R-4

Fraser Shipyards, Inc.

Closure Documentation Report and Monitoring Plan AOCs #1, 3, 5, 7, 8, 9, 11, 12, and 13

Superior, Wisconsin

SEH No. FRASE9401.00

November 1995

FRASER
SHIPYARDS, INC.
P. O. BOX 997
SUPERIOR, WISCONSIN
54880
DIAL (715) 394-7787
FAX (715) 394-2807

November 8, 1995

Mr. Steven LaValley
Hazardous Waste Specialist
Wisconsin Dept. of Natural Resources
1705 Tower Avenue
Superior, WI 54880

Dear Mr. LaValley:

Fraser Shipyards, Inc. (Fraser) is submitting this Closure Documentation Report and Monitoring Plan for AOCs #1, 3, 5, 7, 8, 9, 11, 12, and 13 dated November 1995 for the Fraser Facility located in Superior, Wisconsin. This report was prepared on behalf of Fraser by our consultant, Short Elliott Hendrickson, Inc. (SEH). The document describes investigation activities which were performed and provides closure documentation for select areas of concern (AOCs) at the Fraser facility.

At this time, Fraser wishes to pursue closure of all landside AOCs (AOC #1 through #13) at our facility. Based on the information provided in this report, and the documents previously submitted by Fraser to the WDNR (as outlined in the Introduction of this report), Fraser has complied with the hazardous waste facility closure requirements of s.NR 685.05, Wisconsin Administrative Code and Wisconsin Department of Natural Resources (WDNR) correspondence dated September 19, 1994 and November 18, 1994.

Fraser respectfully requests the WDNR to review this document and issue a letter of completeness which acknowledges that Fraser has met the conditions set forth by the WDNR in s.NR 685.05 Wis. Admin. Code for the AOCs presented and that no further action is required.

If you have any questions regarding the submittal of the Partial Closure Documentation Report, please call me or Cy Ingraham at SEH.

Sincerely,

Fraser Shipyards, Inc.

Ronald Peterson
Yard Superintendent

Distribution List

No. of Copies	Sent to
4	Steven LaValley Hazardous Waste Specialist Wisconsin Department of Natural Resources 1705 Tower Avenue Superior, WI 54880
2	Ron Peterson, Superintendent Fraser Shipyards, Inc. Third Street and Clough Avenue Superior, WI 54880
3	Cyrus Ingraham, P.E. Short Elliott Hendrickson Inc. 421 Frenette Drive Chippewa Falls, WI 54729

Closure Documentation Report and Monitoring Plan
AOCs #1, 3, 5, 7, 9, 11, and 13

Fraser Shipyards, Inc.

Prepared for:
Fraser Shipyards, Inc.
Superior, Wisconsin

Prepared by:
Short Elliott Hendrickson Inc.
421 Frenette Drive
Chippewa Falls, WI 54729
(715) 720-6200

I, Gloria Chojnacki, hereby certify that I am a scientist as that term is defined in s. NR 712.03 (3), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Gloria Chojnacki JPE. 11/8/95

Gloria Chojnacki, CHMM — Date
Environmental Scientist

I, Darrell Reed, hereby certify that I am a Hydrogeologist as that term is defined in s. NR 712.03 (1) Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Darrell Reed 11/8/95

Darrell Reed, P.G. — Date
Hydrogeologist

I, Cyrus W. Ingraham, hereby certify that I am a registered professional engineer in the State of Wisconsin, registered in accordance with the requirements of ch. A-E 4, Wis. Adm. Code; that this document has been prepared in accordance with the Rules of Professional Conduct in ch. A-E 8, Wis. Adm. Code; and that, to the best of my knowledge, all information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code.

Cyrus W. Ingraham 11/8/95

Cyrus W. Ingraham, P. E. — P. E. Number
Senior Project Manager — E-24690

Table of Contents

Cover Letter
Distribution List
Certification Page
Table of Contents

Page

1.0 Introduction 1
1.1 Project Contacts 2
2.0 Closure Documentation 2
2.1 AOC #1 – Waste Oil Staging Area 3
2.1.1 Closure Activities 4
2.1.2 Soil Results 5
2.1.3 Closure Documentation 6
2.2 AOC #3 – Dirty Solvent Staging Area 6
2.2.1 Closure Activities 6
2.2.2 Soil Results 7
2.2.3 Closure Documentation 8
2.3 AOC #5 – Paint Waste Staging Area 8
2.3.1 Container Disposal 8
2.3.2 Closure Activities 9
2.3.3 Soil Results 9
2.3.4 Closure Documentation 9
2.4 AOC #7 – Transformer Staging Area 10
2.4.1 Closure Activities 10
2.4.2 Soil Results 11
2.4.3 Closure Documentation 12
2.5 AOC #8 – Paint Room Storage Pad 13
2.5.1 Sample Collection 13
2.5.2 Soil Results 14
2.5.3 Closure Documentation 14
2.6 AOC #9 – Fuel Storage Area 15
2.6.1 Closure Activities 15
2.6.2 Soil Results 16
2.6.3 Closure Documentation 17

Table of Contents (Continued)

2.7 AOC #11 – Dry Dock Base 17
2.7.1 Sampling 18
2.7.2 Soil Results 18
2.7.3 Closure Documentation 18
2.8 AOC #12 – NW Fill Area 19
2.8.1 Sample Collection 19
2.8.2 Soil Results 20
2.8.3 Closure Documentation 20
2.9 AOC #13 – SE Fill Area 21
3.0 Groundwater Monitoring Plan 21
4.0 Storm Water Pollution Prevention Plan 22
5.0 Standard of Care 23

List of Tables

Table 1 Field and Analytical Results
Table 2 Groundwater Parameters/Analytical Methods

List of Figures

Figure 1 Site Location Map
Figure 2 Site Plan
Figure 3 AOC #1
Figure 4 AOC #3
Figure 5 AOC #5
Figure 6 AOC #7
Figure 7 AOC #8
Figure 8 AOC #9
Figure 9 AOC #11
Figure 10 Dry Dock #1 Cross Section
Figure 11 AOC #12
Figure 12 Proposed Well Locations
Figure 13 Monitoring Well Construction Diagram

List of Appendices

Appendix A Soil Treatment Documentation
Appendix B Laboratory Results
Appendix C Standard Operating Procedures

Closure Documentation Report and Monitoring Plan AOCs #1, 3, 5, 7, 8, 9, 11, 12, and 13

Fraser Shipyards, Inc.

Prepared for Fraser Shipyards, Inc.

1.0 Introduction

Fraser Shipyards, Inc. (Fraser), is submitting this Closure Documentation Report and Monitoring Plan, prepared by Short Elliott Hendrickson Inc. (SEH) to the Wisconsin Department of Natural Resources (WDNR). This report was developed to meet the requirements for closure of an unlicensed hazardous waste facility as outlined in s. NR 685.05 Wisconsin Administrative Code. The required activities for Fraser to perform during closure of the hazardous waste facility are outlined in a WDNR Notice of Violation (June 10, 1993) and Enforcement Conference Summary (July 20, 1993).

A Site Investigation Work Plan was submitted by Fraser to the WDNR in November 1993 which contained specific site information regarding site history, waste materials, handling procedures, SEH standard operating protocols (SOPs), and other pertinent project information. A site investigation was conducted at the Fraser facility in January 1994 for the purpose of determining the presence or absence of contamination in specific areas of concern (AOCs) and to determine whether contamination present is comprised of hazardous constituents above regulatory limits. Documentation of the site investigation field

activities was presented in the Site Investigation Report and Closure Plan which was submitted to the WDNR in May 1994. WDNR correspondence regarding Closure Plan review and closure guidance was provided on September 19, 1994, November 18, 1994, June 8, 1995, and July 14, 1995. Further clarification regarding the requirements for closure at select AOCs was provided by the WDNR during November 2, 1994 and February 8, 1995 meetings.

The purpose of this Closure Documentation Report and Monitoring Plan is to summarize site investigation data gathered from select AOCs at the Fraser facility located in Superior, Wisconsin, provide additional information as required by the WDNR in the above referenced correspondence, and provide documentation to achieve closure of the select AOCs under s. NR 685.05 Wis. Admin. Code.

1.1 Project Contacts

1. Ron Peterson, Superintendent
   Fraser Shipyards, Inc.
   Third Street and Clough Avenue
   Superior, WI 54880
   (715) 394-7787

2. Steve LaValley
   Hazardous Waste Specialist
   Wisconsin Department of Natural Resources
   1705 Tower Avenue
   Superior, WI 54880
   (715) 392-7988

3. Cyrus Ingraham, P.E., Project Manager
   Gloria Chojnacki, CHMM, Environmental Scientist
   Short Elliott Hendrickson Inc.
   421 Frenette Drive
   Chippewa Falls, WI 54729
   (715) 720-6231

2.0 Closure Documentation

As stated in WDNR correspondence dated July 14, 1995, the District Close-Out Committee has agreed that no further action is necessary for AOC's #2 (Sandblasting Grit Storage Area), #6 (600 KVA Substation), and #10 (Upper landing - Dry Dock #1). In subsequent

discussion with the WDNR on August 22, 1995, it was also conveyed that AOC #4 (Bilge Water Storage Area) would be reconsidered for closure with no further action. Additional closure documentation has been prepared for the remaining landside AOCs which were investigated and/or remediated at the Fraser facility. The documentation includes a discussion of waste types and soil contaminant concentrations associated with the specific AOC and closure activities. Follow-up investigative activities have been completed by SEH in accordance with WDNR directives stated in various correspondence and clarification meetings held between the WDNR, SEH, and Fraser. The specific WDNR requirements for closure have been completed at landside AOCs and are described in the following sections.

The site is owned and operated by Fraser and is located at Third Street and Clough Avenue in Superior, Wisconsin as shown in Figure 1, "Site Location Map." The site is located on Howard's Bay and further described as being in Section 1, T49N, R14W in Douglas County, Wisconsin.

Laboratory analysis for this project was performed by Enviroscan Corp. according to specified WDNR and EPA methods at the time of sample collection. The address and phone number of Enviroscan is:

Enviroscan Corp.
303 West Military Road
Rothschild, WI 54474
(800) 338-7226
WI Lab Certification No. 737053130

2.1 AOC #1 – Waste Oil Staging Area

Fraser staged waste oil along the southern fence line between the Fraser Shipyards and Reuben Johnson Construction Company properties. The wastes previously staged in this area were primarily waste lubricating oils. The wastes located in this area at the time of the April 20, 1993 WDNR Hazardous Waste inspection were reportedly generated during the 1992/93 season. The wastes were staged in 55 gallon containers. This waste oil was used to fuel a waste oil powered boiler. The location of AOC #1 is indicated on Figure 2, "Site Plan."

2.1.1 Closure Activities

AOC #1 was investigated for the presence or absence of contaminated soils resulting from waste handling activities. The initial investigation of AOC #1 consisted of the collection of six discrete soil samples (B-1, B-2, B-3, B-4, B-5, B-6) and one composite sample using split spoon sampling procedures from the 2.0 to 3.0 foot depth interval on January 11, 1994. The discrete soil samples were submitted for laboratory analysis of diesel range organics (DRO) and the composite soil sample was submitted for analysis of volatile organic compounds (VOCs). Elevated levels of DRO were found in soil samples B-1 and B-4. A remedial excavation was proposed to remove contaminated soil and define the degree and extent of petroleum contamination. Details of the initial phase of investigation of AOC #1 can be found in the Site Investigation Report and Closure Plan dated May 1994 prepared by SEH. The proposed remedial excavation activities were outlined in the Remedial Action Plan (RAP) dated September 23, 1994. The RAP was verbally approved by the WDNR during a meeting between WDNR, Fraser, and SEH on November 2, 1994.

Seven additional soil samples were obtained with a backhoe on May 3, 1995 (S-1, S-2, S-3, S-4, E-1, EE-1, BW-1) following remedial excavation of soils from AOC #1. During excavation activities at AOC #1, a concrete slab was discovered approximately 1.5 feet below the ground surface. The edge of the concrete slab was encountered approximately 23 feet west of the eastern edge of the AOC. The edge of the concrete to the north, south, and west was not identified. Excavation of contaminated soils extended to a depth of three feet in the eastern portion of AOC #1 in which concrete was not encountered. Soils in the western portion of AOC #1 were excavated down to the concrete surface. Total area of excavation is approximately 10 feet (N-S) by 97 feet (E-W). Another obstacle in the excavation area is the buried high voltage power cable. The exact location of this cable is undetermined due to the concrete slab.

Six soil samples were collected from the excavation sidewalls at a depth of 1.5 feet; one soil sample was collected from the floor of the excavation (3.0 feet). The samples were split into two subsamples as they were obtained. One subsample was used for headspace screening. The second subsample was immediately placed in an ice filled cooler for laboratory analysis. Soil samples were submitted under SEH standard chain of custody procedures for laboratory analysis of DRO and petroleum related VOCs (PVOCs). The locations and depths of the soil samples are indicated on Figure 3, "AOC #1." Analytical results for select AOCs, including AOC #1, are summarized in Table 1, "Field and Analytical Results."

Excavated soils were disposed of by Clean Soils Minnesota Inc. (Clean Soils) of Roseville, Minnesota on August 26, 1995. Contaminated soils were treated through thermal means. A final report on soil treatment prepared by Clean Soils is included in Appendix A, "Soil Treatment Documentation."

2.1.2 Soil Results

Initial soil analytical results indicated that DRO concentrations ranged from none detected to 4,730 μg/g prior to excavation. Post excavation soil samples collected from the floor and sidewalls range from none detected to 266 μg/g. DRO concentrations remain greater than the s. NR 720.09 Wis. Admin. Code generic soil residual petroleum contaminant level standard of 100 μg/g.

Post excavation laboratory analysis of PVOCs indicated very low concentrations of benzene (0.013 μg/g), 1,3,5-trimethylbenzene (0.0069 μg/g), and total xylenes (0.0065 μg/g to 0.119 μg/g). Although these concentrations are low, the benzene level in one sample does exceed the site specific residual contaminant level (RCL) specified in s. NR 720.09 Wis. Admin. Code. Benzene was not detected in the remaining PVOC samples. Copies of the laboratory report from the January 11, 1994 sampling event were included in Appendix B of the Fraser Shipyards, Inc. Site Investigation Report and Closure Plan (May 1994). Copies of the laboratory report from the May 3, 1995 sampling event are included in Appendix B, "Laboratory Results" of this report.

2.1.3 Closure Documentation

Based on the post excavation sampling results, the majority of the contamination source has been removed from AOC #1 and relatively low levels of residual petroleum contaminated soil remain as compared with initial concentrations. Underground obstacles found at the AOC make further excavation of contaminated soil unfeasible. Due to the relatively short distance to Howard's Bay and residual contamination occurring at or near the water table, Fraser proposes groundwater monitoring in this area as discussed in the WDNR correspondence dated September 19, 1994. The Groundwater Monitoring Plan for the Fraser facility can be found in Section 3.0 of this report. Fraser requests approval for no further action at AOC #1 with the initiation of groundwater monitoring.

2.2 AOC #3 – Dirty Solvent Staging Area

Petroleum related wastes (waste oil) and occasionally waste solvents were staged on a steel plate located at AOC #3. These wastes were disposed at Waste Research and Reclamation (WRR) of Eau Claire, Wisconsin on August 2, 1993. The wastes were staged in 55 gallon containers. The location of AOC #3 is indicated on Figure 2.

