE SITE PLAN

SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-5A	15:05	0-1	Brown medium to fine sand, PID = 3.2 ppm
TMW-5B	15:05	1-2	" " PID = 3.4 ppm

Composite Sample? yes No Composite Sample ID Number

Describe Compositing:

composite from 0 → 2' BGS

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		YES	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3

Date Received by Lab: Laboratory: SAVANNAH LABS

Weather Conditions: cloudy

Remarks: Sampling time 15:25 - composite sample from 0 → 2' BGS

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1\OA\gd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL

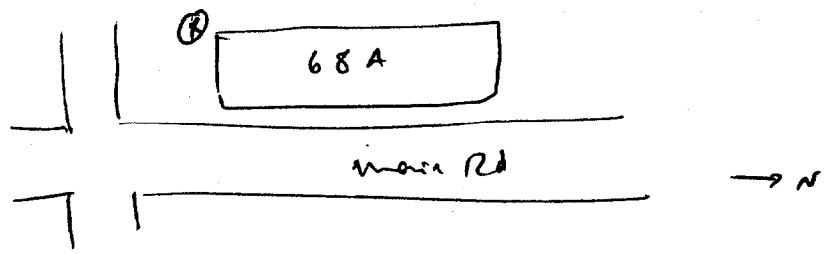
Project Number: 973-3778

Date Collected: 12/4/97

Sample Location: BLDG 68: TMW-6
SW CORNER - BLDG 68A

Collected by: SYE / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-6 A	15:25	0 – 1'	light Brown medium to fine sand, PID = 1.6 ppm
TMW6 B	15:25	1 – 2'	" " " " " " , PID = 1.8 ppm

Composite Sample? Yes No Composite Sample ID Number

Describe Compositing:

Sample from 0' – 2' BGS

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		YES	NO	YES	NO
8270		YES	NO	YES	NO
6010 / 7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3

Date Received by Lab: Laboratory: SAVANNAH LABS

Weather Conditions: cloudy

Remarks: Sample time 15:50, composite from 0 → 2' BGS

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

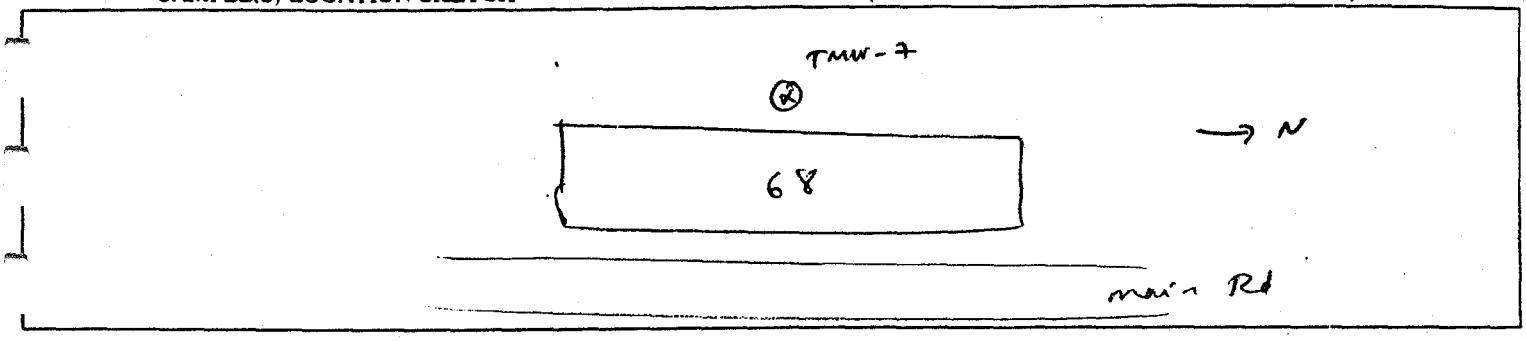
(**) Metals, VOA, Organics, Etc.

SAMPLEFRM WK1/VA\grd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68: TMW-7
WEST-CENTRAL - BLDG 68B
Collected by: SKT / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-7A	16:20	0-1'	Dark Brown silty Sand, PID= 4.2 ppm
TMW-7B	16:20	1-2'	mix of Light to Dk Brown silty Sand, PID=3.9 pp.

Composite Sample? yes No Composite Sample ID Number

Describe Compositing:

mixed soils from 0-2' BGS

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		YES	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3

Date Received by Lab: Laboratory: SAVANNAH LABS

Weather Conditions: cloudy

Remarks: Sample collection 16:45

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

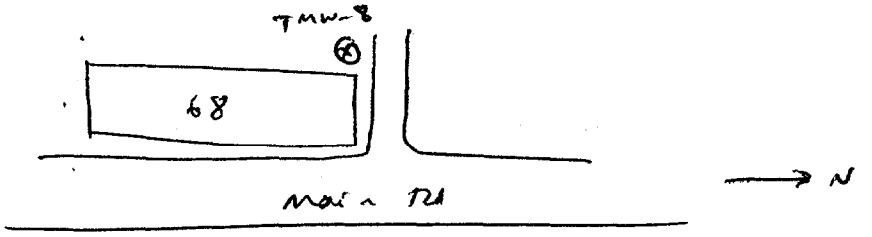
(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1(VA)grd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68: TMW-8
NW CORNER OF BLDG 68
Collected by: SYE / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-8A	~~0-1~~ SYE 15:15	0-1	Brown Silty Sand, PID= 1.6 ppm
TMW-8B	~~1-2~~ 15:15	1-2	" " " , PID= 1.9 ppm

Composite Sample? yes No **Composite Sample ID Number**

Describe Compositing:
Sample from ~ 0.5 → 2' BGS

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		YES	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3
Date Received by Lab:
Laboratory: SAVANNAH LABS
Weather Conditions: cloudy

Remarks: sample collected @ 15:45 — composite sample from ½' → 2.0' BGS

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

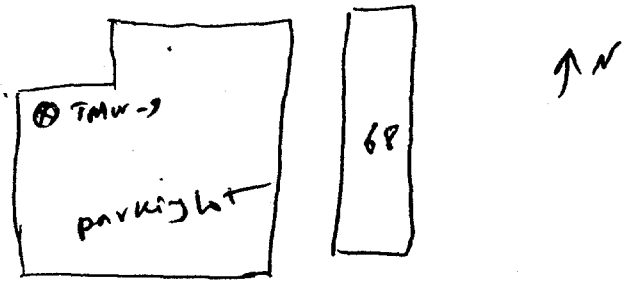
(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1\MA\grd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68 : TMW-9 PARKING LOT - WNW
Collected by: SYT / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-9A	16:10	0-1'	Dark Brown silty sand, PID = 30 ppm
TMW-9B	16:10	1-2'	Dark Brown silty sand, PID = 20 ppm

Composite Sample? yes No Composite Sample ID Number

Describe Compositing: mixed material from 0-2' BGS

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		(YES)	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3

Date Received by Lab: Laboratory: SAVANNAH LABS

Weather Conditions: cloudy

Remarks: composite from 0-2' BGS, collected @ 16:25
used all available soil sample from 0-1' BGS

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

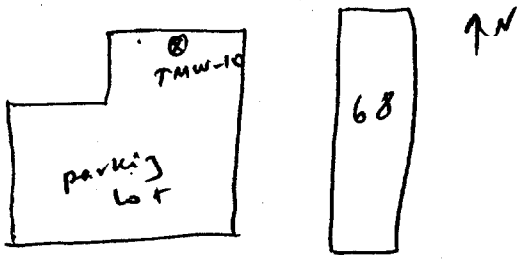
(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1\WA\grd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68 : TMW-10 PARKING LOT - NORTH
Collected by: SYE / MW B

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-10 A	16:20	0-1'	Brown medium to fine sand, PID = 2.7 ppm
TMW-10 B	16:20	1-2'	Brown med. to fine sand, PID = 3.2 PPM

Composite Sample? yes No Composite Sample ID Number

Describe Compositing:

mix of soil from 0-2' BGS

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?	PER COMPOSITE?
8260		YES NO	YES NO
8270		YES NO	YES NO
6010/67470		YES NO	YES NO
		YES NO	YES NO

Number of Containers: 3

Date Received by Lab: Laboratory: SAVANNAH LABS

Weather Conditions: Cloudy

Remarks: sample collected @ 16:40.
collect composite sample

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

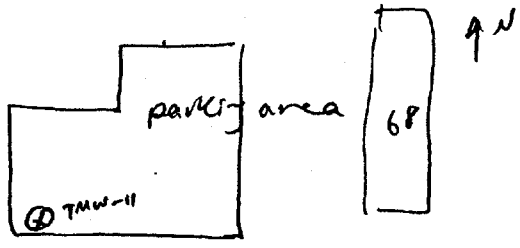
(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1\WA\rd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68 : TMW-11 PARKING LOT - SW
Collected by: SAE / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-11 A	15:45	0 - 1'	Dark Brown silty sand, PID = 2.5 ppm
TMW-11 B	15:45	1 - 2'	Dark Brown silty sand, PID = 2.2 ppm

Composite Sample? yes No Composite Sample ID Number

Describe Compositing:

from 0' → 2' composite

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		YES	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3

