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PROJECT COMPLETION REPORT PHASE I GROUNDWATER TREATMENT AND
RECOVERY SYSTEM OPERABLE UNIT 1 (OU1) NAS PENSACOLA FL
3/1/2000
BECHTEL ENVIRONMENTAL, INC

**PROJECT COMPLETION REPORT
PHASE 1 GROUNDWATER TREATMENT
AND RECOVERY SYSTEM
AT
OPERABLE UNIT 1**

**NAVAL AIR STATION
PENSACOLA, FLORIDA**

Prepared for
**DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND**

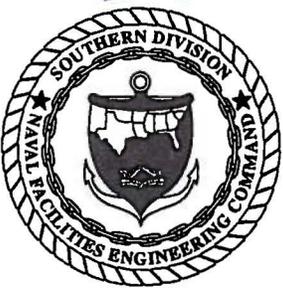
Under Contract No. N62467-93-D-0936
DELIVERY ORDER 0072



Prepared by
**BECHTEL ENVIRONMENTAL, INC.
OAK RIDGE, TENNESSEE**

March 2000

BECHTEL JOB NO. 22567



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FOR
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ACRONYMS AND ABBREVIATIONS

Bechtel	Bechtel Environmental, Inc.
FOTW	federally-owned treatment works
HDPE	high-density polyethylene
NAS	Naval Air Station
NPDES	National Pollutant Discharge Elimination System
PVC	polyvinyl chloride
RAC	Response Action Contractor
ROD	Record of Decision
RWP	Remedial Work Plan
SDR	standard dimension ratio

UNITS OF MEASUREMENT

bls	below land surface
ft	foot
gpm	gallons per minute
in.	inch
mg/L	milligrams per liter
mil	1/1,000 of an inch

EXECUTIVE SUMMARY

This report describes the implementation and installation of the remedial design for the Operable Unit (OU) 1 groundwater recovery and treatment system at the Naval Air Station (NAS) Pensacola, Florida. The work was performed under Delivery Order 0072 in accordance with the *Final Record of Decision, Operable Unit 1, NAS Pensacola*, (EnSafe Inc. 1998a) issued August 19, 1998. The Record of Decision (ROD) required several remedies or related institutional actions; however, it specifically required the installation of a groundwater interceptor system to collect and treat groundwater migrating from Site 1, a former sanitary landfill. Groundwater from this landfill was adversely impacting Wetland 3 to the east of the landfill site. Iron-laden groundwater originated as landfill leachate and recharged Wetland 3 through seeps. When exposed to aerobic conditions and higher levels of dissolved oxygen in the wetland, oxidation of the soluble ferrous iron results, and the iron precipitates as ferric hydroxide. Over time the alkalinity of the water is reduced by this reaction, and the formation of a red precipitate impacts the aesthetic quality of the wetland. Insoluble iron accumulates in the wetland, but the soluble iron concentrations in water leaving Wetland 3 exceeded the Florida Surface Water Quality Standard of 1.0 mg/L.

A phased approach will be used for the remedial action; this report describes Phase I that addresses the following elements of the ROD:

- Installation of an anoxic limestone trench for interception and treatment system for iron-contaminated groundwater originating from landfill leachate and entering Wetland 3.
- Abandonment of 19 groundwater wells located in the Operable Unit 1 area.

Phase II of the remedial action will address the remaining elements of the ROD. Phase II and subsequent activities are outside the scope of work for Bechtel.

Phase I, the construction of the groundwater treatment and recovery system, was accomplished in 8 weeks. Work began on April 12, 1999, with pre-construction activities, followed by clearing and site layout. Construction of the interceptor trench was begun during the week of April 26, 1999. Following a brief delay to obtain a larger trenching machine, trenching was completed on May 7, 1999. Groundwater force main installation, backfill activities, well abandonments, and piezometer installations were conducted concurrently with trenching activities. Directional drilling was used to route the force main under Taylor Road. Electrical services were extended from the station's picnic area along the western shoulder of John Tower Road and into the groundwater pumping system. System testing, startup, and performance monitoring were performed in early June 1999.

1.0 INTRODUCTION

Bechtel Environmental, Inc. (Bechtel) was contracted by the Department of the Navy, Naval Facilities Engineering Command, Southern Division (SouthDiv), to provide remedial services as the Navy's Environmental Response Action Contractor (RAC). Under Delivery Order 0072 of Prime Contract N62467-93-D-0936, Bechtel was contracted to prepare and implement a Remedial Work Plan (RWP) and perform field work for the installation of a groundwater treatment and recovery system for Operable Unit 1 (OU-1) at Naval Air Station (NAS) Pensacola, Florida. The work was performed in accordance with the *Final Record of Decision, Operable Unit 1, NAS Pensacola* (EnSafe Inc. 1998a), issued August 19, 1998. The Record of Decision (ROD) required several remedies or related institutional actions; however, it specifically required the installation of a groundwater inceptor system to collect and treat groundwater migrating from Site 1, a former sanitary landfill, and adversely impacting Wetland 3 to the east of the landfill site. Iron-laden groundwater originated as landfill leachate and recharged Wetland 3 through seeps. When exposed to aerobic conditions and higher levels of dissolved oxygen in the wetland, oxidation of the soluble ferrous iron resulted, and the iron precipitated as ferric hydroxide. Over time the alkalinity of the water was reduced by this reaction, and the formation of a red precipitate impacted the aesthetic quality of the wetland. Insoluble iron accumulated in the wetland, but the soluble iron concentrations in water discharging from Wetland 3 exceeded the Florida Surface Water Quality Standard of 1.0 mg/L.

The technology for the collection and treatment system was proposed in the *Conceptual Remedial Design at Operable Unit (OU) 1, Naval Air Station Pensacola, Florida, Rev. 1* (EnSafe 1998b). The conceptual design described the general technology and design parameters for the installation of an anoxic limestone drain and a groundwater recovery and pumping system. The conceptual design was approved by the U.S. Environmental Protection Agency (EPA), the Florida Department of Environmental Protection (FDEP), and the Navy and became the design basis document for the remedial design.

The final remedial design was prepared by Bechtel and was included as a component of the *Remediation Work Plan/Remedial Design for Phase I Groundwater Treatment and Recovery System at Operable Unit 1*. FDEP and EPA reviewed and approved the final remedial design.

1.1 SITE DESCRIPTION

Site 1 is a former landfill covering approximately 85 acres on the eastern half of NAS Pensacola as shown on Figure 1-1. The site is bordered to the west by Forrest Sherman Airfield, to the north by Bayou Grande, to the east by Wetland 3 and the NAS golf course, and to the south by Taylor Road. The landfill elevation varies from 8 to 20 ft above mean sea level. Wetland 3 is an irregular shaped area of 6-7 acres and is separated from the landfill's easternmost boundary by a narrow strip of undisturbed woods. Figure 1-2 shows an enlargement of the Site 1 area providing details on additional features such as the approximate boundaries of Wetland 3.

2.0 SCOPE OF WORK

The Bechtel scope of work for the Phase I Groundwater Treatment and Recovery System at Operable Unit 1 included the following activities:

- Preparation and implementation of the final remedial design based on Bechtel's interpretation of the conceptual design requirements.

- Construction/installation of the anoxic limestone interceptor trench/drain.
- Horizontal/directional drilling to tie in force main, interceptor trench, and pumping system with sanitary sewer system on western side of the NAS Pensacola Brig.
- Extension of electrical utilities to the site and installation of prefabricated control panel.
- Abandonment of 22 groundwater monitoring wells that will not be used for data collection during the natural attenuation monitoring program.
- Installation of five piezometers to monitor changes in groundwater elevation both upgradient and downgradient of the interceptor trench.

2.1 MOBILIZATION

Bechtel mobilized a Site Superintendent to NAS Pensacola on April 12, 1999, and a Geologist/Field Engineer on April 26, 1999, to perform the fieldwork, including oversight of Bechtel subcontractors. Subcontractors included:

Subcontractor	Address	Responsibility
Onsite Environmental	Onsite Commercial Staffing P.O. Box 198531 Atlanta, GA 30384-8531	Laborers/equipment operators for clearing and miscellaneous field activities
A-1 Land Surveying, Inc.	504 E. Wright Street Pensacola, FL 32501	Trench location layout
Dewind Dewatering, Inc.	7778 116 th Street Holland, MI 49424	Installation of groundwater interceptor trench
Line Power	428 Childers Street Pensacola, FL 32534	Electrical work for groundwater recovery system
Coastal Horizontal	P. O. Box 1837 Ft. Walton Beach, FL 32549	Horizontal drilling beneath Taylor Road
Partridge Well Drilling Co., Inc.	4744 Collins Road Orange Park, FL 32073-2023	Well abandonments and piezometer installations

A pre-construction meeting was held April 14, 1999, before field activities began. The meeting was conducted by Ron Joyner, Base Environmental Department. Representatives from NAS Pensacola Base Security, Fire Department, and the ROICC office were present, in addition to Bechtel Site Superintendent James Pongrace.

3.0 EXECUTION OF WORK

The remediation method selected for Phase I was installation of an anoxic interceptor trench downgradient and to the east of the former landfill to intercept groundwater before it recharges Wetland 3. The limestone provides the alkalinity necessary for the eventual precipitation of the iron at the NAS federally-owned treatment works (FOTW). The design called for the intercepted groundwater to be automatically pumped to the NAS Pensacola sanitary sewer system with treatment at the FOTW.

In the treatment process, the dissolved iron is oxidized to the ferric state by the FOTW's processes and acts as a flocculent aid for the wastewater clarification unit operations. The ferric hydroxide becomes matrixed with the biological sludge that is "wasted" from the treatment facility as required to maintain appropriate operating parameters for effective waste treatment. The sludge is then land-disposed under an existing permit. Treated water from the FOTW is discharged to Pensacola Bay under National Pollutant Discharge Elimination System (NPDES) Permit No. FL0002500 that expires on December 31, 1999.

During the fieldwork, it was necessary to make minor changes or adjustments to the installation of the groundwater treatment and recovery system. Among these changes/adjustments are the following:

- Tracer wire was installed the length of the interceptor trench except where it extends beneath Taylor Road. Tracer wire was pushed approximately 20 ft into each end of the pipe sleeve that extends beneath Taylor Road leaving a short non-continuous segment beneath the road.
- A 4-in. sleeve was used beneath Taylor Road rather than a 5-in. sleeve.
- Due to a change in sleeve size (5 in. to 4 in.), the pipe for the portion of the force main beneath Taylor Road was reduced from 2½ in. to 2 in.
- A precast, high-strength, fiberglass well vault was installed around the riser casing for the interceptor trench.
- One additional piezometer was installed upgradient from the interceptor trench.

As-built drawings are provided (Attachment 2) that show the details of the groundwater treatment and recovery system installation as it was actually performed. The following subsections summarize work activities performed during system installation.

3.1 SITE PREPARATION

All aboveground and underground utilities were located and marked before intrusive activities began. Fieldwork began with clearing and grubbing of an area approximately 30 ft wide by 700 ft long in preparation for laying out the trench location. Care was taken to avoid disturbance of the wetland area. Trees from clearing and grubbing activities to be cut and used for firewood at the nearby station picnic area were stacked aside for station personnel to retrieve. Subcontractor survey personnel performed layout of the trench following clearing of the area. Minor clearing was performed along John Tower and Taylor Roads in preparation of pipeline installation.

3.2 WELL ABANDONMENT

As part of the long-term monitoring requirements specified in the conceptual design, EnSafe identified 22 existing groundwater monitoring wells that were deemed unnecessary to support the natural attenuation monitoring program. As part of the scope of this remedial action, Bechtel's subcontractor, Partridge Drilling, performed well abandonment on the wells listed below. Abandonment was performed in accordance with the applicable sections of *Standard Specifications for Well Drilling, Installation, and Abandonment*, 001-SP000-022, Rev. 1, dated February 5, 1999. Well abandonment logs are provided in Table 3-1. Abandonment of these wells was the only element of the long-term monitoring recommendations that Bechtel implemented under this remedial action.

**Table 3-1
List of Abandoned Wells**

Well Identification Number	Depth Interval	Date of Abandonment
GGM32	Shallow	27 April 99
GGM31	Shallow	27 April 99
GS40	Shallow	27 April 99
GI63	Intermediate	27 April 99
GS60	Shallow	27 April 99
GI61	Intermediate	27 April 99
GS01	Shallow	27 April 99
GI28	Intermediate	27 April 99
GGM35	Shallow	27 April 99
GI30	Intermediate	28 April 99
GGM45	Deep	28 April 99
GGM42	Shallow	28 April 99
GGM43	Deep	28 April 99
GS39	Shallow	28 April 99
GI38	Intermediate	28 April 99
GS58	Shallow	28 April 99
GS37	Shallow	28 April 99
GI35	Intermediate	28 April 99
GGM39	Shallow	28 April 99
GGM44	Deep	28 April 99
GGM03	Shallow	28 April 99
GGM34	Shallow	29 April 99

3.3 EXTENSION OF TELEPHONE AND ELECTRICAL SERVICES

Telephone line was routed to the trench area from a tie-in to voice/data communication lines at the northwestern corner of the intersection of John Tower and Taylor Roads. Telephone and locator wires were buried in a common trench with the groundwater force main. This work was performed by the station's telephone services contractor.

Electrical services were provided by Bechtel's subcontractor, Line Power. Electrical service was routed to the interceptor trench riser pipe location from overhead lines at the picnic area near the northern extension of John Tower Road.

3.4 INSTALLATION OF INTERCEPTOR TRENCH/DRAIN

Dewind Dewatering performed trenching activities related to the installation of the anoxic limestone trench. The trench was installed in accordance with Technical Specification 413-SP-840-001. The trench/drain measured 670 ft in length and 16 in. in width at completion. Its depth ranges from 2 ft bls at the cleanout vault to 18 ft bls at the vertical riser pipe. Six inches of limestone rock were placed in the bottom of the trench. Five-inch, high-density polyethylene (HDPE), corrugated, slotted drain pipe was installed above the 6 in. layer of limestone rock. The HDPE was double wrapped in 1.3-ounce-per-square-yard polyester filter sock and covered with limestone rock to within 18 in. of ground surface. Subsequent to completion of the interceptor trench, a 20-mil PVC liner was placed over the limestone rock and covered with 18 in. of compacted backfill material, using native soil excavated during trenching.

3.5 INSTALLATION OF PUMPING SYSTEM

Upon completion of the interceptor trench/drain, the pumping system for automatic extraction of groundwater from the vertical riser pipe was installed. The pumping system consists of a 12-in. vertical riser pipe and a 30 in. × 48 in. × 24 in., pre-fabricated, fiberglass well vault with an open bottom as surface completions for the vertical riser pipe and cleanout vault. A submersible effluent pump, Goulds Model No. LDN1012, with three pump level sensors/control switches, was installed in the vertical riser pipe. The sensor levels are high-high level (7 ft bls), high level (9 ft bls), and low level (13 ft bls). The pumping cycles on and off automatically between the high and low level switches. The high-high switch activates an alarm.

3.6 FORCE MAIN INSTALLATION

The final remedial design specified that groundwater extracted from the interceptor trench would be pumped into the FOTW at NAS Pensacola through 2½-in. standard dimension ratio (SDR) 26 PVC pipe. This force main was installed in a 6-in. wide trench excavated using a small trenching machine (i.e., Ditch Witch). The force main terminates into an existing sanitary sewer manhole at the northwestern corner of the NAS Pensacola Brig.

Horizontal/directional drilling was required to route the force main beneath Taylor Road for a distance of approximately 100 ft. This directional drilling was performed by a Coastal Horizontal, a lower-tier subcontractor to Line Power. A 4-in. HDPE pipe sleeve was installed beneath Taylor Road instead of a 5-in. as originally planned. The piping was also changed to 2-in. PVC with solvent-welded couplings for the piping segment to be inserted through the sleeve.

3.7 INSTALLATION OF PIEZOMETERS

In the RWP, four piezometers were to be installed; however, a decision was made during construction to install an additional piezometer upgradient of the trench. The locations of the piezometers are shown in the as-built drawings provided with this report. Newly installed piezometers include P-1, P-6, P-7, P-8, and P-9. Piezometers P-6 through P-8 monitor groundwater on the eastern side of the interceptor trench. P-1 was actually an existing piezometer that also monitors groundwater to the east of the trench. P-9 was installed upgradient of the interceptor trench and close to monitoring well 01GGM39.

4.0 PERMITS

Permits were required for construction of the anoxic limestone trench (i.e., the 12-in. vertical riser/casing), the five new piezometers, and the 22 groundwater monitoring wells to be abandoned. These permits were obtained by Partridge Well Drilling Company, Inc., through the St. Johns River Water Management District. Bechtel's environmental compliance representative for the Navy RAC project assisted Base Environmental staff in preparing the application for an Individual Water Use Permit required to withdraw water from a well casing greater than 6 in. in diameter. The permit, No. 19990029, was issued in June 1999. Bechtel also assisted the station in obtaining the concurrence of the Florida Department of Environmental Protection Pensacola office for the discharge of extracted groundwater into the FOTW in accordance with the conditions of the station's NPDES permit.

The vertical riser pipe installed was 12 in. in diameter, and it was assumed that the pump rate would be no more than 20 gpm. However, during startup activities, it was found that the pump was capable of pumping at a higher rate (30 gpm) which resulted in a flow rate that exceeded the original use permit. Bechtel reduced the pumping rate to less than 20 gpm on a full-time basis and recommended that a permit modification be requested to allow the higher pumping rate, enabling improved groundwater capture.