2.2.1 Closure Activities

AOC #3 was initially investigated for the presence or absence of contaminated soils resulting from the waste handling activities. The initial investigation of AOC #3 consisted of the collection of two soil samples (B-7, B-8) using split spoon sampling procedures from the 2.0 to 2.5 foot depth interval on January 11, 1994. Soil samples were submitted for laboratory analysis of DRO and VOCs. Elevated levels of DRO and petroleum related VOCs were found in sample B-7. A remedial excavation was proposed to remove the contaminated soil and define the degree and extent of contamination. Details of the initial phase of investigation of AOC #3 can be found in the Site Investigation Report and Closure Plan dated May 1994 prepared by SEH. The proposed remedial excavation activities were outlined in the RAP dated September 23, 1994. The RAP was verbally approved by the WDNR during a meeting between WDNR, Fraser, and SEH on November 2, 1994.

Five additional soil samples were obtained with a backhoe on March 29, 1995 (SP-1, SP-2) and May 3, 1995 (SW-1, BW-2, SW-4) after the remedial excavation of soils from AOC #3. The soil samples were collected at depth intervals ranging from 1.0 to 3.0 feet. The samples were split into two subsamples as they were obtained. One subsample was used for headspace screening. The second subsample was immediately placed in an ice filled cooler for laboratory analysis. Soil samples were submitted under SEH standard chain of custody procedures for laboratory analysis of DRO, VOC, and total lead. The locations and depths of the soil samples are indicated on Figure 4, "AOC #3." Analytical results for select AOCs, including AOC #3, are summarized in Table 1.

Excavated soils were disposed of by Clean Soils on August 26, 1995. Contaminated soils were treated through thermal means. A final report on soil treatment prepared by Clean Soils is included in Appendix A.

2.2.2 Soil Results

Elevated DRO concentrations (1,820 μg/g and 79.2 μg/g) were detected at B-7 and B-8 prior to the remedial excavation. Post excavation soil samples collected from the floor and sidewalls of the AOC #3 excavation ranged from 15.4 to 50.4 μg/g DRO which are below the s. NR 720.09 Wis. Admin. Code generic soil residual petroleum contaminant level standard of 100 μg/g.

Laboratory analysis for VOCs prior to remedial excavation indicated a benzene concentration of 0.05 μg/g and 1,2-dichlorobenzene concentrations ranging from 0.29 μg/g to 0.43 μg/g. Post excavation samples ranged from no detectable concentrations of VOCs to very low concentrations of n- and tert-butylbenzene (0.00667 μg/g and 0.0108 μg/g, respectively). These samples were collected to further characterize the contaminant chemistry as requested by the WDNR in a November 18, 1994 correspondence. Results of the VOC analysis indicate that the contaminant present at AOC #3 appears to be petroleum related. Solvent constituents did not appear to be present.

A soil sample was also collected from AOC #3 for laboratory analysis of total lead. Results indicated a concentration of 27.7 μg/g total lead which is below the ch. NR 720 Wis. Admin. Code standard for lead of 500 mg/kg at an industrial site based on human health risk from direct contact related to land use. This standard was verbally approved by the WDNR on February 21, 1995 as an acceptable residual soil value for lead at the Fraser property. Copies of the laboratory report from the January 11, 1994 sampling event were included in Appendix B of the Fraser Shipyards, Inc. Site Investigation Report and Closure Plan (May 1994). Copies of the laboratory reports from the March 29, 1995 and May 3, 1995 sampling events are included in Appendix B of this report.

2.2.3 Closure Documentation

Based on the analytical results, the contamination previously identified in this AOC appears to have been petroleum related. The remedial activities performed in this area have successfully removed the contaminant source to acceptable levels. Post excavation analytical results indicate residual DRO and lead concentrations are below ch. NR 720 Wis. Admin. Code soil clean-up standards. Therefore, Fraser requests that AOC #3 be submitted for closure and no further action be required.

2.3 AOC #5 – Paint Waste Staging Area

Fraser historically staged paint wastes at AOC #5 from their painting operations. The wastes were staged in two portable aboveground storage containers. The wastes included paint wastes potentially mixed with dirty solvents. All containers, with the exception of fuel oil tanks in the AOC have been cleaned, cut up, and recycled. The location of AOC #5 is indicated on Figure 2.

2.3.1 Container Disposal

According to s. NR 600.03(42) the definition of container "means any portable enclosure in which a material is stored, transported, treated, disposed of or otherwise handled." The enclosures used to stage the paint wastes at AOC #5 were aboveground and portable. The contents of the containers were disposed of at WRR on July 2, 1993. At this time residue in the containers was removed using commonly employed

practices as specified in s. NR. 605.06 (3), Wis. Admin. Code. Upon proper emptying of the containers at AOC #5, they were cut up and recycled.

2.3.2 Closure Activities

AOC #5 was investigated for the presence or absence of contaminated soils resulting from waste handling activities. The investigation of AOC #5 consisted of the collection of six discrete soil samples from soil borings performed on January 11, 1994. The select soil samples were submitted for laboratory analysis of VOCs and total lead, cadmium, chromium, and mercury. In addition, a Toxicity Characteristic Leaching Procedure (TCLP) was performed on the samples with the highest concentrations of total lead and chromium; a water leach procedure for lead (ASTM D3987-85), was also conducted on the sample with the highest total lead concentration. Details of the investigation of AOC #5 can be found in the Site Investigation Report and Closure Plan dated May 1994 prepared by SEH. The locations and depths of the soil samples are indicated on Figure 5, "AOC #5." Analytical results for the select AOCs, including AOC #5, are summarized in Table 1.

2.3.3 Soil Results

Soil analytical results indicate that VOCs were not found above the laboratory detection limit. The samples were collected from fill material above the zone of saturation. Total lead and chromium concentrations were detected above the ch. NR 720 Wis. Admin. Code residual soil contaminant levels based on human health risk from direct contact related to land use of 500 mg/kg and 200 mg/kg, respectively. (Because the valence number of the chromium on site is unknown the more conservative hexavalent chromium value was used.) Copies of the laboratory results for AOC #5 can be found in Appendix B of the Fraser Shipyards Site Investigation Report and Closure Plan (May 1994).

2.3.4 Closure Documentation

Elevated residual lead and chromium is found above ch. NR 720 Wis. Admin. Code RCLs in the soil at AOC #5. In addition, groundwater is relatively close to the surface as well as the AOC being in close proximity to Howard's Bay. Fraser, therefore, proposes protection of public health through monitoring controls. A groundwater monitoring program will be implemented to monitor potential current or future impacts to the groundwater. The groundwater monitoring plan for the Fraser facility can be found in Section 3.0 of this report. A storm water pollution prevention plan (SWPPP) will also be implemented which will monitor and provide engineering control of potential surface water runoff to Howard's Bay. A description of the SWPPP for the Fraser facility can be found in Section 4.0 of this report.

2.4 AOC #7 – Transformer Staging Area

Fraser historically staged transformers which were not in use in an area between two small storage buildings along the southern fence line. The wastes located in AOC #7 include transformer units and potentially contaminated soil from minor releases of transformer oils. A transformer staged in this area which had a Polychlorinated Biphenyls (PCB) detection of 597,000 ppm was disposed of at Minnesota Power on September 13, 1993. The remaining transformer units did not contain PCBs over a 1 ppm detection limit. These transformer units were disposed of at Bickford, Inc. of New Lisbon, Wisconsin on November 18, 1993. The location of AOC #7 is indicated on Figure 2.

2.4.1 Closure Activities

AOC #7 was initially investigated for the presence or absence of contaminated soils resulting from transformer staging at the AOC. The initial investigation of AOC #7 consisted of the collection of three soil samples (B-17, B-18, B-19) obtained with a backhoe on January 25, 1994. Soil samples were collected from depth intervals ranging from 0 to 0.5 feet to 2.0 to 2.5 feet and submitted for laboratory analysis of DRO. In addition, field screening for PCBs was conducted on the initial soil samples at AOC #7. The soil sample with the highest field screened PCB concentration was also submitted for laboratory

confirmation of the screening results. Elevated levels of DRO were encountered in sample B-17. PCBs were not identified at levels requiring further action. A remedial excavation was proposed to remove impacted soil. Details of the initial investigation phase of AOC #7 can be found in the Site Investigation Report and Closure Plan dated May 1994 prepared by SEH. The proposed excavation was outlined in the RAP dated September 23, 1994. The RAP was approved by the WDNR on November 2, 1994.

Four additional soil samples were obtained with a backhoe on March 29, 1995 (T-Z) and May 3, 1995 (SS-1, SS-2, BN-1) to define the extent of contamination after remedial excavation of soils from AOC #7. Samples were collected at depths ranging from 1.5 to 3.0 feet. The samples were split into two subsamples as they were obtained. One subsample was used for headspace screening; the second subsample was immediately placed in an ice filled cooler for laboratory analysis. Soil samples were submitted under SEH standard chain of custody procedures for laboratory analysis of PCBs, DRO, and VOCs. The locations and depths of the soil samples are indicated on Figure 6, "AOC #7." Analytical results for select AOCs, including AOC #7, are summarized in Table 1.

Excavated soils were disposed of by Clean Soils on August 26, 1995. Contaminated soils were treated through thermal means. A final report on soil treatment prepared by Clean Soils is included in Appendix A.

2.4.2 Soil Results

Soil analytical results indicate that DRO concentrations prior to remedial excavation ranged from 115 μg/g to 843 μg/g. A post excavation sample (T-Z) collected on March 29, 1995 from a depth of two feet indicated a residual soil DRO concentration of 147 μg/g. Additional excavation of soils was conducted on May 3, 1995 with the collection of three soil samples from the excavation sidewalls and floor. Excavation of the soils was extended to three feet in depth and to the maximum width between the sheds without undermining the sheds. Analytical results indicated residual DRO concentrations at the sidewalls of 10.4 μg/g (SS-1) and 6.83 μg/g (SS-2). The soil sample collected from the floor (BN-1) was collected directly below the soil

sample (T-Z) collected on March 29, 1995. Analytical results indicated a residual DRO concentration of 17.2 μg/g at the floor of the excavation. Post excavation DRO concentrations on the floor and sidewalls are below the s. NR 720.09 Wis. Admin. Code generic soil residual petroleum contaminant level standard of 100 μg/g.

A soil sample was submitted for laboratory analysis of VOCs from the initial remedial excavation on March 29, 1995. Low concentrations of benzene (0.00230 μg/g), tert-butylbenzene (0.00895 μg/g), and 1,3-dichloropropane (0.0194 μg/g) were detected. The soil sample for laboratory analysis of VOCs was submitted to further characterize the contaminant chemistry at AOC #7 as requested by the WDNR in a November 18, 1994 correspondence. Results of the VOC analysis indicate that the contamination appears to be petroleum related. An additional soil sample collected on May 3, 1995 after further excavation and located directly below the March 29, 1995 soil sample, yielded no detectable concentrations of VOCs.

Field screening of the initial soil sample for PCBs indicated concentrations ranging from 0.5 ppm to 1.0 ppm. Laboratory confirmation of the initial sampling event correlated well with field screening results with a confirmatory concentration of 1.0 μg/g. A post-excavation sample (T-Z) collected on March 29, 1995 indicated a PCB concentration of 0.48 μg/g. A soil sample collected on May 3, 1995 after final excavation of soils indicated that PCBs were not detected above the laboratory detection limits. Copies of the laboratory reports from the January 25, 1994 sampling event were included in Appendix B of the Fraser Shipyards, Inc. Site Investigation Report and Closure Plan (May 1994). Copies of the laboratory reports from the March 29, 1995 and May 3, 1995 sampling events are included in Appendix B of this report.

2.4.3 Closure Documentation

Soil analytical results indicate that the residual soil DRO concentrations in post excavation samples are below the ch. NR 720 Wis. Admin. Code RCLs, and VOC and PCB concentrations in the final excavation were not detected. Therefore, Fraser requests that AOC #7 be submitted for closure and no further action be required.

2.5 AOC #8 – Paint Room Storage Pad

Fraser temporarily stores (less than 90 days) flammable liquids in a paint room located in the Fabrication Shop. A small storage pad is located south of the paint room where partially used containers of paint and solvents are staged. This storage pad had a crushed stone base, which has subsequently been covered with concrete to facilitate protection of the soils from potential future releases. The concrete pad was constructed in July 1994. The partially used materials associated with this AOC include paint and solvents. Scrap metal and solid wastes (paper, rags, etc.) were also staged in this area. The location of AOC #8 is indicated on Figure 2.

2.5.1 Sample Collection

AOC #8 was initially investigated for the presence or absence of contaminated soils associated with potential release from materials staged at the AOC. The initial investigation consisted of two soil samples (B-20 and B-21) obtained from a shallow test pit from the 0 to 1 foot (B-20) and 2 to 2.5 foot (B-21) depth intervals on January 25, 1994. The soil samples were submitted for laboratory analysis of VOCs, and total cadmium, chromium, mercury, and lead. Details of the initial investigation phase of AOC #8 can be found in the Site Investigation Report and Closure Plan (May 1994) prepared by SEH. The WDNR requested that further definition of the degree and extent of impacted floor materials (soil) be performed in this AOC.

Two additional soil samples were obtained on August 23, 1995 (HAX-1, HAX-2) with a hand auger to define the extent of contamination. Sample HAX-1 was collected at a depth of eight inches and HAX-2 was collected at a depth of 12 inches. The samples were immediately placed in an ice filed cooler for laboratory analysis. Soil samples were submitted under standard chain of custody procedures for laboratory analysis of VOCs. The locations and depths of the soil samples are indicated on Figure 7, "AOC #8." Analytical results for select AOCs, including AOC #8, are summarized in Table 1.

2.5.2 Soil Results

Initial soil analytical results indicate that benzene and toluene concentrations of 0.0058 μg/g and 0.150 μg/g, respectively, were detected closer to the surface (B-20) at AOC #8, while no concentrations of VOCs above the laboratory detection limits were found at the 2 to 2.5 foot depth interval (B-21). Initial soil samples were also analyzed for select metals. The total lead concentration at the upper interval (B-20) was 167 μg/g with no lead above the laboratory detection level at the lower depth. The remaining metals (cadmium, chromium, and mercury) in both depth intervals were either not detected or were within the concentration ranges typically found in Wisconsin soils based on an internal WDNR memorandum from Bob Schaefer dated June 20, 1980.

At a meeting attended by Fraser, SEH, and the WDNR on February 21, 1995, it was concluded that the ch. NR 720 Wis. Admin. Code RCL for lead of 500 mg/kg at an industrial site was an acceptable residual soil value for the Fraser property. This standard is based on human health risk from direct contact related to land use. The total lead concentration of 167 μg/g (mg/kg) does not exceed the RCL and therefore can justifiably be left in place with adequate protection of the environment and human health.

Additional floor samples analyzed for VOCs indicate low level concentrations of various compounds which appear to be petroleum and manufacturing related. The total VOC concentration at HAX-2 is 24.360 μg/g. Solvent constituents do not appear to be present. Copies of the laboratory report from the January 25, 1994 sampling event were included in Appendix B of the Fraser Shipyards, Inc. Site Investigation and Closure Plan (May 1994). Copies of the laboratory report from the August 23, 1995 sampling event are included in Appendix B of this report.

2.5.3 Closure Documentation

The Fabrication Shop Building is used for equipment storage as well as fabrication. A machine shop and welding area are also located in this building. These activities necessitate frequent movement of equipment through the sampled area. The building has a dirt floor at

this time; however, Fraser has plans for constructing a concrete floor in the future. The concrete floor in addition to the overhead roof will further prevent the downward migration of floor surface contaminants in the building.

Based on the fact that neither VOCs nor lead within AOC #8 would negatively impact human health or the environment, and that surface contamination located outside of the AOC appears to be related to equipment movement and activities, Fraser requests that AOC #8 be submitted for closure and no further action be required.

2.6 AOC #9 – Fuel Storage Area

Fraser stores bulk fuels (diesel and unleaded gasoline) in two aboveground storage tanks located north of the main office building. The tanks were installed in 1992 and are enclosed in precast concrete secondary containment structures. The containment structures were equipped with siphon hoses for the removal of accumulated precipitation. The AOC consists of the ground surface where the diesel siphon hose previously discharged. The siphon hoses have subsequently been removed and a roof has been constructed over the tanks. The location of AOC #9 is indicated on Figure 2.