Date Received by Lab: Laboratory: SAVANNAH LABS

Weather Conditions: cloudy

Remarks: Sample Collected @ 16:00

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

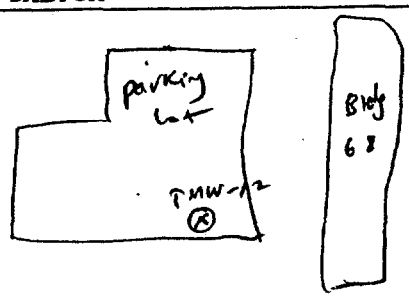
(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1\WA\grd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / CECIL FIELD / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68: TMW-12 PARKING LOT - SE
Collected by: SYT / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-12A	15:50	0-1'	Light Brown silty sand, PID = 2.5 ppm
TMW-12B	15:50	1-2'	Light Brown silty sand, PID = 2.6 ppm

Composite Sample? Yes No Composite Sample ID Number

Describe Compositing:

from 0 → 2' BGS

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		YES	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3

Date Received by Lab: ~~yet~~ Laboratory: SAVANNAH LABS

Weather Conditions: cloudy

Remarks: Sample Collected 16:15, composite from 0 - 2' BGS

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

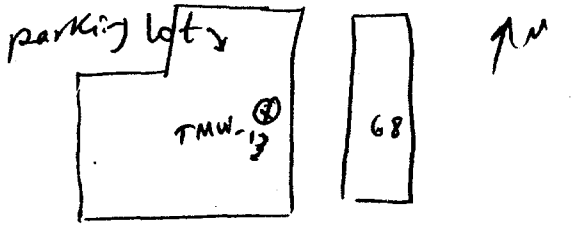
(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1/WA\gn

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778
Date Collected: 12/4/97
Sample Location: BLDG 68 : TMW-13 PARKING LOT - EAST / CENTRAL
Collected by: SYT / MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-13 A	16:30	0 – 1'	Light Brown silty sand, PID = 5.7 ppm
TMW-13 B	16:30	1 – 2'	" " " " , PID = 4.9 ppm

Composite Sample? Yes No Composite Sample ID Number

Describe Compositing:

Composite from 0 – 2' BGS (mixed)

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		YES	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3

Date Received by Lab: Laboratory:

Weather Conditions: cloudy

Remarks: collected sample @ 16:55

SAMPLE NOT ANALYZED - RE-COLLECTED 12/5/97

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

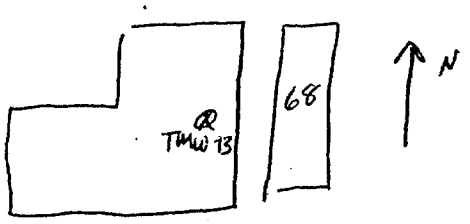
(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1\MA\grd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC/Cecil Field
Project Number: 973-3778
Date Collected: 12/5/97
Sample Location: Bld 68 - TMW - 13 (2) Parking Lot - East/Central
Collected by: MWB

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
TMW-13		0-1 FT	PID= 5.7
TMW-13		1-2FT	SAME AS 12/4/97 PID= 4.9

Composite Sample? yes No Composite Sample ID Number

Describe Compositing: SAME AS 12/4/97

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		YES	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 6

Date Received by Lab: Laboratory: Savannah

Weather Conditions: Partly cloudy

Remarks: collected sample @
Duplicate 68-SS-
RE-COLLECT SAMPLE / GOT DUPLICATE

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

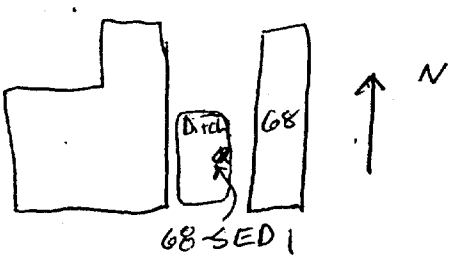
(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1\WA\rd

SOIL SAMPLE
FIELD COLLECTION REPORT

Project Name: NGC/Cecil Field
Project Number: 973-3778
Date Collected: 12/9/97
Sample Location: Bld 68 SED-1 behind bld 68 in holding ditch (RETENTION POND)
Collected by: MGN

SAMPLE(S) LOCATION SKETCH (USE BACK SIDE OF FORM IF NECESSARY)



SAMPLE ID NUMBER	TIME COLLECTED	DEPTH OF SAMPLE	SOIL DESCRIPTION (Color, Composition, Staining, Odor, Field Measurements*)
68-SED-1	1400	0-1'	very dark some black sediment WET SAMPLE - NO PID SCREENING

Composite Sample? yes No Composite Sample ID Number

Describe Compositing: composite from 0-1'

SAMPLE TYPES COLLECTED

TYPES(**)	VOLUME	PER SAMPLE?		PER COMPOSITE?	
8260		YES	NO	YES	NO
8270		YES	NO	YES	NO
6010/7470		YES	NO	YES	NO
		YES	NO	YES	NO

Number of Containers: 3

Date Received by Lab: Laboratory: Savannah Labs

Weather Conditions: Cloudy light rain

Remarks: collected sample @ 1400
SAMPLE COLLECTED ADJACENT TO STORMWATER OUTFALL IN RETENTION BASIN.

(*) Organic Vapor Analysis, Pocket Penetrometer, Etc.

(**) Metals, VOA, Organics, Etc.

SAMPLEFRM.WK1\GA\grd

APPENDIX A-4

Groundwater Sample Collection Records

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: Sunny ~~60~~ Upper 50s
Wind: 0-5mph
Precipitation: None

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-1 S
Date: 12/5/97
Time at Well Site: 11:50
Time of Sample Collection: 12:12
Sampled by: MWB/MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: None
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 15 feet
Volume of Water in Well: 0.67 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 2.02 gallons
Method of Purging: ~~Centrifugal Pump~~ Peristalic
Well Purged Dry?: Yes (No)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 15 ft TOC
Depth to Water : NM ft TOC NR
Column of Water in Well: <15 ft
Stickup: Flush ft

Appearance of Sample: Clear, very little sediment ~~[illegible]~~

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1205	1207	1211			
Volume Removed (gal.):	2.0	3.0	4.0			
pH:	5.08	5.24	5.30			
Specific Conductance (µmhos/cm):	103	96	99.0			
Temperature (Degrees °F):	80°F	79°F	79°F			
Turbidity (NTU):			14.6			
:						

Starting Purge Time: 1200
Ending Purge Time: 1221
Average Purge Rate: ~0.2 gal/min
Total Volume Purged: 4.0 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8010/8020	(3) 40-ml vial	NA	HCl - Lab
8100	(3) 1-Liter Amber Glass	NA	None
200.7	(1) 250 ml plastic	NA	HNO_3 - Lab
FL-PRO	(2) 1-Liter Amber Glass	NA	HCL - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-7
Lab Name: Savannah Labs
Air Bill #:

EMARKS: Shallow well only. Depth to water was not recorded

Field Team Leader: M. Brunsma

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 70's
Wind: 0-5 mph
Precipitation: Overcast

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-2 S
Date: 12/4/97
Time at Well Site: 16:10
Time of Sample Collection: 16:35
Sampled by: JSP/MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: EQUIPMENT Blank 68-8
Field Blank /Rinse Water type: LAB WATER
Lot Number:
Analyses: SAME AS Below

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 11.09 feet
Volume of Water in Well: 0.5 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 1.5 gallons
Method of Purging: ~~Centrifugal Pump~~ Peristaltic
Well Purged Dry?: Yes (No)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 15 ft TOC
Depth to Water : 3.91 ft TOC
Column of Water in Well: 11.09 ft
Stickup: Flush ft

Appearance of Sample: Clear / Lt brown

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	16:34	16:35	16:39			
Volume Removed (gal.):	2.0	3.0	4.0			
pH:	5.24	5.21	5.19			
Specific Conductance (μmhos/cm):	85	77	76			
Temperature (Degrees C):	82°F	81°F	81°F			
Turbidity (NTU):	Clear	Clear	Clear/lt	26.7		
:	Lt brown	Lt brown	Brown			

Starting Purge Time: 16:30
Ending Purge Time: 16:39
Average Purge Rate: ~0.4 gal/min
Total Volume Purged: 4.0 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8010/8020	(3) 40-ml vial	NA	HCl - Lab
8100	(3) 1-Liter Amber Glass	NA	None
200.7	(1) 250 ml plastic	NA	HNO_3 - Lab
FL-PRO	(2) 1-Liter Amber Glass	NA	HCL - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-6
Lab Name: Savannah Labs
Air Bill #:

EMARKS: Shallow well only.