5.0 STARTUP TESTING AND PERFORMANCE MONITORING

Installation of electrical utilities, system startup, and performance monitoring were performed during a 2-week period from June 8-17, 1999. Work performed the first week included setting utility poles for electrical service to the system, installation of a concrete pad for the system control panel, and telephone connections to the control panel. Initial startup of the system began on June 14, 1999, with initiation of groundwater pumping through the force main, inspection of exposed pipe joints for leaks, calibration of flow transmitter, programming of control panel autodialer, and activation of long-distance telephone service for the control panel telemetry system.

Water levels in piezometer was measured during the second week of startup activities and a 0.63 ft drawdown was observed in the 12-ft riser pipe after 3 days of continuous pumping at approximately 30 gpm. Groundwater samples were collected on June 16, 1999, and submitted for laboratory analysis for volatile organic compounds, Target Analyte List metals, alkalinity, pH, and total dissolved solids (TDS).

Attachment 3 provides a table summarizing the analytical data for all samples collected since startup. The table includes only those parameters of interest from an O&M perspective. Copies of the data reports from ENCO Laboratories are also provided; they include all results, including VOC and target analyte list metals. Attachment 3 also includes two additional tables that provide groundwater pumping data and the results of piezometer readings taken at various time intervals since system startup.

6.0 DEMOBILIZATION

Demobilization included cleaning of rental equipment and work areas, removing equipment from the work site, and returning all small tools and supplies to the Bechtel equipment storage area at NAS Pensacola. The key to this storage area was given to Ron Joyner, Base Environmental Department.

7.0 MAJOR PROBLEMS ENCOUNTERED/DELAYS

7.1 PROBLEMS ENCOUNTERED

A section of the underground sprinkler system near the NAS Pensacola Brig was damaged. This occurred during trenching activities to tie in the force main, interceptor trench, and its pumping system with the sanitary sewer system on the western side of the new Brig. Bechtel repaired the damage to the sprinkler system.

Damage also occurred to the original submersible pump and the autodialer during the first month of operation. The cause of the damage was believed to be the result of a lightning strike. Both units were replaced under warranty and a spare pump was purchased.

A second submersible pump failed in January of 2000. Inspection indicted the problem might be associated with the line voltage, which was 245 volts. The spare pump was installed, and the transformer taps were changed to reduce the voltage to 230 volts. At this voltage and the design pumping rate of 20 gpm, the pump motor current is 6.2 amps, which is just below the motor face plate maximum amperage. The system has performed satisfactorily in this operating condition for nearly 2 months.

7.2 DELAYS

Equipment problems experienced by the trenching subcontractor, Dewind Dewatering, delayed trenching activities for approximately 7 days. The initial trenching machine was of insufficient size to adequately perform the work in the "flowing sands" encountered at OU-1. A larger machine was obtained, work resumed, and, despite sporadic mechanical problems, work was completed within 2 days of obtaining the larger equipment.

8.0 PHOTOGRAPHIC RECORDS

Representative photographs of the activities performed during the installation of the groundwater treatment and recovery system are included as an attachment to this report. The photographs are captioned with the specific information regarding the construction activity.

REFERENCES

Bechtel (Bechtel Environmental, Inc.), 1999. *Remediation Work Plan/Remedial Design for Phase I Groundwater Treatment and Recovery System at Operable Unit 1.*

EnSafe, Inc. 1998a. *Final Record of Decision, Operable Unit 1, NAS Pensacola.* August.

Ensafe, Inc. 1998b. *Conceptual Remedial Design at Operable Unit (OU) 1, Naval Air Station Pensacola, Florida, Rev. 1.*

ATTACHMENT 1

PHOTOGRAPHS



Photograph No. 1: Continuous trenching machine setting 12-in. riser pipe.



Photograph No. 2: Deployment of 5-in. horizontal drain in interceptor trench.



Photograph No. 3: Placement of limestone rock into interceptor trench.



Photograph No. 4: Installation of 20-mil PVC liner on top of limestone rock.



Photograph No. 5: Completed interceptor trench installation.



Photograph No. 6: Trenching for 2½-in. force main installation.



Photograph No. 7: Directional drilling under Taylor Road.



Photograph No. 8: Force main termination at sanitary sewer manhole.

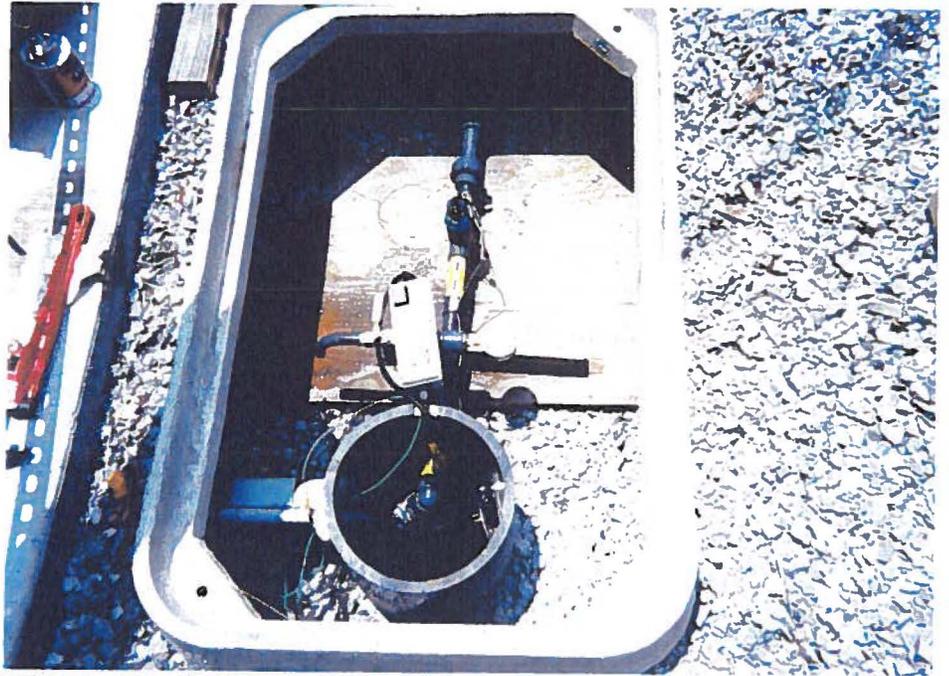


Photograph No. 9: New piezometer installation.



Photograph No. 10: Installation of new pole line for overhead electrical service.

Photograph No. 11:
Well head construction
at 12-in. riser.

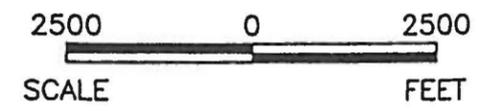
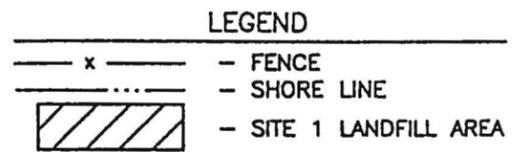
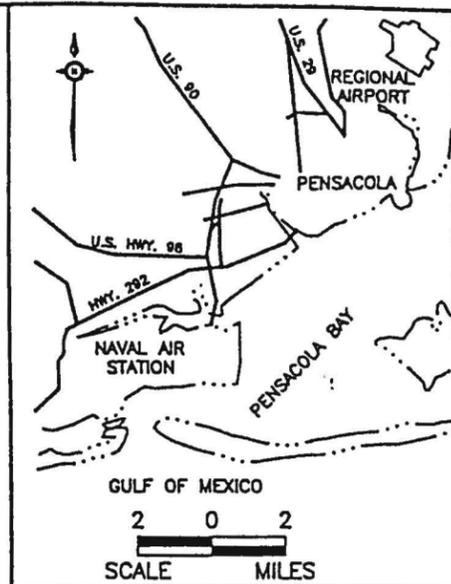
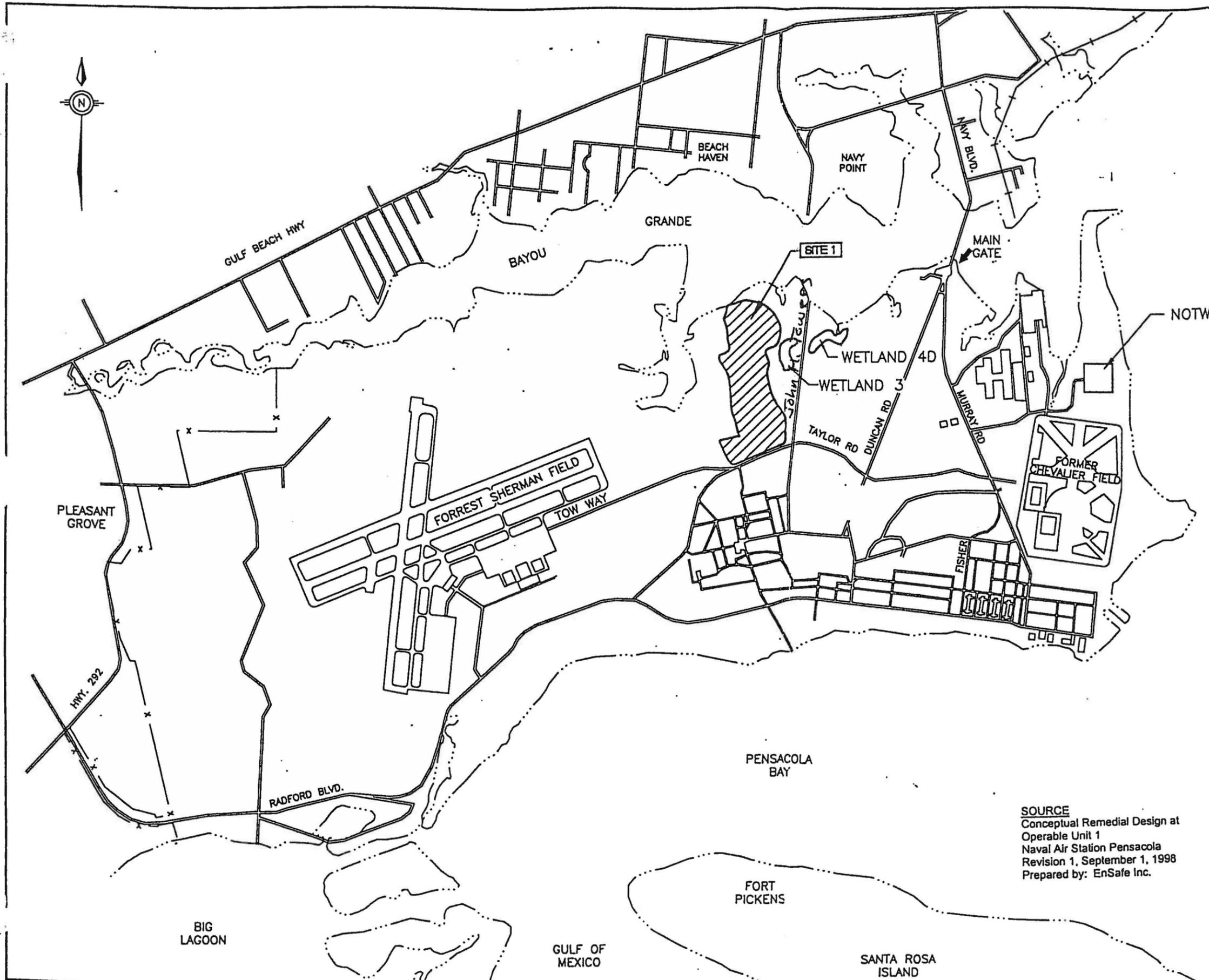


Photograph No. 12:
Control and lighting panels

Photograph No. 13:
Instrumentation layout
at control panel (CP-1)



ATTACHMENT 2
FIGURES AND AS-BUILT SKETCHES

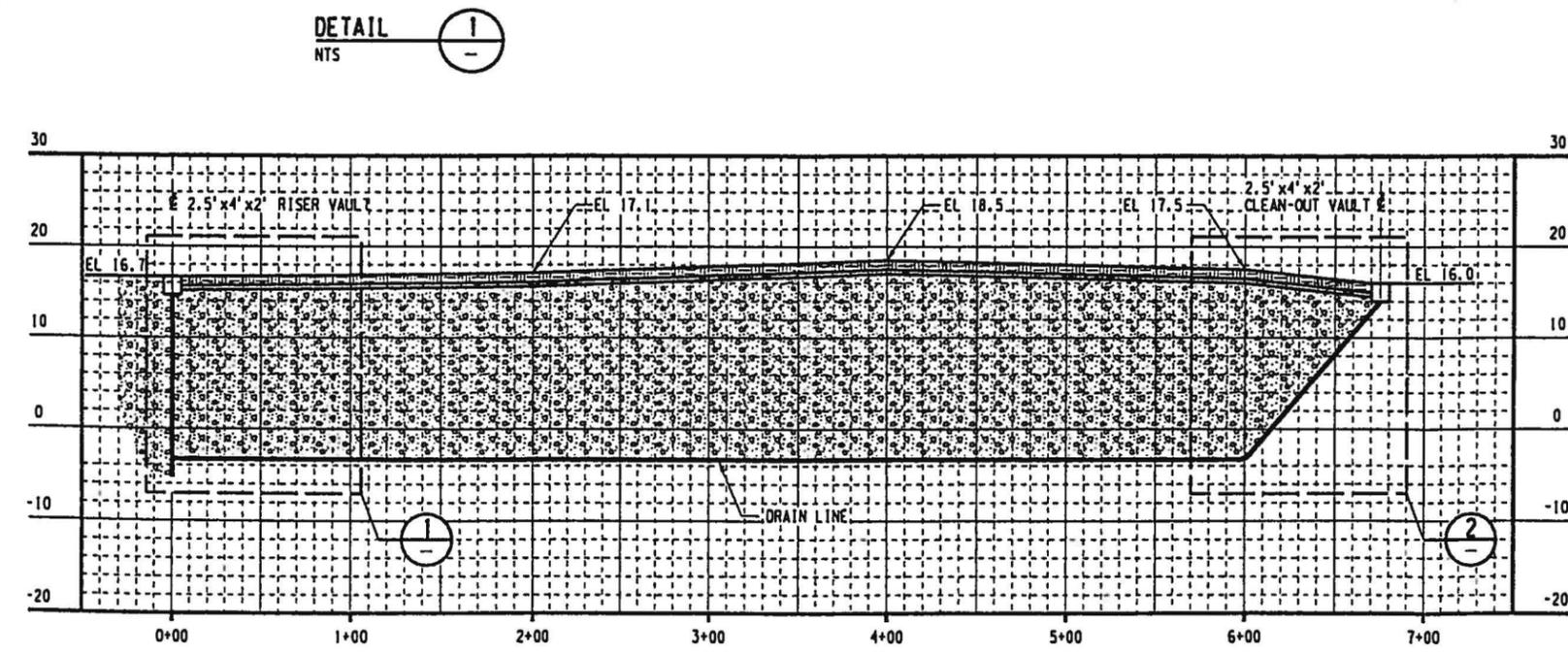
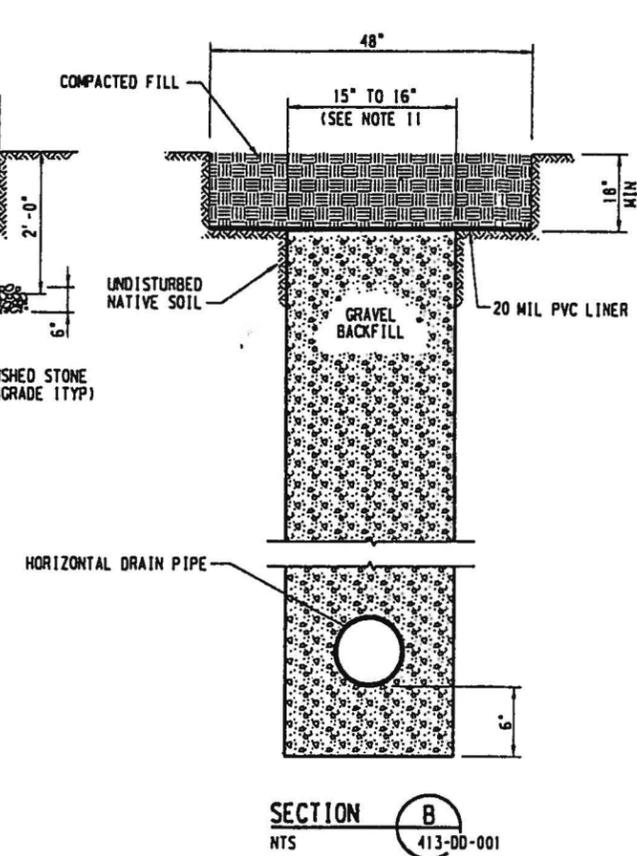
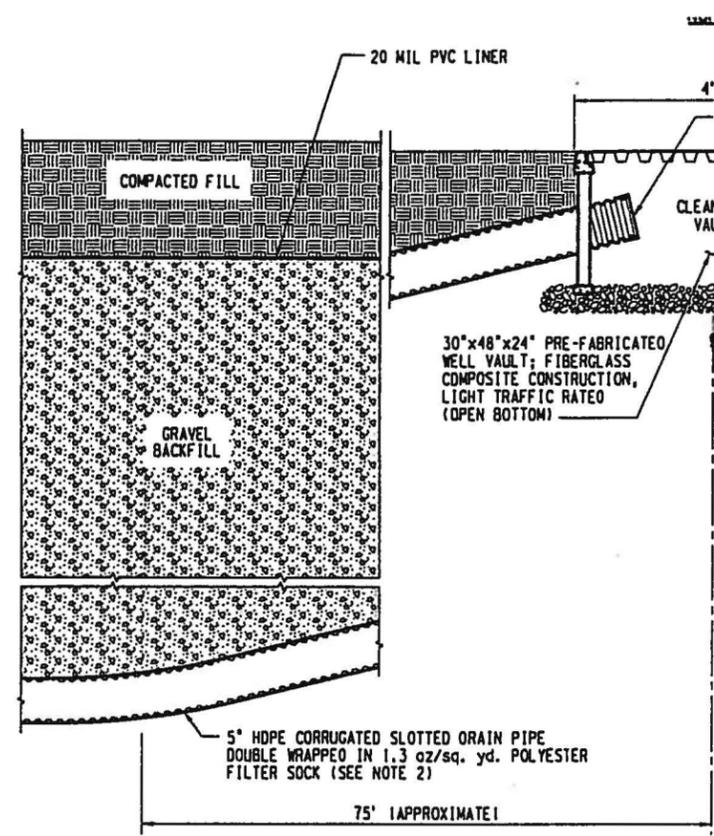
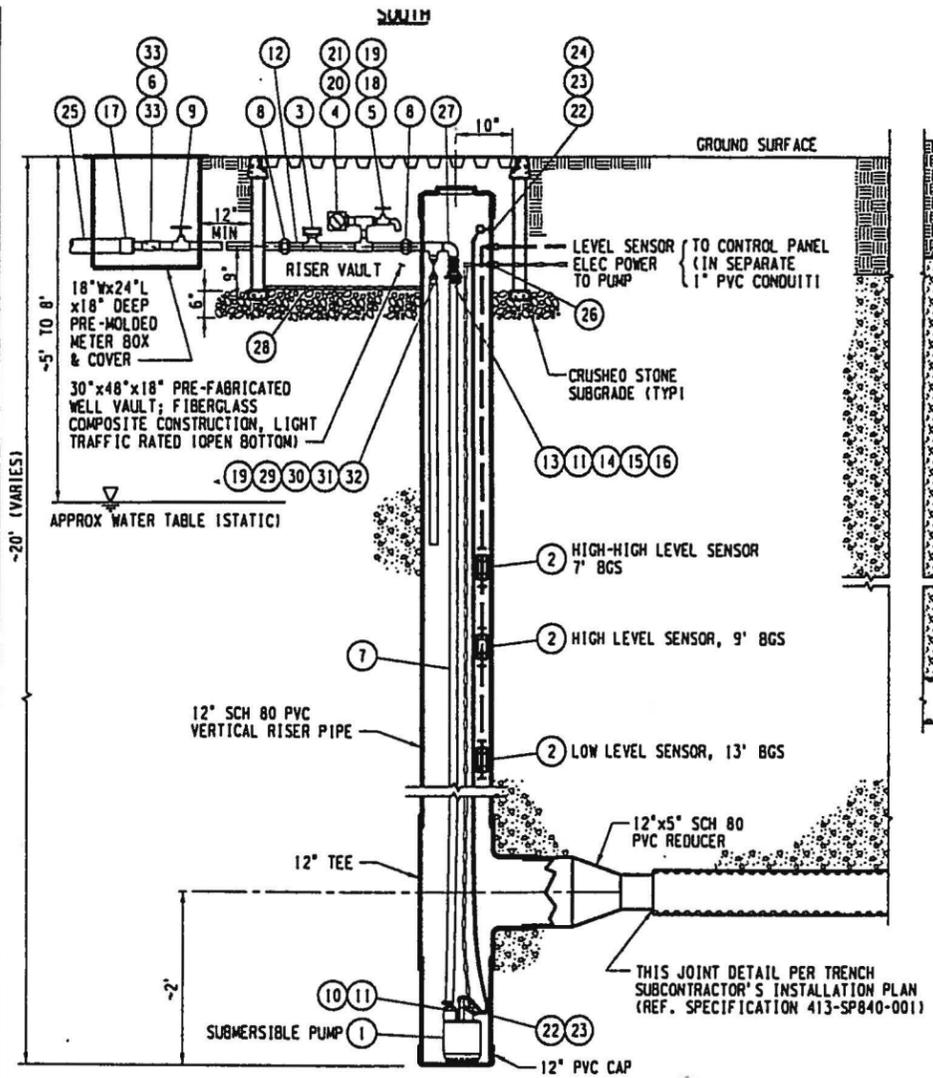