2.6.1 Closure Activities

AOC #9 was initially investigated for the presence or absence of contaminated soils resulting from discharged siphon water at the AOC. The initial investigation of AOC #9 consisted of the collection of one soil sample (B-22) obtained with a backhoe on January 25, 1994. The sample was collected from an area adjacent to the containment structures at a depth interval of 2.0 to 2.5 feet. The soil sample was submitted for laboratory analysis of DRO and VOCs. The sample exhibited DRO concentrations slightly above the RCL. Details of the initial investigation phase of AOC #9 can be found in the Site Investigation Report and Closure Plan dated May 1994 prepared by SEH. The WDNR required that remediation of the impacted soil in AOC #9 be performed similar to AOC #1, #3, and #7.

Three additional soil samples were obtained on March 29, 1995 (ST-1) and May 3, 1995 (B-1, B-2) with a backhoe after remedial excavation of soils from AOC #9. Samples were collected at depth intervals ranging from 1.0 to 2.0 feet to 2.0 to 3.0 feet. The samples were split into two subsamples as they were obtained. One subsample was used for headspace screening. The second subsample was immediately placed in an ice filled cooler for laboratory analysis. Soil samples were submitted under SEH standard chain of custody procedures for laboratory analysis of DRO and VOCs.

A soil sample (B-3) was also obtained on May 3, 1995 at AOC #9 in the area of the diesel siphon hose discharge. The soil sample was obtained using hand auger techniques from a depth interval of one to two feet. A soil sample was submitted for laboratory analysis under SEH standard chain of custody procedures for laboratory analysis of DRO and PVOCs. The locations and depths of the soil samples are indicated on Figure 8, "AOC #9." Analytical results for select AOCs, including AOC #9, are summarized in Table 1.

Excavated soils were disposed of by Clean Soils on August 26, 1995. Contaminated soils were treated through thermal means. A final report on soil treatment prepared by Clean Soils is included in Appendix A.

2.6.2 Soil Results

Soil analytical results indicated that a DRO concentration of 163 μg/g was detected in the sample collected prior to remedial excavation. Post excavation samples collected from the floor and sidewalls of the excavation indicated residual soil DRO concentrations ranging from 23.9 μg/g to 63.9 μg/g which are below the s. 720.09 Wis. Admin. Code generic soil residual petroleum contaminant level standard of 100 μg/g.

A soil sample was submitted for laboratory analysis of VOCs on January 25, 1995, prior to remedial excavation. Toluene was detected at a concentration of 0.0291 μg/g at this time. This soil sample for VOC analysis was submitted to further characterize the contaminant at AOC #9 as requested by the WDNR in a November 18, 1994 correspondence. Results of the VOC analysis indicate that the

contamination appears to be petroleum related. An additional soil sample collected on March 29, 1995 after remedial excavation yielded no detectable concentrations of VOCs.

Soil analytical results from the sample which was collected with a hand auger (B-3) at the siphon hose location indicate that the DRO concentration is 30.2 μg/g and no PVOCs are present above the laboratory detection limit. Copies of the laboratory reports from the January 11, 1994 sampling event were included in Appendix B of the Fraser Shipyards, Inc. Site Investigation Report and Closure Plan (May 1994). Copies of the laboratory reports from the March 29, 1995 and May 3, 1995 sampling events are included in Appendix B of this report.

2.6.3 Closure Documentation

Based on the soil analytical results, post excavation soil DRO concentrations at AOC #9 are below the ch. NR 720 Wis. Admin. Code RCL, and VOC concentrations in the excavation and soil boring were not detected. Therefore, Fraser requests that AOC #9 be submitted for closure and no further action be required.

2.7 AOC #11 – Dry Dock Base

Dry Dock #1 was originally constructed with a concrete base in the southern third of the dock and a stone and wooden base in the remaining northern section. As ships are repaired within the dock, wastes may potentially fall onto the stone base and become difficult to remove. Potential wastes which may be generated in this AOC consist of sandblasting grit wastes and solid wastes. The location of AOC #11 is indicated on Figure 2.

In order to prevent migration of potential contaminants into the stone base, Fraser poured concrete over the northern two third section of Dry Dock #1 during July and August 1994. Approximately two feet of crushed stone was placed directly below the concrete over a floor of natural red clay.

2.7.1 Sampling

Prior to placement of the stone and concrete in Dry Dock #1, seven soil grab samples were collected. Two samples were collected on July 7, 1994 (DD001, DD002) by Fraser. The samples were collected from a depth of six inches into the clay floor. A third sample (DD003) was collected by Fraser on August 4, 1994 from a depth of 6 to 10 inches into the clay floor. The four remaining soil samples (T-1, T-2, T-3, T-4) were collected by SEH on August 17, 1994 at the red clay surface. The locations of the grab samples are shown on Figure 9, "AOC #11." The samples were immediately placed in an ice filled cooler for laboratory analysis. Soil samples were submitted under standard chain of custody procedures for laboratory analysis of total lead according to EPA Method SW846-6010. Analytical results for select AOCs, including AOC #11, are summarized in Table 1.

2.7.2 Soil Results

Soil analytical results indicate a total lead concentration ranging from 30.1 μg/g to 272 μg/g at a depth of 6 to 10 inches into the red clay floor. Total lead concentrations at the clay surface ranged from 832 μg/g to 958 μg/g. A copy of the laboratory reports from AOC #11 is included in Appendix A of the Fraser Shipyards, Inc. Partial Closure Documentation Report (April 1995). Based on the results of the soil sampling, the WDNR requested that Fraser provide additional documentation that residual lead will not impact human health or the environment.

2.7.3 Closure Documentation

The soil samples collected for laboratory analysis from AOC #11 were taken from two different depth intervals; 6 to 10 inches into the confining red clay layer and at the clay surface. Laboratory analysis for total lead concentrations indicates levels at the clay surface exceed the agreed upon RCL for the site. However, greatly reduced lead concentrations which are below the lead RCL for the site are found in shallow samples collected from the clay strata. This demonstrates the confining nature of the clay soils beneath the AOC which prevents downward migration of potential contaminants.

Residual lead concentrations at the clay surface have been contained *in-situ* by the concrete matrix placed in the dry dock, the clay soils below, and the sheet pile walls of the site. SEH obtained an original design drawing for Dry Dock #1 and developed a cross section to demonstrate that the isolated layer of lead contaminated soil is contained for vertical and horizontal migration. Figure 10, "Dry Dock #1 Cross Section" shows a cross section through the dry dock. Because of the low permeability of the surrounding construction materials, the negligible leachability of the lead which has been demonstrated in the Site Investigation Report and Closure Plan (May 1994 - AOC #5) and the naturally confining clay soils, the risk posed by the residual lead would be low. Therefore, Fraser requests that AOC #11 be submitted for closure and no further action be required.

2.8 AOC #12 – NW Fill Area

Fill materials were placed along the shoreline at AOC #12 in the late 1980's in the form of a berm five to eight feet high. The fill reportedly consisted primarily of demolition materials. The berm was capped with onsite soils and seeded to minimize erosion to Howard's Bay. The intended purpose of fill placement was to prevent surface runoff to the Bay. Intentional handling of wastes did not occur in this area. An investigation of AOC #12 was conducted to determine the composition of fill materials in the berm area. The location of AOC #12 is indicated in Figure 2.

2.8.1 Sample Collection

The initial investigation of AOC #12 consisted of the excavation of four test pits (TP-5, TP-6, TP-7, TP-8) with soil sample collection on January 25, 1994 from depths ranging from 2.5 to 6 feet. Discrete soil samples were submitted for laboratory analysis of VOCs from three of the four test pits. Details of the initial phase of investigation of AOC #12 can be found in the Site Investigation Report and Closure Plan (May 1994).

Three additional soil samples (HA-1, HA-2, HA-3) were obtained using hand auger techniques on August 23, 1995 to define the extent of contamination. The soil samples were collected at depths ranging from 12 inches to 18 inches. After collection, the samples were

immediately placed in an ice filled cooler for laboratory analysis. Soil samples were submitted under SEH standard chain of custody procedures for laboratory analysis of PVOCs. The locations and depths of the soil samples are indicated on Figure 11, "AOC #12." Analytical results for select AOCs, including AOC #12, are summarized in Table 1.

2.8.2 Soil Results

Soil analytical results from the initial investigation phase indicated the presence of toluene ranging from 0.356 μg/g (TP-5) to 0.420 μg/g (TP-7). Additional sampling conducted on August 23, 1995 for the purpose of defining the extent of contamination indicates the presence of low level concentrations of various non-specific petroleum related compounds. Total PVOC concentrations range from 0.119 μg/g to 1.087 μg/g and did not support the existence of a plume originating either within the AOC or to the south or east. Copies of the laboratory report from the January 25, 1994 sampling event were included in Appendix B of the Fraser Shipyards, Inc. Site Investigation Report and Closure Plan (May 1994). Copies of the laboratory report from the August 23, 1995 sampling event are included in Appendix B of this report.

2.8.3 Closure Documentation

The concentrations of toluene, ethylbenzene and total xylenes at AOC #12 are below the ch. NR 720 Wis. Admin. Code RCLs and do not appear to be associated with a specific release. In addition, the historic loading and earthwork activities associated with the transfer of bulk materials (rock, etc.) in the area are most probably the source of non-specific PVOCs noted in the surface samples. Based on the determination that fill materials at AOC #12 did not need to be removed as stated during a meeting attended by the WDNR, Fraser, and SEH on February 8, 1995; Fraser requests that AOC #12 be submitted for closure and no further action be required. Fraser intends to reseed the areas of fill disturbed during the investigation and mow the area annually.

2.9 AOC #13 – SE Fill Area

The placement of fill materials historically occurred at AOC #13. The area was graded and seeded in the early 1990's. Intentional handling of wastes did not occur in this area. Investigation of this area was conducted to determine the composition of fill materials. The location of AOC #13 is indicated on Figure 2.

The investigation of AOC #13 consisted of the excavation of four test pits with soil sample collection. No physical or field screening evidence of contamination was found in any of the test pit excavations. Details of the investigation can be found in Fraser Shipyard's Inc. Site Investigation Report and Closure Plan (May 1994). Fraser will reseed the areas of fill disturbed during the investigation to maintain the integrity of the cap. Vegetation at the AOC will also be mowed annually.

WDNR correspondence dated July 14, 1995 stated that information regarding AOC #13 was reviewed by the solid waste, water regulation, and zoning staff and that removal of the fill would not be required. Therefore, Fraser requests the formal closure of AOC #13 with no further action required.

3.0 Groundwater Monitoring Plan

A groundwater monitoring plan is proposed to evaluate the potential for groundwater contamination in the western portion of the Fraser Shipyard, Inc. property. Three groundwater monitoring wells will be constructed at the locations shown on Figure 12, "Proposed Well Locations." The wells will be constructed in accordance with ch. NR 141, Wis. Admin. Code requirements. However, depth to groundwater is anticipated to be approximately five feet below grade at the proposed well locations. Therefore, the filter pack seal has been reduced to allow for the placement of an adequate annuler space seal. A "Monitoring Well Construction Diagram" is submitted for WDNR review and approval (Figure 13).

Upon completion of well installation, each of the monitoring wells will be developed to remove fine grained materials from within and around the well screen. The wells will be developed in accordance with ch. NR 141, Wis. Admin. Code. Following well installation, the wells will be surveyed with respect to elevation. The elevation of the top of PVC will be surveyed to the nearest 0.01 foot. The adjacent ground surface will be surveyed to the nearest 0.1 foot.

SEH will collect quarterly groundwater samples from the three wells for a period of one year. Groundwater samples will be forwarded to Enviroscan, Inc., a WDNR certified laboratory following the SEH protocols contained in Appendix C, "Standard Operating Procedures." The groundwater samples will be analyzed for VOCs, PAHs, and select metals (dissolved). A summary of the analytical program is shown on Table 2, "Groundwater Parameters/Analytical Methods."

SEH will submit a Site Status Report to the WDNR within 30 days after the first round of groundwater analytical results are received from the laboratory. The Site Status Report will include a discussion of site activities, an analytical results table, laboratory reports, groundwater contours, pertinent WDNR forms, and any proposed revisions to the monitoring schedule. Subsequent site status reports will be forwarded to the WDNR on a bi-annual schedule.

4.0 Storm Water Pollution Prevention Plan

Fraser obtained a stormwater Discharge Permit in accordance with ch. NR 216 Wis. Admin. Code. Fraser is classified as a Tier 1 Industrial Source based on their SIC code. The first step in complying with the permit is to develop a Stormwater Pollution Prevention Plan (SWPPP). Fraser will utilize the stormwater regulatory requirements to address residual surface and shallow soil contamination at the facility. This contamination is primarily related to lead from historical metal storage and manufacturing performed in various areas of the facility. The ground surface in outside manufacturing areas will be identified as a potential source area for stormwater contamination in the SWPPP.

The second step in evaluating the potential need for corrective measures related to surficial soil contamination will be the collection

and analysis of stormwater samples. If levels of lead or other contaminants are identified above regulatory limits in the stormwater samples, a Best Management Practice (BMP) will be selected to address the exceedance. Source control and treatment BMPs will be evaluated and implemented to comply with the stormwater permit. This approach should eliminate the risk to surface water from the residual surface soil contamination at the facility.

5.0 Standard of Care

The conclusions and recommendations contained in this report were arrived at in accordance with generally accepted professional engineering practice at this time and location. Other than this, no warranty is implied or intended.

