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NSTC GREAT LAKES, IL
5090.3a

REPORT OF ENGINEERING SERVICES FOR TESTING AND REPLACEMENT OF
UNLEADED AND DIESEL FUEL PIPING SYSTEMS ADJACENT TO BUILDING 1600 A NS
GREAT LAKES IL
8/1/1991
VERSAR, INC

361

REPORT OF ENGINEERING SERVICES
FOR TESTING AND REPLACEMENT OF
UNLEADED AND DIESEL FUEL
PIPING SYSTEMS ADJACENT TO
BUILDING 1600A
GREAT LAKES NAVAL TRAINING CENTER

Prepared For:

NAVY PUBLIC WORKS CENTER
GREAT LAKES, ILLINOIS

Prepared By:

Versar, Inc.
1520 Kensington Road
Suite 115
Oak Brook, Illinois 60521

AUGUST 1991

REPORT OF ENGINEERING SERVICES
FOR TESTING AND REPLACEMENT OF
UNLEADED AND DIESEL FUEL
PIPING SYSTEMS ADJACENT TO
BUILDING 1600A
GREAT LAKES NAVAL TRAINING CENTER

This report was prepared
by John Angstmann

Under the direction and
review of Anthony Andrews

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1.0 INTRODUCTION

Versar, Inc. was contracted by Navy Public Works Center (NPWC), Great Lakes IL, to provide engineering services to upgrade the fuel piping system adjacent to Building 1600A of the Great Lakes Naval Training Center. The work was performed under contract/purchase order N65113-91-M0729 and N65113-91-M-1206.

Versar's original scope of work called for a site contamination investigation to determine the site's classification in accordance with IEPA's LUST Guidance Manual and provide repair or replacement of up to 70 lineal feet of FRP piping. The scope of work was later amended to provide a leak inspection pressure test of the three product lines and pumps underneath the tank pad and their subsequent repairs or replacement.

Versar completed the environmental investigation, and observed contamination along the route of the fuel system line. Repairs to the fuel line system were made, and the fuel dispensing station was returned to operation.

2.0 SITE CONTAMINATION INVESTIGATION

An initial field investigation was conducted by Versar on 14 February 1991. Versar subcontracted the services of Exploration Technology, Inc of Madison WI to drill and retrieve soil samples along the length of the existing buried fuel line. During the course of the drilling, a Versar environmental scientist continually screened each borehole for the presence of volatile organic compounds with an HNu photoionization detector. Soil samples were also collected and field screened. One soil sample was submitted to NWPC for laboratory analyses of BETX¹

The results of the investigation indicated that the backfill along the entire fuel line run exhibited petroleum contamination, and also indicated that the level of contamination was greater at the north end of the pipe run (pump island). A soil sample collected for laboratory analysis indicated a total BTEX level of 275 ppm; which is greater than the IEPA Soil Cleanup Objective for Petroleum LUST Sites of 16,025 ppm for total BETX. This information confirmed the NPWC's suspicion that a release had occurred, as based upon the failure of a piping system tightness test previously performed. Once this confirmation was made, the two unleaded UST systems were taken out of operation until the repairs could be made.

¹ BETX - benzene, ethylbenzene, toluene, xylene

3.0 FUEL PIPING SYSTEM REPAIRS

Work began at the site on 15 April 1991 and continued through 26 April 1991 to repair and replace the fuel piping system. An application for the replacement and upgrade of the system was submitted to the Office of State Fire Marshall (OSFM), State of Illinois, on March 13, 1991 and a permit was issued on 4 April 1991, (Appendix A). Versar initially subcontracted P.J. Hartman Company to replace 70 lineal feet of FRP fuel line system run found deficient by NPWC's previous pressure tests, and performed oversight of its subcontractor construction activities including excavation of the existing piping, installation of the new piping, pressure testing of the lines, and replacement of certain components of the fuel delivery system. Site photographs are included in Appendix B.

Excavation of the existing piping system began at the edge of concrete slab of the dispenser island. It was observed that the pipes were encased in concrete; the extent of which could not be determined without further excavation. Since removal of the encased lines would be time consuming and extended the temporary closure of the station, Versar recommended that the existing system be abandoned in place by flushing out the system and capping both ends. NPWC approved of the recommendation. The system was flushed out by blowing compressed air from the submersible pump back to the dispenser until no more product was removed. A total of approximately 15 gallons each was removed from the diesel and center unleaded UST lines. However, only two gallons could be flushed out of the line from the south unleaded UST; further evidence of the leak. Exhibit 1 (Appendix B) illustrates the locations of original fuel lines.