SOURCE
 Conceptual Remedial Design at
 Operable Unit 1
 Naval Air Station Pensacola
 Revision 1, September 1, 1998
 Prepared by: EnSafe Inc.



**CONCEPTUAL REMEDIAL
 DESIGN
 SITE 1
 NAS PENSACOLA**

**FIGURE 1-1
 SITE LOCATION MAP**



NOTE:
ELEVATIONS ARE RELATIVE TO TOP OF PAD AT WELL PS-01 ASSUMED ELEVATION 16.0'. ACTUAL ELEVATIONS TO BE VERIFIED AT 25 FOOT STATIONS BY CIVIL SURVEY. (SEE NOTE 5)

ITEM	DESCRIPTION
1	SUMP PUMP, GOULDS MODEL LDN1012
2	LOW/HIGH/HIGH-HIGH LEVEL SENSOR, MULTITRODE CONDUCTIVE LEVEL SENSOR, MODEL 0.2/1-33
3	SIGNET MODEL 3-2536-PO LOW FLOW SENSOR FOR 1" PIPE WITH INSTALLATION FITTING PV8T010F & MODEL 8512 TRANSMITTER
4	PRESSURE GAUGE, 0-30 PSI, 1/4" NPT
5	1/2" PVC BALL VALVE, MPT ENDS
6	1" BRASS CHECK VALVE
7	1 1/4" ID HOSE
8	1" PIPE UNION, PVC SCH 80
9	1" BRASS GLOBE VALVE
10	1 1/4" MNPT x 1 1/4" GALV HOSE BARB
11	1 1/4" SS HOSE CLAMP
12	1" PVC PIPE, SCH 80
13	HOSE SHANK & COUPLER, C COUPLER, McMASTER CARR NO. 51415K33
14	A ADAPTER, ADAPTER x NPT FEMALE McMASTER CARR NO. 51415K53
15	1 1/4" x 1" REDUCER BUSHING, MTPxFITP PVC SCH 80
16	1" NIPPLE, NPT, PVC SCH 80
17	2" x 1" REDUCER COUPLING, SOCKET, PVC SCH 80
18	1" x 1/2" NPT REDUCER BUSHING SPIGXFITP, PVC SCH 40
19	1" x 1" x 1" TEE, PVC SCH 80
20	1" x 1" x 1/2" REDUCING TEE, PVC SCH 80
21	1/2" x 1/4" NPT REDUCER BUSHING SPIGXFITP, PVC SCH 80
22	1/8" SS CABLE
23	1/4" SS CABLE CLAMP
24	1/4" SS EYEBOLT WITH 2 NUTS
25	2 1/2" PIPE SDR 26 PVC
26	WEATHERTITE CABLE CLAMP
27	1" 90° ELBOW, PVC SCH 80
28	1/4" PRESSURE-TREATED PLYWOOD
29	1" BRASS GATE VALVE
30	1" x 1/4" BUSHING, PVC SCH 80
31	1/4" x 3" NIPPLE, PVC SCH 80
32	1" ID x 5' RUBBER HOSE
33	1" BRASS PIPE

- NOTES**
- TRENCH INSTALLATION TECHNIQUE AND GRAVEL BACKFILL SHALL BE IN ACCORDANCE WITH SPECIFICATION 413-SP840-001.
 - 5" DIAMETER PTI CORR-A-FLEX SLOTTED PE TUBING, 1/8" x 3/4" SLOTS PER CORRUGATION, >2.0 SO. INCH OPENINGS PER LINEAR FT. FILTER SOCK IS A DOUBLE LAYER OF 1.3 OUNCE/SO. YO. POLYESTER WITH WATER FLOW RATE OF 700 GAL./FT²/MIN. AT 3" MINIMUM HEAD.
 - 20 MIL PVC LINER, SINGLE-PLY, TENSILE STRENGTH=2300 PSI, GRAVES TEAR 325 LB/IN
 - NATIVE FILL MATERIAL WAS GRADED OVER THE 20 MIL PVC LINER AND COMPACTED BY MAKING MULTIPLE PASSES WITH A OOEZER. NO COMPACTION TEST WAS PERFORMED.
 - SEE LOCATION SURVEY SHEETS 1 AND 2 DATED 5/19/99 (A-1 LAND SURVEYING JOB NO. 99-301) FOR HORIZONTAL COORDINATES AND FINISHED GRADE ELEVATIONS FOR THE BACKFILLED TRENCH.

LEGEND

NO.	DATE	REVISIONS	BY	CHKD	REAPP'D	ENGR	PROJ. ENGR	HL CRD	FLWD
1		AS-BUILT	JED	WEH	JRM				
2	3/20/00	REVISED AND RE-ISSUED FOR USE	XCL	GDM	JRM				
3	3/25/99	ISSUED FOR USE	JMH	GDM	JRM				
4	2/25/99								

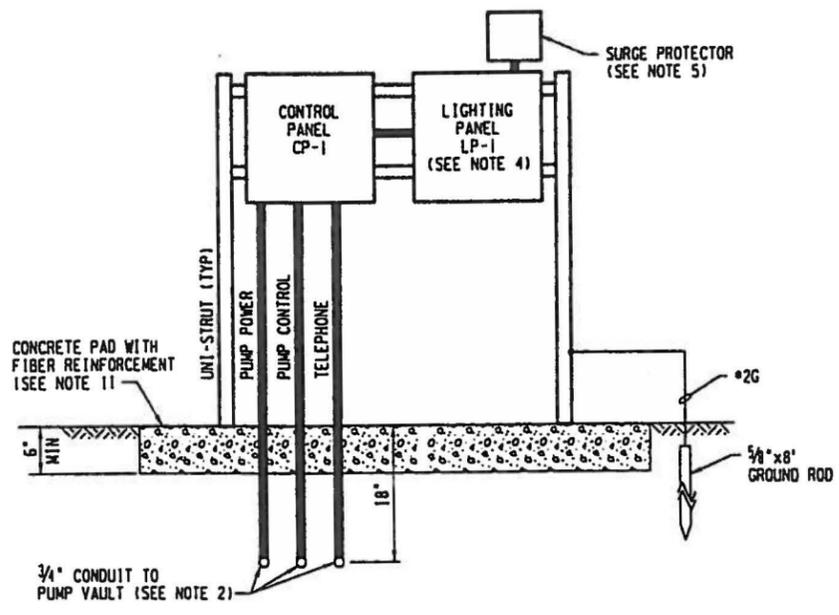
SCALE NOTED

BECHTEL ENVIRONMENTAL INC.
OAK RIDGE, TENNESSEE

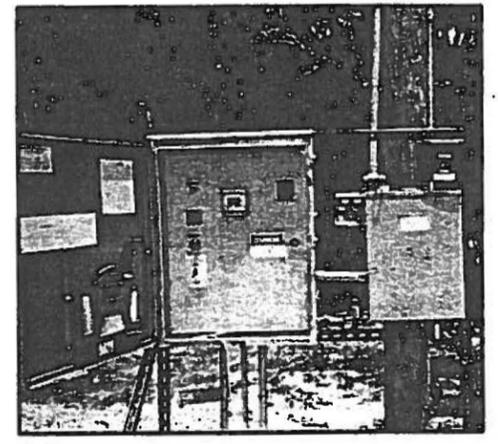
DEPARTMENT OF THE NAVY
SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA

NAS PENSACOLA
OPERABLE UNIT 1 GROUNDWATER INTERCEPTOR AND TREATMENT SYSTEM - PROFILE AND SECTIONS

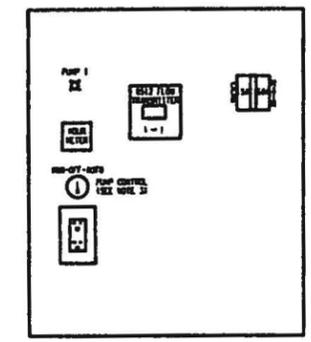
JOB NO.	DRAWING NO.	REV
22567	413-DD-002	2



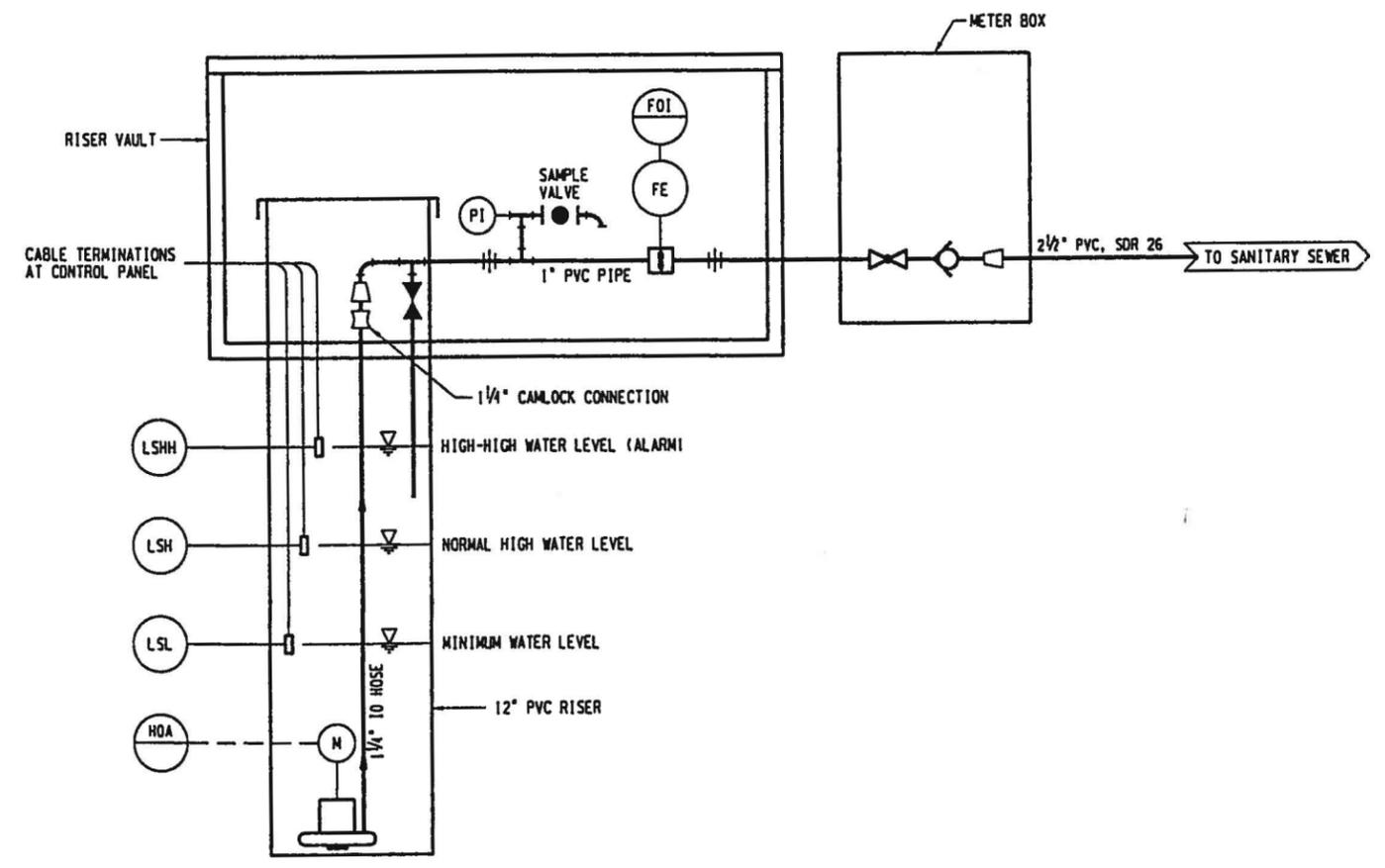
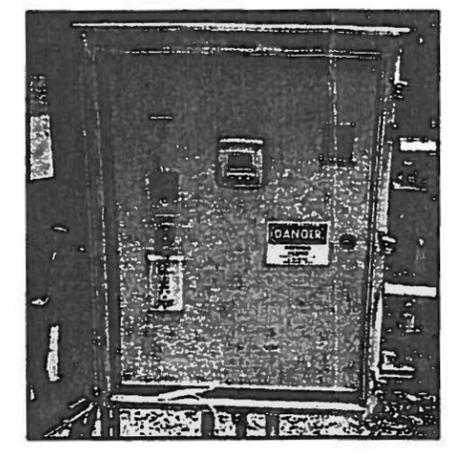
PANEL ORIENTATION



CONTROL PANEL INSTALLED IN NEMA 3R ENCLOSURE



CONTROL PANEL CP-1 LAYOUT



NOTE:
SEE DRAWING 413-DD-002 FOR COMPONENT DESCRIPTIONS

CONTROL AND INSTRUMENTATION DIAGRAM

NOTES

1. SPECIFIC SIZE OF CONCRETE PAD FOR ELECTRICAL PANEL TO BE FIELD DETERMINED.
2. SEPARATE BURIED CABLE FOR COMMUNICATION AND POWER BY 18".
3. PUMP CONTROL: SELF CONTAINED, COMBINATION MOTOR/STARTER, HAND-OFF-AUTO SWITCH
4. LIGHTING PANEL: NEMA 3R ENCLOSURE, SINGLE # , 240V OR 250V BREAKERS. 60 AMP ON MAIN
5. SURGE PROTECTOR
ADVANCE PROTECTION TECH (SUREGE PROTECTOR)
MODEL TE/1XF (MANUF DATE) 3/99
VOLTAGE: 120/240V, 50-60 HZ, TVSS
SVR N-G 330
L-N330
L-L 700
L-G330

LEGEND

- GLOBE VALVE
- GATE VALVE
- BALL VALVE (NORMALLY CLOSED)
- FLOW METER
- BALL CHECK VALVE
- PRESSURE INDICATOR
- REDUCER FITTING
- UNION