Tables

Table 1 – Field and Analytical Results
Table 2 – Groundwater Parameters/Analytical Methods

TABLE 1
FRASER SHIPYARDS, INC.
FIELD AND ANALYTICAL RESULTS

AOC #	SAMPLE ID	DEPTH	DATE	FIELD SCREEN FID units	FIELD SCREEN PID units	FIELD SCREEN PCB* ppm	ANALYTICAL PARAMETERS PCB (8080) ug/g	DRO** ug/g	VOC (8010/8020 or 8021) ug/g	PVOC (8021a) ug/g	Pb (6010) ug/g	Cd (6010) ug/g	Cr (6010) ug/g	Hg (7471) ug/g
1	WASTE OIL STAGING AREA													
	B-1	(2.5-3')	1-11-94	1000+	331	--	--	94.4	--	--	--	--	--	--
	B-2	(2-2.5')	1-11-94	20	96	--	--	4,370	--	--	--	--	--	--
	B-3	(2-2.5')	1-11-94	1000+	31	--	--	X	--	--	--	--	--	--
	B-4	(2-2.5')	1-11-94	300	27	--	--	176	--	--	--	--	--	--
	B-5	(2-2.5')	1-11-94	600	104	--	--	--	--	--	--	--	--	--
	B-6	(2-2.5')	1-11-94	180	108	--	--	--	--	--	--	--	--	--
	COMPOSITE		1-11-94	--	--	--	--	--	0.0444 xylenes	--	--	--	--	--
	S-1	(1.5')	5-3-95	1.22	--	--	--	96.9	--	--	--	--	--	--
	S-2	(1.5')	5-3-95	49.63	--	--	--	266	--	0.013 benzene	--	--	--	--
	S-3	(1.5')	5-3-95	236	--	--	--	73.1	--	0.0069 1,3,5-trimethylbenzene 0.0065 m- & p-xylene	--	--	--	--
	S-4	(1.5')	5-3-95	1.08	--	--	--	222	--	--	--	--	--	--
	E-1	(1.5')	5-3-95	40	--	--	--	257	--	--	--	--	--	--
	EE-1	(1.5')	5-3-95	120	--	--	--	X	--	--	--	--	--	--
	BW-1	(3.0')	5-3-95	584	--	--	--	246	--	0.0776 m-&p- xylenes 0.0418 o-xylene & styrene	--	--	--	--
3	DIRTY SOLVENT STAGING AREA													
	B-7	(2-2.5')	1-11-94	590	51	--	--	1820	0.05 benzene 0.43 1,2-dichlorobenzene	--	--	--	--	--
	B-8	(2-2.5')	1-11-94	74	6	--	--	79.2	0.05 benzene 0.29 1,2-dichlorobenzene	--	--	--	--	--
	SP-1	(1-2')	3-29-95	--	--	--	--	42.1	0.00667 n-butylbenzene 0.0108 tert-butylbenzene	--	--	--	--	--
	SP-2	(1-2')	3-29-95	--	--	--	--	--	--	--	27.7	--	--	--
	SW-1	(1-2')	5-3-95	154	--	--	--	15.4	X	--	--	--	--	--
	BW-2	(3')	5-3-95	21.75	--	--	--	19.4	X	--	--	--	--	--
	SW-4	(1-2')	5-3-95	4.8	--	--	--	50.4	--	--	--	--	--	--
5	PAINT WASTE STAGING AREA													
	B-9	(2-2.5')	1-11-94	1000+	42	--	--	--	X	--	685***	0.18	22.7	0.083
	B-10	(0-6")	1-11-94	0	36	--	--	--	--	--	--	--	--	--
	B-10	(2-2.5')	1-11-94	--	--	--	--	--	X	--	270	0.28	274****	0.25
	B-11	(0-6")	1-11-94	0	34	--	--	--	--	--	66.1	0.64	22.2	X
	B-12	(0-6")	1-11-94	1.4	34	--	--	--	--	--	--	--	--	--
	B-12	(2-2.5')	1-11-94	1000+	50	--	--	--	X	--	177	0.38	23.1	X

-- indicates parameter not analyzed
X = analyzed but not detected
* DTech Immunoassay PCB Test Kit - EM Industries, Gibbstown, NJ
** WDNR Modified DRO
***TCLP - Pb, B-9 (2-2.5') = none detected
ASTM - Pb, B-9 (2-2.5') = none detected
****TCLP - Cr, B-10 (2-2.5') = none detected

prepared by: ge
checked by: JB

FRASER SHIPYARDS, INC.
FIELD AND ANALYTICAL RESULTS

AOC #	SAMPLE ID	DEPTH	DATE	FIELD SCREEN FID units	FIELD SCREEN PID units	FIELD SCREEN PCB* ppm	ANALYTICAL PARAMETERS PCB (8080) ug/g	DRO** ug/g	VOC (8010/8020 or 8021) ug/g	PVOC (8021a) ug/g	Pb (6010) ug/g	Cd (6010) ug/g	Cr (6010) ug/g	Hg (7471) ug/g
7	TRANSFORMER STAGING AREA													
	B-17	(2-2.5')	1-25-94	1.5	--	0.5-1	--	843	--	--	--	--	--	--
	B-18	(0-0.5')	1-25-94	2	--	0.5	--	131	--	--	--	--	--	--
	B-19	(0-0.5')	1-25-94	2.5	--	1.0	1.0	115	--	--	--	--	--	--
	T-Z	(2')	3-29-95	--	--	--	0.48	147	0.00230 benzene 0.00895 tert-butylbenzene 0.0194 1,3-dichloropropane	--	--	--	--	--
	SS-1	(1.5')	5-3-95	1.19	--	--	--	10.4	--	--	--	--	--	--
	SS-2	(1.5')	5-3-95	1.79	--	--	--	6.83	--	--	--	--	--	--
	BN-1	(3')	5-3-95	0.44	--	--	X	17.2	X	--	--	--	--	--
8	PAINT ROOM STORAGE PAD													
	B-20	(0-1')	1-25-94	1	--	--	--	--	0.0058 benzene 0.150 toluene	--	167	0.218	7.53	0.0509
	B-21	(2-2.5')	1-25-94	1	--	--	--	--	X	--	X	X	4.94	X
	HAX-1	(8")	8-23-95	--	--	--	--	--	0.104 n-butylbenzene 0.240 naphthalene 0.0665 1,2,4 trimethylbenzene 0.194 m- & p-xylene 0.131 o-xylene & styrene	--	--	--	--	--
	HAX-2	(1')	8-23-95	--	--	--	--	--	3.24 n-butylbenzene 0.910 sec-butylbenzene 0.557 tert-butylbenzene 1.24 ethylbenzene 0.469 p-isopropyltoluene 5.11 naphthalene 0.658 n-propylbenzene 2.01 1,2,4-trimethylbenzene 0.696 1,3,5-trimethylbenzene 6.45 m- & p-xylene 3.02 o-xylene & styrene	--	--	--	--	--
9	FUEL STORAGE AREA													
	B-22	(2-2.5')	1-25-94	1	--	--	--	163	0.0291 toluene	--	--	--	--	--
	ST-1	(1-2')	3-29-95	--	--	--	--	23.9	X	--	--	--	--	--
	B-1	(2-3')	5-3-95	2.9	--	--	--	63.9	--	--	--	--	--	--
	B-2	(1-2')	5-3-95	1.33	--	--	--	44.9	--	--	--	--	--	--
	B-3	(1-2')	5-3-95	6.09	--	--	--	30.2	--	X	--	--	--	--

-- indicates parameter not analyzed
X = analyzed but not detected
* DTech Immunoassay PCB Test Kit - EM Industries, Gibbstown, NJ
** WDNR Modified DRO

TABLE 1 (continued)
FRASER SHIPYARDS, INC.
FIELD AND ANALYTICAL RESULTS

AOC #	SAMPLE ID DEPTH	DATE	FIELD SCREEN			ANALYTICAL PARAMETERS							
			FID units	PID units	PCB* ppm	PCB (8080) ug/g	DRO** ug/g	VOC (8010/8020 or 8021) ug/g	PVOC (8021a) ug/g	Pb (6010) ug/g	Cd (6010) ug/g	Cr (6010) ug/g	Hg (7471) ug/g
11	**DRY DOCK #1 BASE**												
	DD001 (6" into the	7-7-95	--	--	--	--	--	--	--	272	--	--	--
	DD002 clay)	7-7-95	--	--	--	--	--	--	--	30.1	--	--	--
	DD003	8-4-94	--	--	--	--	--	--	--	34.1	--	--	--
	T1 (clay	8-17-94	--	--	--	--	--	--	--	927	--	--	--
	T2 surface)	8-17-94	--	--	--	--	--	--	--	832	--	--	--
	T3	8-17-94	--	--	--	--	--	--	--	958	--	--	--
	T4	8-17-94	--	--	--	--	--	--	--	855	--	--	--
12	**NW FILL AREA**												
	TP-5 (2.5')	1-25-94	15	--	--	--	--	0.356 toluene	--	--	--	--	--
	TP-6 (5')	1-25-94	13	--	--	--	--	X	--	--	--	--	--
	TP-7 (6')	1-25-94	350	--	--	--	--	0.42 toluene	--	--	--	--	--
	TP-8 (4')	1-25-94	2	--	--	--	--	--	--	--	--	--	--
	HA-1 (1.5')	8-23-95	--	--	--	--	--	0.0491 ethylbenzene 0.0387 1,3,5-trimethylbenzene 0.0313 m- & p-xylene	--	--	--	--	--
	HA-2 (1.5')	8-23-95	--	--	--	--	--	0.0568 ethylbenzene 0.0560 toluene 0.0794 1,2,4-trimethylbenzene 0.0718 1,3,5-trimethylbenzene 0.0685 m- & p-xylene 0.0401 o-xylene & styrene	--	--	--	--	--
	HA-3 (1')	8-23-95	--	--	--	--	--	0.0604 ethylbenzene 0.0777 toluene 0.0802 1,2,4-trimethylbenzene 0.092 m- & p-xylene 0.0793 o- xylene & styrene	--	--	--	--	--

-- indicates parameter not analyzed
X = analyzed but not detected
* DTech Immunoassay PCB Test Kit - EM Industries, Gibbstown, NJ
** WDNR Modified DRO

Table 2
Groundwater Parameters/Analytical Methods

Parameters	Methods	Monitoring Wells		
		MW-1	MW-2	MW-3
VOC[1]	EPA Method 8021	X	X	X
PAH	EPA Method 8310	X	X	X
Pb[2]	EPA Method 7421	X	X	X
Cr[2]	EPA Method 7191	X	X	X

[1] = Sample for the full list of VOCs in the first round of samples. Subsequent rounds may be limited to the PVOCs or as requested by the WDNR project manager.

[2] = Sample for Pb and Cr in the first round of samples. Field filtered using a 0.45 micron filter. If no detections of Pb or Cr in the first sampling round request that analyses be dropped.

Note: WDNR LUST Guidance (7/93) used as reference for diesel contaminated groundwaters.

Figures

Figure 1 – Site Location Map
Figure 2 – Site Plan
Figure 3 – AOC #1
Figure 4 – AOC #3
Figure 5 – AOC #5
Figure 6 – AOC #7
Figure 7 – AOC #8
Figure 8 – AOC #9
Figure 9 – AOC #11
Figure 10 – Dry Dock #1 Cross Section
Figure 11 – AOC #12
Figure 12 – Proposed Well Locations
Figure 13 – Monitoring Well Construction Diagram

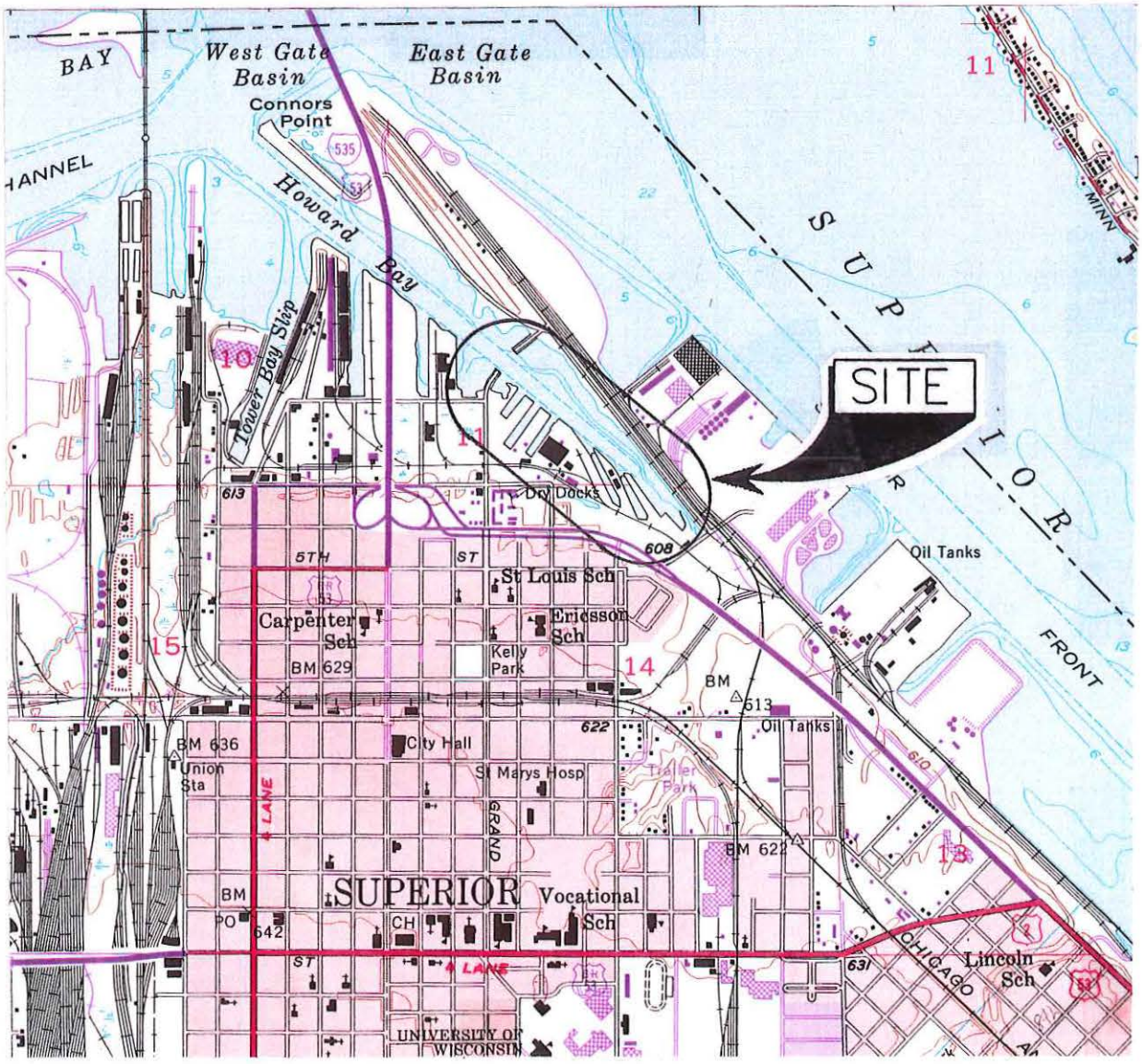
REPRODUCED FROM

USGS SUPERIOR QUADRANGLE

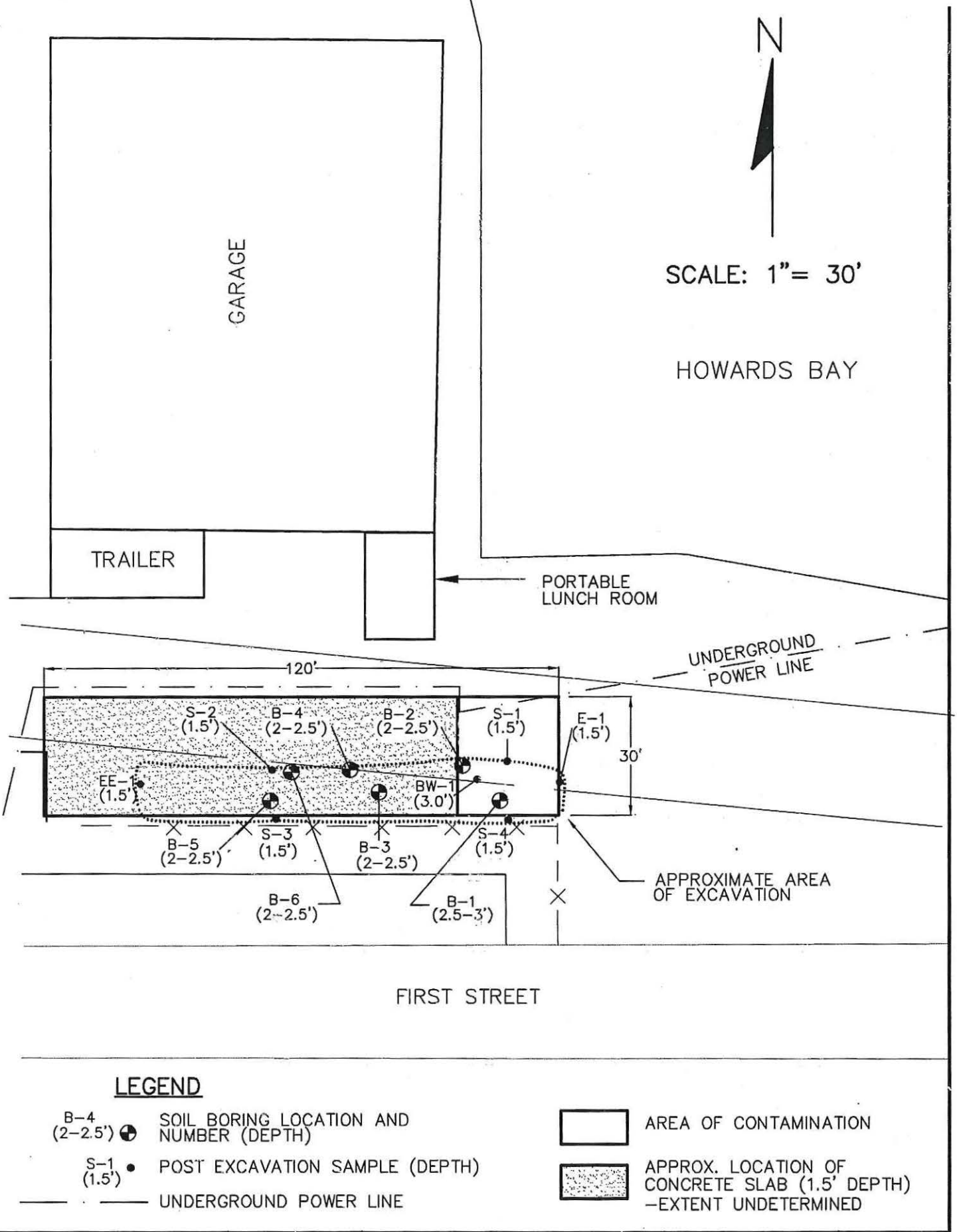
WISCONSIN - DOUGLAS CO. 7.5 MINUTE SERIES