Approximately 70 lineal feet of a new FRP piping system was installed parallel to and approximately eight feet away from the abandoned in-place lines (Exhibit 2, Appendix B). During excavation of the trench, petroleum contaminated soil was encountered. A total of approximately 55 cubic yards of contaminated soil was removed and stockpiled on plastic for future disposal by NPWC. Soil samples were collected from two locations along the trench base prior to backfilling the pipe run with

pea gravel. Additional information regarding environmental sampling and observations is provided in Section 3 of this report.

During repair of the FRP piping, it was determined that the three product lines and pumps underlying the fuel tank pad would require leak pressure testing and possible repair or replacement. Since this work would be beyond Versar's original scope of work, Versar submitted a revised proposal for the testing and repair. NPWC issued contract/purchase order N65113-91-M1206 for the additional work.

On 25 April 1991, a pressure test of the newly installed fuel lines was made. After passing the pressure test the area was then backfilled, new sumps and covers were constructed at the tanks, and the concrete was patched in the cover slab. The fuel line system was completed and returned to operation after 26 April 1991, but bituminous pavement patching and resurfacing was not completed until 17 May 1991.

A cross section of the new fuel system construction is illustrated in Exhibit 3 of Appendix B.

4.0 ENVIRONMENTAL SAMPLING

During the excavation of existing piping and excavation for replacement fuel lines, Versar monitored and sampled the soils. All excavated soil was found to be BETX contaminated and was stockpiled on the property, for future disposal by NWPC. At the request of NWPC, Versar sampled the waste stockpile and submitted a composite sample for waste permit analysis. The analysis was to include tests for BETX, PNAs, and Total Lead. Additionally two samples were taken along the new pipeline trench floor for analysis of BETX and PNAs. The locations of those samples are depicted in Exhibit 2. These samples were taken to document the condition of the soil below the new pipelines prior to backfilling the trench. Both samples were "grab" samples collected approximately 6 inches below the floor of the trench. Versar's environmental scientist noted strong "petroleum orders" within the trench during field sampling.

All the samples were collected using a decontaminated steel sampling tool, placing the soil in a laboratory sample bottle sealed with a teflon lid. Samples were kept chilled in an iced cooler until delivery under "Chain of Custody". All samples were turned over to Navy Public Works personnel. The results of the laboratory analysis are found in Appendix C.

Analytical results indicate that sample TB 1 exceeded both the benzene and total BTEX objectives of 25 ppb and 16,025 ppb, respectively. Sample TB 2 did not exceed either of the soil clean up objectives. Total lead concentrations measured in TB 1 and TB 2 were 16.3 ppm and 24.2 ppm, respectively. Although the toxic characteristic leachate procedure (TCLP) test was not run on the two trench bottom samples, it was analyzed for in a waste pile sample. The TCLP - lead results were below the detection limit of 0.12 ppm. This is far below the level (5.0 ppm) at which the soil would be defined as hazardous waste.

5.0 SUMMARY AND CONCLUSIONS

Versar was retained by NPWC to provide engineering services to replace the fuel piping system and to characterize the site contamination in accordance with the IEPA Guidance Manual for Petroleum - Related LUST Cleanups in Illinois.

The existing steel pipe run was removed or properly abandoned in place, and replaced with single wall FRP pipe. During excavation of the existing steel pipes at the pump island and at the USTs, contaminated soil was discovered and removed. Contaminated soil was also removed during excavation of the new trench adjacent to the abandoned in-place lines. A total of approximately 55 cubic yards of contaminated soil was removed and stockpiled for subsequent disposal by the NPWC. Soil sampling along the northern trench base (near the pump island) indicated BTEX levels exceed the IEPA cleanup levels. At no time during the excavation was ground water encountered. The extent of the excavation was approximately three feet deep. Any contaminated soils on site are covered by concrete or asphalt pavement eliminating any direct human exposure.

Versar recommends that an investigation be conducted to determine the extent of soil contamination and whether the ground water has been impacted. This investigation would be necessary to determine the site's LUST classification. This may be accomplished by using a combination of soil vapor monitoring and soil sampling techniques and through the installation and sampling of ground water monitoring wells.