△							
△							
△							
△	3/20/00	AS-BUILT	JED	WEH	JRM	JRM	
△	3/25/99	ISSUED FOR USE	KCL	GDN	JRM	--	JRM
NO.	DATE	REVISIONS	BY	CHKD	DESIGN	ENGR	PROJ. MICRO ENGR. FLWD

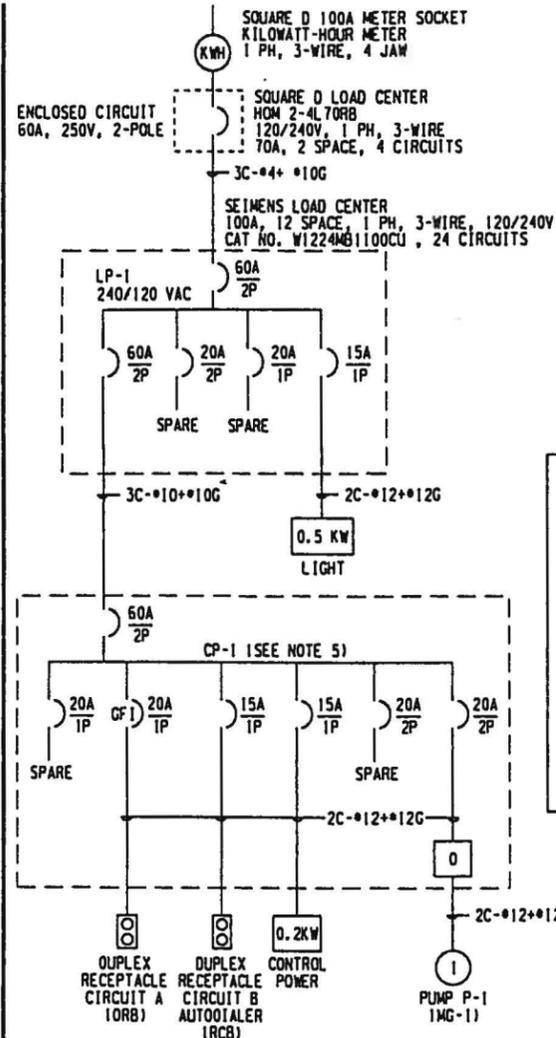
SCALE NOTED

BECHTEL ENVIRONMENTAL INC.
OAK RIDGE, TENNESSEE

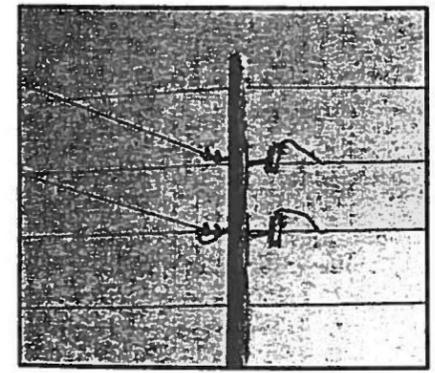
DEPARTMENT OF THE NAVY
SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA

NAS PENSACOLA
OPERABLE UNIT 1 GROUNDWATER INTERCEPTOR
AND TREATMENT SYSTEM - CONTROL DETAILS

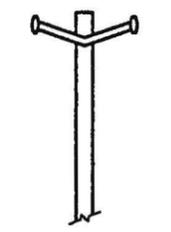
	JOB NO.	DRAWING NO.	REV
	22567	413-DD-003	1



SINGLE LINE DIAGRAM



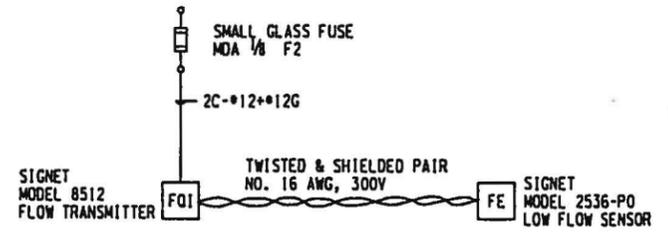
**EXISTING TERMINATION AT POLE 2687
(1 LOCATION)**
NTS



**LINE POLE
(6 LOCATIONS)**
NTS

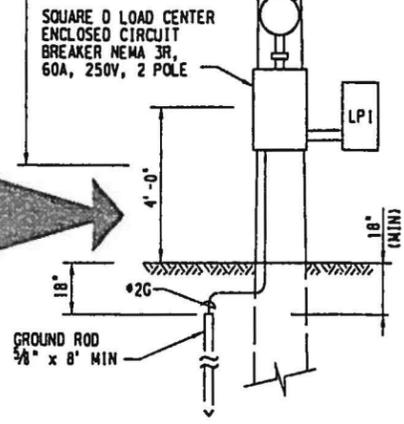
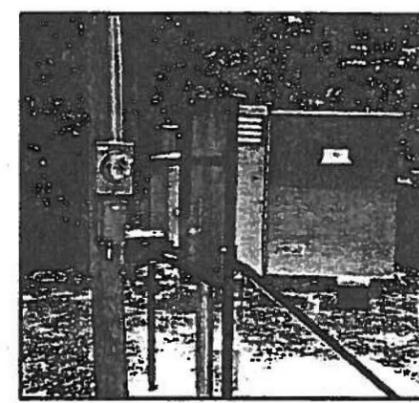


**OFFSET LINE POLE
(1 LOCATION)**
NTS

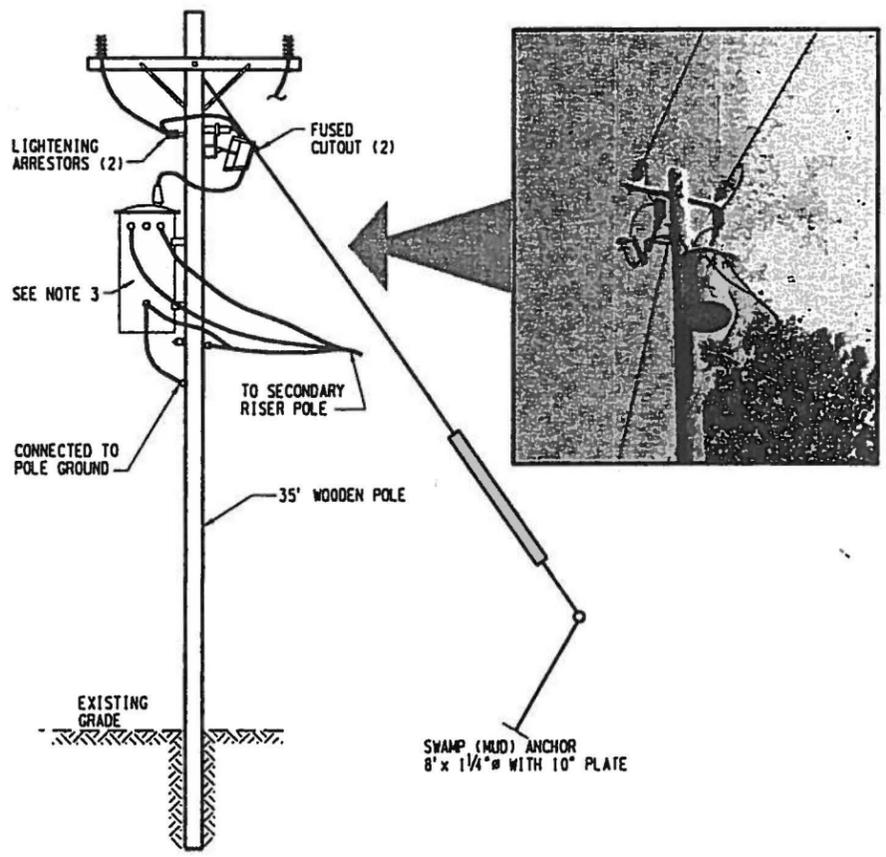


FLOW INDICATOR

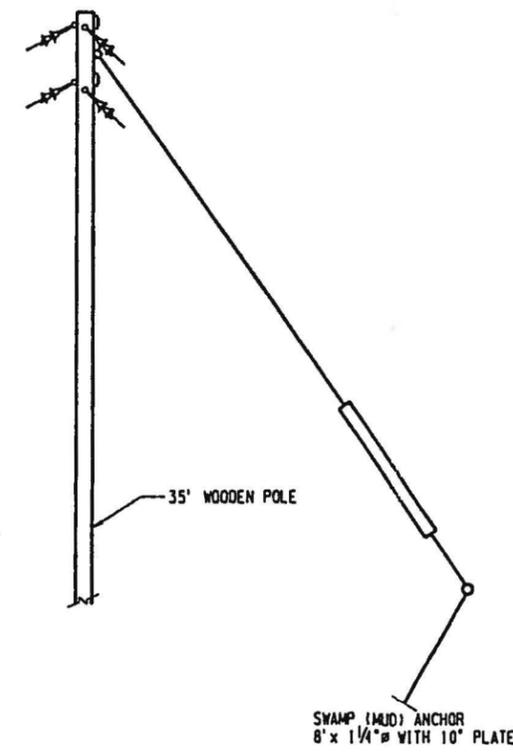
PANEL NO. LP-1		VOLTAGE: <input checked="" type="checkbox"/> 120/240V, 1 PHASE, 3 WIRE		GROUND: <input type="checkbox"/> LUG <input type="checkbox"/> BUS	
MOUNTING: <input type="checkbox"/> FLUSH <input checked="" type="checkbox"/> SURFACE	MAINS: <input type="checkbox"/> LUGS ONLY <input checked="" type="checkbox"/> MAIN BREAKER	AMP. 60 AMP.	<input type="checkbox"/> TOP <input type="checkbox"/> BOTTOM	NEUTRAL: <input type="checkbox"/> 50 % <input checked="" type="checkbox"/> 100 %	
COVER: <input checked="" type="checkbox"/> WITH DOOR <input type="checkbox"/> WITHOUT DOOR		<input checked="" type="checkbox"/> WITH LOCK <input type="checkbox"/> WITHOUT LOCK		ALL BRANCH BKRS. 20A., 1 POLE UNLESS NOTED OTHERWISE U/L LISTED BKR. INTERRUPTING RATING 10000 RMS SYM. AMPS.	
CONNECTED LOAD: PHASE A 1.75 KVA		PHASE B 1.75 KVA		TOTAL 3.5 KVA	
LOCATION	LOAD NO.	NO.	LOAD	LOCATION	
CONTROL PANEL CP-1	1.25 1	60	A B 15	2	LIGHT
CONTROL PANEL CP-1	1.25 3	20	20	4	0.5 SPARE
SPARE	5	20		6	SPACE
SPARE	7	20		8	SPACE
SPARE	9			10	SPACE
SPARE	11			12	SPACE



SECONDARY RISER
NTS



**TRANSFORMER AT POLE 2693
(1 LOCATION)**
NTS



**CORNER POLE
(2 LOCATION)**
NTS

- NOTES**
- POLE WITH #6 AWG SOLID COPPER GROUND WIRE.
 - SQUARE D METER SOCKET: 3 WIRE 1 PH, 120/240V, CL100 OR CL200
GENERAL ELECTRIC CL100 METER: 3 WIRE, 240V, 60 Hz, FM2S, KH 3.6, TA 15, TYPE IM-70-S/1 WATT HOUR METER
 - TRANSFORMER:
WHITES, JACKSONVILLE, ARKANSAS
25 KVA, POLARITY SUB
VOLTAGE PRIMARY SIDE: 12410V
VOLTAGE SERVICE SIDE: 120/240V, 1 PH
IMP AT 85° C: 2-1
WEIGHT: 427 LBS
SEC SETTING: A-B-C-D-E
60 HZ, CLASS OA
DELTA 2 PH POT
TRANSFORMER IS SET ON A TAP 95% (YIELDS 231V, 114V TO GND)
(C TAP YIELDS 245V)
 - THE TELEPHONE CABLE IS DIRECT BURIED CABLE TERMINATED INTO THE CONTROL PANEL.
 - FOR DETAILS ON CONTROL PANEL CP-1, SEE AS-BUILT DRAWING OC4164 FROM QUALITY CONTROL INC (OCI) DATED 6/7/99.

LEGEND

AS-BUILT	JED	WEH	JRM	WEH	JRM
NO.	DATE	REVISIONS	BY	CHKD	DESIGN
3/20/00					

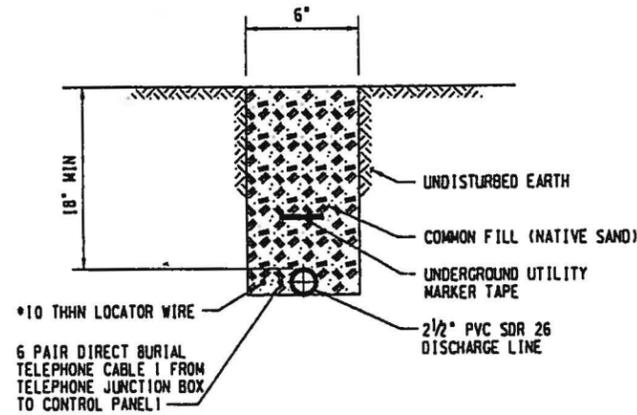
SCALE NOTED

BECHTEL ENVIRONMENTAL INC.
OAK RIDGE, TENNESSEE

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA

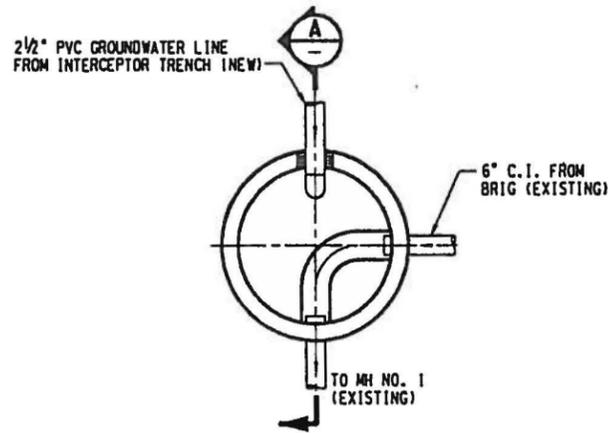
NAS PENSACOLA
OPERABLE UNIT 1 GW INTERCEPTOR & TREATMENT
SYSTEM - ELECTRICAL CONSTRUCTION DETAILS

JOB NO.	DRAWING NO.	REV
22567	413-DD-004	0

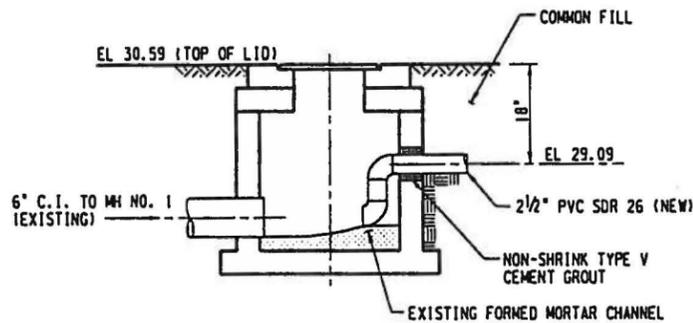


GROUNDWATER LINE TRENCH

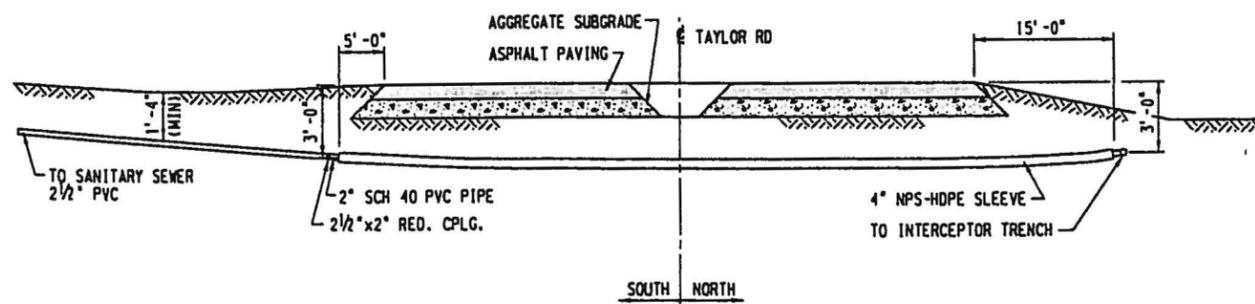
SECTION C
1"=1'-0" 413-00-001



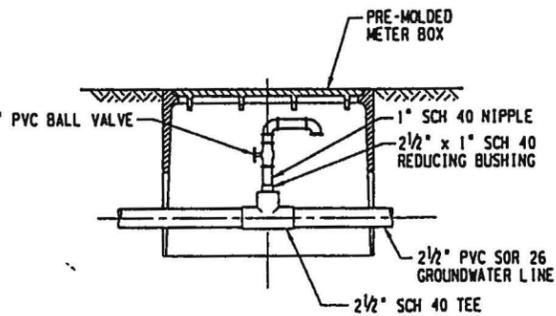
PLAN VIEW
MODIFICATION DETAIL
FOR MANHOLE NO. 2



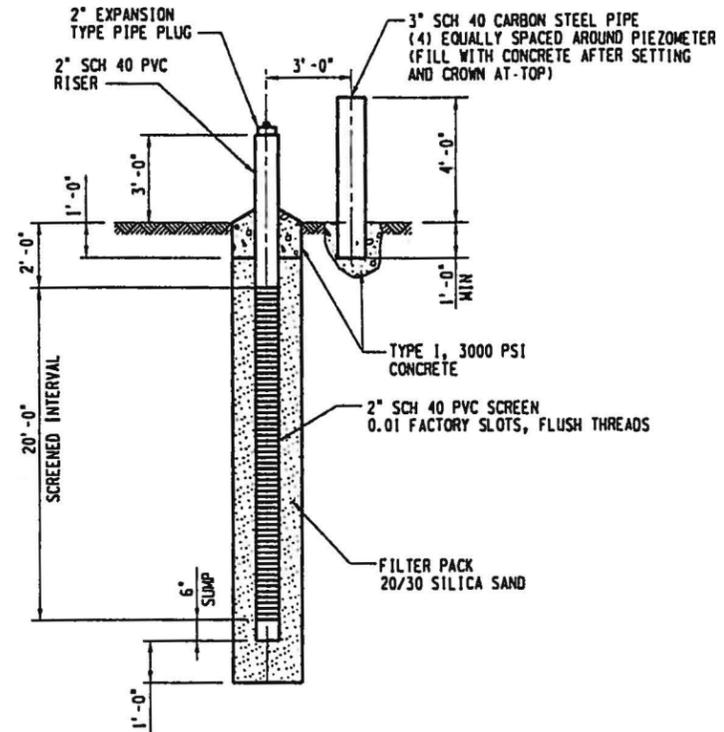
SECTION A
NTS



SECTION D
NTS 413-00-006



AIR VENT DETAIL - (3) LOCATIONS
NTS



PIEZOMETER DETAIL
NTS

NOTES

1. THE 4" HDPE PIPE SLEEVE WAS INSTALLED VIA DIRECTIONAL DRILLING.
2. BREAK OPENING APPROXIMATELY 4" IN DIAMETER IN MANHOLE NO. 2. INSTALL 2 1/2" PVC LINE AND PATCH HOLE USING A NON-SHRINK CEMENT GROUT, TYPE V (SULFATE RESISTANT) (REF MODIFICATION DETAIL FOR MANHOLE NO.2)
3. INSIDE 4" HDPE PIPE SLEEVE 2" SCH 40 PVC PIPE WAS INSTALLED WITH SOLVENT-WELDED COUPLINGS. (REF SECTION D, DRAWING 413-00-006).
4. A TRACER WIRE WAS PLACED IN THE GROUNDWATER LINE TRENCH CONTINUOUS FROM THE EXTRACTION WELL TO SANITARY SEWER MANHOLE NO. 2 EXCEPT TRACER IS NOT CONTINUOUS UNDER TAYLOR ROAD. TRACER WIRE IS PUSHED INTO 4" PIPE SLEEVE APPROXIMATELY 20 FEET FROM EACH SIDE OF TAYLOR ROAD.
6. SEE LOCATION SURVEY SHEETS 1 AND 2 DATED 5/19/99 (A1 LAND SURVEYING JOB NO. 99-3011 FOR HORIZONTAL AND VERTICAL COORDINATES OF GROUNDWATER FORCE MAIN.