N

SCALE: 1"=2,000'



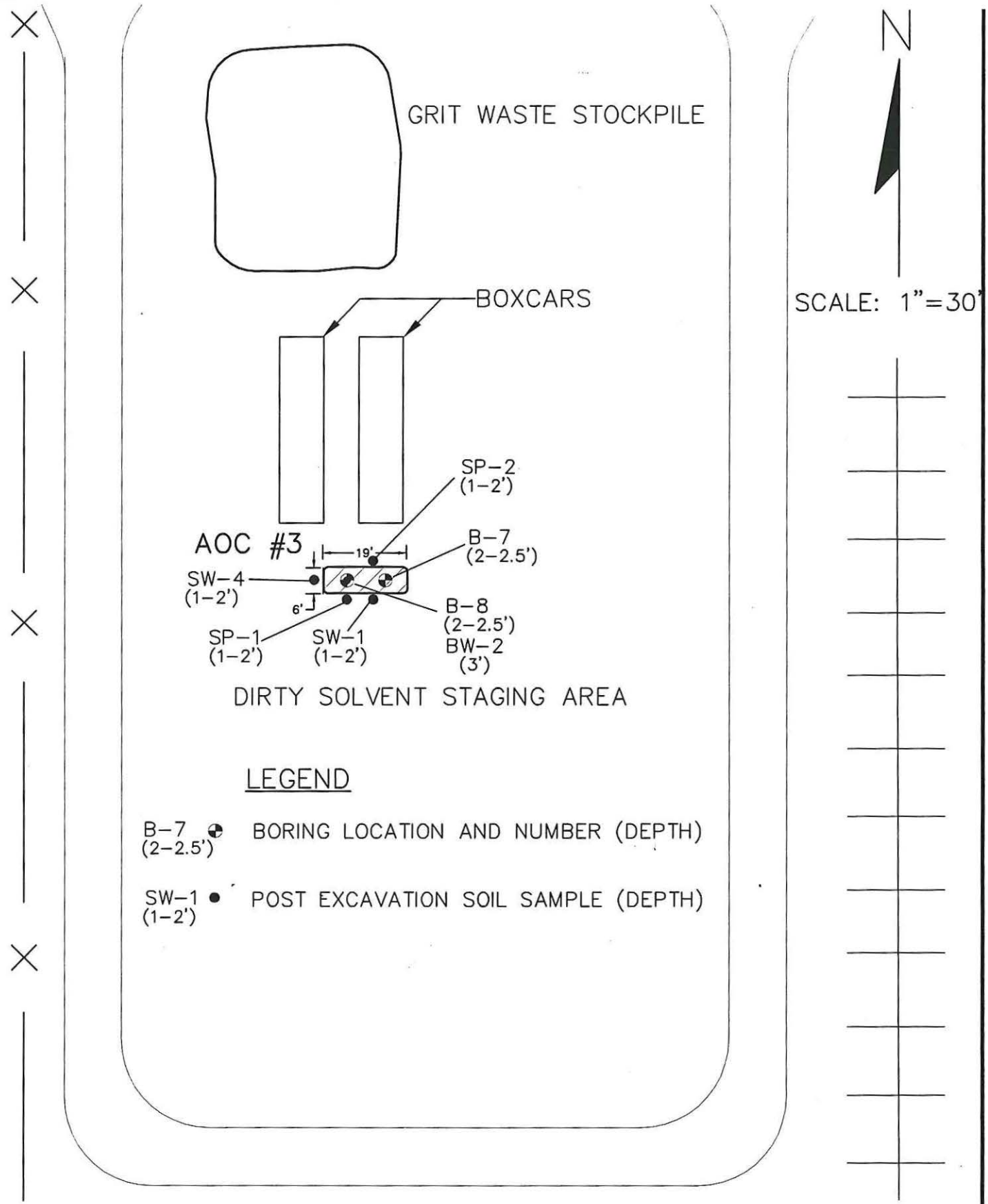
ENGINEERS ■ ARCHITECTS ■ PLANNERS	DRAWN BY: KEA 10/18/93 CHECKED BY:	FIGURE 1 FRASER SHIPYARDS, INC. SUPERIOR, WISCONSIN	FILE NO. FRASE9401 DRG. NO. 9401FZA1



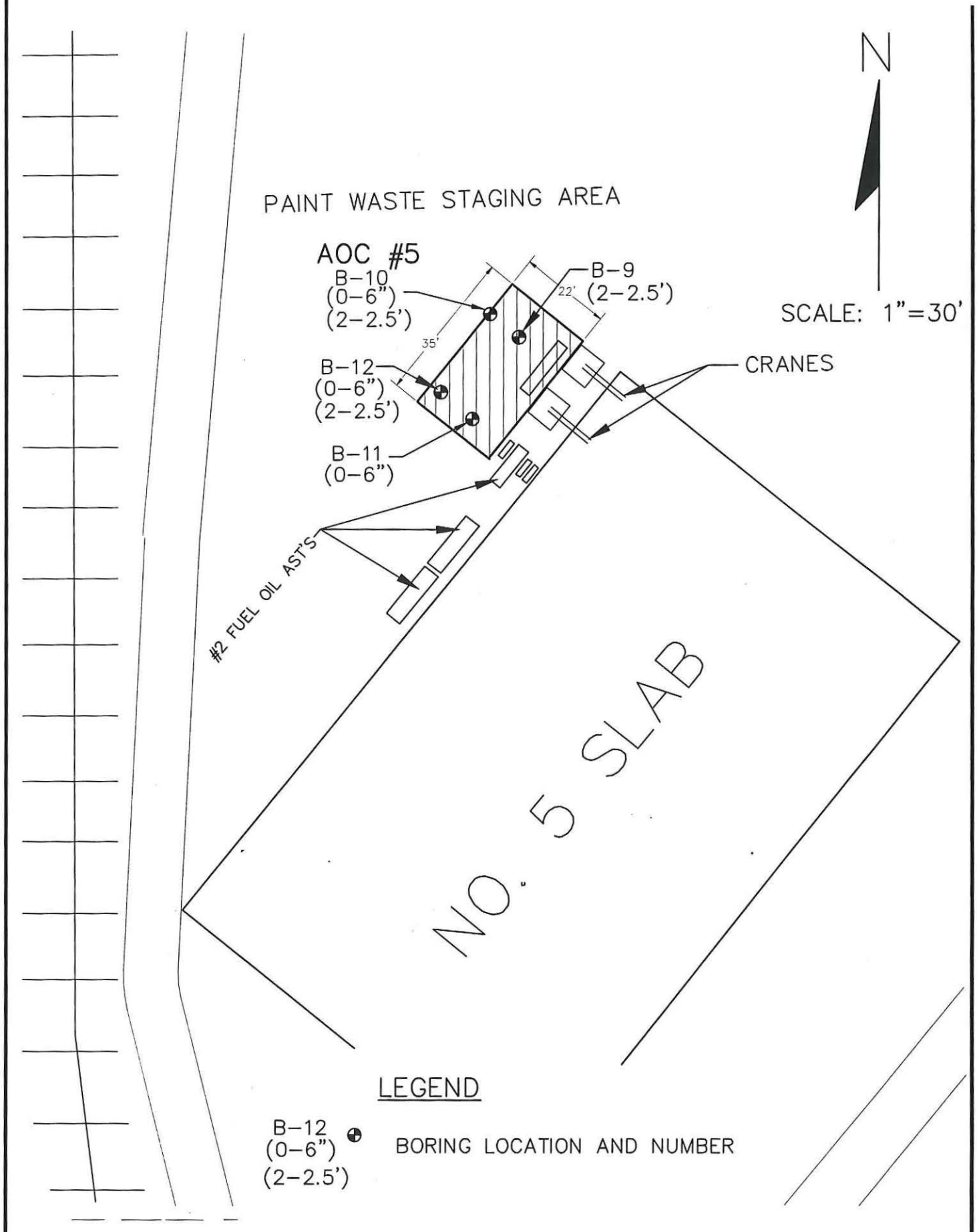
LEGEND

- B-4 (2-2.5') — SOIL BORING LOCATION AND NUMBER (DEPTH)
- S-1 (1.5') — POST EXCAVATION SAMPLE (DEPTH)
- UNDERGROUND POWER LINE
- AREA OF CONTAMINATION
- APPROX. LOCATION OF CONCRETE SLAB (1.5' DEPTH) –EXTENT UNDETERMINED

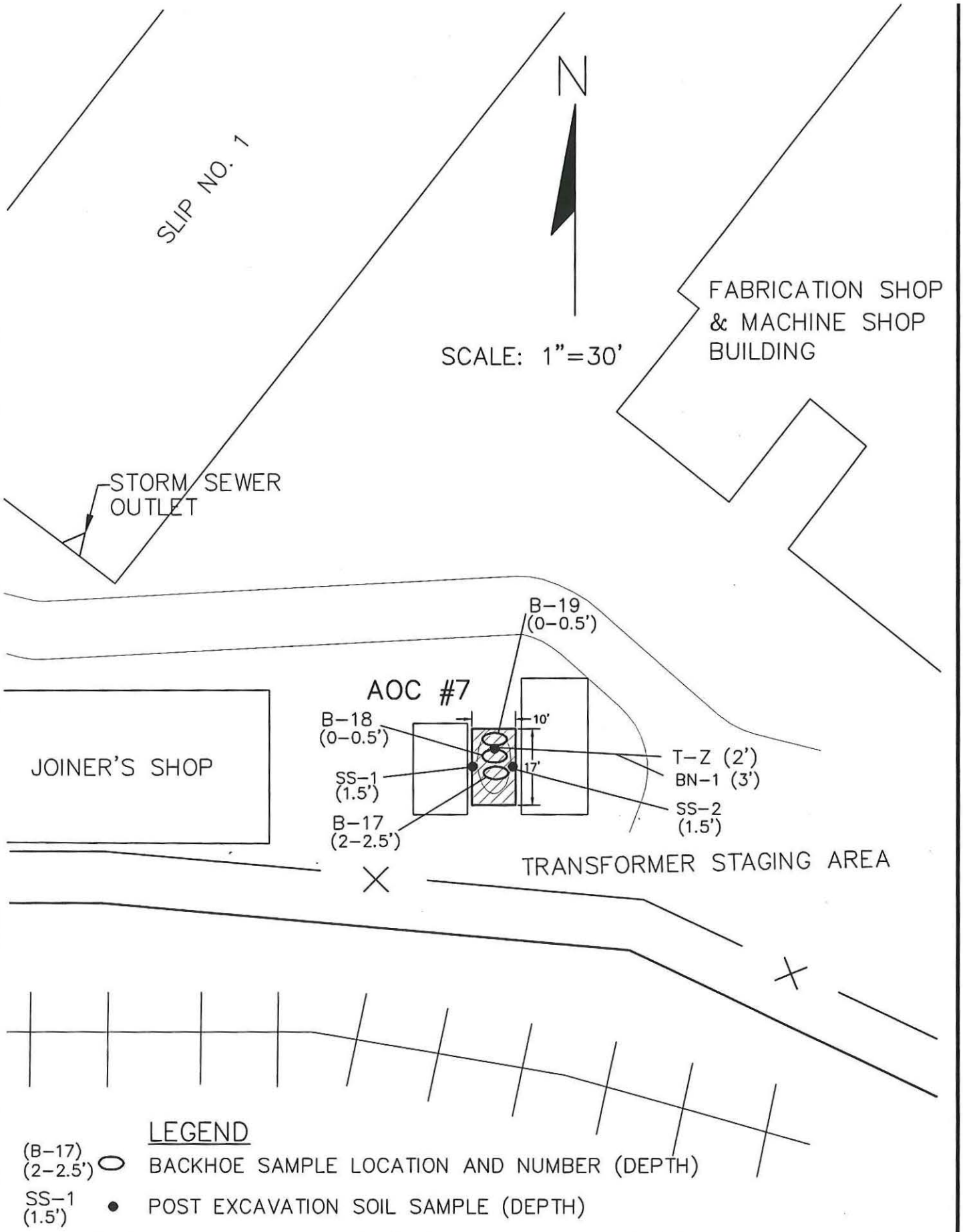
ENGINEERS ■ ARCHITECTS ■ PLANNERS	DRAWN BY: JLE 10/19/95 CHECKED BY: CWL 11/8/95	FIGURE 3 FRASER SHIPYARDS, INC. AOC #1	FILE NO. FRAS9401 DRG. NO. 9401FZE3



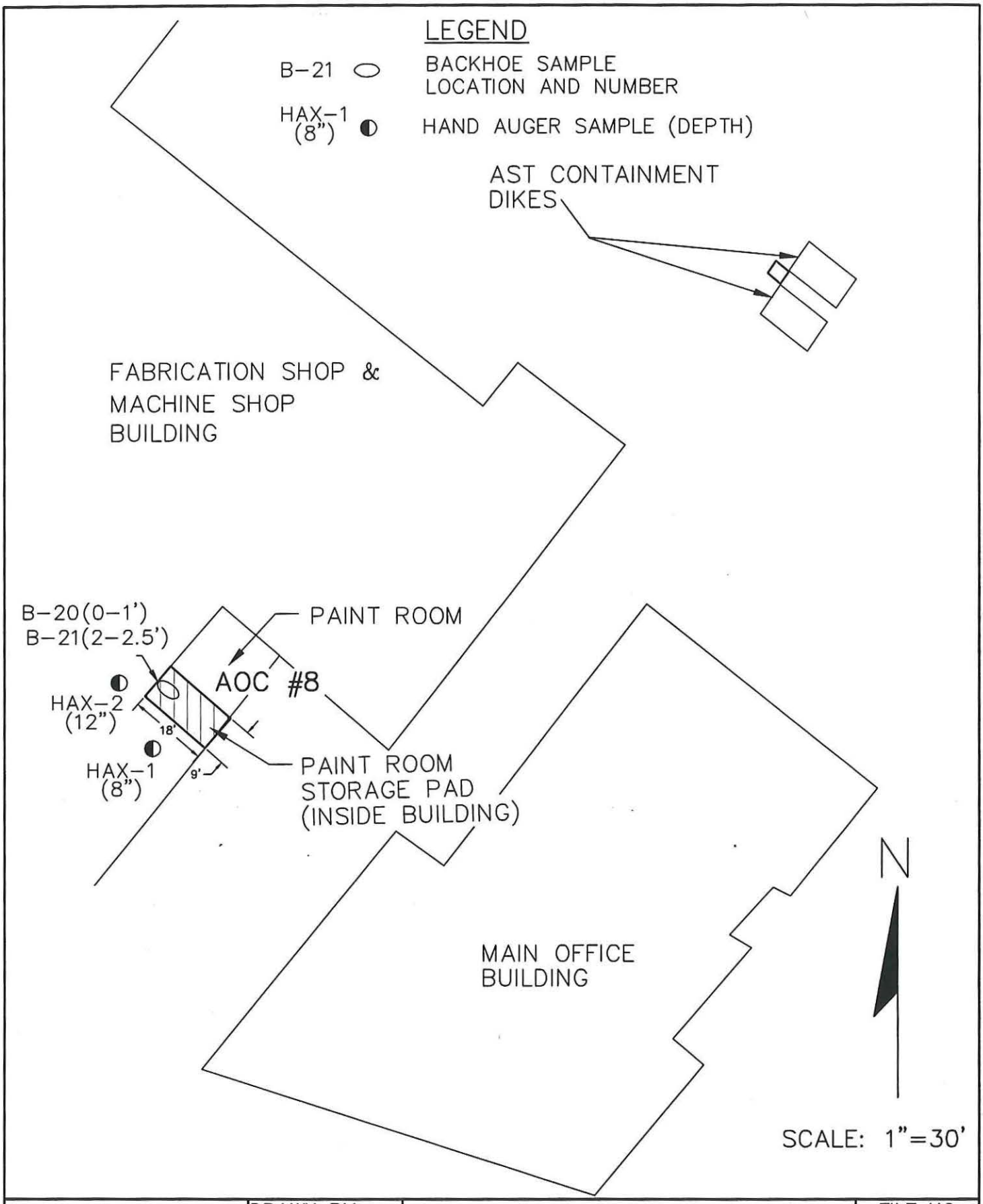
ENGINEERS ■ ARCHITECTS ■ PLANNERS	DRAWN BY: JLE 10/19/95 CHECKED BY: CWI 11/8/95	FIGURE 4 FRASER SHIPYARDS, INC. AOC #3	FILE NO. FRAS9401 DRG. NO. 9401FZH4