Field Team Leader: James S Pearce

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 50's
Wind: 0-5 mph
Precipitation: Sunny

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-3 S
Date: 12/5/97
Time at Well Site: 8:50
Time of Sample Collection: 9:40
Sampled by: JSP / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: Duplicate 68-7
Field Blank /Rinse Water type: lab DI H_2O

Lot Number:
Analyses: Same as below

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 11.91 feet
Volume of Water in Well: 0.5 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 1.5 gallons
Method of Purging: ~~Centrifugal~~ Pump Peristaltic
Well Purged Dry?: Yes No

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 15 ft TOC
Depth to Water : 3.09 ft TOC
Column of Water in Well: 11.91 ft
Stickup: Flush ft

Appearance of Sample: Clear

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	9:21	9:26	9:31			
Volume Removed (gal.):	2.0	3.0	4.2			
pH:	5.23	4.92	4.76			
Specific Conductance (μmhos/cm):	76	71	67			
Temperature (Degrees C):	78°F	78°F	78°F			
Turbidity (NTU):	Clear/	Clear	Clear	19.20		
:	Lt brown					

Starting Purge Time: 9:18
Ending Purge Time: 9:31
Average Purge Rate: ~0.32 gal/min
Total Volume Purged: 4.2 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8280	(2) 1-Liter Amber Glass	NA	None
8270/8080/8140/8150	(6) 250 ml plastic	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab
Cn	(1) 500 ml plastic	NA	NaOH - Lab
H_2S	(1) 500 ml plastic	NA	Zinc Acetate - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-7
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only:~~ JSP

Field Team Leader: James S Pence

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 50's
Wind: 0.5 mph
Precipitation: Sunny

FIELD BLANK NOTES

Field Blank Name: — NONE
Field Blank /Rinse Water type:
Lot Number:
Analyses:

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 30 ft TOC
Depth to Water : 3.47 ft TOC
Column of Water in Well: 26.53 ft
Stickup: Flush ft

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-3 D
Date: 12/5/97
Time at Well Site: 8:50
Time of Sample Collection: 10:15
Sampled by: JSP / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 26.53 feet
Volume of Water in Well: 1.19 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 3.58 gallons
Method of Purging: ~~Centrifugal~~ Pump Peristaltic
Well Purged Dry?: Yes (No)

Appearance of Sample: Lt brown

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	9:34	10:00	10:07			
Volume Removed (gal.):	3.0	5.0	6.4			
pH:	5.77	6.01	5.89			
Specific Conductance (μmhos/cm):	111	121	107			
Temperature (Degrees C):	78°F	78°F	78°F			
Turbidity (NTU):	Lt brown	Lt brown	Lt brown	159.2		
:	Silty					

Starting Purge Time: 9:18
Ending Purge Time: 10:07
Average Purge Rate: ~0.13 gal/min
Total Volume Purged: 6.4 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8280	(2) 1-Liter Amber Glass	NA	None
8270/8080/8140/8150	(6) 250 ml plastic	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab
Cn	(1) 500 ml plastic	NA	NaOH - Lab
H_2S	(1) 500 ml plastic	NA	Zinc Acetate - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-7
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only~~ JSP Battery Died during purge effort

Field Team Leader: Jane S Pace

Sampfrm3.xls

GOLDER ASSOCIATES INC.

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 50-60°F
Wind: LIGHT - ENE
Precipitation: —

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-4 S
Date: 12/8/97
Time at Well Site: 1430
Time of Sample Collection: 1530
Sampled by: RSK / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: NONE
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 10.15 feet
Volume of Water in Well: 0.46 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 1.4 gallons
Method of Purging: ~~Centrifugal Pump~~ PERISTALTIC PUMP
Well Purged Dry?: ~~No~~ Yes No

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 15.0 ft TOC
Depth to Water : 4.85 ft TOC
Column of Water in Well: 10.15 ft
Stickup: 0.0 ft

Appearance of Sample: MED. BROWN. VERY SILTY

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1448	1502	1510			
Volume Removed (gal.):	~1.0	~1.5	~2.0			
pH:	5.12	5.06	4.98			
Specific Conductance (μmhos/cm):	76	78	80			
Temperature (Degrees °C):	76°F	80°F	80°F			
Turbidity (NTU):	80°F		169.3			
:						

* CHANGED THERMOMETER

Starting Purge Time: 1441
Ending Purge Time: 1511
Average Purge Rate: ~0.1 gal/min
Total Volume Purged: ~2.0 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-8
Lab Name: Savannah Labs
Air Bill #:

REMARKS: ~~Shallow well only~~ Purged dry - Slow Recovery

Field Team Leader: R. KEENAN

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 50-60°F
Wind: LIGHT - ENE
Precipitation: —

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-4 D
Date: 12/8/97
Time at Well Site: 1430
Time of Sample Collection: 1570
Sampled by: RSK / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: NONE
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 25.36 feet
Volume of Water in Well: 1.14 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 3.4 gallons
Method of Purging: ~~Centrifugal Pump~~ PERISTALTIC PUMP
Well Purged Dry?: Yes (NO)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 30.0 ft TOC
Depth to Water : 4.64 ft TOC
Column of Water in Well: 25.36 ft
Stickup: ~0.20 ft

Appearance of Sample: Lt. BROWN, SILTY.

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4 RSK	Purge 5	Purge 6
Time:	1450	1455	1458	~~1~~ 1500		
Volume Removed (gal.):	~2	~4.5	~6.0	~7		
pH:	5.83	5.59	5.46	5.44		
Specific Conductance (µmhos/cm):	123	111	102	97		
Temperature (Degrees °F):	82°F	81°F	82°F	82°F		
Turbidity (NTU):				166.2		
:						

Starting Purge Time: 1448
Ending Purge Time: 1500
Average Purge Rate: ~0.6 gal/min
Total Volume Purged: ~7 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	✓ (2) 1-Liter Amber Glass	NA	None
8080	✓ (1) 1-Liter Amber Glass	NA	None
Metals (6010)	✓ (1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	✓ (1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-8
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only.~~ RSK

Field Team Leader: R. KEENAN

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 50-60°F
Wind: LIGHT - ENE
Precipitation: —

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-5 S
Date: 12/8/97
Time at Well Site: 1320
Time of Sample Collection: 1348
Sampled by: RSL / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: NONE
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 9.25 feet
Volume of Water in Well: 0.42 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 1.25 gallons
Method of Purging: ~~Centrifugal Pump~~ PERISTALTIC PUMP
Well Purged Dry?: Yes (No)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 15.0 ft TOC
Depth to Water : 5.75 ft TOC
Column of Water in Well: 9.25 ft
Stickup: ~0.10 ft

Appearance of Sample: MED. BROWN, SILTY

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1335	1338	1341			
Volume Removed (gal.):	3/4	2.5	5.0			
pH:	5.51	5.37	5.35			
Specific Conductance (µmhos/cm):	96	82	83			
Temperature (Degrees °F):	80°F	79°F	80°F			
Turbidity (NTU):			162.2			
:						

Starting Purge Time: 1334
Ending Purge Time: 1343
Average Purge Rate: ~0.7 gal/min
Total Volume Purged: ~5.0 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-8
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only~~ RSL

Field Team Leader: R. KEENAN

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 50-60°F
Wind: LIGHT - ENE
Precipitation: —

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-5 D
Date: 12/8/97
Time at Well Site: 1320
Time of Sample Collection: 1405
Sampled by: RSK / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: NONE
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 24.24 feet
Volume of Water in Well: 1.1 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 3.3 gallons
Method of Purging: ~~Centrifugal Pump~~ PERISTALTIC PUMP
Well Purged Dry?: Yes (NO)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 30 ft TOC
Depth to Water : 5.76 ft TOC
Column of Water in Well: 24.24 ft
Stickup: Ø ft

Appearance of Sample: CLEAR. TRACE SILT.

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1348	1351	1354	1357		
Volume Removed (gal.):	~1.5	~3	~4.5	~6		
pH:	6.00	5.83	5.69	5.61		
Specific Conductance (µmhos/cm):	119	87	79	73		
Temperature (Degrees C):	78°F	78°F	78°F	78°F		
Turbidity (NTU):				31.4		
:						

Starting Purge Time: 1344
Ending Purge Time: 1358
Average Purge Rate: ~0.5 gal/min
Total Volume Purged: ~6.5 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	✓ (2) 1-Liter Amber Glass	NA	None
8080	✓ (1) 1-Liter Amber Glass	NA	
Metals (6010)	✓ (1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	✓ (1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-8
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only~~. RSK
PURGED CLEAR

Field Team Leader: R. KIERNAN

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 70's
Wind: 0-5 mph
Precipitation: overcast

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-6 S
Date: 12/4/97
Time at Well Site: 11:30
Time of Sample Collection: 12:35
Sampled by: JSP/MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: EQUIPMENT BLANK 68-6
Field Blank /Rinse Water type: ~~Duplicate 68-5~~ JSP
WATER From Lab
Lot Number:
Analyses: SAME AS BELOW

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 10.08 feet
Volume of Water in Well: 0.45 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 1.4 gallons
Method of Purging: ~~Centrifugal~~ Pump Peristalic
Well Purged Dry?: (Yes) No

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 15 ft TOC
Depth to Water : 4.92 ft TOC
Column of Water in Well: 10.08 ft
Stickup: Flush ft

Appearance of Sample: Clear / Little Cloudy

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	12:12					
Volume Removed (gal.):	2.0					
pH:	5.88					
Specific Conductance (μmhos/cm):	197					
Temperature (Degrees ~~C~~ F):	78°F					
Turbidity (NTU):	Cloudy	64.7				
:						

Starting Purge Time: 12:03
Ending Purge Time: 12:20
Average Purge Rate: ~0.15 gal/min
Total Volume Purged: ~2.5 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8280	(2) 1-Liter Amber Glass	NA	None
8270/8080/8140/8150	(6) 250 ml plastic	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab
Cn	(1) 500 ml plastic	NA	NaOH - Lab
H_2S	(1) 500 ml plastic	NA	Zinc Acetate - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: TRIP 68-6
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only~~. JSP Purged Dry 2 times

Field Team Leader: James S Pease

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 70's
Wind: 0-5mph
Precipitation: Overcast

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-6 D
Date: 12/4/97
Time at Well Site: 11:30
Time of Sample Collection: 12:30
Sampled by: JSP/
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: Duplicate 68-5
Field Blank /Rinse Water type:

Lot Number:
Analyses: SAME AS Below

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 25.0 feet
Volume of Water in Well: 1.13 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 3.38 gallons
Method of Purging: ~~Centrifugal~~ Pump Peristaltic
Well Purged Dry?: Yes (No)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 30 ft TOC
Depth to Water : 5.0 ft TOC
Column of Water in Well: 25.0 ft
Stickup: 0.15 ft

Appearance of Sample: Clear / Little Cloudy

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	12:06	12:10	12:14	12:17		
Volume Removed (gal.):	2.0	4.0	6.5	9.0		
pH:	5.60	5.45	5.22	5.18		
Specific Conductance (μmhos/cm):	151	120	107	105		
Temperature (Degrees C):	78°F	78°F	78°F	78°F		
Turbidity (NTU):	Lt brown	Lt Brown	Lt Brown	Lt Brown	164.0	
:						

Starting Purge Time: 12:03
Ending Purge Time: 12:17

Average Purge Rate: ~0.6 gal/min
Total Volume Purged: 9.0 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8280	(2) 1-Liter Amber Glass	NA	None
8270/8080/8140/8150	(6) 250 ml plastic	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab
Cn	(1) 500 ml plastic	NA	NaOH - Lab
H_2S	(1) 500 ml plastic	NA	Zinc Acetate - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: TRIP 68-06
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only.~~ JSP

Field Team Leader: James S Pearce

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GOLDER ASSOCIATES INC.