APPENDIX A
PERMITS

1035 Stevenson Drive
Springfield, IL 62703-4259

Permit # 9451 UPG/KEV
Request Rec'd 03/15/91
Approval Date 04/04/91

PERMIT FOR INSTALLATION OF
UNDERGROUND STORAGE TANKS AND PIPING FOR PETROLEUM AND HAZARDOUS MATERIALS

Permission to install underground storage tank or tanks and piping is hereby granted. Such installation must be in complete accordance with acceptable materials and procedures as specified in the Federal Register, Part II Environmental Protection Agency, 40 CFR Parts 280 and 281, and also with all sections of 41 Illinois Administrative Code, Part 170. A forty-eight (48) hour - 2 working day notice is required to confirm final date of the installation, repair, relining or upgrade for confirmation of our Inspector to be on site. You must contact the Division of Fire Prevention by phone; Chicago 312/314-2593, Marion 618/997-4371 ext.210, Springfield 217/785-4713.

1) Owner-Corporation, partnership or other business entity:

Navy Public Works Center
Name
Bldg. 1A - Naval Training Center
Street Address
Great Lakes IL 60088-5600
City State Zip
Phone

2) Name and location of facility where installation is to occur:

Navy Public Works Center
Name
Bldg. 1600A, Ray Street
Street Address
Great Lakes IL 60088-5600 Lake
City State Zip County
Contact Person Phone

3) Person, Firm or Company Performing Work:

Peter J. Hartmann Co.
Name
2440 South Wolf Road
Street Address
Des Plaines IL 60018
City State Zip
708/298-3141 362-25-8370
Phone Registration No.

COPY

THIS PERMIT IS VALID FOR SIX (6) MONTHS
FROM THE APPROVAL DATE.

PERMIT EXPIRES 10/04/91

4) Installation of tanks:

- a) Number and size of tanks being Upgraded: (2)-10,000 gal. & (1)-6,000 gal.
- b) Type of tanks: Existing fiberglass
- c) Type of piping: Replacing existing steel with new fiberglass
- d) Type of leak detection being installed for each tank and piping: None for tanks
None for piping (existing Red Jacket)
- e) Product to be stored for each tank (2)-10,000 gasoline, (1)-6,000 gal. diesel
- f) Corrosion protection being installed for each tank system (including piping:)
Tanks are existing fiberglass and installing fiberglass piping
- g) Spill/Overfill prevention devices being installed for each tank: None

5) You must notify this office when completion of tank installation has taken place, on EPA Notification Form 7530. Please note a EPA Form 7530-1 has been forwarded to the name and address shown in Item 1.

6) A minimum distance of 200 feet from nearest neighbors potable water well or 75 feet from nearest potable water wells on owners property must be maintained for all tanks and piping being installed.

jrm
cc: Fire Prevention Region Chicago
Fire Department

Sincerely,

W. Dale Tanke
W. Dale Tanke, Storage Tank Safety Engineer

FILE COPY

spike with... approved
OK 4/2/91

OFFICE OF THE ILLINOIS STATE FIRE MARSHALL
Division of Petroleum and Chemical Safety
1035 Stevenson Drive
Springfield, Illinois 62703-4259

FOR OFFICIAL USE ONLY
Facility # _____
Permit _____
Approval Date _____
Approved By _____
3/22/91

Application For Permit to UPGRADE OR REPAIR
OF UNDERGROUND Storage Tanks for Petroleum and Hazardous Materials

To be completed in quadruplet with site plans and filed with the Division of Petroleum and Chemical Safety; 1035 Stevenson Drive, Springfield, Illinois 62703-4259 (217/785-5878) or (217/785-1020).

1) (Owner of tanks) -- Corporation, partnership or other business entity

NAVY PUBLIC WORKS CENTER
Name
BLDG. 1A-NAVAL TRAINING CENTER
Street Address
GREAT LAKES IL 60088-5600
City State Zip
Contact Person Phone

2) Facility -- name and address of where tanks are located

NAVY PUBLIC WORKS CENTER
Name
BLDG 1600A, RAY STREET
Street Address
GREAT LAKES IL 60088-5600 LAKE
City State Zip County
Contact Person Phone

3) (Contractor) -- Person, firm or company performing work:

Peter J. Hartmann Co.
Name
2440 South Wolf Road
Street Address
Des Plaines IL 60018 Cook
City State Zip County
(708) 298-5141 362258370
Phone Registration No.

Facility Registration I. D. Number (if known)

2-023810

POSTED

Incident # 903584

mailed U.P.S. overnight
3/13/91

4) Upgrade or Repair of Tanks:

a) Number and size of tanks being upgraded or repaired TANK# 1 -10,000 TANK# 2 -10,000 TANK# 3 -6,000

Are tanks being upgraded or repaired? No if so, please specify: N/A

Is piping being upgraded or repaired? Yes if so, please specify: Existing piping to be replaced with single wall fiberglass.

b) Type of tanks: Existing 2-10,000 gallon & 1-6,000 gallon fiberglass tanks.