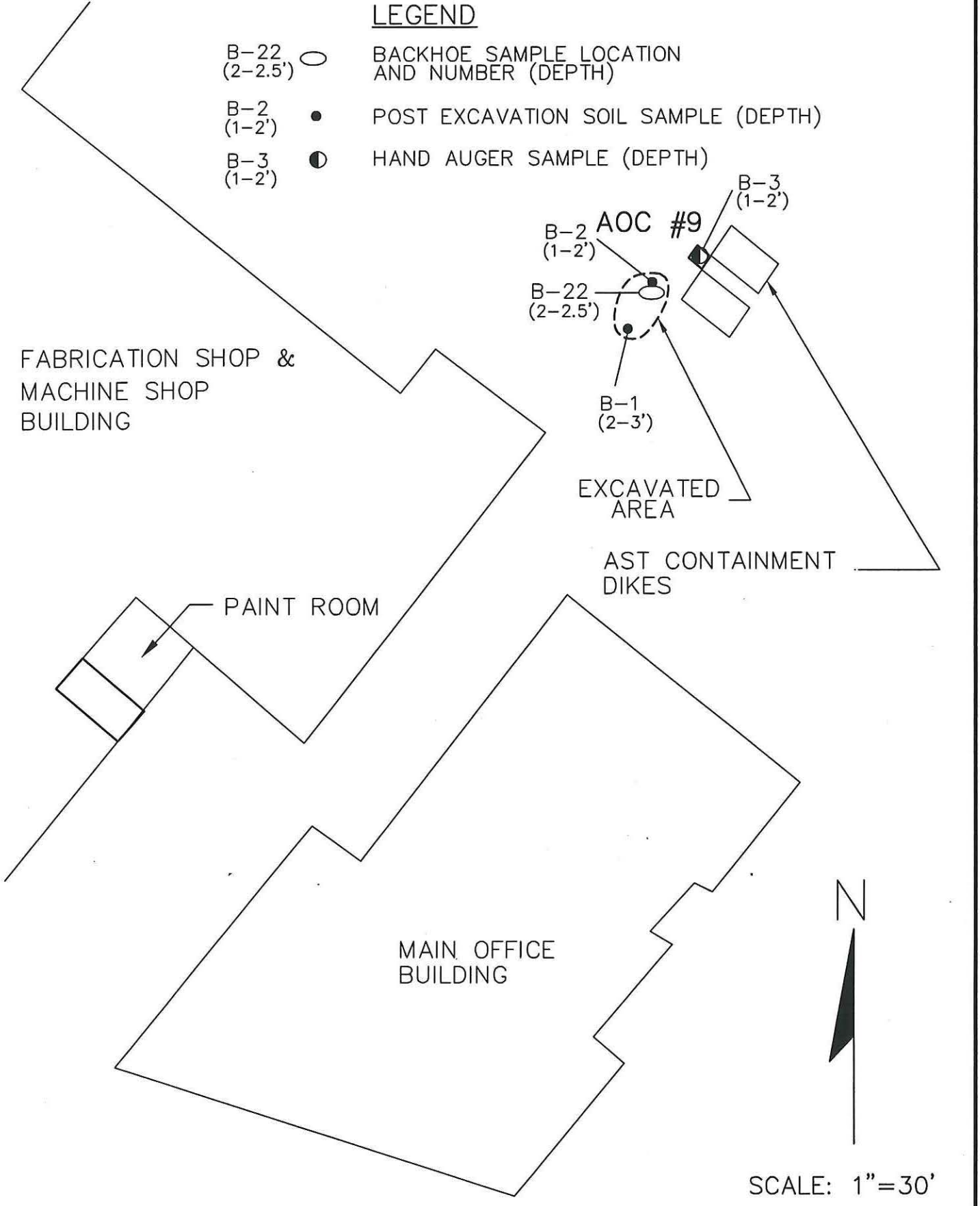
ENGINEERS ■ ARCHITECTS ■ PLANNERS	DRAWN BY: JLE 10/19/95 CHECKED BY: CWI 11/8/95	FIGURE 5 FRASER SHIPYARDS, INC. AOC #5	FILE NO. FRASE9401 DRG. NO. 9401FZH5



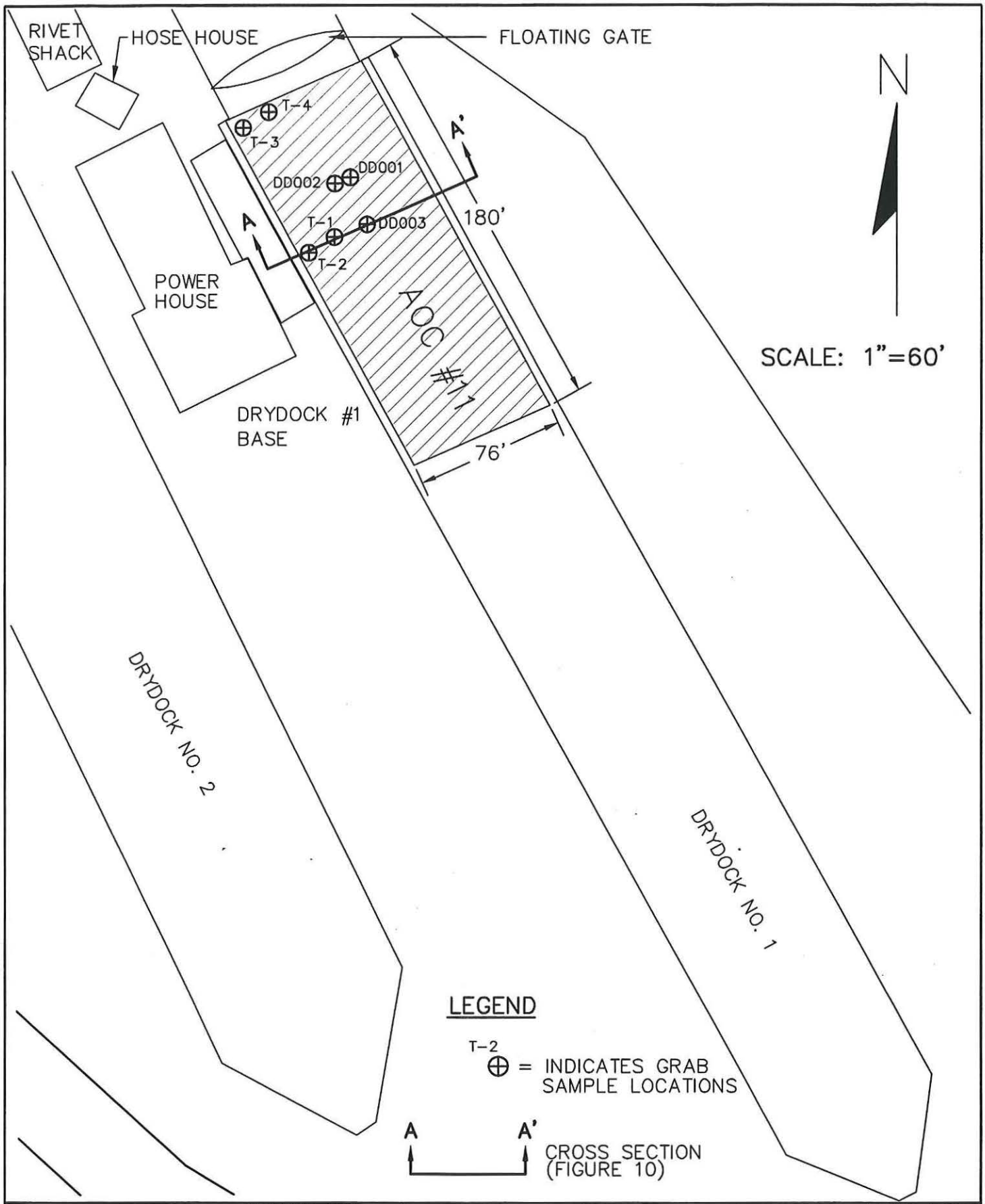
SEH ENGINEERS ■ ARCHITECTS ■ PLANNERS	DRAWN BY: JLE 10/19/95 CHECKED BY: CWL 11/8/95	FIGURE 6 FRASER SHIPYARDS, INC. AOC #7	FILE NO. FRAS9401 DRG. NO. 9401FZH7



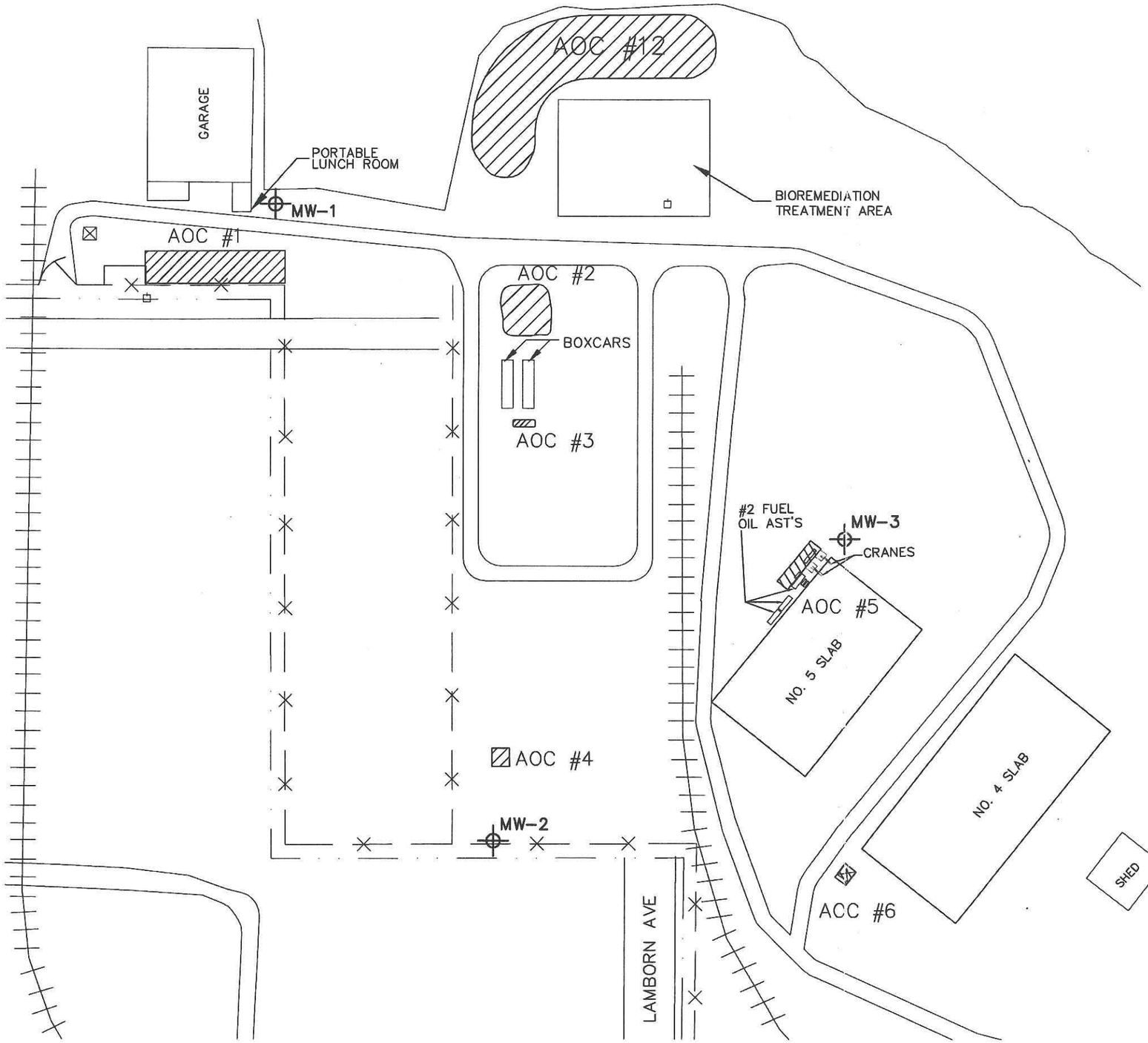
ENGINEERS ■ ARCHITECTS ■ PLANNERS	DRAWN BY: JLE 10/19/95 CHECKED BY: CWI 11/8/95	FIGURE 7 FRASER SHIPYARDS, INC. AOC #8	FILE NO. FRASE9401 DRG. NO. 9401FZZ1



ENGINEERS ■ ARCHITECTS ■ PLANNERS	DRAWN BY: JLE 10/19/95 CHECKED BY: CWL 11/8/95	FIGURE 8 FRASER SHIPYARDS, INC. AOC #9	FILE NO. FRAS9401 DRG. NO. 9401FZH9



ENGINEERS ■ ARCHITECTS ■ PLANNERS	DRAWN BY: JLE 10/19/95 CHECKED BY: OWI 11/8/95	FIGURE 9 FRASER SHIPYARDS, INC. AOC #11	FILE NO. FRASE9401 DRG. NO. 9401FZH6

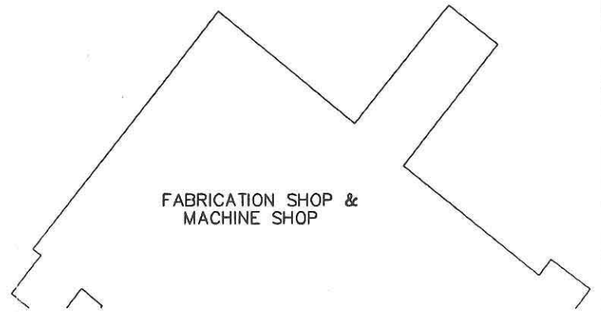


N

SCALE: 1"=100'

LEGEND

- RAILROAD
- STORM SEWER OUTLET
- SUB STATION (600 KVA)
- PROPERTY BOUNDARY
- FENCE
- AREAS OF CONCERN
  - AOC #2
- MW-1 PROPOSED GROUNDWATER MONITORING WELL