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 70's
Wind: 0-5 mph
Precipitation: Overcast

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-7 S
Date: 12/4/97
Time at Well Site: 13:55
Time of Sample Collection: 15:00
Sampled by: JSP / MGO
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: Equipment Blank 68-7
Field Blank /Rinse Water type: DI Water from Lab
Lot Number:
Analyses: Same As Below

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 9.84 feet
Volume of Water in Well: ~0.4 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 1.3 gallons
Method of Purging: ~~Centrifugal Pump~~ Peristaltic
Well Purged Dry?: (Yes) No

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 15 ft TOC
Depth to Water : 5.16 ft TOC
Column of Water in Well: 9.84 ft
Stickup: Flush ft

Appearance of Sample: Clear / Lt brown

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	~~14:40~~	14:44				
Volume Removed (gal.):	~~0.5~~	2.0				
pH:	~~4.23~~	5.38				
Specific Conductance (µmhos/cm):	~~49~~	69				
Temperature (Degrees C):	~~80~~	79°F				
Turbidity (NTU):	~~Some~~	Lt brown	118			
JSP :	~~silty~~					

Starting Purge Time: 14:34
Ending Purge Time: 14:50
Average Purge Rate: ~0.2 gal/min
Total Volume Purged: 3.0 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-6
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only~~ JSP Purged dry 2 times
Slow Recharge → Dry during sample effort

Field Team Leader: Jong S Pelz

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 70's
Wind: 0-5 mph
Precipitation: Overcast

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-7 D
Date: 12/4/97
Time at Well Site: 13:55
Time of Sample Collection: 15:05
Sampled by: JSP/MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: Duplicate 68-6
Field Blank /Rinse Water type:

Lot Number:
Analyses: SAME AS Below

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 24.7 feet
Volume of Water in Well: 1.1 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 3.3 gallons
Method of Purging: ~~Centrifugal Pump~~ Peristalic Pump
Well Purged Dry?: Yes (No)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 30 ft TOC
Depth to Water : 5.26 ft TOC
Column of Water in Well: 24.7 ft
Stickup: Flush ft

Appearance of Sample: Lt brown / silty

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	14:42	14:48	14:54			
Volume Removed (gal.):	2.5	5.0	7.5			
pH:	4.78	4.79	4.70			
Specific Conductance (µmhos/cm):	47	43	45			
Temperature (Degrees C):	80°F	79°F	79°F			
Turbidity (NTU):	Ultraclear	Lt brown	Lt brown	7216		
:	silty					

Starting Purge Time: 14:34
Ending Purge Time: 14:55
Average Purge Rate: ~0.4 gal/min
Total Volume Purged: 8.0 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-6
Lab Name: Savannah Labs
Air Bill #:

REMARKS: ~~Shallow well only~~ JSP

Field Team Leader: James S Pierce

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: P/C ~~to~~ 50's
Wind: 5-10 mph
Precipitation: \

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-8 S
Date: 12/5/97
Time at Well Site: 1320
Time of Sample Collection: ~~1322~~ 1345
Sampled by: MWB / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: \
Field Blank /Rinse Water type: None
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 11.6 feet
Volume of Water in Well: ~0.5 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 1.5 gallons
Method of Purging: ~~Centrifugal Pump~~ Peristaltic
Well Purged Dry?: Yes (No)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 15.0 ft TOC
Depth to Water : ~~3.65~~ ft TOC 3.45
Column of Water in Well: 11.6 ft
Stickup: Flush ft

Appearance of Sample: Very dark brown

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1333	1338	1342			
Volume Removed (gal.):	2.0	5.0	6.0			
pH:	5.37	5.29	5.37			
Specific Conductance (μmhos/cm):	109	97	97			
Temperature (Degrees F):	80°F	79°F	77°F			
Turbidity (NTU):			157.5			
:						

Starting Purge Time: 1322
Ending Purge Time: 1345
Average Purge Rate: ~0.44 gal/min
Total Volume Purged: ~10 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip-68-7
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only.~~ MGD

Field Team Leader: Mike Brunsma

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 50s
Wind: 5-10 mph
Precipitation: \

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-8 D
Date: 12/5/97
Time at Well Site: 1320 MGD
Time of Sample Collection: ~~MWB/MGD~~ 1338
Sampled by: MWB/MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name:
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 26.4 feet
Volume of Water in Well: 1.2 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 3.6 gallons
Method of Purging: ~~Centrifugal Pump~~ Peristaltic
Well Purged Dry?: Yes (No)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 30.0 ft TOC
Depth to Water : ~~3.45~~ ft TOC 3.65 MD
Column of Water in Well: 26.4 ft
Stickup: Flush ft

Appearance of Sample: dark brown / silty

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1332	1335	1338			
Volume Removed (gal.):	2.5	5.0	6.5			
pH:	5.29	5.13	4.96			
Specific Conductance (μmhos/cm):	90	84	86			
Temperature (Degrees C):	74°F	74°F	78°F			
Turbidity (NTU):			160.2			
:						

Starting Purge Time: 1330
Ending Purge Time: 1342
Average Purge Rate: ~0.8 gal/min
Total Volume Purged: ~9 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-7
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only~~. MGD

Field Team Leader: Mike Brunsma

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 40-50°F
Wind: Light - NE
Precipitation:

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-9 S
Date: 12/8/97
Time at Well Site: 0850
Time of Sample Collection: 0945
Sampled by: RSK / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: None
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: ~~49~~ MD feet 10.78
Volume of Water in Well: 0.49 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 1.5 gallons
Method of Purging: Centrifugal Pump PERISTALTIC PUMP
Well Purged Dry?: (Yes) No

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 15.0 ft TOC
Depth to Water : 4.22 ft TOC
Column of Water in Well: 10.78 ft
Stickup: -0.18 ft

Appearance of Sample: v. Light brown. with Silt.

WELL PURGE CONTROL

	MD Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	~~415~~	0923	0928	0933		
Volume Removed (gal.):	~~2.5~~	1.5	2.5	~3.25		
pH:	~~4.96~~	5.86	5.94	5.87		
Specific Conductance (µmhos/cm):	~~130.4~~	194	178	176		
Temperature (Degrees °C):	~~28~~	83°F	83°F	83°F		
Turbidity (NTU):				89.9		
:						

Starting Purge Time: 9:12
Ending Purge Time: 0935
Average Purge Rate: ~0.2 gal/min
Total Volume Purged: ~3.5 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	✓ (3) 40-ml vial	NA	HCl - Lab
8270	✓ (2) 1-Liter Amber Glass	NA	None
8080	✓ (1) 1-Liter Amber Glass	NA	NONE
Metals (6010)	✓ (1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	✓ (1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-8
Lab Name: Savannah Labs
Air Bill #:

EMARKS: Shallow well only. RSK

Field Team Leader: R. Keenan

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 40-50°F
Wind: Light - NE
Precipitation:

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-9 D
Date: 12/8/97
Time at Well Site: 0850
Time of Sample Collection: 0935
Sampled by: MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: None
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 25.7 feet
Volume of Water in Well: 1.16 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 3.5 gallons
Method of Purging: ~~Centrifugal Pump~~ Peristaltic pump
Well Purged Dry?: Yes (No)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 30 ft TOC
Depth to Water : 4.3 ft TOC
Column of Water in Well: 25.7 ft
Stickup: -0.07 ft

Appearance of Sample: Lt. Brown. Little Silty.