Type of piping: Existing single wall steel.

c) Type of leak detection being installed for each tank (manufacturer & model): N/A

Type of leak detection for piping: Existing Red Jacket.

d) Products to be stored in each tank? Existing 2-10,000 gallon tanks contain gasoline, and existing hazardous substances must have CASRN number indicated: 4,000 gallon tank contains diesel.

e) Corrosion protection being installed for each tank system: N/A

Corrosion protection for piping system: Piping will be fiberglass

f) Spill containment devices being installed for each tank (manufacturer & model): N/A

Overfill protection devices being installed for each tank (manufacturer & model): N/A

5) Are new tanks UL approved? Existing tanks are UL approved.
Used tanks must be recertified by written documentation from the manufacturer and submitted with this specification and be approved by the Division of Petroleum & Chemical Safety before re-use.

6) Are tanks, pumps and piping:

a) At least 300 feet from any mine shaft, air or escape shaft for any mine? YES

b) At least 85 feet from any schoolhouse, church, hospital or place of public assembly? YES

c) At least 200 feet from any neighbor's wells? YES

At least 75 feet from any wells on your own property? YES

- d) At least 30 feet from any building or combustible or flammable stored liquid? YES
- At least 30 feet from all sewers, manholes, catch-basins, cesspools, septic tanks or cisterns? YES
- At least 30 feet from any property line? YES

- 7) Are four site plans and application forms enclosed showing tanks, piping, buildings, sewers, wells and property lines with appropriate distances indicated on plans? YES
- 8) Insufficient information supplied for permit review is grounds for application rejection. No work is to commence without a granted permit in hand and must be available upon request of inspectors. All work must be done by contractors register owner only.
- 9) A permit fee of \$100 for each facility must accompany this application. (Checks or money orders are to be made payable to the Office of the State Fire Marshal).
 - CHECK
 - MONEY ORDER

I certify under penalty of Law that I have personally examined and am familiar with the information submitted in this and all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that all submitted information is true, accurate and complete.

Name of Authorized Individual: CAROLINE MROZ Title: PERMIT COORDINATOR

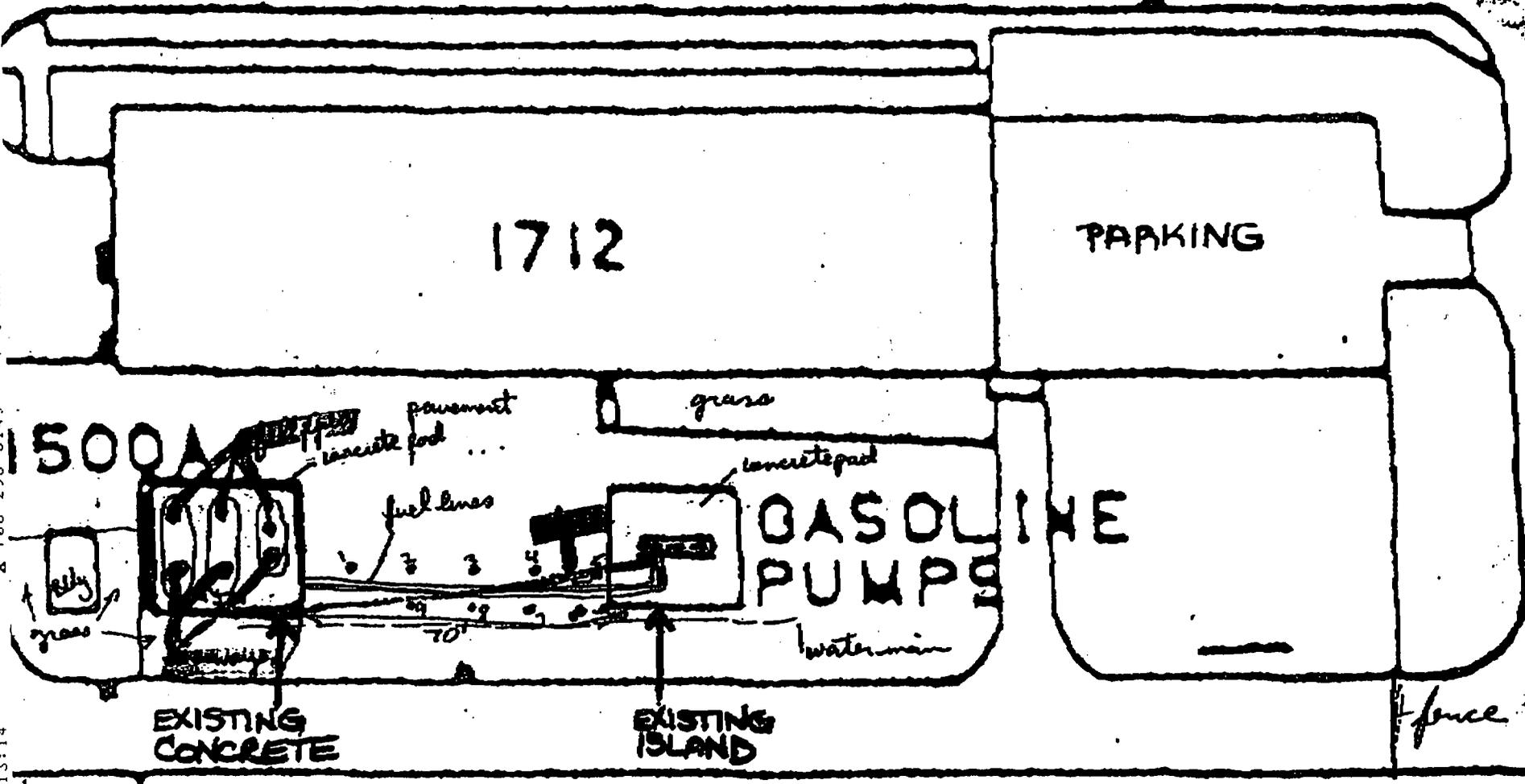
Signature of Authorized Representative: *Caroline Mroz* Date: 03/08/91