LEGEND

NO.	DATE	REVISIONS	BY	CHKD	DESIGN SUPV	ENGR	PROJ ENGR	W/CD 7/14/00
△								
△								
△	3/20/00	AS-BUILT	JED	WEH	JRM		JRM	
△	3/25/99	ISSUED FOR USE	KCL	GDN	JRM	--	JRM	

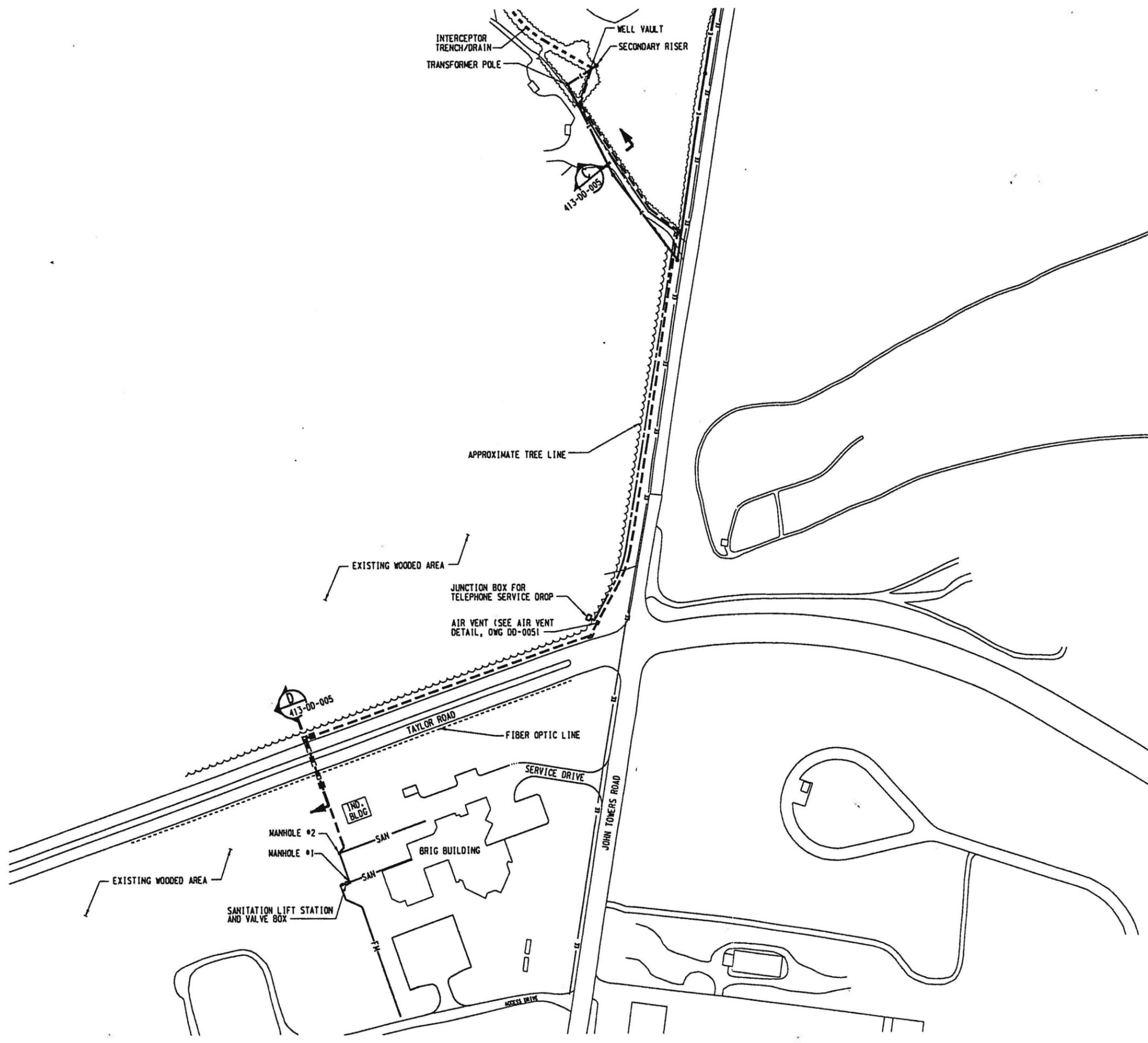
SCALE NOTED

BECHTEL ENVIRONMENTAL INC.
OAK RIDGE, TENNESSEE

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA

NAS PENSACOLA
OPERABLE UNIT 1 GROUNDWATER INTERCEPTOR
AND TREATMENT SYSTEM - DETAILS

JOB NO.	DRAWING NO.	REV
22567	413-DD-005	1

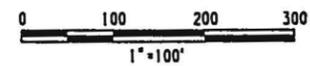


NOTES

1. 2 1/2" PVC GROUNDWATER FORCE MAIN INSTALLED IN 6" WIDE TRENCH OUG BY SMALL EXCAVATOR.
2. THRUST BLOCKS WERE INSTALLED AT ALL BENDS IN THE GROUNDWATER FORCE MAIN GREATER THAN 45°. THRUST BLOCKS FORMED BY PLACING TWO 80 LB BAGS OF "SACKCRETE" IN THE TRENCH ADJACENT TO THE LINE AND PERFORATING THE BAGS.

LEGEND

- SAN — EXISTING 6" CAST IRON SANITARY SEWER
- FM — EXISTING 3" DUCTILE IRON PIPE FORCE MAIN
- OH — EXISTING OVERHEAD HIGH VOLTAGE ELECTRICAL LINES
- E — NEW OVERHEAD ELECTRICAL LINE
- FO — EXISTING FIBER OPTIC LINE
- G — NEW 2 1/2" PVC GROUNDWATER FORCE MAIN
- T — NEW TELEPHONE DIRECT BURIED CABLE
- AIR VENT LOCATION
- ∟ THRUST BLOCK



△							
△							
△							
△	3/20/00	AS-BUILT	JED	WEH		JRM	
△	3/25/99	ISSUED FOR USE	KCL	GDN	JRM	JRM	
NO.	DATE	REVISIONS	BY	CHKD	DESIGN	ENGR	PROJ. MGR.

BECHTEL ENVIRONMENTAL INC.
OAK RIDGE, TENNESSEE

DEPARTMENT OF THE NAVY
SOUTHERN DIVISION NAVAL FACILITIES ENGINEERING COMMAND
CHARLESTON, SOUTH CAROLINA

NAS PENSACOLA
OPERABLE UNIT 1, GROUNDWATER FORCE MAIN
SITE PLAN

	JOB NO.	DRAWING NO.	REV
	22567	413-DD-006	1

ATTACHMENT 3
ANALYTICAL DATA AND O&M RECORDS

ANALYTICAL DATA

**Extracted Groundwater Analytical Results
 OU-1 Groundwater Treatment and Recovery System
 NAS Pensacola, Pensacola, FL**

Date Sampled	Sample ID	Ph	Alkalinity mg/l	TDS mg/l	Calcium mg/l	Iron mg/l	Magnesium mg/l	Comments
June 16, 1999	PE18158	6.6	200	310	98	17	3.7	
July 23, 1999	PE18159	6.6	200	310	90	16	3.5	
Sep 21, 1999	PE18160	6.7	190	23	71	11	3.5	TDS value is believed to be in error
Jan 27, 2000	PE18161	6.8	190	350	80	9.2	3.8	

413 - 00037

Environmental Conservation Laboratories, Inc.
4810 Executive Park Court, Suite 211
Jacksonville, Florida 32216-6069
904 / 296-3007
Fax 904 / 296-6210
www.encolabs.com



DHRS Certification No. E82277

CLIENT : Bechtel Environmental, Inc.
ADDRESS: 151 Lafayette Dr.
Oak Ridge, TN 37830

REPORT # : JR7307
DATE SUBMITTED: June 17, 1999
DATE REPORTED :

PAGE 1 OF 12

ATTENTION: Mr. J.R. Manning

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

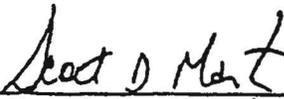
PROJECT #: PE-OU-001

NAS Pensacola OU-1 Interceptor Trench

06/16/99

#1 - PE18158 @ 11:00

PROJECT MANAGER



Scott D. Martin

ENCO LABORATORIES
 REPORT # : JR7307
 DATE REPORTED:
 REFERENCE : PE-OU-001
 PROJECT NAME : NAS Pensacola OV-1
 Interceptor Trench

PAGE 2 OF 12

RESULTS OF ANALYSIS

<u>EPA METHOD 8260 - VOLATILE ORGANICS</u>	<u>PE18158</u>	<u>Units</u>
Dichlorodifluoromethane	2.0 U	µg/L
Chloromethane	1.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	2.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	1.0 U	µg/L
1,1-Dichloroethene	1.0 U	µg/L
Acetone	50 U	µg/L
Carbon Disulfide	50 U	µg/L
Methylene Chloride	3.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	µg/L
Methyl tert-butyl ether	6.0 U	µg/L
1,1-Dichloroethane	1.0 U	µg/L
2,2-Dichloropropane	2.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	µg/L
2-Butanone	20 U	µg/L
Chloroform	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	µg/L
Carbon tetrachloride	1.0 U	µg/L
1,1-Dichloropropene	1.0 U	µg/L
<u>Benzene</u>	<u>8.3</u>	<u>µg/L</u>
1,2-Dichloroethane	1.0 U	µg/L
<u>Trichloroethene</u>	<u>1.0 I</u>	<u>µg/L</u>
1,2-Dichloropropane	1.0 U	µg/L
Dibromomethane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L

U = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL)
 and the Practical Quantitation Level (PQL).

ENCO LABORATORIES

REPORT # : JR7307

DATE REPORTED:

REFERENCE : PE-OU-001

PROJECT NAME : NAS Pensacola OV-1
Interceptor Trench

PAGE 4 OF 12

RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
VOLATILE ORGANICS

	<u>PE18158</u>	<u>Units</u>
2-Chloroethyl vinyl ether	6.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	µg/L
4-Methyl-2-pentanone	20 U	µg/L
Toluene	1.6 I	µg/L
t-1,3-Dichloropropene	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	3.0 U	µg/L
1,3-Dichloropropane	1.0 U	µg/L
2-Hexanone	20 U	µg/L
Dibromochloromethane	1.0 U	µg/L
1,2-Dibromoethane	1.0 U	µg/L
Chlorobenzene	19	µg/L
1,1,1,2-Tetrachloroethane	1.0 U	µg/L
Ethylbenzene	1.0 U	µg/L
m-Xylene & p-Xylene	2.0 U	µg/L
o-Xylene	1.0 U	µg/L
Styrene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
Isopropylbenzene	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	µg/L
Bromobenzene	1.0 U	µg/L
1,2,3-Trichlorobenzene	1.0 U	µg/L
n-Propylbenzene	1.1	µg/L
2-Chlorotoluene	1.0 U	µg/L
1,3,5-Trimethylbenzene	1.0 U	µg/L
4-Chlorotoluene	1.0 U	µg/L

U = Compound was analyzed for but not detected to the level shown.

I = Analyte detected; value is between the Method Detection Level (MDL)
and the Practical Quantitation Level (PQL).

ENCO LABORATORIES

REPORT # : JR7307

DATE REPORTED:

REFERENCE : PE-OU-001

PROJECT NAME : NAS Pensacola OV-1
Interceptor Trench

PAGE 5 OF 12

RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -

VOLATILE ORGANICS

	<u>PE18158</u>	<u>Units</u>
tert-Butylbenzene	1.0 U	µg/L
1,2,4-Trimethylbenzene	1.0 U	µg/L
s-Butylbenzene	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	µg/L
p-Isopropyltoluene	2.4 I	µg/L
1,4-Dichlorobenzene	4.5	µg/L
n-Butylbenzene	1.0 U	µg/L
1,2-Dichlorobenzene	1.3	µg/L
1,2-Dibromo-3-chloropropane	1.0 U	µg/L
1,2,4-Trichlorobenzene	1.0 U	µg/L
Hexachlorobutadiene	1.0 U	µg/L
Naphthalene	2.5	µg/L
1,2,3-Trichloropropane	1.0 U	µg/L
Bromochloromethane	1.0 U	µg/L

Surrogate:

	<u>% RECOV</u>	<u>LIMITS</u>
Dibromofluoromethane	98	52-149
D8-Toluene	90	70-132
Bromofluorobenzene	98	60-135
Date Analyzed	06/25/99	

U = Compound was analyzed for but not detected to the level shown.

I = Analyte detected; value is between the Method Detection Level (MDL)
and the Practical Quantitation Level (PQL).

ENCO LABORATORIES

REPORT # : JR7307

DATE REPORTED:

REFERENCE : PE-OU-001

PROJECT NAME : NAS Pensacola OV-1
Interceptor Trench

PAGE 6 OF 12

RESULTS OF ANALYSIS

<u>MISCELLANEOUS</u>	<u>METHOD</u>	<u>PE18158</u>	<u>LAB BLANK</u>	<u>Units</u>
Alkalinity, Total Date Analyzed	310.1	200 06/22/99	1.0 U 06/22/99	mg/L
Total Dis. Solids Date Analyzed	160.1	310 06/19/99	1.0 U 06/19/99	mg/L
pH Date Analyzed	150.1	6.6 06/17/99	NR	S.U.

U = Compound was analyzed for but not detected to the level shown.
NR = Analysis not requested for this sample.

ENCO LABORATORIES
 REPORT # : JR7307
 DATE REPORTED:
 REFERENCE : PE-OU-001
 PROJECT NAME : NAS Pensacola OV-1
 Interceptor Trench

PAGE 7 OF 12

RESULTS OF ANALYSIS

<u>TOTAL METALS</u>	<u>METHOD</u>	<u>PE18158</u>	<u>LAB BLANK</u>	<u>Units</u>
Aluminum Date Analyzed	200.7	0.10 06/18/99	0.050 U 06/18/99	mg/L
Antimony Date Analyzed	200.7	0.0060 U 06/18/99	0.0060 U 06/18/99	mg/L
Arsenic Date Analyzed	200.7	0.010 U 06/18/99	0.010 U 06/18/99	mg/L
Barium Date Analyzed	200.7	0.10 06/18/99	0.10 U 06/18/99	mg/L
Beryllium Date Analyzed	200.7	0.0010 U 06/18/99	0.0010 U 06/18/99	mg/L
Cadmium Date Analyzed	200.7	0.0010 I 06/18/99	0.0010 U 06/18/99	mg/L
Calcium Date Analyzed	200.7	98 06/25/99	0.50 U 06/18/99	mg/L
Chromium Date Analyzed	200.7	0.010 U 06/18/99	0.010 U 06/18/99	mg/L
Cobalt Date Analyzed	200.7	0.050 U 06/18/99	0.050 U 06/18/99	mg/L
Copper Date Analyzed	200.7	0.050 U 06/18/99	0.050 U 06/18/99	mg/L
Iron Date Analyzed	200.7	17 06/18/99	0.050 U 06/18/99	mg/L

U = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL)
 and the Practical Quantitation Level (PQL).