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	0915	09:18	0920	0922		
Volume Removed (gal.):	2.5	5	6.5	7.5		
pH:	4.96	4.59	4.26	4.20		
Specific Conductance (μmhos/cm):	130	115.2	120	118		
Temperature (Degrees ℃):	78°F	80°F	80°F	80°F		
Turbidity (NTU):				139		
:						

Starting Purge Time: 9:13
Ending Purge Time: 0923
Average Purge Rate: ~0.8 gal/min
Total Volume Purged: ~8 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	✓ (3) 40-ml vial	NA	HCl - Lab
8270	✓ (2) 1-Liter Amber Glass	NA	None
8080	✓ (1) 1-Liter Amber Glass	NA	None
Metals (6010)	✓ (1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	✓ (1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-8
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only?~~ RSK

Field Team Leader: R. Keenan

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 50s
Wind: 5-10 mph
Precipitation: None

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-10 S
Date: 12/5/97
Time at Well Site: 1420
Time of Sample Collection: 1455
Sampled by: MWB/MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: Duplicate-68-8
Field Blank /Rinse Water type:

Lot Number:
Analyses: Same as below

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 10.7 feet
Volume of Water in Well: 0.5 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 1.5 gallons MD
Method of Purging: ~~Centrifugal~~ Pump Peristaltic
Well Purged Dry?: Yes No

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 15.0 ft TOC
Depth to Water : 4.35 ft TOC
Column of Water in Well: 10.7 ft
Stickup: flush ft

Appearance of Sample: Lt. Brown Silty

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1445	1447	1450			
Volume Removed (gal.):	2.0	3.0	4.0			
pH:	6.09	5.41	5.71			
Specific Conductance (µmhos/cm):	156	143	140			
Temperature (Degrees F):	78°F	78°F	78°F			
Turbidity (NTU):			30.2			
:						

Starting Purge Time: 1440
Ending Purge Time: 1455
Average Purge Rate: ~0.3 gal/min
Total Volume Purged: 5 gal gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip - 68 - 7
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only.~~ MD

Field Team Leader: M. Brunsma

Sampfrm3.xls

GOLDER ASSOCIATES INC.

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 50's
Wind: 5-10 mph
Precipitation: None

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-10 D
Date: 12/5/97
Time at Well Site: 14:20
Time of Sample Collection: 1534
Sampled by: MWB/MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: FEQ Blank-68-9
Field Blank /Rinse Water type: DI

Lot Number:
Analyses: 8270

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: ~~~0.9~~ feet MD 20.7
Volume of Water in Well: 0.9 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 2.7 gallons
Method of Purging: ~~Centrifugal Pump~~ Peristalic Pump MD
Well Purged Dry?: Yes (No)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 30.0 ft TOC
Depth to Water : 9.34 ft TOC
Column of Water in Well: 20.7 ft
Stickup: 4.80 ft

Appearance of Sample: Lt Brown / Silty

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	~~1518~~ 1527	1530	1533			
Volume Removed (gal.):	2.0	3.0	4.0			
pH:	5.88	5.74	5.73			
Specific Conductance (µmhos/cm):	116	100	95			
Temperature (Degrees °F):	78°F	78°F	78°F			
Turbidity (NTU):			161.7			
:						

Starting Purge Time: 1516
Ending Purge Time: ~~[illegible]~~ 1535
Average Purge Rate: ~0.3 gal/min
Total Volume Purged: ~5 gal gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-7
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only.~~ MD

Field Team Leader: M. Brunsma

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 50-60°F
Wind: Light - NE
Precipitation:

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-11 S
Date: 12/8/97
Time at Well Site: 1010
Time of Sample Collection: 1040
Sampled by: RSK / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: NONE
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 10.87 feet
Volume of Water in Well: 0.5 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 1.5 gallons
Method of Purging: ~~Centrifugal Pump~~ Peristaltic Pump
Well Purged Dry?: Yes No

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 15.0 ft TOC
Depth to Water : 4.13 ft TOC
Column of Water in Well: 10.87 ft
Stickup: flush ft

Appearance of Sample: MED. BROWN. VERY SILTY.

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1021	1026	1029			
Volume Removed (gal.):	3/4	2.0	3.5			
pH:	5.30	5.15	5.06			
Specific Conductance (µmhos/cm):	98	79	74			
Temperature (Degrees °C):	80°F	84°F	84°F			
Turbidity (NTU):			>170			
:						

Starting Purge Time: 1018
Ending Purge Time: 1032
Average Purge Rate: ~0.3 gal/min
Total Volume Purged: ~4 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-B
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only.~~ RSK
DID NOT CLEAR BUBBLE DURING PURGE.

Field Team Leader: R. KEENAN

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: ~~NONE~~ 50-60°F
Wind: LIGHT - NE
Precipitation: —

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-11 D
Date: 12/8/97
Time at Well Site: 1010
Time of Sample Collection: 1045
Sampled by: RSK / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: NONE
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 25.88 feet
Volume of Water in Well: 1.16 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 3.5 gallons
Method of Purging: ~~Centrifugal Pump~~ PERISTALTIC PUMP
Well Purged Dry?: Yes (NO)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 30.0 ft TOC
Depth to Water : 4.12 ft TOC
Column of Water in Well: 25.88 ft
Stickup: None ft

Appearance of Sample: LT. TAN. MOD. SILTY. CLEARED SIGNIFICANTLY DURING PURGE

WELL PURGE CONTROL

	Purge 1	Purge 2 (1029)	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1025	~~1027~~	1034			
Volume Removed (gal.):	1.5	3.0	~5.0			
pH:	5.64	5.46	5.32			
Specific Conductance (μmhos/cm):	134	108	102			
Temperature (Degrees °C):	84°F	85°F	85°F			
Turbidity (NTU):			162.4			
:						

Starting Purge Time: 1021
Ending Purge Time: 1036
Average Purge Rate: ~0.4 gal/min
Total Volume Purged: ~5.5 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-8
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only~~. RSK

Field Team Leader: R. KEENAN

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 60-70°F
Wind: LIGHT - NE
Precipitation: —

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-12 S
Date: 12/8/97
Time at Well Site: 1114
Time of Sample Collection: 1146
Sampled by: RSK / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: NONE
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 10.18 feet
Volume of Water in Well: ~0.5 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: ~1.5 gallons MD
Method of Purging: ~~Centrifugal Pump~~ Peristalic Pump
Well Purged Dry?: (Yes) No

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 15.0 ft TOC
Depth to Water : 4.82 ft TOC
Column of Water in Well: 10.18 ft
Stickup: flush ft

Appearance of Sample: CLEAR. NO COLOR NO VISIBLE SILT

WELL PURGE CONTROL

	Purge 1 (RSK)	Purge 2 (RSK)	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1124	1128	1129	1134	1140	
Volume Removed (gal.):	2.5	5.0	1.0	~1.75	~3.0	
pH:	5.35	5.08	5.33	5.17	5.49	
Specific Conductance (µmhos/cm):	95	84	90	86	78	
Temperature (Degrees C):	86F	86F	82°F	81°F	81°F	
Turbidity (NTU):					17.2	
:						

Starting Purge Time: 1118
Ending Purge Time: 1142
Average Purge Rate: ~0.14 gal/min
Total Volume Purged: ~3.25 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-B
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only!~~ RSK
CLOGGED SUBSTANTIALLY DURING PURGE.

Field Team Leader: R. KEENAN

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 60-70°F
Wind: LIGHT - NE
Precipitation: ——

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-12 D
Date: 12/8/97
Time at Well Site: 1110
Time of Sample Collection: 1145
Sampled by: RSK / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: NONE
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 25.06 feet
Volume of Water in Well: 1.12 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 3.38 gallons
Method of Purging: ~~Centrifugal Pump~~ Peristaltic pump
Well Purged Dry?: Yes (No)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 30.0 ft TOC
Depth to Water : 4.94 ft TOC
Column of Water in Well: 25.06 ft
Stickup: flush ft

Appearance of Sample: Lt. Brown. Little Silty.

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1124	1128	1132	1134		
Volume Removed (gal.):	2.5	5.0	~7.0	9.0		
pH:	5.35	5.08	4.85	4.78		
Specific Conductance (µmhos/cm):	95	84	77	76		
Temperature (Degrees C):	86°F	86°F	86°F	86°F		
Turbidity (NTU):				98.8		
:						

Starting Purge Time: 1121
Ending Purge Time: 1136
Average Purge Rate: ~0.6 gal/min
Total Volume Purged: ~9.5 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-8
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only~~. RSK

Field Team Leader: R Keenan

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: ~~60~~ 60's
Wind: 5-10 mph
Precipitation: None

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-13 S
Date: 12/5/97
Time at Well Site: 1549
Time of Sample Collection: 1605
Sampled by: MWB / MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: None
Field Blank /Rinse Water type:
Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft MD 0.
Column of Water in Well: ~~7.77~~ feet 10.19
Volume of Water in Well: ~~0.35~~ gallons MD 0.45
Well Volumes to Purge: 3
Min. Volume to be Purged: ~~1.1~~ MD gallons 1.4 MD
Method of Purging: ~~Centrifugal Pump~~ Peristalic Pump
Well Purged Dry?: (Yes) No

COLUMN OF WATER IN WELL BEFORE PURGE MD

Total Depth of Well: ~~15.0~~ ft TOC 17.4
Depth to Water : 7.21 ft TOC MD
Column of Water in Well: ~~7.79~~ ft 10.19
Stickup: 2.40 ft

Appearance of Sample: MED BROWN, SILTY

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1603					
Volume Removed (gal.):	1.0					
pH:	6.39					
Specific Conductance (µmhos/cm):	396					
Temperature (Degrees C):	78°F					
Turbidity (NTU):	159.5					
:						

Starting Purge Time: 1558
Ending Purge Time: ~~1~~ 1604
Average Purge Rate: ~0.2 gal/min
Total Volume Purged: ~1.2 gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-7
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only.~~ MGD
Does not produce well

Field Team Leader: M. Brunsma

GROUNDWATER SAMPLE COLLECTION FORM

SITE DESCRIPTION

Project Name: NGC / Cecil Field / FL
Project Number: 973-3778.102
Location: NAS Cecil Field

WEATHER CONDITIONS

Temperature: 60s
Wind: 5-10 mph
Precipitation:

SAMPLE DESCRIPTION

Sample ID: Bldg 68: TMW-13 D
Date: 12/5/97
Time at Well Site: 1549
Time of Sample Collection: 1620
Sampled by: MWB/MGD
Sampling Method: Bailer / Tubing
Type of Sampling Equipment: Polyethylene

FIELD BLANK NOTES

Field Blank Name: None
Field Blank /Rinse Water type:

Lot Number:
Analyses:

VOLUME OF WATER TO BE PURGED

Casing Inside Diameter: 1 inches
Casing Volume: 0.045 gal/ft
Column of Water in Well: 25.35 feet
Volume of Water in Well: 1.14 gallons
Well Volumes to Purge: 3
Min. Volume to be Purged: 3.42 gallons MD
Method of Purging: ~~Centrifugal Pump~~ Peristalic Pump
Well Purged Dry?: Yes (No)

COLUMN OF WATER IN WELL BEFORE PURGE

Total Depth of Well: 30.0 ft TOC
Depth to Water : 4.65 ft TOC
Column of Water in Well: 25.35 ft
Stickup: flush ft

Appearance of Sample: MED BROWN, SILTY

WELL PURGE CONTROL

	Purge 1	Purge 2	Purge 3	Purge 4	Purge 5	Purge 6
Time:	1611	1614	1616			
Volume Removed (gal.):	2.0	3.0	4.5			
pH:	6.27	6.08	5.89			
Specific Conductance (µmhos/cm):	223	184	175			
Temperature (Degrees F):	80°F	80°F	80°F			
Turbidity (NTU):			160.8			
:						

Starting Purge Time: 1606
Ending Purge Time: 1616
Average Purge Rate: ~0.4 gal/min
Total Volume Purged: 5 gal gallons

SAMPLE CONTAINERS REQUIRED

Analysis	Container Number, Type and Size	Filter	Preservative and Source
8260	(3) 40-ml vial	NA	HCl - Lab
8270	(2) 1-Liter Amber Glass	NA	None
8080	(1) 1-Liter Amber Glass	NA	None
Metals (6010)	(1) 500 ml plastic	NA	HNO_3 - Lab
Hg-L	(1) 250 ml plastic	NA	HNO_3 - Lab

Chain of Custody #:
Shuttle ID:
Trip Blank ID: Trip 68-7
Lab Name: Savannah Labs
Air Bill #:

EMARKS: ~~Shallow well only~~. MD

Field Team Leader: M. Brunsma

APPENDIX A-5

Daily Equipment Calibration Records

DAILY EQUIPMENT CALIBRATION LOG

WEATHER CONDITIONS

Temperature: 70's
Wind: 0-5 mph
Precipitation: Overcast

SITE DESCRIPTION

Project Name: NGC/Cecil Field/FL
Project Number: 973-3788.102
Location: Jacksonville, FL
Date: 12/4/97

pH Meter Calibration Log

Golder Associates Equipment No.:
Manufacturer: Hanna
Make/Model: HI-9023

Buffer Solution Brand: Cole Palmer
Lot Numbers: 4.01 - 6-1084
7.00 - 6-1222

TIME	pH BUFFER SOLUTION USED	METER READING	NOTES
11:00	pH Buffer 4.01	4.01	
	pH Buffer 7.00	7.00	Calibrated
	pH Buffer 10.00		
15:00	pH Buffer 4.01	3.86	
	pH Buffer 7.00	6.92	Calibrated to 4.01/7.00
	pH Buffer 10.00		
16:42	pH Buffer 4.01	4.00	
	pH Buffer 7.00	6.98	
	pH Buffer 10.00		
	pH Buffer 4.01		
	pH Buffer 7.00		
	pH Buffer 10.00		

Specific Conductance Meter Calibration Log

Golder Associates Equipment No.:
Manufacturer: Hanna
Make/Model: HI-9033

Buffer Solution Brand: Cole Palmer
Lot Number:

TIME	BUFFER SOLUTION USED	METER READING	NOTES
11:00	Buffer 46.7 (µmhos)		
	Buffer 445 (µmhos)	445	
	Buffer: (µmhos)		
15:00	Buffer 46.7 (µmhos)		
	Buffer 445 (µmhos)	447	
	Buffer: (µmhos)		
16:42	Buffer 46.7 (µmhos)		
	Buffer 445 (µmhos)	443	
	Buffer: (µmhos)		
	Buffer 46.7 (µmhos)		
	Buffer 445 (µmhos)		
	Buffer: (µmhos)		

Recommendations: TURBIDITY METER CALIBRATED PRIOR TO EACH SAMPLE WITH 40 NTU OR 1.0 NTU STANDARD

Printed Name: JAMES S PEARE **Signature:** James S Peare

DAILY EQUIPMENT CALIBRATION LOG

WEATHER CONDITIONS

Temperature: 50's
Wind: 0-5 mph
Precipitation: Sunny

SITE DESCRIPTION

Project Name: NGC/Cecil Field/FL
Project Number: 973-3788.102
Location: Jacksonville, FL
Date: 12/5/97

pH Meter Calibration Log

Golder Associates Equipment No.:
Manufacturer: Hanna
Make/Model: HI-9023

Buffer Solution Brand: Cole Palmer
Lot Numbers: 4.01 - 6-1084
7.00 - 6-1222

TIME	pH BUFFER SOLUTION USED	METER READING	NOTES
9:05	pH Buffer 4.01	4.00	
	pH Buffer 7.00	7.01	
	pH Buffer 10.00		
1315	pH Buffer 4.01	4.01	
	pH Buffer 7.00	6.97	
	pH Buffer 10.00		
	pH Buffer 4.01		
	pH Buffer 7.00		
	pH Buffer 10.00		
	pH Buffer 4.01		
	pH Buffer 7.00		
	pH Buffer 10.00		

Specific Conductance Meter Calibration Log

Golder Associates Equipment No.:
Manufacturer: Hanna
Make/Model: HI-9033

Buffer Solution Brand: Cole Palmer
Lot Number:

TIME	BUFFER SOLUTION USED	METER READING	NOTES
9:07	Buffer 46.7 (μmhos)		
	Buffer 445 (μmhos)	444	
	Buffer: (μmhos)		
1315	Buffer 46.7 (μmhos)		
	Buffer 445 (μmhos)	421	
	Buffer: (μmhos)		
	Buffer 46.7 (μmhos)		
	Buffer 445 (μmhos)		
	Buffer: (μmhos)		
	Buffer 46.7 (μmhos)		
	Buffer 445 (μmhos)		
	Buffer: (μmhos)		

Recommendations: TURBIDITY METER CALIBRATED PRIOR TO EACH SAMPLE WITH 40 NTU OR 1.0 NTU STANDARD

Printed Name: JAMES S. PEACE
Signature: James S. Peace

DAILY EQUIPMENT CALIBRATION LOG

WEATHER CONDITIONS

Temperature: 30-40° F
Wind: Light
Precipitation: —

SITE DESCRIPTION

Project Name: NGC/Cecil Field/FL
Project Number: 973-3788.102
Location: Jacksonville, FL
Date: 12/8/97

pH Meter Calibration Log

Golder Associates Equipment No.: N/A
Manufacturer: HANNA
Make/Model: HI 9023

Buffer Solution Brand: COLE PARMER
Lot Numbers: 4.01 - 6-1084
7.00 - 6-1376

TIME	pH BUFFER SOLUTION USED	METER READING	NOTES
0855	pH Buffer 4.01	4.00	CALIBRATED
	pH Buffer 7.00	7.01	CALIBRATED
	pH Buffer 10.00		
1315	pH Buffer 4.01	4.01	RECALIBRATED
	pH Buffer 7.00	6.85/7.01	INITIAL/RECAL
	pH Buffer 10.00		
1525	pH Buffer 4.01	4.00	END DAY
	pH Buffer 7.00	7.05	END DAY
	pH Buffer 10.00		
	pH Buffer 4.01		
	pH Buffer 7.00		
	pH Buffer 10.00		

Specific Conductance Meter Calibration Log

Golder Associates Equipment No.: N/A
Manufacturer: HANNA
Make/Model: HI-9033

Buffer Solution Brand: MYRON L
Lot Number: N/A

TIME	BUFFER SOLUTION USED	METER READING	NOTES
0850	Buffer 46.7 (μmhos)		
	Buffer 445 (μmhos)	443	CALIBRATED
	Buffer: (μmhos)		
1320	Buffer 46.7 (μmhos)		
	Buffer 445 (μmhos)	439/443	INITIAL/RECAL
	Buffer: (μmhos)		
1530	Buffer 46.7 (μmhos)	~~442~~	END DAY
	Buffer 445 (μmhos)	442	
	Buffer: (μmhos)		
	Buffer 46.7 (μmhos)		
	Buffer 445 (μmhos)		
	Buffer: (μmhos)		

Recommendations: TURBIDITY METER CALIBRATED PRIOR TO EACH SAMPLE WITH 40 NTU OR 1.0 NTU STANDARD

Printed Name: RICK KEENAN.

Signature: [signature]

Calibfm.xls

GOLDER ASSOCIATES INC.