The Office of the State Fire Marshal is requesting information that is necessary to accomplish the statutory purpose as outlined in Illinois Revised Statutes, Chapter 127 1/2, Paragraph 9. Disclosure of this information REQUIRED. Failure to provide any information will result in this form not being processed. This form has been approved by Forms Management Center.

PETER J. HARTMANN COMPANY
2440 South Wolf Road
Des Plaines, IL 60018

P. J. HARTMANN
708 298 3149
07/23 13:14

NOT TO SCALE



Navy Public Works Center
Building 1600A, Ray Street
Naval Training Center
Great Lakes, IL. 60088-5600



APPENDIX B
EXHIBITS

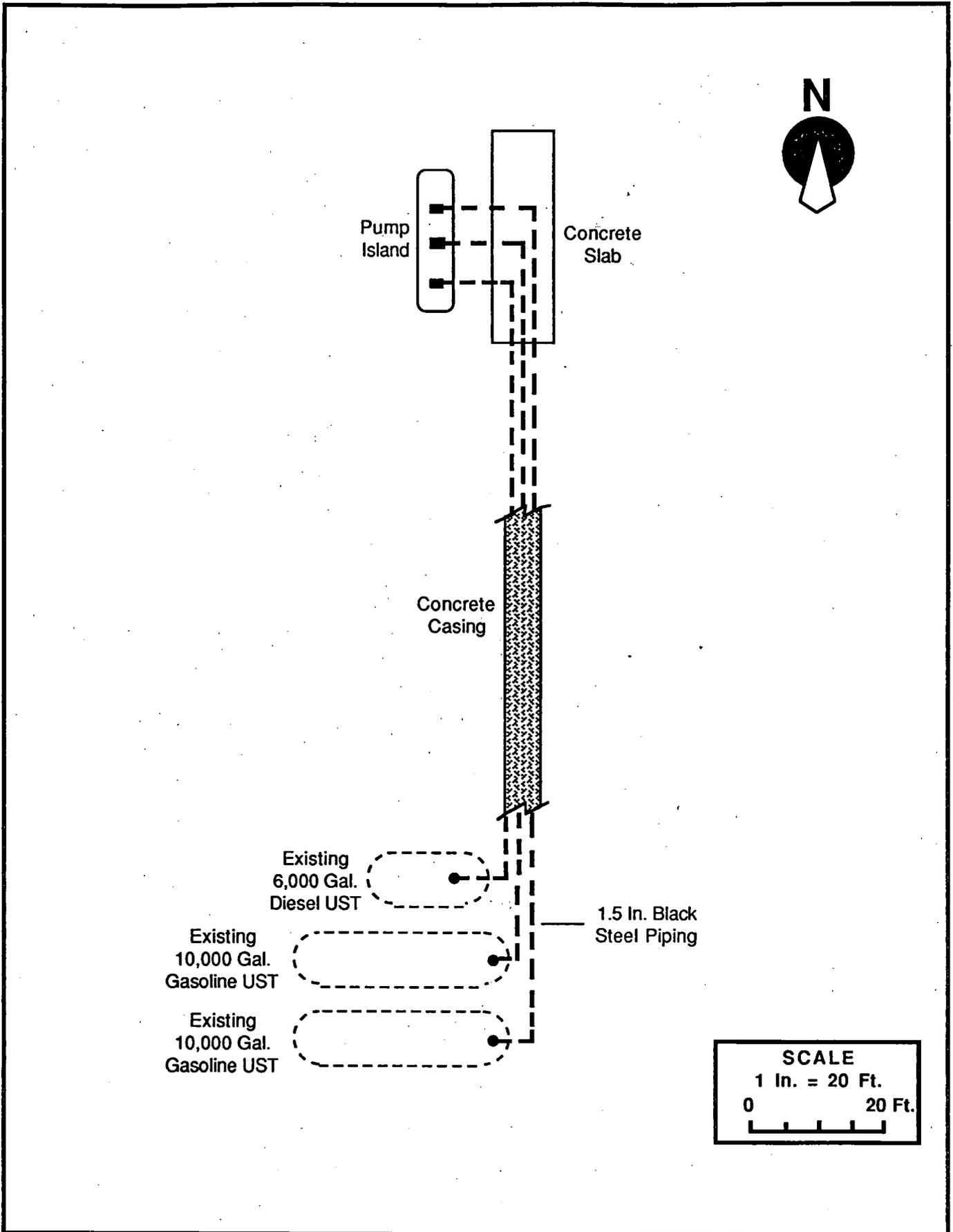


Figure 1.
Original Fuel Piping Run
 Navy Public Works Center - Great Lakes, Illinois

Versar INC.