ENCO LABORATORIES
 REPORT # : JR7307
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 PROJECT NAME : NAS Pensacola OV-1
 Interceptor Trench

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RESULTS OF ANALYSIS

<u>TOTAL METALS</u>	<u>METHOD</u>	<u>PE18158</u>	<u>LAB BLANK</u>	<u>Units</u>
Lead Date Analyzed	200.7	0.0050 U 06/18/99	0.0050 U 06/18/99	mg/L
Magnesium Date Analyzed	200.7	3.7 06/18/99	0.50 U 06/18/99	mg/L
Manganese Date Analyzed	200.7	0.21 06/18/99	0.010 U 06/18/99	mg/L
Mercury Date Analyzed	245.1	0.00020 U 06/21/99	0.00020 U 06/21/99	mg/L
Nickel Date Analyzed	200.7	0.010 U 06/18/99	0.010 U 06/18/99	mg/L
Potassium Date Analyzed	258.1	1.2 06/23/99	0.50 U 06/23/99	mg/L
Selenium Date Analyzed	200.7	0.010 U 06/18/99	0.010 U 06/18/99	mg/L
Silver Date Analyzed	200.7	0.010 U 06/18/99	0.010 U 06/18/99	mg/L
Sodium Date Analyzed	273.1	7.0 06/18/99	0.50 U 06/18/99	mg/L
Thallium Date Analyzed	200.7	0.0040 U 06/18/99	0.0040 U 06/18/99	mg/L
Vanadium Date Analyzed	200.7	0.010 U 06/18/99	0.010 U 06/18/99	mg/L
Zinc Date Analyzed	200.7	0.10 U 06/18/99	0.10 U 06/18/99	mg/L

U = Compound was analyzed for but not detected to the level shown.

413-00037

ENCO LABORATORIES
 REPORT # : JR7307
 DATE REPORTED:
 REFERENCE : PE-OU-001
 PROJECT NAME : NAS Pensacola OV-1
 Interceptor Trench

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QUALITY CONTROL DATA

<u>Parameter</u>	<u>% RECOVERY MS/MSD/LCS</u>	<u>ACCEPT LIMITS</u>	<u>% RPD MS/MSD</u>	<u>ACCEPT LIMITS</u>
<u>Miscellaneous</u>				
Alkalinity, Total, 310.1	84/ 91/ 94	73-126	8	11
Total Dis. Solids, 160.1	NA/ NA/104	-	NA	
pH, 150.1	NA/ NA/100	-	NA	
<u>Total Metals</u>				
Aluminum, 200.7	124/111/103	78-125	11	22
Antimony, 200.7	104/102/101	38-138	2	30
Arsenic, 200.7	101/ 98/ 97	64-126	3	12
Barium, 200.7	103/101/ 99	74-119	2	11
Beryllium, 200.7	105/103/103	76-126	2	12
Cadmium, 200.7	104/102/ 99	68-121	2	12
Calcium, 200.7	104/102/105	63-131	2	22
Chromium, 200.7	104/102/100	73-120	2	10
Cobalt, 200.7	104/102/100	76-120	2	17
Copper, 200.7	103/102/ 98	75-123	<1	11
Iron, 200.7	103/101/ 97	48-144	2	23
Lead, 200.7	102/100/100	68-126	2	19
Magnesium, 200.7	112/103/106	59-129	8	22
Manganese, 200.7	102/100/ 99	86-105	2	19
Mercury, 245.1	103/105/105	70-136	2	12

Environmental Conservation Laboratories Comprehensive QA Plan #960038

< = Less Than
 MS = Matrix Spike
 MSD = Matrix Spike Duplicate
 LCS = Laboratory Control Standard
 RPD = Relative Percent Difference

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ENCO LABORATORIES

REPORT # : JR7307

DATE REPORTED:

REFERENCE : PE-OU-001

PROJECT NAME : NAS Pensacola OV-1
Interceptor Trench

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QUALITY CONTROL DATA

<u>Parameter</u>	<u>% RECOVERY</u> <u>MS/MSD/LCS</u>	<u>ACCEPT</u> <u>LIMITS</u>	<u>% RPD</u> <u>MS/MSD</u>	<u>ACCEPT</u> <u>LIMITS</u>
<u>Total Metals</u>				
Nickel, 200.7	100/ 98/ 96	64-126	2	12
Potassium, 258.1	102/ 99/103	76-126	3	13
Selenium, 200.7	102/100/100	65-129	2	10
Silver, 200.7	102/101/ 99	69-121	<1	12
Sodium, 273.1	95/ 95/ 97	46-127	<1	21
Thallium, 200.7	103/ 99/101	67-135	4	13
Vanadium, 200.7	114/112/109	82-115	2	16
Zinc, 200.7	103/101/ 99	63-131	2	24

Environmental Conservation Laboratories Comprehensive QA Plan #960038

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MS = Matrix Spike
MSD = Matrix Spike Duplicate
LCS = Laboratory Control Standard
RPD = Relative Percent Difference

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413-000044

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4810 Executive Park Court, Suite 211
Jacksonville, Florida 32216-6069
904 / 296-3007
Fax 904 / 296-6210
www.encolabs.com



DHRS Certification No. E82277

CLIENT : Bechtel Environmental, Inc.
ADDRESS: 151 Lafayette Dr.
Oak Ridge, TN 37830

REPORT # : JR7809
DATE SUBMITTED: July 24, 1999
DATE REPORTED : July 30, 1999

PAGE 1 OF 9

ATTENTION: Ms. Nicke Ring

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

PROJECT #: WO # PE001

NAS Pensacola, OU-1 Interceptor Trench

07/23/99

#1 - ~~OU1-IT~~ @ 12:40
PE 18159

JRM

PROJECT MANAGER

Scott D. Martin

Scott D. Martin

413-000044

ENCO LABORATORIES

REPORT # : JR7809

DATE REPORTED: July 30, 1999

REFERENCE : WO # PE001

PROJECT NAME : NAS Pensacola, OU-1

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RESULTS OF ANALYSIS

EPA METHOD 8260 -
VOLATILE ORGANICS

PE 18159

~~OU-1~~

TRM

LAB BLANK

Units

EPA METHOD 8260 - VOLATILE ORGANICS	PE 18159 OU-1	LAB BLANK	Units
Dichlorodifluoromethane	2.0 U	2.0 U	µg/L
Chloromethane	1.0 U	1.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	2.0 U	2.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	1.0 U	1.0 U	µg/L
1,1-Dichloroethene	1.0 U	1.0 U	µg/L
Acetone	50 U	50 U	µg/L
Carbon Disulfide	50 U	50 U	µg/L
Methylene Chloride	5.0 U	5.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
Methyl tert-butyl ether	6.0 U	6.0 U	µg/L
1,1-Dichloroethane	1.0 U	1.0 U	µg/L
2,2-Dichloropropane	2.0 U	2.0 U	µg/L
c-1,2-Dichloroethene	1.5 I	1.0 U	µg/L
2-Butanone	20 U	20 U	µg/L
Chloroform	1.0 U	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon tetrachloride	1.0 U	1.0 U	µg/L
1,1-Dichloropropene	1.0 U	1.0 U	µg/L
Benzene	4.1	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	1.0 U	µg/L
Trichloroethene	1.2 I	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	1.0 U	µg/L
Dibromomethane	1.0 U	1.0 U	µg/L
Bromodichloromethane	1.0 U	1.0 U	µg/L

U = Compound was analyzed for but not detected to the level shown.

I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

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REPORT # : JR7809

DATE REPORTED: July 30, 1999

REFERENCE : WO # PE001

PROJECT NAME : NAS Pensacola, OU-1

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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
VOLATILE ORGANICSPE 18159
~~OU-1 IT~~

JRM

LAB BLANKUnits

	PE 18159 OU-1 IT	LAB BLANK	Units
2-Chloroethyl vinyl ether	6.0 U	6.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
4-Methyl-2-pentanone	20 U	20 U	µg/L
Toluene	1.0 U	1.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
Tetrachloroethene	3.0 U	3.0 U	µg/L
1,3-Dichloropropane	1.0 U	1.0 U	µg/L
2-Hexanone /	20 U	20 U	µg/L
Dibromochloromethane	1.0 U	1.0 U	µg/L
1,2-Dibromoethane	1.0 U	1.0 U	µg/L
Chlorobenzene	14	1.0 U	µg/L
1,1,1,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
Ethylbenzene	1.0 U	1.0 U	µg/L
m-Xylene & p-Xylene	2.0 U	2.0 U	µg/L
p-Xylene	1.0 U	1.0 U	µg/L
Styrene	1.0 U	1.0 U	µg/L
Bromoform	1.0 U	1.0 U	µg/L
Isopropylbenzene	1.0 U	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
Bromobenzene	1.0 U	1.0 U	µg/L
1,2,3-Trichlorobenzene	1.0 U	1.0 U	µg/L
m-Propylbenzene	1.0 U	1.0 U	µg/L
2-Chlorotoluene	1.0 U	1.0 U	µg/L
1,3,5-Trimethylbenzene	1.0 U	1.0 U	µg/L
p-Chlorotoluene	1.0 U	1.0 U	µg/L

= Compound was analyzed for but not detected to the level shown.

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ENCO LABORATORIES

REPORT # : JR7809
 DATE REPORTED: July 30, 1999
 REFERENCE : WO # PE001
 PROJECT NAME : NAS Pensacola, OU-1

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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) - VOLATILE ORGANICS	PE 18159 OU1-IT <i>JRM</i>	LAB BLANK	Units
tert-Butylbenzene	1.0 U	1.0 U	µg/L
1,2,4-Trimethylbenzene	1.0 U	1.0 U	µg/L
is-Butylbenzene	1.0 U	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
p-Isopropyltoluene	1.0 U	1.0 U	µg/L
1,4-Dichlorobenzene	3.1	1.0 U	µg/L
n-Butylbenzene	1.0 U	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
1,2-Dibromo-3-chloropropane	1.0 U	1.0 U	µg/L
1,2,4-Trichlorobenzene	1.0 U	1.0 U	µg/L
Hexachlorobutadiene	1.0 U	1.0 U	µg/L
Naphthalene	4.2	2.0 U	µg/L
1,2,3-Trichloropropane	1.0 U	1.0 U	µg/L
Bromochloromethane	1.0 U	1.0 U	µg/L
<u>Surrogate:</u>	<u>% RECOV</u>	<u>% RECOV</u>	<u>LIMITS</u>
Dibromofluoromethane	109	103	38-143
D8-Toluene	98	96	78-126
Bromofluorobenzene	93	90	72-132
Date Analyzed	07/29/99	07/29/99	

= Compound was analyzed for but not detected to the level shown.

413-000044

ENCO LABORATORIES
 REPORT # : JR7809
 DATE REPORTED: July 30, 1999
 REFERENCE : WO # PE001
 PROJECT NAME : NAS Pensacola, OU-1

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RESULTS OF ANALYSIS

<u>TOTAL METALS</u>	<u>METHOD</u>	<u>PE 18159</u> OU-1 IT ^{IR2M}	<u>LAB BLANK</u>	<u>Units</u>
Aluminum Date Analyzed	200.7	0.075 07/28/99	0.050 U 07/28/99	mg/L
Antimony Date Analyzed	200.7	0.0060 U 07/26/99	0.0060 U 07/26/99	mg/L
Arsenic Date Analyzed	200.7	0.010 U 07/26/99	0.010 U 07/26/99	mg/L
Barium Date Analyzed	200.7	0.10 U 07/26/99	0.10 U 07/26/99	mg/L
Beryllium Date Analyzed	200.7	0.0010 U 07/26/99	0.0010 U 07/26/99	mg/L
Cadmium Date Analyzed	200.7	0.0020 I 07/26/99	0.0010 U 07/26/99	mg/L
Calcium Date Analyzed	200.7	90 07/26/99	0.50 U 07/26/99	mg/L
Chromium Date Analyzed	200.7	0.010 U 07/26/99	0.010 U 07/26/99	mg/L
Cobalt Date Analyzed	200.7	0.050 U 07/26/99	0.050 U 07/26/99	mg/L
Copper Date Analyzed	200.7	0.050 U 07/26/99	0.050 U 07/26/99	mg/L
Iron Date Analyzed	200.7	16 07/26/99	0.050 U 07/26/99	mg/L

U = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL)
 and the Practical Quantitation Level (PQL).

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REPORT # : JR7809

DATE REPORTED: July 30, 1999

REFERENCE : WO # PE001

PROJECT NAME : NAS Pensacola, OU-1

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RESULTS OF ANALYSIS

<u>TOTAL METALS</u>	<u>METHOD</u>	<u>PE 18159</u> OU-1-IT <i>(TRM)</i>	<u>LAB BLANK</u>	<u>Units</u>
Lead	200.7	0.0050 U	0.0050 U	mg/L
Date Analyzed		07/26/99	07/26/99	
Magnesium	200.7	3.5	0.50 U	mg/L
Date Analyzed		07/26/99	07/26/99	
Manganese	200.7	0.18	0.010 U	mg/L
Date Analyzed		07/26/99	07/26/99	
Mercury	245.1	0.00023 I	0.00020 U	mg/L
Date Analyzed		07/27/99	07/27/99	
Nickel	200.7	0.010 U	0.010 U	mg/L
Date Analyzed		07/26/99	07/26/99	
Potassium	258.1	1.1	0.50 U	mg/L
Date Analyzed		07/28/99	07/28/99	
Selenium	200.7	0.010 U	0.010 U	mg/L
Date Analyzed		07/26/99	07/28/99	
Silver	200.7	0.010 U	0.010 U	mg/L
Date Analyzed		07/26/99	07/26/99	
Sodium	273.1	7.0	0.50 U	mg/L
Date Analyzed		07/28/99	07/28/99	
Thallium	200.7	0.0040 U	0.0040 U	mg/L
Date Analyzed		07/26/99	07/26/99	
Vanadium	200.7	0.010 U	0.010 U	mg/L
Date Analyzed		07/26/99	07/26/99	
Zinc	200.7	0.10 U	0.10 U	mg/L
Date Analyzed		07/26/99	07/26/99	

U = Compound was analyzed for but not detected to the level shown.

I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

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REPORT # : JR7809
DATE REPORTED: July 30, 1999
REFERENCE : WO # PE001
PROJECT NAME : NAS Pensacola, OU-1

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RESULTS OF ANALYSIS

<u>MISCELLANEOUS</u>	<u>METHOD</u>	PE 18159 <i>(item)</i> OU-1 IT	<u>LAB BLANK</u>	<u>Units</u>
Alkalinity, Total	310.1	200	1.0 U	mg/L
Date Analyzed		07/30/99	07/30/99	
Total Dis. Solids	160.1	310	1.0 U	mg/L
Date Analyzed		07/27/99	07/27/99	
pH	150.1	6.6	NR	S.U.
Date Analyzed		07/24/99		

U = Compound was analyzed for but not detected to the level shown.
NR = Analysis not requested for this sample.

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REPORT # : JR7809

DATE REPORTED: July 30, 1999

REFERENCE : WO # PE001

PROJECT NAME : NAS Pensacola, OU-1

PAGE 8 OF 9

QUALITY CONTROL DATA

<u>Parameter</u>	<u>% RECOVERY</u> <u>MS/MSD/LCS</u>	<u>ACCEPT</u> <u>LIMITS</u>	<u>% RPD</u> <u>MS/MSD</u>	<u>ACCEPT</u> <u>LIMITS</u>
<u>EPA Method 624/8260</u>				
1,1-Dichloroethene	104/ 97/112	45-167	7	30
Benzene	106/ 98/101	60-130	8	23
Trichloroethene	97/ 91/ 97	50-122	6	10
Toluene	92/ 86/105	57-136	7	12
Chlorobenzene	106/101/106	59-126	5	11
<u>Total Metals</u>				
Aluminum, 200.7	106/108/103	78-125	2	22
Antimony, 200.7	99/ 98/ 98	38-138	1	30
Arsenic, 200.7	101/101/100	64-126	<1	12
Barium, 200.7	99/ 99/ 99	74-119	<1	11
Beryllium, 200.7	100/ 99/100	76-126	1	12
Cadmium, 200.7	99/100/100	68-121	1	12
Calcium, 200.7	80/ 82/ 99	63-131	2	22
Chromium, 200.7	101/101/100	73-120	<1	10
Cobalt, 200.7	98/ 97/ 99	76-120	1	17
Copper, 200.7	102/101/ 98	75-123	<1	11
Iron, 200.7	74/ 76/100	48-144	3	23
Lead, 200.7	100/100/101	68-126	<1	19
Magnesium, 200.7	100/ 99/102	59-129	1	22
Manganese, 200.7	97/ 97/ 99	86-105	<1	19
Mercury, 245.1	99/100/106	70-136	1	12

Environmental Conservation Laboratories Comprehensive QA Plan #960038

< = Less Than

MS = Matrix Spike

MSD = Matrix Spike Duplicate

LCS = Laboratory Control Standard

RPD = Relative Percent Difference

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ENCO LABORATORIES
 REPORT # : JR7809
 DATE REPORTED: July 30, 1999
 REFERENCE : WO # PE001
 PROJECT NAME : NAS Pensacola, OU-1

QUALITY CONTROL DATA

<u>Parameter</u>	<u>% RECOVERY MS/MSD/LCS</u>	<u>ACCEPT LIMITS</u>	<u>% RPD MS/MSD</u>	<u>ACCEPT LIMITS</u>
Nickel, 200.7	100/ 99/ 99	64-126	1	12
Potassium, 258.1	95/ 98/ 95	76-126	3	13
Selenium, 200.7	101/102/100	65-129	<1	10
Silver, 200.7	103/ 96/ 98	69-121	7	12
Sodium, 273.1	93/ 97/ 93	46-127	4	21
Thallium, 200.7	100/ 98/ 98	67-135	2	13
Vanadium, 200.7	101/100/101	71-130	<1	16
Zinc, 200.7	95/ 94/ 96	63-131	1	24
<u>Miscellaneous</u>				
Alkalinity, Total, 310.1	92/ 91/ 94	73-126	1	11
Total Dis. Solids, 160.1	NA/ NA/100	NA	NA	NA
pH, 150.1	NA/ NA/100	NA	NA	NA