APPENDIX A-6

Surveyor's Report of Monitoring Well, Piezometer, and Soil Boring Locations and Elevations

POINT NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
105	13387.860	10067.742	77.583	SB+4-B900
106	13344.847	10073.686	77.283	MW+5S-B900
107	13343.685	10073.680	77.172	MW+5D-B900
108	13609.689	10063.320	78.351	MW+3S-B900
109	13608.186	10063.188	78.261	MW+3D-B900
110	13550.907	10217.402		BDC+IBC-900
111	13551.038	10123.508		BDC+IBC-900
112	13559.646	10203.599	78.566	SB+3-B900
113	13612.126	10262.944	78.888	MW+4S-B900
114	13611.060	10264.136	78.824	MW+4D-B900
115	13393.230	10217.370		BDC+B1C-900
116	13377.848	10204.863	77.996	MW+1S-B900
117	13377.622	10205.901	78.231	MW+1D-B900
118	13375.937	10189.665	78.239	MW+2S-B900
119	13375.438	10190.906	78.241	MW+2D-B900
120	13355.533	10264.310	77.616	MW+6S-B900
121	13355.405	10263.045	77.405	MW+6D-B900
122	13380.659	10132.422	78.491	SB5-B900
124	12883.869	10169.140	75.711	DSB1
126	9942.963	10059.386	76.501	BM+5-EL. 76.50
127	10036.360	9936.403	75.965	MW+5S-B68
128	10035.977	9938.445	75.987	MW+5D-B68
130	10177.614	9935.158	76.462	MW+1S-B68
131	10170.962	9934.836	76.566	SB+2-B68
132	10188.531	9935.004	76.548	SB+1-B68

133	10360.263	9915.685		BDC+M1I-68A
134	10360.289	9915.709		BDC+M1I-68B
135	10060.455	9714.840		BDC+M1I-68A
136	10094.216	9640.931	75.175	MW+6S-B68
137	10095.463	9644.264	75.250	MW+6D-B68
153	10373.423	9453.876	74.400	MW+12S-B68
154	10374.463	9453.815	74.410	MW+12D-B68
155	10376.949	9316.832	74.733	MW+11S-B68
156	10378.068	9317.101	74.798	MW+11D-B68
157	10490.509	9322.530	75.151	MW+9S-B68
158	10489.564	9324.706	75.210	MW+9D-B68
159	10648.534	9426.349	76.204	MW+10S-B68
160	10647.844	8427.921	81.149	MW+10D-B68
161	10546.608	9488.870	78.724	MW+13S-B68
162	10553.514	9488.843	76.185	MW+13D-B68
163	10468.178	9669.190	76.082	MW+7S-B68
164	10468.366	9666.411	75.939	MW+7D-B68
167	10899.933	9657.447	76.416	MW+8S-B68
168	10900.303	9654.845	76.512	MW+8D-B68
170	10895.129	9971.155	76.324	MW+3S-B68
171	10894.992	9973.011	76.340	MW+3D-B68
172	10708.264	9947.486	76.468	MW+2S-B68
173	10718.291	9940.250	76.534	SB+3-B68
174	10698.470	9939.738	76.565	SB+4-B68
178	10440.871	9973.840	75.752	MW+4S-B68
179	10437.619	9974.167	75.725	MW+4D-B68

APPENDIX B

Laboratory Analytical Report

APPENDIX B-1

Positive Results Summary Report

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S7-76867
Received: 05 DEC 97
Reported: 15 DEC 97

Mr. Mark Jordana
Golder Associates, Inc.
8933 Western Way, Suite 12
Jacksonville, FL 32256

CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 102871216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
76867-1	68-TMW-6(S)-GW	12-04-97
76867-2	68-TMW-6(D)-GW	12-04-97
76867-3	Duplicate 68-5	12-04-97
76867-4	EQ. Blank-68-6	12-04-97

PARAMETER	76867-1	76867-2	76867-3	76867-4
Volatile Organic Compounds (8260)				
Bromodichloromethane, ug/l	---	2.9	4.5	---
Carbon disulfide, ug/l	19	4.3	3.7	---
Dibromochloromethane, ug/l	---	1.5	2.0	---
Chloroform, ug/l	---	7.3	10	---

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

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Code: 102871216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
76867-1	68-TMW-6(S)-GW	12-04-97
76867-2	68-TMW-6(D)-GW	12-04-97
76867-3	Duplicate 68-5	12-04-97
76867-4	EQ. Blank-68-6	12-04-97

PARAMETER	76867-1	76867-2	76867-3	76867-4
Metals (6010)				
Barium, mg/l	0.019	0.073	0.076	---
Chromium, mg/l	---	0.028	0.028	---
Lead, mg/l	---	0.018	0.017	---
Vanadium, mg/l	---	0.013	0.012	---
Zinc, mg/l	---	---	---	0.027

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CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 102871216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
76867-5	68-TMW-7(S)	12-04-97
76867-6	68-TMW-7(D)	12-04-97
76867-7	Duplicate-68-6	12-04-97

PARAMETER	76867-5	76867-6	76867-7
Volatiles by GC/MS (8260)			
Carbon disulfide, ug/l	16	10	48
Arsenic (6010)			
Arsenic, mg/l	---	0.018	0.020
Barium (6010)			
Barium, mg/l	0.042	0.18	0.16
Cadmium (6010)			
Cadmium, mg/l	---	0.0054	0.0052
Chromium (6010)			
Chromium, mg/l	---	0.12	0.10
Lead (6010)			
Lead, mg/l	0.0088	0.074	0.069

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CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 102871216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
76867-9	EQ. Blank-68-SS-8	12-04-97

PARAMETER	76867-9
Volatiles by GC/MS (8260)	
Carbon disulfide, ug/l	2.2

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& ENVIRONMENTAL SERVICES, INC.

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Jacksonville, FL 32256

CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 102871216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
76867-15	68-TMW-10-SL	12-04-97/1640
76867-16	68-TMW-7-SL	12-04-97/1645
76867-17	68-TMW-6-SL	12-04-97/1550
76867-18	68-TMW-9-SL	12-04-97/1625
76867-19	68-TMW-11-SL	12-04-97/1600

PARAMETER	76867-15	76867-16	76867-17	76867-18	76867-19
TCL Semivolatiles (8270)					
bis(2-Chloroethyl)ether, ug/kg dw	---	580	---	---	---

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

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Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 102871216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
76867-15	68-TMW-10-SL	12-04-97/1640
76867-16	68-TMW-7-SL	12-04-97/1645
76867-17	68-TMW-6-SL	12-04-97/1550
76867-18	68-TMW-9-SL	12-04-97/1625
76867-19	68-TMW-11-SL	12-04-97/1600

PARAMETER	76867-15	76867-16	76867-17	76867-18	76867-19
Volatiles by GC/MS (8260)					
Acetone, ug/kg dw	---	---	---	---	70
Trichloroethene, ug/kg dw	34	---	---	---	---
Barium (6010)					
Barium, mg/kg dw	1.9	7.1	3.3	2.5	4.3
Chromium (6010)					
Chromium, mg/kg dw	1.8	1.5	2.9	1.6	2.2
Lead (6010)					
Lead, mg/kg dw	1.7	1.7	7.8	1.9	2.7
Mercury (7471)					
Mercury, mg/kg/dw	---	0.016	0.014	---	0.017

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8933 Western Way, Suite 12
Jacksonville, FL 32256

CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 102871216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
76867-21	68-TMW-12-SL	12-04-97/1615
76867-22	68-TMW-1-SL	12-04-97/1315
76867-23	68-TMW-2-SL	12-04-97/1421
76867-24	68-TMW-5-SL	12-04-97/1525
76867-25	68-TMW-4-SL	12-04-97/1515

PARAMETER	76867-21	76867-22	76867-23	76867-24	76867-25
TCL Semivolatiles (8270)					
bis(2-Chloroethyl)ether, ug/kg dw	---	---	---	---	---

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S7-76867
Received: 05 DEC 97
Reported: 15 DEC 97

Mr. Mark Jordana
Golder Associates, Inc.
8933 Western Way, Suite 12
Jacksonville, FL 32256

CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 102871216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
76867-21	68-TMW-12-SL	12-04-97/1615
76867-22	68-TMW-1-SL	12-04-97/1315
76867-23	68-TMW-2-SL	12-04-97/1421
76867-24	68-TMW-5-SL	12-04-97/1525
76867-25	68-TMW-4-SL	12-04-97/1515

PARAMETER	76867-21	76867-22	76867-23	76867-24	76867-25
Volatiles by GC/MS (8260)					
Acetone, ug/kg dw	---	---	---	---	---
Trichloroethene, ug/kg dw	---	---	---	---	---
Barium (6010)					
Barium, mg/kg dw	5.1	2.8	5.1	2.5	3.8
Chromium (6010)					
Chromium, mg/kg dw	1.4	1.9	2.2	1.5	2.4
Lead (6010)					
Lead, mg/kg dw	1.6	3.4	2.1	2.1	20
Mercury (7471)					
Mercury, mg/kg/dw	0.014	---	---	0.012	0.014

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

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Received: 05 DEC 97
Reported: 15 DEC 97

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Golder Associates, Inc.
8933 Western Way, Suite 12
Jacksonville, FL 32256

CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 102871216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
76867-26	Duplicate-68-SS-2	12-04-97
76867-27	68-TMW-3-SL	12-04-97/1500
76867-28	68-TMW-8-SL	12-04-97/1545
76867-29	Duplicate-68-SS-3	12-04-97

PARAMETER	76867-26	76867-27	76867-28	76867-29
TCL Semivolatiles (8270)				
bis(2-Chloroethyl)ether, ug/kg dw	---	---	---	---

SL SAVANNAH LABORATORIES
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LOG NO: S7-76867
Received: 05 DEC 97
Reported: 15 DEC 97