SEH JOB #: E:\WASTE\FRAS9401

DRAWING NAME: 9401FZD3
LAYERS OFF:

DRAWN BY: JLE DATE: 10/95
DESIGNER: ____ DATE: ____
CHECKED BY: CWL DATE: 11/8/95

NO.	BY	DATE	REVISIONS	ITEM	DESIGN	CHECKED

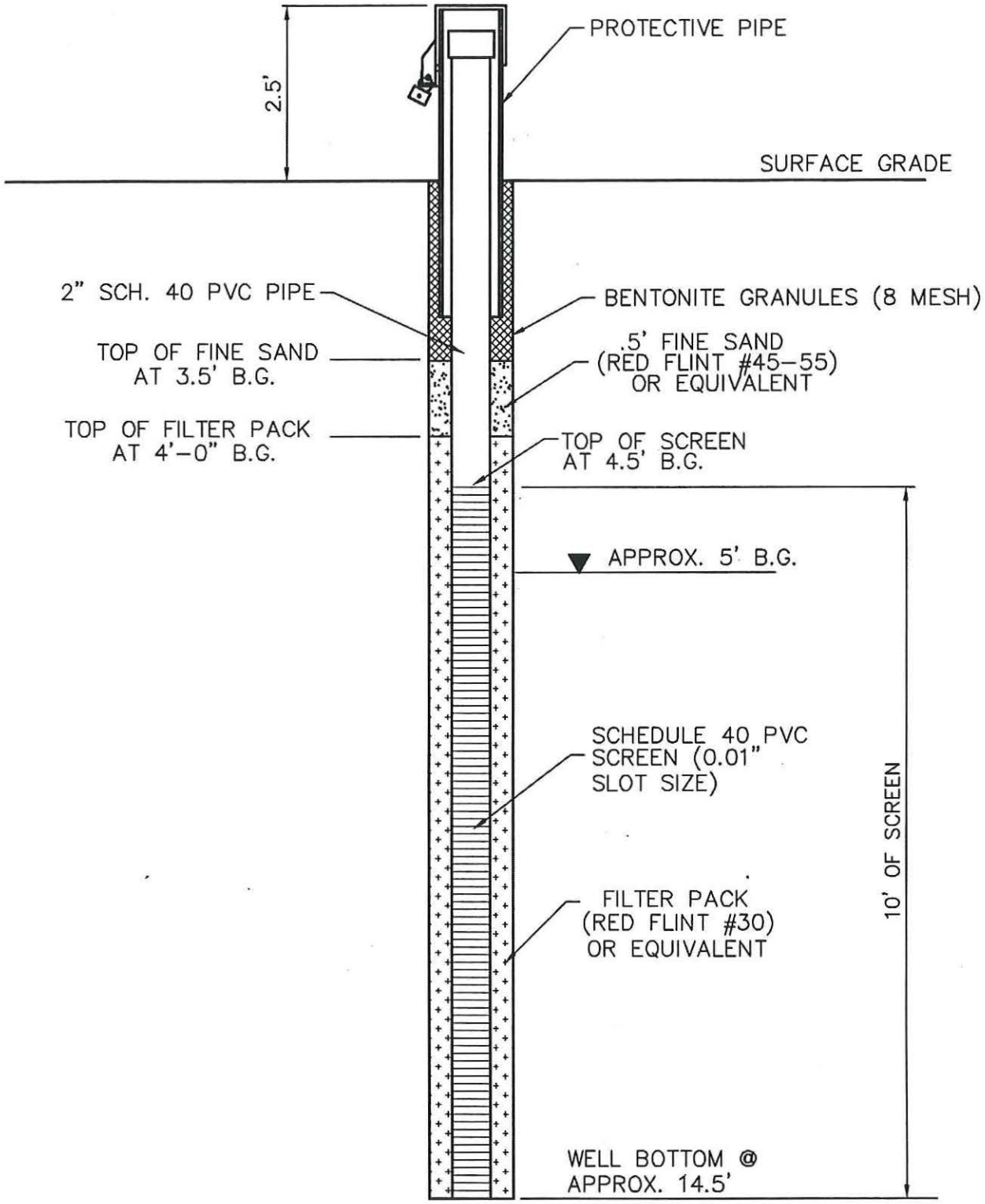
ENGINEERS ARCHITECTS PLANNERS

FRASER SHIPYARDS, INC.
SUPERIOR, WISCONSIN

FIGURE 12
PROPOSED WELL LOCATIONS

FILE NO. FRAS9401
DWG. NO. 9401FZD3

12/13



NTS

ENGINEERS ■ ARCHITECTS ■ PLANNERS	DRAWN BY: JLE 10/19/95 CHECKED BY: CWI 11/8/95	FIGURE 13 **FRASER SHIPYARDS, INC.** MONITORING WELL CONSTRUCTION DIAGRAM	FILE NO. FRASE9401 DRG. NO. 9401FZD4

Appendix A

Soil Treatment Documentation

CleanSoils
SOIL REMEDIATION SPECIALISTS

CleanSoils Minnesota Inc.
2360 West County Road C
Roseville, MN 55113
Office: (612) 639-8811
FAX: (612) 639-8813

October 3, 1995

Mr. Ronald Peterson
Fraser Shipyards, Inc.
P.O. Box 997
Superior, WI 54880

Dear Mr. Peterson:

RE: Final Report on Soil Treatment and Notification of Post-Burn Sampling Results

Site: Fraser Shipyards, Inc., Third Street and Clough Avenue, Superior, WI 54880
MPCA Leak ID#: N/A4
CleanSoils Project #: MN1861

CleanSoils has successfully completed the thermal treatment of petroleum contaminated soil from the above referenced site. The treated soil meets all MPCA requirements. Attached please find a copy of independent post-burn analyses for BTEX, GRO and/or DRO. Below is other information regarding the treated soil.

Quantity of Soil: 131.79 tons
Completion Date: August 26, 1995
Post-Burn Samples: MN1861-1
Final Disposition of Soil: Held for Qualified Fill Project

If you should have any questions regarding this project, please contact me at (612) 639-8811.

Sincerely,

Daniel P. Rose
Manager, CleanSoils Minnesota Inc.

attachments

cc: File
Jessica Ebertz, MPCA
Consultant

SERCO Laboratories

1931 West County Road C2. St. Paul. Minnesota 55113 Phone (612) 636-7173 FAX (612) 636-7178

LABORATORY ANALYSIS REPORT NO: 53885
09/28/95

CleanSoils, Inc.
2360 W County Road C
Roseville, MN 55113

DATE COLLECTED: 09/20/95
DATE RECEIVED: 09/20/95
COLLECTED BY : CLIENT
DELIVERED BY : CLIENT
SAMPLE TYPE : SOIL

Attn: Dan Rose

CLIENT'S ID: 10013 Postburns

SERCO SAMPLE NO: 139535

SAMPLE DESCRIPTION: MN1861-1

ANALYSIS:	
Diesel Range Organics C10-C28, dry weight, mg/kg	<10
Analytical Method for MOD DRO	MOD DRO
Date of Extraction for MOD DRO	09/20/95
Date of Analysis for MOD DRO	09/25/95
Benzene, dry weight, mg/kg	<0.05
Ethylbenzene, dry weight, mg/kg	<0.05
Methyl tertiary butyl ether, dry weight, mg/kg	<0.5
Toluene, dry weight, mg/kg	<0.05
Total Xylene, dry weight, mg/kg	<0.05
Analytical Method for BETX/MTBE	8020
Date of analysis for BETX/MTBE	09/21/95
Total Solids, percent	96.7
Lead, mg/kg as Pb	32

< means "not detected at this level". 1 mg = 1000 ug.

Appendix B

Laboratory Results

ENVIROSCAN

ENVIRONMENTAL AND ANALYTICAL SERVICES

April 13, 1995

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

RECEIVED
APR 18 1995
HORT, ELLIOTT, HENDRICKSON
CHIPPEWA FALLS, WI

Attn: Gloria Chojnacki

Re: FRASE9401.00

Please find enclosed the analytical results for the samples received March 31, 1995.

All analyses were completed in accordance with appropriate EPA and Wisconsin methodologies. Methods and dates of analysis are included in the report tables.

The chain of custody document is enclosed.

If you have any questions about the results, please call. Thank you for using Enviroscan Corp. for your analytical needs.

Sincerely,

Enviroscan Corp.

Eric P. Martin
Analytical Chemist

303 West Military Road Rothschild, WI 54474 (715) 359-7226
An Affiliate of the Black Clawson Co.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	ST-1 AO#9 03/29/95	Qualifiers	Date Analyzed
EPA 8021					
Benzene	mg/kg	0.001	X		04/05/95
Bromobenzene	mg/kg	0.0024	X		04/05/95
Bromodichloromethane	mg/kg	0.0024	X		04/05/95
n-Butylbenzene	mg/kg	0.0049	X		04/05/95
sec-Butylbenzene	mg/kg	0.0049	X		04/05/95
tert-Butylbenzene	mg/kg	0.0049	X		04/05/95
Carbon Tetrachloride	mg/kg	0.0024	X		04/05/95
Chlorobenzene	mg/kg	0.01	X		04/05/95
Chlorodibromomethane	mg/kg	0.0024	X		04/05/95
Chloroethane	mg/kg	0.01	X		04/05/95
Chloroform	mg/kg	0.0024	X		04/05/95
Chloromethane	mg/kg	0.01	X	SPH DUP CSL	04/05/95
o-Chlorotoluene	mg/kg	0.0049	X		04/05/95
p-Chlorotoluene	mg/kg	0.0049	X		04/05/95
1,2-Dibromo-3-chloropropane	mg/kg	0.064	X		04/05/95
1,2-Dibromoethane	mg/kg	0.0049	X		04/05/95
1,2-Dichlorobenzene	mg/kg	0.0049	X		04/05/95
1,3-Dichlorobenzene	mg/kg	0.0049	X		04/05/95
1,4-Dichlorobenzene	mg/kg	0.0024	X	CSH	04/05/95
Dichlorodifluoromethane	mg/kg	0.01	X	DUP	04/05/95
1,1-Dichloroethane	mg/kg	0.0024	X		04/05/95
1,2-Dichloroethane	mg/kg	0.0024	X		04/05/95
1,1-Dichloroethylene	mg/kg	0.0019	X		04/05/95
cis-1,2-Dichloroethylene	mg/kg	0.0024	X		04/05/95
trans-1,2-Dichloroethylene	mg/kg	0.0024	X		04/05/95
1,2-Dichloropropane	mg/kg	0.0024	X		04/05/95
1,3-Dichloropropane	mg/kg	0.0024	X	SPH	04/05/95
2,2-Dichloropropane	mg/kg	0.01	X		04/05/95
Ethylbenzene	mg/kg	0.0049	X		04/05/95
Hexachlorobutadiene	mg/kg	0.0049	X		04/05/95
Isopropylbenzene	mg/kg	0.0049	X		04/05/95
Isopropyl Ether	mg/kg	0.0049	X		04/05/95
p-Isopropyltoluene	mg/kg	0.0049	X		04/05/95
Methyl tert Butyl Ether	mg/kg	0.01	X		04/05/95
Methylene Chloride	mg/kg	0.012	X		04/05/95
Naphthalene	mg/kg	0.0049	X		04/05/95
n-Propylbenzene	mg/kg	0.0049	X		04/05/95
Tetrachloroethylene	mg/kg	0.0024	X		04/05/95
1,1,2,2-Tetrachloroethane	mg/kg	0.0049	X		04/05/95
Toluene	mg/kg	0.01	X		04/05/95
1,2,3-Trichlorobenzene	mg/kg	0.0049	X		04/05/95
1,2,4-Trichlorobenzene	mg/kg	0.0049	X		04/05/95
Analytical No.:			36659		

X = Analyzed but not detected.
Results calculated on a dry weight basis.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EBM 20m
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	ST-1 AO#9 03/29/95	Qualifiers	Date Analyzed
1,1,1-Trichloroethane	mg/kg	0.0024	X		04/05/95
1,1,2-Trichloroethane	mg/kg	0.0024	X		04/05/95
Trichloroethylene	mg/kg	0.001	X		04/05/95
Trichlorofluoromethane	mg/kg	0.0049	X		04/05/95
1,2,4-Trimethylbenzene	mg/kg	0.0049	X		04/05/95
1,3,5-Trimethylbenzene	mg/kg	0.0049	X		04/05/95
Vinyl Chloride	mg/kg	0.001	X		04/05/95
m- & p-Xylene	mg/kg	0.0049	X		04/05/95
o-Xylene	mg/kg	0.0049	X		04/05/95
Analytical No.:			36659		

X = Analyzed but not detected.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	SP-1 AOC#3 03/29/95	Qualifiers	Date Analyzed
EPA 8021					
Benzene	mg/kg	0.0012	X	ISL	04/06/95
Bromobenzene	mg/kg	0.003	X	ISL	04/06/95
Bromodichloromethane	mg/kg	0.003	X	ISL	04/06/95
n-Butylbenzene	mg/kg	0.006	0.00667	ISL	04/06/95
sec-Butylbenzene	mg/kg	0.006	X	ISL	04/06/95
tert-Butylbenzene	mg/kg	0.006	0.0108	ISL	04/06/95
Carbon Tetrachloride	mg/kg	0.003	X	ISL	04/06/95
Chlorobenzene	mg/kg	0.012	X	ISL	04/06/95
Chlorodibromomethane	mg/kg	0.003	X	ISL	04/06/95
Chloroethane	mg/kg	0.012	X	ISL	04/06/95
Chloroform	mg/kg	0.003	X	ISL	04/06/95
Chloromethane	mg/kg	0.012	X	ISL DUP CSL	04/06/95
o-Chlorotoluene	mg/kg	0.006	X	ISL	04/06/95
p-Chlorotoluene	mg/kg	0.006	X	ISL	04/06/95
1,2-Dibromo-3-chloropropane	mg/kg	0.08	X	ISL	04/06/95
1,2-Dibromoethane	mg/kg	0.006	X	ISL	04/06/95
1,2-Dichlorobenzene	mg/kg	0.006	X	ISL	04/06/95
1,3-Dichlorobenzene	mg/kg	0.006	X	ISL	04/06/95
1,4-Dichlorobenzene	mg/kg	0.003	X	CSH ISL	04/06/95
Dichlorodifluoromethane	mg/kg	0.012	X	DUP ISL	04/06/95
1,1-Dichloroethane	mg/kg	0.003	X	ISL	04/06/95
1,2-Dichloroethane	mg/kg	0.003	X	ISL	04/06/95
1,1-Dichloroethylene	mg/kg	0.0025	X	ISL	04/06/95
cis-1,2-Dichloroethylene	mg/kg	0.003	X	ISL	04/06/95
trans-1,2-Dichloroethylene	mg/kg	0.003	X	ISL	04/06/95
1,2-Dichloropropane	mg/kg	0.003	X	ISL	04/06/95
1,3-Dichloropropane	mg/kg	0.003	X	SPH ISL	04/06/95
2,2-Dichloropropane	mg/kg	0.012	X	ISL	04/06/95
Ethylbenzene	mg/kg	0.006	X	ISL	04/06/95
Hexachlorobutadiene	mg/kg	0.006	X	ISL	04/06/95
Isopropylbenzene	mg/kg	0.006	X	ISL	04/06/95
Isopropyl Ether	mg/kg	0.006	X	ISL	04/06/95
p-Isopropyltoluene	mg/kg	0.006	X	ISL	04/06/95
Methyl tert Butyl Ether	mg/kg	0.012	X	ISL	04/06/95
Methylene Chloride	mg/kg	0.015	X	ISL	04/06/95
Naphthalene	mg/kg	0.006	X	ISL	04/06/95
n-Propylbenzene	mg/kg	0.006	X	ISL	04/06/95
Tetrachloroethylene	mg/kg	0.003	X	ISL	04/06/95
1,1,2,2-Tetrachloroethane	mg/kg	0.006	X	ISL	04/06/95
Toluene	mg/kg	0.012	X	ISL	04/06/95
1,2,3-Trichlorobenzene	mg/kg	0.006	X	ISL	04/06/95
1,2,4-Trichlorobenzene	mg/kg	0.006	X	ISL	04/06/95
Analytical No.:			36660		