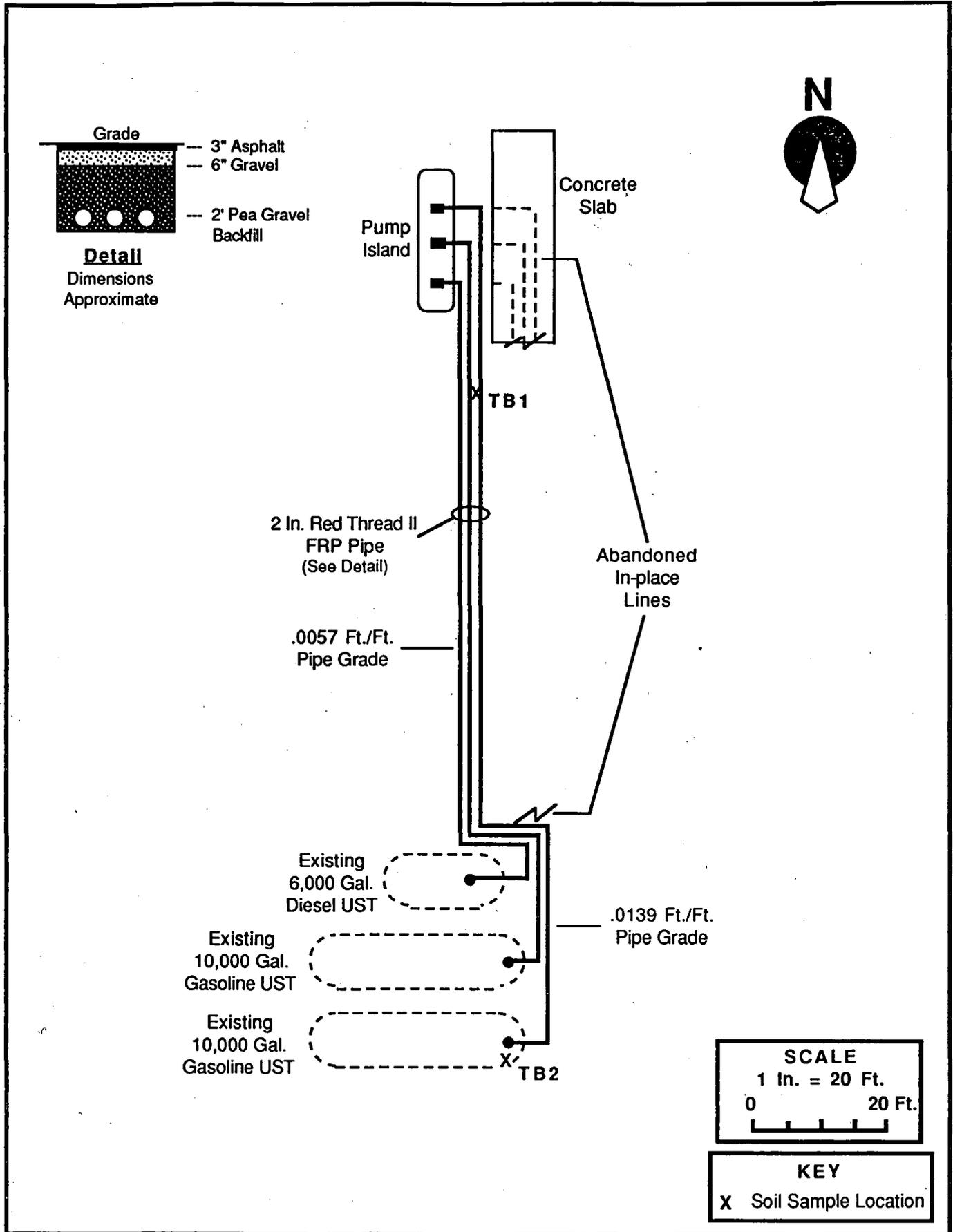


Figure 2.
Replacement Fuel Piping System Building 1600 A
Navy Public Works Center - Great Lakes, Illinois

Versar INC.

APPENDIX C
LABORATORY RESULTS

PROJECT NO.		PROJECT NAME					PARAMETERS							INDUSTRIAL HYGIENE SAMPLE		
		Naval Public Works Center - Bld 1600A												Y	N	
SAMPLERS: (Signature) <i>John Angstmann</i>					(Printed) <i>John Angstmann</i>					REMARKS						
FIELD SAMPLE NUMBER	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	BTEX	PNAs	Total PAs							
	4/24/99	3:30 pm	X		Waste Pipe Composite	2	X	X	X							
		4:00 pm		X	TB2	2	X	X								
		4:15 pm		X	TB1	2	X	X								
Relinquished by: (Signature) <i>John Angstmann</i>					Date / Time		Received by: (Signature) <i>Mark R. Schultz</i>					Date / Time		Received by: (Signature) <i>D. Boehm</i>		
(Printed) <i>John Angstmann</i>					4/24/99 4:20 pm		(Printed) <i>MARK R. SCHULTZ</i>					4/25/99 11:20		(Printed)		
Relinquished by: (Signature) <i>D. Boehm</i>					Date / Time		Received for Laboratory by: (Signature) <i>J. Gandy</i>					Date / Time		Remarks		