Mr. Mark Jordana
Golder Associates, Inc.
8933 Western Way, Suite 12
Jacksonville, FL 32256

CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 102871216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
76867-26	Duplicate-68-SS-2	12-04-97
76867-27	68-TMW-3-SL	12-04-97/1500
76867-28	68-TMW-8-SL	12-04-97/1545
76867-29	Duplicate-68-SS-3	12-04-97

PARAMETER	76867-26	76867-27	76867-28	76867-29
Volatiles by GC/MS (8260)				
Acetone, ug/kg dw	---	---	---	---
Trichloroethene, ug/kg dw	---	---	---	---
Barium (6010)				
Barium, mg/kg dw	1.6	2.7	7.7	1.8
Chromium (6010)				
Chromium, mg/kg dw	2.1	3.7	1.8	1.4
Lead (6010)				
Lead, mg/kg dw	2.2	3.0	6.3	2.1
Mercury (7471)				
Mercury, mg/kg/dw	0.020	0.040	---	---

SL SAVANNAH LABORATORIES
& ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S7-76867
Received: 05 DEC 97
Reported: 15 DEC 97

Mr. Mark Jordana
Golder Associates, Inc.
8933 Western Way, Suite 12
Jacksonville, FL 32256

CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 102871216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
76867-30	68-SB-3	12-04-97/1430
76867-31	68-SB-1	12-04-97/1325
76867-32	68-SB-4	12-04-97/1410
76867-33	68-SB-2	12-04-97/1245

PARAMETER	76867-30	76867-31	76867-32	76867-33
Percent Solids (160.3), %	85	89	88	89

Steven J. White

Steven J. White

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: S7-76897
Received: 06 DEC 97
Reported: 16 DEC 97

Mr. Mark Jordana
Golder Associates, Inc.
8933 Western Way, Suite 12
Jacksonville, FL 32256

CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 153771216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
76897-2	68-TMW-2(S)	12-04-97/1635
76897-3	EQ. Blank-68-8	12-04-97/1635

PARAMETER	76897-2	76897-3
Lead (200.7)		
Lead, mg/l	0.0072	0.0070

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LOG NO: S7-76897
Received: 06 DEC 97
Reported: 16 DEC 97

Mr. Mark Jordana
Golder Associates, Inc.
8933 Western Way, Suite 12
Jacksonville, FL 32256

CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 153771216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
76897-4	68-TMW-13(S)	12-05-97/1605
76897-5	68-TMW-13(D)	12-05-97/1620
76897-6	68-TMW-8(S)	12-05-97
76897-7	68-TMW-8(D)	12-05-97
76897-9	68-TMW-10(D)	12-05-97/1534

PARAMETER	76897-4	76897-5	76897-6	76897-7	76897-9
Volatiles by GC/MS (8260)					
Carbon disulfide, ug/l	1.2	8.4	7.4	14	10
Chloroform, ug/l	---	4.6	---	---	6.1
Bromodichloromethane, ug/l	---	3.1	---	---	3.0
Dibromochloromethane, ug/l	---	1.8	---	---	1.5
Arsenic (6010)					
Arsenic, mg/l	---	---	---	0.014	0.015
Barium (6010)					
Barium, mg/l	0.021	0.051	0.019	0.041	0.058
Cadmium (6010)					
Cadmium, mg/l	---	---	---	0.011	---
Chromium (6010)					
Chromium, mg/l	0.016	0.12	---	0.055	0.12
Lead (6010)					
Lead, mg/l	0.014	0.0090	0.012	0.062	0.096
Mercury (7470)					
Mercury, mg/l	---	---	---	0.00022	0.00036

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POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
76897-4	68-TMW-13(S)	12-05-97/1605
76897-5	68-TMW-13(D)	12-05-97/1620
76897-6	68-TMW-8(S)	12-05-97
76897-7	68-TMW-8(D)	12-05-97
76897-9	68-TMW-10(D)	12-05-97/1534

PARAMETER	76897-4	76897-5	76897-6	76897-7	76897-9
Selenium (6010)					
Selenium, mg/l	---	---	---	0.056	0.14

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Sampled By: Client
Code: 153771216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
76897-10	Duplicate 68-8	12-05-97

PARAMETER	76897-10
Volatiles by GC/MS (8260)	
Carbon disulfide, ug/l	1.9
Chloroform, ug/l	---
Bromodichloromethane, ug/l	---
Dibromochloromethane, ug/l	---
Arsenic (6010)	
Arsenic, mg/l	---
Barium (6010)	
Barium, mg/l	---
Cadmium (6010)	
Cadmium, mg/l	---
Chromium (6010)	
Chromium, mg/l	---
Lead (6010)	
Lead, mg/l	---
Mercury (7470)	
Mercury, mg/l	---
Selenium (6010)	
Selenium, mg/l	---

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Code: 153771216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE SAMPLED
76897-12	Duplicate-68-7	12-05-97
76897-13	68-TMW-3(S)	12-05-97/0940
76897-14	68-TMW-3(D)	12-05-97

PARAMETER	76897-12	76897-13	76897-14
Volatile Organic Compounds (8260)			
Carbon disulfide, ug/l	26	3.4	12
Chlorinated Dioxins/Furans-App 9 (8280)			
Hexa CDD, ug/l	---	---	0.0050
Metals (6010)			
Barium, mg/l	0.013	0.013	0.057
Chromium, mg/l	---	---	0.046
Lead, mg/l	---	---	0.011
Vanadium, mg/l	---	---	0.011
Zinc, mg/l	---	0.031	0.028

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Received: 06 DEC 97
Reported: 16 DEC 97

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Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 153771216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
76897-18	68-TMW-13-SL	12-05-97/1045
76897-19	Duplicate-68-SS-4	12-05-97/1045

PARAMETER	76897-18	76897-19
Volatiles by GC/MS (8260)		
Acetone, ug/kg dw	---	190
Benzene, ug/kg dw	---	16
Toluene, ug/kg dw	---	15
Xylenes, ug/kg dw	---	13
Barium (6010)		
Barium, mg/kg dw	8.2	3.1
Lead (6010)		
Lead, mg/kg dw	1.8	1.4

Steven J. White

Steven J. White

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

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LOG NO: S7-76942
Received: 09 DEC 97
Reported: 16 DEC 97

Mr. Mark Jordana
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CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 172471216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
76942-1	68-TMW-12(S)	12-08-97/1146
76942-2	68-TMW-12(D)	12-08-97/1145
76942-3	68-TMW-5(S)	12-08-97/1348
76942-4	68-TMW-5(D)	12-08-97/1405
76942-5	68-TMW-4(S)	12-08-97/1530

PARAMETER	76942-1	76942-2	76942-3	76942-4	76942-5
Barium (6010)					
Barium, mg/l	0.027	0.046	0.060	0.029	0.12
Chromium (6010)					
Chromium, mg/l	---	0.012	0.015	---	0.036
Lead (6010)					
Lead, mg/l	---	0.0068	0.031	---	0.055
Mercury (7470)					
Mercury, mg/l	---	---	---	---	0.00036

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LOG NO: S7-76942
Received: 09 DEC 97
Reported: 16 DEC 97

Mr. Mark Jordana
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Jacksonville, FL 32256

CC: Rick Doria (Grumman-St)

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 172471216

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , LIQUID SAMPLES	DATE/ TIME SAMPLED
76942-6	68-TMW-4(D)	12-08-97/1510
76942-7	68-TMW-9(S)	12-08-97/0945
76942-8	68-TMW-9(D)	12-08-97/0935
76942-9	68-TMW-11(S)	12-08-97/1040
76942-10	68-TMW-11(D)	12-08-97/1045

PARAMETER	76942-6	76942-7	76942-8	76942-9	76942-10
Barium (6010)					
Barium, mg/l	0.052	0.013	0.038	0.38	0.034
Chromium (6010)					
Chromium, mg/l	0.067	---	0.014	0.080	0.033
Lead (6010)					
Lead, mg/l	0.013	---	0.023	0.15	0.014
Mercury (7470)					
Mercury, mg/l	---	---	---	0.00023	---

Steven J. White

Steven J. White

SL SAVANNAH LABORATORIES & ENVIRONMENTAL SERVICES, INC.

5102 LaRoche Avenue • Savannah, GA 31404 • (912) 354-7858 • Fax (912) 352-0165

LOG NO: T7-23491
Received: 10 DEC 97
Reported: 16 DEC 97

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CC: Mr. Rick Doria

Project: 973-3778/Grumman Cecil Field
Sampled By: Client
Code: 143071229

POSITIVE RESULTS SUMMARY REPORT

LOG NO	SAMPLE DESCRIPTION , SOLID OR SEMISOLID SAMPLES	DATE/ TIME SAMPLED
23491-1	68-SED-1	12-09-97/1400

PARAMETER	23491-1
TCL Semivolatiles (8270)	
Phenanthrene, ug/kg dw	480
Fluoranthene, ug/kg dw	1200
Pyrene, ug/kg dw	1000
bis(2-Ethylhexyl)phthalate, ug/kg dw	1100
Chrysene, ug/kg dw	730
Benzo(b)fluoranthene, ug/kg dw	780
Benzo(a)pyrene, ug/kg dw	440
ICP Metals (6010)	
Arsenic, mg/kg dw	1.1
Barium, mg/kg dw	22
Chromium, mg/kg dw	12
Lead, mg/kg dw	34
Percent Solids, %	77

APPENDIX B-2

Computer Disk with
Soil and Groundwater Analytical Data