Environmental Conservation Laboratories Comprehensive QA Plan #960038

- < = Less Than
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- LCS = Laboratory Control Standard
- RPD = Relative Percent Difference

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Environmental Conservation Laboratories, Inc.
4810 Executive Park Court, Suite 211
Jacksonville, Florida 32216-6069
904 / 296-3007
Fax 904 / 296-6210
www.encolabs.com



DHRS Certification No. E82277

CLIENT : Bechtel Environmental, Inc.
ADDRESS: 151 Lafayette Dr.
Oak Ridge, TN 37830

REPORT # : JR8596
DATE SUBMITTED: September 22, 1999
DATE REPORTED : October 4, 1999

PAGE 1 OF 9

ATTENTION: Mr. Robin Manning

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

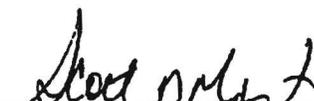
WO# PE002

Pensacola,OU-1 Interceptor Trench

09/21/99

#1 - PE18160 @ 16:00

PROJECT MANAGER


Scott D. Martin

ENCO LABORATORIES

REPORT # : JR8596
 DATE REPORTED: October 4, 1999
 REFERENCE : WO# PE002
 PROJECT NAME : Pensacola,OU-1
 Interceptor Trench

PAGE 2 OF 9

RESULTS OF ANALYSIS

EPA METHOD 8260 -
 VOLATILE ORGANICS

	<u>PE18160</u>	<u>LAB BLANK</u>	<u>Units</u>
Dichlorodifluoromethane	2.0 U	2.0 U	µg/L
Chloromethane	1.0 U	1.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	2.0 U	2.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	1.0 U	1.0 U	µg/L
1,1-Dichloroethene	1.0 U	1.0 U	µg/L
Acetone	50 U	50 U	µg/L
Carbon Disulfide	50 U	50 U	µg/L
Methylene Chloride	5.0 U	5.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
Methyl tert-butyl ether	6.0 U	6.0 U	µg/L
1,1-Dichloroethane	1.0 U	1.0 U	µg/L
2,2-Dichloropropane	2.0 U	2.0 U	µg/L
c-1,2-Dichloroethene	1.8 I	1.0 U	µg/L
2-Butanone	20 U	20 U	µg/L
Chloroform	1.0 U	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon tetrachloride	1.0 U	1.0 U	µg/L
1,1-Dichloropropene	1.0 U	1.0 U	µg/L
Benzene	3.7	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	1.0 U	µg/L
Trichloroethene	1.1 I	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	1.0 U	µg/L
Dibromomethane	1.0 U	1.0 U	µg/L
Bromodichloromethane	1.0 U	1.0 U	µg/L

U = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL)
 and the Practical Quantitation Level (PQL).

ENCO LABORATORIES

REPORT # : JR8596
 DATE REPORTED: October 4, 1999
 REFERENCE : WO# PE002
 PROJECT NAME : Pensacola,OU-1
 Interceptor Trench

PAGE 3 OF 9

RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
 VOLATILE ORGANICS

	<u>PE18160</u>	<u>LAB BLANK</u>	<u>Units</u>
2-Chloroethyl vinyl ether	6.0 U	6.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
4-Methyl-2-pentanone	20 U	20 U	µg/L
Toluene	1.0 U	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
Tetrachloroethene	3.0 U	3.0 U	µg/L
1,3-Dichloropropane	1.0 U	1.0 U	µg/L
2-Hexanone	20 U	20 U	µg/L
Dibromochloromethane	1.0 U	1.0 U	µg/L
1,2-Dibromoethane	1.0 U	1.0 U	µg/L
Chlorobenzene	9.4	1.0 U	µg/L
1,1,1,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
Ethylbenzene	1.0 U	1.0 U	µg/L
m-Xylene & p-Xylene	2.0 U	2.0 U	µg/L
o-Xylene	1.0 U	1.0 U	µg/L
Styrene	1.0 U	1.0 U	µg/L
Bromoform	1.0 U	1.0 U	µg/L
Isopropylbenzene	1.0 U	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
Bromobenzene	1.0 U	1.0 U	µg/L
1,2,3-Trichlorobenzene	1.0 U	1.0 U	µg/L
n-Propylbenzene	1.0 U	1.0 U	µg/L
2-Chlorotoluene	1.0 U	1.0 U	µg/L
1,3,5-Trimethylbenzene	1.0 U	1.0 U	µg/L
4-Chlorotoluene	1.0 U	1.0 U	µg/L

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

REPORT # : JR8596
 DATE REPORTED: October 4, 1999
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 Interceptor Trench

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RESULTS OF ANALYSIS

**EPA METHOD 8260 (cont.) -
 VOLATILE ORGANICS**

	<u>PE18160</u>	<u>LAB BLANK</u>	<u>Units</u>
tert-Butylbenzene	1.0 U	1.0 U	µg/L
1,2,4-Trimethylbenzene	1.0 U	1.0 U	µg/L
s-Butylbenzene	1.0 U	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
p-Isopropyltoluene	1.0 U	1.0 U	µg/L
1,4-Dichlorobenzene	2.0	1.0 U	µg/L
n-Butylbenzene	1.0 U	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
1,2-Dibromo-3-chloropropane	1.0 U	1.0 U	µg/L
1,2,4-Trichlorobenzene	1.0 U	1.0 U	µg/L
Hexachlorobutadiene	1.0 U	1.0 U	µg/L
Naphthalene	2.3	2.0 U	µg/L
1,2,3-Trichloropropane	1.0 U	1.0 U	µg/L
Bromochloromethane	1.0 U	1.0 U	µg/L

<u>Surrogate:</u>	<u>% RECOV</u>	<u>% RECOV</u>	<u>LIMITS</u>
Dibromofluoromethane	100	95	38-143
D8-Toluene	95	93	78-126
Bromofluorobenzene	92	91	72-132
Date Analyzed	09/27/99	09/27/99	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

REPORT # : JR8596
 DATE REPORTED: October 4, 1999
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RESULTS OF ANALYSIS

<u>TOTAL METALS</u>	<u>METHOD</u>	<u>PE18160</u>	<u>LAB BLANK</u>	<u>Units</u>
Aluminum	200.7	0.074	0.050 U	mg/L
Date Analyzed		09/23/99	09/23/99	
Antimony	200.7	0.0060 U	0.0060 U	mg/L
Date Analyzed		09/23/99	09/23/99	
Arsenic	200.7	0.010 U	0.010 U	mg/L
Date Analyzed		09/23/99	09/23/99	
Barium	200.7	0.10 U	0.10 U	mg/L
Date Analyzed		09/23/99	09/23/99	
Beryllium	200.7	0.0010 U	0.0010 U	mg/L
Date Analyzed		09/23/99	09/23/99	
Cadmium	200.7	0.0010 I	0.0010 U	mg/L
Date Analyzed		09/23/99	09/23/99	
Calcium	200.7	71	0.50 U	mg/L
Date Analyzed		09/27/99	09/23/99	
Chromium	200.7	0.010 U	0.010 U	mg/L
Date Analyzed		09/23/99	09/23/99	
Cobalt	200.7	0.050 U	0.050 U	mg/L
Date Analyzed		09/23/99	09/23/99	
Copper	200.7	0.050 U	0.050 U	mg/L
Date Analyzed		09/23/99	09/23/99	
Iron	200.7	11	0.050 U	mg/L
Date Analyzed		09/23/99	09/23/99	

U = Compound was analyzed for but not detected to the level shown.
 I = Analyte detected; value is between the Method Detection Level (MDL)
 and the Practical Quantitation Level (PQL).

ENCO LABORATORIES

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 DATE REPORTED: October 4, 1999
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RESULTS OF ANALYSIS

<u>TOTAL METALS</u>	<u>METHOD</u>	<u>PE18160</u>	<u>LAB BLANK</u>	<u>Units</u>
Lead Date Analyzed	200.7	0.0050 U 09/23/99	0.0050 U 09/23/99	mg/L
Magnesium Date Analyzed	200.7	3.5 09/23/99	0.50 U 09/23/99	mg/L
Manganese Date Analyzed	200.7	0.15 09/23/99	0.010 U 09/23/99	mg/L
Mercury Date Analyzed	245.1	0.00020 U 09/29/99	0.00020 U 09/29/99	mg/L
Nickel Date Analyzed	200.7	0.010 U 09/23/99	0.010 U 09/23/99	mg/L
Potassium Date Analyzed	258.1	1.8 09/29/99	0.50 U 09/29/99	mg/L
Selenium Date Analyzed	200.7	0.010 U 09/23/99	0.010 U 09/23/99	mg/L
Silver Date Analyzed	200.7	0.010 U 09/23/99	0.010 U 09/23/99	mg/L
Sodium Date Analyzed	273.1	7.0 09/29/99	0.50 U 09/29/99	mg/L
Thallium Date Analyzed	200.7	0.0040 U 09/23/99	0.0040 U 09/23/99	mg/L
Vanadium Date Analyzed	200.7	0.010 U 09/23/99	0.010 U 09/23/99	mg/L
Zinc Date Analyzed	200.7	0.10 U 09/23/99	0.10 U 09/23/99	mg/L

J = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

<u>MISCELLANEOUS</u>	<u>METHOD</u>	<u>PE18160</u>	<u>LAB BLANK</u>	<u>Units</u>
Alkalinity, Total	310.1	190	10	mg/L
Date Analyzed		10/01/99	10/01/99	
Total Dis. Solids	160.1	23	1.0 U	mg/L
Date Analyzed		09/30/99	09/30/99	
pH	150.1	6.7	NR	S.U.
Date Analyzed		09/25/99		

U = Compound was analyzed for but not detected to the level shown.
NR = Analysis not requested for this sample.

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QUALITY CONTROL DATA

<u>Parameter</u>	<u>% RECOVERY MS/MSD/LCS</u>	<u>ACCEPT LIMITS</u>	<u>% RPD MS/MSD</u>	<u>ACCEPT LIMITS</u>
<u>EPA Method 624/8260</u>				
1,1-Dichloroethene	104/100/105	45-167	4	30
Benzene	104/108/107	60-130	4	23
Trichloroethene	95/ 99/101	50-122	4	10
Toluene	102/100/110	57-136	2	12
Chlorobenzene	103/104/108	59-126	<1	11
<u>Miscellaneous</u>				
Alkalinity, Total, 310.1	#134/130/ 96	73-126	3	11
Total Dis. Solids, 160.1	NA/ NA/108	NA	NA	NA
pH, 150.1	NA/ NA/101	NA	NA	NA

Environmental Conservation Laboratories Comprehensive QA Plan #960038

- # = One or more of the associated value failed to meet laboratory established criteria for accuracy.
- < = Less Than
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- LCS = Laboratory Control Standard
- RPD = Relative Percent Difference

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 Interceptor Trench

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QUALITY CONTROL DATA

<u>Parameter</u>	<u>% RECOVERY</u> <u>MS/MSD/LCS</u>	<u>ACCEPT</u> <u>LIMITS</u>	<u>% RPD</u> <u>MS/MSD</u>	<u>ACCEPT</u> <u>LIMITS</u>
<u>Total Metals</u>				
Aluminum, 200.7	#374/384/104	78-125	3	22
Antimony, 200.7	98/ 98/104	38-138	<1	30
Arsenic, 200.7	101/100/106	64-126	<1	12
Barium, 200.7	98/ 99/103	74-119	1	11
Beryllium, 200.7	98/ 98/104	76-126	<1	12
Cadmium, 200.7	96/ 96/103	68-121	<1	12
Calcium, 200.7	#126/134/106	63-131	6	22
Chromium, 200.7	97/ 97/103	73-120	<1	10
Cobalt, 200.7	98/ 98/105	76-120	<1	17
Copper, 200.7	101/101/104	75-123	<1	11
Iron, 200.7	* / * / 98	48-144	*	23
Lead, 200.7	97/ 98/105	68-126	1	19
Magnesium, 200.7	99/113/106	59-129	13	22
Manganese, 200.7	108/114/105	86-105	5	19
Mercury, 245.1	98/ 96/102	70-136	2	12
Nickel, 200.7	97/ 97/104	64-126	<1	12
Potassium, 258.1	94/ 94/100	76-126	<1	13
Selenium, 200.7	101/100/105	65-129	<1	10
Silver, 200.7	95/ 94/104	69-121	1	12
Sodium, 273.1	118/ 97/100	46-127	20	21
Thallium, 200.7	89/ 88/103	67-135	1	13
Vanadium, 200.7	99/ 99/105	71-130	<1	16
Zinc, 200.7	95/ 96/103	63-131	1	24

Environmental Conservation Laboratories Comprehensive QA Plan #960038

- * = MS/MSD/RPD unavailable due to high original sample concentration.
- # = One or more of the associated value failed to meet laboratory established criteria for accuracy.
- < = Less Than
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- LCS = Laboratory Control Standard
- RPD = Relative Percent Difference

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DHRS Certification No. E82277

CLIENT : Bechtel Environmental, Inc.
ADDRESS: NAS Jacksonville
P.O. Box 171
Jacksonville, FL 32215

REPORT # : JR1351
DATE SUBMITTED: January 28, 2000
DATE REPORTED : February 7, 2000

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ATTENTION: W.E. Hevrdeys

SAMPLE IDENTIFICATION

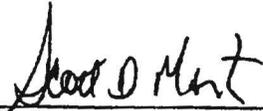
Samples submitted and
identified by client as:

OU-1 Interceptor Trench

01/27/00

#1 - PE18161 @ 11:40

PROJECT MANAGER



Scott D. Martin

ENCO LABORATORIES

REPORT # : JR1351

DATE REPORTED: February 7, 2000

PROJECT NAME : OU-1 Interceptor Trench

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RESULTS OF ANALYSIS

EPA METHOD 8260 -
VOLATILE ORGANICS

	<u>PE18161</u>	<u>LAB BLANK</u>	<u>Units</u>
Dichlorodifluoromethane	2.0 U	2.0 U	µg/L
Chloromethane	1.0 U	1.0 U	µg/L
Vinyl Chloride	1.0 U	1.0 U	µg/L
Bromomethane	2.0 U	2.0 U	µg/L
Chloroethane	2.0 U	2.0 U	µg/L
Trichlorofluoromethane	1.0 U	1.0 U	µg/L
1,1-Dichloroethene	1.0 U	1.0 U	µg/L
Acetone	50 U	50 U	µg/L
Carbon Disulfide	50 U	50 U	µg/L
Methylene Chloride	5.0 U	5.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	1.0 U	µg/L
Methyl tert-butyl ether	1.0 U	1.0 U	µg/L
1,1-Dichloroethane	1.0 U	1.0 U	µg/L
2,2-Dichloropropane	2.0 U	2.0 U	µg/L
c-1,2-Dichloroethene	2.5	1.0 U	µg/L
2-Butanone	20 U	20 U	µg/L
Chloroform	1.0 U	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	1.0 U	µg/L
Carbon tetrachloride	1.0 U	1.0 U	µg/L
1,1-Dichloropropene	1.0 U	1.0 U	µg/L
Benzene	1.0 U	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	1.0 U	µg/L
Trichloroethene	2.0	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	1.0 U	µg/L
Dibromomethane	1.0 U	1.0 U	µg/L
Bromodichloromethane	1.0 U	1.0 U	µg/L

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
VOLATILE ORGANICS

	<u>PE18161</u>	<u>LAB BLANK</u>	<u>Units</u>
2-Chloroethyl vinyl ether	6.0 U	6.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
4-Methyl-2-pentanone	20 U	20 U	µg/L
Toluene	1.0 U	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	1.0 U	µg/L
Tetrachloroethene	3.0 U	3.0 U	µg/L
1,3-Dichloropropane	1.0 U	1.0 U	µg/L
2-Hexanone	20 U	20 U	µg/L
Dibromochloromethane	1.0 U	1.0 U	µg/L
1,2-Dibromoethane	1.0 U	1.0 U	µg/L
Chlorobenzene	6.9	1.0 U	µg/L
1,1,1,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
Ethylbenzene	1.0 U	1.0 U	µg/L
m-Xylene & p-Xylene	2.0 U	2.0 U	µg/L
o-Xylene	1.0 U	1.0 U	µg/L
Styrene	1.0 U	1.0 U	µg/L
Bromoform	1.0 U	1.0 U	µg/L
Isopropylbenzene	1.0 U	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	1.0 U	µg/L
Bromobenzene	1.0 U	1.0 U	µg/L
1,2,3-Trichlorobenzene	1.0 U	1.0 U	µg/L
n-Propylbenzene	1.0 U	1.0 U	µg/L
2-Chlorotoluene	1.0 U	1.0 U	µg/L
1,3,5-Trimethylbenzene	1.0 U	1.0 U	µg/L
4-Chlorotoluene	1.0 U	1.0 U	µg/L

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES

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PROJECT NAME : OU-1 Interceptor Trench

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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) -
VOLATILE ORGANICS

	<u>PE18161</u>	<u>LAB BLANK</u>	<u>Units</u>
tert-Butylbenzene	1.0 U	1.0 U	µg/L
1,2,4-Trimethylbenzene	1.0 U	1.0 U	µg/L
s-Butylbenzene	1.0 U	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	1.0 U	µg/L
p-Isopropyltoluene	1.0 U	1.0 U	µg/L
1,4-Dichlorobenzene	1.2	1.0 U	µg/L
n-Butylbenzene	1.0 U	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	1.0 U	µg/L
1,2-Dibromo-3-chloropropane	1.0 U	1.0 U	µg/L
1,2,4-Trichlorobenzene	1.0 U	1.0 U	µg/L
Hexachlorobutadiene	1.0 U	1.0 U	µg/L
Naphthalene	2.0 U	2.0 U	µg/L
1,2,3-Trichloropropane	1.0 U	1.0 U	µg/L
Bromochloromethane	1.0 U	1.0 U	µg/L