(Printed) <i>D. Boehm</i>					4/24/99 4/24/99 1:13		(Printed) <i>J. Gandy</i>					4/25/99 1:15 pm				



ALLIED LABORATORIES, LTD.

716 North Iowa Avenue
 Villa Park, IL 60181
 Phone: 708. 279. 0390
 Fax: 708. 279. 3114

Report No.: 15932-C

Date: 05-15-91

10.

Sample Description: P.O.#
 N65113-91-N 0740

Public Works Center
 Great Lakes Naval Training Station
 Great Lakes, IL 60088
 Attn: Midge

Received: 04-25-91

LABORATORY REPORT :

	NPWC Bld. 1600 A WASTE COMP. E0110030 ~~~~~	NPWC Bld. 1600 A T B 2 E9331020 ~~~~~	NPWC Bld. 1600 A T B 1 E0110030 ~~~~~
pH	8.62.	8.20.	8.82.
Density	1.6 gm/cu.cm	2.0 gm/cu.cm	1.8 gm/cu.cm.
Flashpoint (open cup)	> 100 C	> 100 C	> 100 C
Paint filter test	Passes	Passes	Passes
Color	Light to dark brownish grey	Light to dark brownish grey	Light to dark brownish grey
Odor	Mild petroleum hydrocarbon	Strong petroleum hydrocarbon	Very strong petroleum hydrocarbon

Irving L. Domsky
 Irving L. Domsky, Ph.D.
 Laboratory Director



ALLIED LABORATORIES, LTD.