Surrogate:

	<u>% RECOV</u>	<u>% RECOV</u>	<u>LIMITS</u>
Dibromofluoromethane	107	103	38-143
D8-Toluene	96	99	78-126
Bromofluorobenzene	96	99	72-132
Date Analyzed	02/02/00	02/02/00	

<u>MISCELLANEOUS</u>	<u>METHOD</u>	<u>PE18161</u>	<u>LAB BLANK</u>	<u>Units</u>
Alkalinity, Total	310.1	190	1.0 U	mg/L
Date Analyzed		02/05/00	02/05/00	
Total Dis. Solids	160.1	350	1.0 U	mg/L
Date Analyzed		01/31/00	01/31/00	
pH	150.1	6.8	NR	S.U.
Date Analyzed		01/28/00		

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
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RESULTS OF ANALYSIS

<u>TOTAL METALS</u>	<u>METHOD</u>	<u>PE18161</u>	<u>LAB BLANK</u>	<u>Units</u>
Aluminum Date Analyzed	200.7	0.050 U 01/31/00	0.050 U 02/01/00	mg/L
Antimony Date Analyzed	200.7	0.0060 U 01/31/00	0.0060 U 01/31/00	mg/L
Arsenic Date Analyzed	200.7	0.010 U 01/31/00	0.010 U 01/31/00	mg/L
Barium Date Analyzed	200.7	0.10 U 01/31/00	0.10 U 01/31/00	mg/L
Beryllium Date Analyzed	200.7	0.0010 U 01/31/00	0.0010 U 01/31/00	mg/L
Cadmium Date Analyzed	200.7	0.0010 U 01/31/00	0.0010 U 01/31/00	mg/L
Calcium Date Analyzed	200.7	80 01/31/00	0.50 U 01/31/00	mg/L
Chromium Date Analyzed	200.7	0.010 U 01/31/00	0.010 U 01/31/00	mg/L
Cobalt Date Analyzed	200.7	0.050 U 01/31/00	0.050 U 01/31/00	mg/L
Copper Date Analyzed	200.7	0.050 U 01/31/00	0.050 U 01/31/00	mg/L
Iron Date Analyzed	200.7	9.2 02/01/00	0.050 U 01/31/00	mg/L

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

<u>TOTAL METALS</u>	<u>METHOD</u>	<u>PE18161</u>	<u>LAB BLANK</u>	<u>Units</u>
Lead	200.7	0.0050 U	0.0050 U	mg/L
Date Analyzed		01/31/00	01/31/00	
Magnesium	200.7	3.8	0.50 U	mg/L
Date Analyzed		01/31/00	01/31/00	
Manganese	200.7	0.16	0.010 U	mg/L
Date Analyzed		01/31/00	01/31/00	
Mercury	245.1	0.00030 J	0.00031 J	mg/L
Date Analyzed		01/31/00	01/31/00	
Nickel	200.7	0.010 U	0.010 U	mg/L
Date Analyzed		01/31/00	01/31/00	
Potassium	258.1	1.7	0.50 U	mg/L
Date Analyzed		02/01/00	02/01/00	
Selenium	200.7	0.010 U	0.010 U	mg/L
Date Analyzed		01/31/00	01/31/00	
Silver	200.7	0.010 U	0.010 U	mg/L
Date Analyzed		01/31/00	01/31/00	
Sodium	273.1	7.4	0.50 U	mg/L
Date Analyzed		01/31/00	01/31/00	
Thallium	200.7	0.0040 U	0.0040 I	mg/L
Date Analyzed		01/31/00	01/31/00	
Vanadium	200.7	0.010 U	0.010 U	mg/L
Date Analyzed		01/31/00	01/31/00	
Zinc	200.7	0.10 U	0.10 U	mg/L
Date Analyzed		01/31/00	01/31/00	

U = Compound was analyzed for but not detected to the level shown.

I = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

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QUALITY CONTROL DATA

<u>Parameter</u>	<u>% RECOVERY MS/MSD/LCS</u>	<u>ACCEPT LIMITS</u>	<u>% RPD MS/MSD</u>	<u>ACCEPT LIMITS</u>
<u>EPA Method 624/8260</u>				
1,1-Dichloroethene	125/124/123	45-167	<1	30
Benzene	106/100/102	60-130	6	23
Trichloroethene	102/102/ 98	50-122	<1	10
Toluene	100/103/102	57-136	3	12
Chlorobenzene	102/101/100	59-126	<1	11
<u>Miscellaneous</u>				
Alkalinity, Total, 310.1	102/102/103	73-126	<1	11
Total Dis. Solids, 160.1	NA/ NA/117	NA	NA	NA
pH, 150.1	NA/ NA/ 98	NA	NA	NA
<u>Total Metals</u>				
Aluminum, 200.7	114/109/ 96	78-125	4	22
Antimony, 200.7	99/ 98/ 93	38-138	1	30
Arsenic, 200.7	99/102/ 99	64-126	3	12
Barium, 200.7	101/ 98/ 98	74-119	3	11
Beryllium, 200.7	99/ 98/ 98	70-131	1	21
Cadmium, 200.7	97/ 97/ 97	68-121	<1	12
Calcium, 200.7	101/ 96/ 98	63-131	5	22
Chromium, 200.7	98/ 98/ 97	73-120	<1	10
Cobalt, 200.7	97/ 96/ 98	76-120	1	17
Copper, 200.7	99/ 98/ 97	75-123	1	11
Iron, 200.7	96/ 98/ 96	48-144	2	23
Lead, 200.7	99/ 98/ 98	68-126	1	19

Environmental Conservation Laboratories Comprehensive QA Plan #910190

- < = Less Than
- MS = Matrix Spike
- MSD = Matrix Spike Duplicate
- LCS = Laboratory Control Standard
- RPD = Relative Percent Difference

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QUALITY CONTROL DATA

<u>Parameter</u>	<u>% RECOVERY MS/MSD/LCS</u>	<u>ACCEPT LIMITS</u>	<u>% RPD MS/MSD</u>	<u>ACCEPT LIMITS</u>
<u>Total Metals</u>				
Magnesium, 200.7	101/ 95/ 98	59-129	6	22
Manganese, 200.7	98/100/ 97	86-105	2	19
Mercury, 245.1	101/102/103	70-136	<1	12
Nickel, 200.7	97/ 97/ 98	64-126	<1	12
Potassium, 258.1	91/ 91/ 93	76-126	<1	13
Selenium, 200.7	99/ 99/ 99	65-129	<1	10
Silver, 200.7	101/100/ 99	69-121	<1	12
Sodium, 273.1	92/ 87/ 92	46-127	6	21
Thallium, 200.7	97/ 97/ 99	67-135	<1	13
Vanadium, 200.7	99/ 97/ 97	71-130	2	16
Zinc, 200.7	95/ 94/ 97	63-131	1	24

Environmental Conservation Laboratories Comprehensive QA Plan #910190

< = Less Than

MS = Matrix Spike

MSD = Matrix Spike Duplicate

LCS = Laboratory Control Standard

RPD = Relative Percent Difference

This report shall not be reproduced except in full, without the written approval of the laboratory. Results for these procedures apply only to the samples as submitted.

O&M REPORTS

NAS Pensacola Florida
OU-1 Groundwater Interceptor Trench
Pump Flow Rate - Head Pressure- Power Demand

Time	Flow Rate		Pressure		Current	Voltage	Flow Valve Position	By-Pass Valve Position	Comments
	hrs	gpm	psi	feet	Amp	Volt			
Date: 25-Jan-00									
15:00	28	20	46	7.3			100% open	closed	Current check with Fluke Amp Meter, unless other wise Indicated.
	21	24	55.2	6.9			partially closed	closed	
	0	30+	69	6.5			closed	closed	Pump is running valve closed to provide a dead head condition for the pump. Dead Head pressure is not much past 30 psi which is the max reading on the gage.
	6			6.6	245				
	4.1	28	64.4	6.4			partially opened	partially opened	
	20	15	34.5	6.9				partially opened +	
	22	15	34.5	6.9			100% open	partially opened ++	
	18	12.5	28.8	7			100% open	partially opened +++	
	20	13.5	31.1	7			100% open	partially open, begin closing	
15:20	7	7.5	17.3	7.2			100% open	100% open	
	28	20	46	6.8			100% open	closed	
	18	26	59.8	6.6-6.5				closed	
	10	30	69	6.4				closed	
	8	30	69	6.6			approx 50% open	closed	
16:30	9			6.5				closed	Check current with Sperry Amp Meter, shut system down until voltage changed on transformer to 230 volt. Electric hour meter rdg. 3236.1 Shutdown conditions/data: 0gpm; 05045434 gal x 0001; 05091192 total gal; 4.0mA; 6-17-99; electric hour meter 3236.1
Date: 26-Jan-00									
11:00									Transformer Tap changed from "c" to "a" and voltage changed to 230
11:24	20			6.2	230		4 turns closed from full open position	closed	Fluke and Sperry amp Meters used to read Amps. Both had the same reading. Bled air vents on pipeline.
11:33	29	19	43.7	6.3	230		100% open	closed	
11:38	25	21.5	49.5	6.3	230		3.5 turns closed from full open position	closed	

NAS Pensacola Florida
OU-1 Groundwater Interceptor Trench
Pump Flow Rate - Head Pressure- Power Demand

Time	Flow Rate	Pressure		Current	Voltage	Flow Valve Position	By-Pass Valve Position	Comments
hrs	gpm	psi	feet	Amp	Volt			* add 8 feet to the value to get the dynamic head at the pump
11:40	19	24.5	56.4	6.2	230	4 turns closed from full open position	closed	
11:46	13	27	62.1	6	230	4.25 turns closed from full open position	closed	
11:50	15	26.5	61	6.1	230	4.125 turns closed from full open position	closed	No change to valve position but noticed a decrease in flow rate and increase in pressure. Vented the pipeline at 12:30, no effect on flow rate or pressure. No trapped air noticed during venting.
12:10	11	28	64.4					
12:40	10.5	28	64.4					
12:51	17.8	24.5	56.4	6	230	3.875 turns closed from full open position	closed	Sperry Amp Meter used for remaining current readings.
12:58			0					Control Pnl exhaust fans turn on due to sunlight shining on the sensor.
13:00	18.1	24.5	56.4					Flow meter data: 05047158gal x 0001; 05092921 total gal; 7.64mA; 6-17-99
15:00	17.8	25.5	58.7	6.2	230	"	closed	
15:42	17	26	59.8	6.2	232	"	closed	Flow meter data: 0595773 total gal.
								Returned the damaged pump for warranty replacement to Escambia Electric Motors, (850)432-1577, Glenn, 1101 W Main Str. Pensacola
Date: 27-Jan-00								
9:00	16.1	26.2	60.3	6.2	235	3.875 turns closed from full open position	closed	Sperry Amp Meter used for remaining current readings. Flow meter rdg: 05113580 total gal; 7.23mA. System ran overnight with no changes to valve settings. Bled pipeline air vents, no trapped air noticed.
11:40	16			6.2		"	partially opened to reduce water pressure at sample port during sampling.	
12:00	15.2			5.9		"	closed	Flow rate did not return to 16 gpm after closing sample port and by-pass valves.

NAS Pensacola Florida
OU-1 Groundwater Interceptor Trench
Pump Flow Rate - Head Pressure- Power Demand

Time	Flow Rate		Pressure		Current	Voltage	Flow Valve Position	By-Pass Valve Position	Comments
	hrs	gpm	psi	feet	Amp	Volt			
13:00	20.5	23.5	54.1	6.2		3.625 turns closed from full open position	closed	* add 8 feet to the value to get the dynamic head at the pump Open flow valve and began closing to get the flow back to ~18gpm.	
13:05	19.4			6.2		3.75 turns closed from full open position	closed		
13:10	17.8	25	57.5	6.2		3.875 turns closed from full open position	closed		
14:21	17.7	25	57.5	6.2	232	"	closed		
15:28	17.7	25.3	58.2	6.1	232	"	closed	Reprogramed telemetry. Disconnected the telephone line surge protector from the telemetry unit, as it was blocking incoming calls. Suspect lightening damage or base has new low voltage phone system.	

NAS Pensacola Florida
Operable Unit 1, Groundwater Interceptor Trench
Piezometer Readings and OU-1 Well Pumping Rate

Date	Time	GW Elevation (feet below T/casing)						Pipe Line Press. (psi)	OU-1 Well Pumping Data			Comments
		Piezometer/Well Number							GPM	GPD	Totalizer (Gal)	
		P-1	P-6	P-7	P-8	P-10	WELL					
14-Jun-99	10:20	8.95	10.38	7.94	8.50	8.16	6.39	-			0	Initial Piezometer readings before startup
"	13:30							17.0	16.5	23,760		Start pumping
15-Jun-99	8:00	-	-	-	-	-	6.80	18.5	18.0	25,920		
"	11:20	-	-	-	8.70	8.35	-	-				
"	14:00	9.17	10.61	8.24	8.73	8.37	6.84	-				
16-Jun-99	11:25	9.30	10.70	8.35	8.81	8.48	6.94	18.5	30.2	43,488		Field pH is 6.45, D.O. is 4.77mg/l
17-Jun-99	10:45	9.35	10.77	8.44	8.88	8.54	7.02	-				
21-Jul-99		-	-	-	-	-	6.92	-			1,335,489	First O&M visit. Goulds pump not running, replacement pump sought
22-Jul-99									25.0			Elec. hour meter read 884.5 HRS which calc an average flow rate of 25 gpm for the period since startup
23-Jul-99		9.55	10.92	8.58	9.14	8.82	7.25	17.5	29.8	42,840		Goulds pump replaced S/N FG1 16135 6531 Current draw on motor is 7.5 amp
21-Sep-99	15:00	10.68	12.00	9.79	10.11	9.86	-	18.0	30.5	41,764	3,924,875	Elec. Hour meter read 2328.9 HRS.
22-Sep-99	15:30	10.64	12.06	9.79	10.14	9.85	8.35	18.2	30.3	43,392	3,968,267	Elec. Hour meter read 2352.6. Current draw on pump motor 7 amp.
30-Sep-99	9:29	-	-	-	-	-	-	-	30.0	43,506	4,305,435	
"	9:30	-	-	-	-	-	-	25.0	19.0	27,360	4,305,435	PWC reset pump discharge rate to 19 gpm to stay within permit limit of 28800 gpd
05-Oct-99	8:00	-	-	-	-	-	-	0.0	0.0		4,434,588	Alrm cond. 2(high-high well water level) recvd. Elec. is on. Attmpt'd to contact PWC.

NAS Pensacola Florida

Operable Unit 1, Groundwater Interceptor Trench
Piezometer Readings and OU-1 Well Pumping Rate

Date	Time	GW Elevation (feet below T/casing)						Pipe Line Press. (psi)	OU-1 Well Pumping Data			Comments
		Piezometer/Well Number							GPM	GPD	Totalizer (Gal)	
		P-1	P-6	P-7	P-8	P-10	WELL					
07-Oct-99	10:45	-	-	-	-	-	-	30.0	10.4	14,976	4,434,588	Pump was off. System restarted by PWC. Reset Goulds motor starter control box.
08-Oct-99		-	-	-	-	-	-		-			Alrm cond. 2(high high well water level) recvd. Elec. is on.
12-Oct-99	8:20	-	-	-	-	-	-	30.0	8.3	13,300	4,499,978	Line Power onsite to check electrical. Pump was running. Press. gage pegged at 30+ psf.
12-Oct-99	8:40	-	-	-	-	-	-	29.2	13.1	18,864	4,499,978	Line Power reset pump discharge rate to reduce press rdg.
30-Nov-99		-	-	-	-	-	-	0	0		~5,088,000	PWC responds to alarm cond No. 2. Pump is off, reset attempts failed. MS clicks-in but pump will not start.
3-Dec-99		-	-	-	-	-	-	0	0			Line Power check current draw, overloads, circuit condition all is normal. Pump is suspected failure
25-Jan-00	16:30	-	-	-	-	-	-	0	0		5,091,192	Line Power replaces pump with Goulds LDN 1012, SN 0499 016859. Line voltage checks at 245V; pump 6.8A w/28 gpm, 6.5A w/9 gpm. System off at 16:30 for line voltage correction. Pump tag data max AMP is 6.2. Elec Hr meter rdg 3236.1
26-Jan-00	8:30	10.38	11.84	9.46	10.05	9.84	7.93	0	0		5,091,192	Water level rdgs taken prior to system restart.
26-Jan-00	13:00	-	-	-	-	-	-	24.5	18.1		5,092,921	System restarted @11:20 after resetting transformer taps to 230 volt. Adjusted flow valve until pump AMP draw was 6.2A or less. Bled air vents on pipeline.
26-Jan-00	15:45	-	-	-	-	-	8.21	26	17		5,095,773	Pump running continuous since 13:00hrs. Flow rate decreasing with time, Pump @ 6.2A & 232V
27-Jan-00	9:00	-	-	-	-	-	-	26.2	16.1	23,184	5,113,580	Pump @ 6.2A & 235V.
27-Jan-00	10:00	10.61	11.95	9.72	10.22	10.03	8.31	26	16			Pump @ 6.2A & 235V. Telemetry batteries replaced. Effluent water sample collected @ 11:40 hrs.
27-Jan-00	15:28	-	-	-	-	-	-	25.3	17.7	25,488	5,119,737	Adjusted valve to reset flow. Pump @ 6.2A & 232V. Completed reprogramming telemetry. Damaged phoneline surge protector disconnected.