716 North Iowa Avenue
 Villa Park, IL 60181
 Phone: 708. 279. 0390
 Fax: 708. 279. 3114

Report No.: 15932-A

Date: 04-30-91

TO:
 Public Works Center
 Great Lakes Naval Training Station
 Great Lakes, IL 60088
 Attn: Mr. Midge

Sample Description: P.O.#
 N65113-91-N-0740

Received: 04-25-91

LABORATORY REPORT :

TEST	NPWC Bld. 1600 A WASTE COMP. E0110030 ~~~~~	NPWC Bld. 1600 A T B 2 E9331020 ~~~~~	NPWC Bld. 1600 A T B 1 E0110030 ~~~~~
BENZENE	0.23 ppb	10.4 ppb	580 ppb
TOLUENE	1.02 ppb	46.3 ppb	2490 ppb
ETHYLBENZENE	0.31 ppb	3.64 ppb	4390 ppb
XYLENE	2.96 ppb	284 ppb	13440 ppb
LEAD	35.4 ppm	24.2 ppm	16.3 ppm

Irving I. Domsky
 Irving I. Domsky, Ph.D.
 Laboratory Director



ALLIED LABORATORIES, LTD.

716 North Iowa Avenue
 Villa Park, IL 60181
 Phone: 708. 279. 0390
 Fax: 708. 279. 3114

Report No.: 15932-B

Date: 04-30-91

Sample Description: P.O.#
 N65113-91-N-740

TO:
 Public Works Center
 Great Lakes Naval Training Station
 Great Lakes, IL 60088
 Attn: Midge

Received: 04-25-91

LABORATORY REPORT :

TESTS	NPWC Bld. 1600 A WASTE COMP. E0110030	NPWC Bld. 1600 A T B 2 E9331020	NPWC Bld. 1600 A T B 1 E0110030
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.....
CARCINOGENIC PNAs:-

Benzo(a)anthracene	< 5 ppb	< 5 ppb	< 5 ppb
Benzo(a)pyrene	<10 ppb	<10 ppb	<10 ppb
Benzo(b)fluoranthene	<10 ppb	<10 ppb	<10 ppb
Chrysene	<30 ppb	<30 ppb	<30 ppb
Dibenzo(a,h)anthracene	<10 ppb	<10 ppb	<10 ppb

.....
NON-CARCINOGENIC PNAs:-

.....
TOTAL OF

Acenaphthene } Acenaphthylene } Fluorene }	507 ppb	<100 ppb	<100 ppb
--	---------	----------	----------

Benzo(g,h,i)perylene	<30 ppb	<30 ppb	<30 ppb
Benzo(k)fluoranthene	<10 ppb	<10 ppb	<10 ppb

.....
TOTAL OF

Fluoranthene } Anthracene }	<20 ppb	<20 ppb	171 ppb
Indeno(1,2,3-c,d)pyrene	<60 ppb	<60 ppb	<60 ppb
Phenanthrene	<40 ppb	139 ppb	<40 ppb
Pyrene	45.7 ppb	<30 ppb	<30 ppb
Naphthalene	1191 ppb	1029 ppb	2220 ppb

Irving I. Domsky

 Irving I. Domsky, Ph.D.
 Laboratory Director



1380 Busch Parkway • Buffalo Grove, Illinois 60089
(708) 808-7766 FAX (708) 808-7772

Navy Public Works Center
Building 1A, Code 30E
Great Lakes, IL 60088-5600
Attention: Mark Schultz

Client Project ID: Building 1600 fuel line repair
Sample Descript: TCLP Extraction
Lab Number: 106-0351

Sampled: Jun 25, 1991
Received: Jun 25, 1991
Extracted: Jul 2, 1991
Analyzed: Jul 2, 1991
Reported: Jul 2, 1991

TCLP METALS

Analyte	Detection Limit mg/L (ppm)	Sample Results mg/L (ppm)
Lead.....	0.12	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

GREAT LAKES ANALYTICAL

Kevin W. Keelgy



1380 Busch Parkway • Buffalo Grove, Illinois 60089
(708) 808-7766 FAX (708) 808-7772

Navy Public Works Center
Building 1A, Code 30E
Great Lakes, IL 60088-5600
Attention: Mark Schultz

Client Project ID: Building 1600 fuel line repair

QC Sample Group: 106-0351

Reported: Jul 2, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Lead
---------	------

Method: 3010/7420
Analyst: E. Mayo
Reporting Units: mg/L
Date Analyzed: Jul 2, 1991
QC Sample #: 106-0351

Sample Conc.: N.D.

Spike Conc. Added: 1.0

Conc. Matrix Spike: 0.86

Matrix Spike % Recovery: 86

Conc. Matrix Spike Dup.: 0.89

Matrix Spike Duplicate % Recovery: 89

Relative % Difference: 3.4

GREAT LAKES ANALYTICAL

Keith W. Keeley

% Recovery:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$

106-0351.NNN <2>