X = Analyzed but not detected.
Results calculated on a dry weight basis.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	SP-1 AOC#3 03/29/95	Qualifiers	Date Analyzed
1,1,1-Trichloroethane	mg/kg	0.003	X	ISL	04/06/95
1,1,2-Trichloroethane	mg/kg	0.003	X	ISL	04/06/95
Trichloroethylene	mg/kg	0.0012	X	ISL	04/06/95
Trichlorofluoromethane	mg/kg	0.006	X	ISL	04/06/95
1,2,4-Trimethylbenzene	mg/kg	0.006	X	ISL	04/06/95
1,3,5-Trimethylbenzene	mg/kg	0.006	X	ISL	04/06/95
Vinyl Chloride	mg/kg	0.0012	X	ISL	04/06/95
m- & p-Xylene	mg/kg	0.006	X	ISL	04/06/95
o-Xylene	mg/kg	0.006	X	ISL	04/06/95
Analytical No.:			36660		

X = Analyzed but not detected.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	L-1 AOC#2 03/29/95	Qualifiers	Date Analyzed
EPA 6010					
Lead	mg/kg	5.6	99.6		04/04/95
Analytical No.:			36661		

Results calculated on a dry weight basis.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	L-2 AOC#2 03/29/95	Qualifiers	Date Analyzed
EPA 6010					
Lead	mg/kg	7.7	55.7		04/04/95
Analytical No.:			36662		

Results calculated on a dry weight basis.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson,Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	L-3 AOC#2 03/29/95	Qualifiers	Date Analyzed
EPA 6010					
Lead	mg/kg	5.8	97.6		04/04/95
Analytical No.:			36663		

Results calculated on a dry weight basis.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	L-4 AOC#2 03/29/95	Qualifiers	Date Analyzed
EPA 6010					
Lead	mg/kg	5.3	41.3		04/04/95
Analytical No.:			36664		

Results calculated on a dry weight basis.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	L-5 AOC#2 03/29/95	Qualifiers	Date Analyzed
EPA 6010					
Lead	mg/kg	6.1	109		04/04/95
Analytical No.:			36665		

Results calculated on a dry weight basis.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	L-6 AOC#2 03/29/95	Qualifiers	Date Analyzed
EPA 6010					
Lead	mg/kg	6.2	18.0		04/04/95
Analytical No.:			36666		

Results calculated on a dry weight basis.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	SP-2 AOC#3 03/29/95	Qualifiers	Date Analyzed
EPA 6010					
Lead	mg/kg	7.0	27.7		04/04/95
Analytical No.:			36667		

Results calculated on a dry weight basis.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	T-Z AOC #7 03/29/95	Qualifiers	Date Analyzed
EPA 8021					
Benzene	mg/kg	0.001	0.00230	ISL	04/06/95
Bromobenzene	mg/kg	0.0026	X	ISL	04/06/95
Bromodichloromethane	mg/kg	0.0026	X	ISL	04/06/95
n-Butylbenzene	mg/kg	0.005	X	ISL	04/06/95
sec-Butylbenzene	mg/kg	0.005	X	ISL	04/06/95
tert-Butylbenzene	mg/kg	0.005	0.00895	ISL	04/06/95
Carbon Tetrachloride	mg/kg	0.0026	X	ISL	04/06/95
Chlorobenzene	mg/kg	0.01	X	ISL	04/06/95
Chlorodibromomethane	mg/kg	0.0026	X	ISL	04/06/95
Chloroethane	mg/kg	0.01	X	ISL	04/06/95
Chloroform	mg/kg	0.0026	X	ISL	04/06/95
Chloromethane	mg/kg	0.01	X	ISL DUP CSL	04/06/95
o-Chlorotoluene	mg/kg	0.005	X	ISL	04/06/95
p-Chlorotoluene	mg/kg	0.005	X	ISL	04/06/95
1,2-Dibromo-3-chloropropane	mg/kg	0.067	X	ISL	04/06/95
1,2-Dibromoethane	mg/kg	0.005	X	ISL	04/06/95
1,2-Dichlorobenzene	mg/kg	0.005	X	ISL	04/06/95
1,3-Dichlorobenzene	mg/kg	0.005	X	ISL	04/06/95
1,4-Dichlorobenzene	mg/kg	0.0026	X	CSH ISL	04/06/95
Dichlorodifluoromethane	mg/kg	0.01	X	DUP ISL	04/06/95
1,1-Dichloroethane	mg/kg	0.0026	X	ISL	04/06/95
1,2-Dichloroethane	mg/kg	0.0026	X	ISL	04/06/95
1,1-Dichloroethylene	mg/kg	0.002	X	ISL	04/06/95
cis-1,2-Dichloroethylene	mg/kg	0.0026	X	ISL	04/06/95
trans-1,2-Dichloroethylene	mg/kg	0.0026	X	ISL	04/06/95
1,2-Dichloropropane	mg/kg	0.0026	X	ISL	04/06/95
1,3-Dichloropropane	mg/kg	0.0026	0.0194	SPH ISL	04/06/95
2,2-Dichloropropane	mg/kg	0.01	X	ISL	04/06/95
Ethylbenzene	mg/kg	0.005	X	ISL	04/06/95
Hexachlorobutadiene	mg/kg	0.005	X	ISL	04/06/95
Isopropylbenzene	mg/kg	0.005	X	ISL	04/06/95
Isopropyl Ether	mg/kg	0.005	X	ISL	04/06/95
p-Isopropyltoluene	mg/kg	0.005	X	ISL	04/06/95
Methyl tert Butyl Ether	mg/kg	0.01	X	ISL	04/06/95
Methylene Chloride	mg/kg	0.013	X	ISL	04/06/95
Naphthalene	mg/kg	0.005	X	ISL	04/06/95
n-Propylbenzene	mg/kg	0.005	X	ISL	04/06/95
Tetrachloroethylene	mg/kg	0.0026	X	ISL	04/06/95
1,1,2,2-Tetrachloroethane	mg/kg	0.005	X	ISL	04/06/95
Toluene	mg/kg	0.01	X	ISL	04/06/95
1,2,3-Trichlorobenzene	mg/kg	0.005	X	ISL	04/06/95

Analytical No.: 36668

X = Analyzed but not detected.
Results calculated on a dry weight basis.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

	Units	Reporting Limit	T-Z AOC #7 03/29/95	Qualifiers	Date Analyzed
1,2,4-Trichlorobenzene	mg/kg	0.005	X	ISL	04/06/95
1,1,1-Trichloroethane	mg/kg	0.0026	X	ISL	04/06/95
1,1,2-Trichloroethane	mg/kg	0.0026	X	ISL	04/06/95
Trichloroethylene	mg/kg	0.001	X	ISL	04/06/95
Trichlorofluoromethane	mg/kg	0.005	X	ISL	04/06/95
1,2,4-Trimethylbenzene	mg/kg	0.005	X	ISL	04/06/95
1,3,5-Trimethylbenzene	mg/kg	0.005	X	ISL	04/06/95
Vinyl Chloride	mg/kg	0.001	X	ISL	04/06/95
m- & p-Xylene	mg/kg	0.005	X	ISL	04/06/95
o-Xylene	mg/kg	0.005	X	ISL	04/06/95
EPA 8080					
Soil Organic Extraction		-	COMP		04/05/95
PCB-1016	mg/kg	0.43	X	SCR	04/05/95
PCB-1221	mg/kg	0.43	X	SCR	04/05/95
PCB-1232	mg/kg	0.43	X	SCR	04/05/95
PCB-1242	mg/kg	0.43	X	SCR	04/05/95
PCB-1248	mg/kg	0.43	X	SCR	04/05/95
PCB-1254	mg/kg	0.43	X	SCR	04/05/95
PCB-1260	mg/kg	0.17	0.48		04/07/95
Analytical No.:			36668		

X = Analyzed but not detected.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 03/31/95
REPORT DATE: 04/13/95
PREPARED BY: EPM
REVIEWED BY:

Attn: Gloria Chojnacki

Qualifier Descriptions

SPH	The matrix spike included with this analytical batch had a high recovery. Since that sample matrix appears similar to your sample, your result may also be high.
DUP	Result of duplicate analysis in this quality assurance batch exceeds the limits for precision. Sample results may also show a degree of variability.
CSL	Check standard for this analyte exhibited a low bias. Sample results may also be biased low. Non-detects were verified by comparison with a low standard.
CSH	Check standard for this analyte exhibited a high bias. Sample results may also be biased high. Non-detects were verified by comparison with a low standard.
ISL	Internal standard recovery was below normal limits. Sample results may be biased high.
SCR	Determination for indicated parameter is based on comparison of sample to a low standard at this equivalent concentration.

QUALITY ASSURANCE

Sample Receipt Report

Client: Short Date Rec'd: 3/31/95

Analytical No.: 9-366659 Thru 366668

Check all deviations from EPA or WDNR sample protocol.

[ ] Sample(s) received at ____°C which is above the EPA and WDNR limit of 4°C.

[ ] VOC vial(s) received with headspace. Explain: _____

[ ] Sample(s) received in bottles not furnished by Enviroscan. Preservation method, if used, is unknown.

[ ] Sample(s) not properly preserved per EPA/WDNR protocol for the following: _____

[ ] Sample(s) received beyond EPA holding time for: _____

[ ] Sample date/time not supplied by client. Actual holding time unknown.

[ ] GRO/DRO (circle appropriate) sample(s) exceed 20 gm, but are within the WDNR stated 1.2 gm tolerance allowed for average vial weight. Sample(s) over-weight: _____

[ ] GRO/DRO (circle appropriate) sample(s) exceed 20 gm. Sample(s) over-weight: _____

[X] Other: Customer provided DRO preweight

Client _____ (contact name) notified of the above deviation(s) on ___/___/___ at ___:___ am/pm by _____ (signature) and the client ordered:

[ ] Proceed with analyses as ordered.

[ ] Proceed with analyses after taking the following corrective action: _____

[ ] Do NOT proceed with analyses.

ENVIROSCAN

REQUEST FOR SERVICES

303 W. MILITARY RD. ROTHSCHILD, WI 54474 1-800-338-SCAN

CLIENT INFORMATION

Name:
Company: FRASER Shipyards Inc
Address: Third Street and Clough Ave
Superior WI 54880
Phone: (715) 394 7787
P.O. # / Project #: FRASE 9401.00
Quote / Reference #: 1614-0
Note: Terms and conditions printed on back apply.
If Questions call Gloria Chojnacki (GEH)

Turnaround Time

☒ Normal
☐ Rush
Date Needed

(Preapproved by Lab)

Sample Type

(Check all that apply)
☐ Groundwater
☐ Wastewater
☒ Soil
☐ Solid Waste
☐ Oil
☐ Other

Sample Handling

☒ Nonhazardous
☐ Flammable
☐ Skin Irritant
☐ Highly Toxic
☐ Other *(specify)*
☐ Refrigerate
☐ Work in Hood
☐ Wear Gloves

ANALYTICAL REQUESTS
(use separate sheet if necessary)

LAB USE ONLY	DATE	TIME	No. of Containers COMP	No. of Containers GRAB	SAMPLE ID	DRO Soil DRO	VOC's L-5031 vacuum	Lead TCLP total	5-PCB's		REMARKS
09036659	3/29/95			2	ST-1 AOC#9 ✓	X	X				
09036660	↓			2	SP-1 AOC#3 ✓	X	X				
09036661				1	L-1 AOC#2 ✓			X			
09036662				1	L-2 " " ✓			X			If total lead on any samples exceeds the 20:1 TCLP total lead factor then run TCLP on that one sample
09036663				1	L-3 " " ✓			X			
09036664				1	L-4 " " ✓			X			
09036665				1	L-5 " " ✓			X			
09036666				1	L-6 " " ✓			X			
09036667		12:15		1	SP-2 AOC 3 ✓			X	limited		
09036668	↓	2:00		3	T-1 AOC 7 ✓	X	X		X		

SHORT | Bill to FRASERSH

Del'v: Hand ~~Comm.~~
Ship. Cont. OK? (Y) N N/A
Rec'd Refrig.? (Y) N N/A
Seals OK? (Y) N N/A
Samples leaking? Y (N) N/A
Comments:

CHAIN OF CUSTODY RECORD

SAMPLERS: *(Signature)* [signature]

RELINQUISHED BY: *(Signature)*	DATE/TIME	RECEIVED BY: *(Signature)*
[signature]	3/30/95 2:30	
RELINQUISHED BY: *(Signature)*	DATE/TIME	RECEIVED BY: *(Signature)*
RELINQUISHED BY: *(Signature)*	DATE/TIME	RECEIVED FOR LABORATORY BY: *(Signature)* [signature] — DATE/TIME 3/31/95 10:30 AM

ENVIROSCAN

ENVIRONMENTAL AND
ANALYTICAL SERVICES

May 19, 1995

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

Attn: Cy Ingraham

Re: FRAZE9401

Please find enclosed the analytical results for the samples received May 5, 1995.

All analyses were completed in accordance with appropriate EPA and Wisconsin methodologies. Methods and dates of analysis are included in the report tables.

The chain of custody document is enclosed. If you have any questions about the results, please call. Thank you for using Enviroscan Corp. for your analytical needs.

Sincerely,

Enviroscan Corp.

Jay C. Hunger
Analytical Chemist

303 West Military Road Rothschild, WI 54474 (715) 359-7226
An Affiliate of the Black Clawson Co.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/18/95
PREPARED BY: DJB
REVIEWED BY:

Attn: Cy Ingraham

Modified Diesel Range Organics (DRO)
Parameter # 78919

	DRO	Qualifiers	Date Ext	Date Analyzed	Analytical No.
AOC9 B-1	63.9	D3 D4	05/05/95	05/09/95	39552
AOC9 B-2	44.9	D3 D4	05/05/95	05/09/95	39553
AOC9 B-3	30.2	D3 D4	05/05/95	05/09/95	39554
AOC7 SS-1	10.4	D3 D4	05/05/95	05/09/95	39555
AOC7 SS-2	6.83	D3 D4	05/05/95	05/09/95	39556
AOC7 BN-1	17.2	D3 D4	05/05/95	05/09/95	39557
AOC3 SW-1	15.4	D3 D4	05/05/95	05/09/95	39558
AOC3 BW-2	19.4	D3 D4	05/05/95	05/09/95	39559
AOC3 SW-4	50.4	D2 D4	05/05/95	05/09/95	39560
Reporting Limit	5.0				
Units	mg/kg				

Results calculated on a dry weight basis.

Qualifiers: Only above indicated qualifiers apply.

(D1) The chromatogram is characteristic for a fuel oil/diesel. (i.e. #1 or #2 Diesel, jet fuel, kerosene, aged or degraded diesel, etc.)
(D2) The chromatogram is not characteristic for diesel. It has the characteristics of a product which has significant peaks within the DRO window.
(D2A) The chromatogram is characteristic for a light petroleum product (i.e. gasoline, aged or degraded gasoline, mineral spirits, etc.)
(D2B) The chromatogram is characteristic for a heavier petroleum product other than diesel (i.e. motor oil, hydraulic oil, etc.)
(D3) The chromatogram is not characteristic for diesel or any single common petroleum product.
(D4) The chromatogram contained significant peaks outside the DRO window.
(D5) The chromatogram contained significant peaks and a raised baseline outside the DRO window.

The entire area within the DRO window was quantitated.

The replicate spike recovery of this batch of samples was found to be 108.% and 105.%.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/18/95
PREPARED BY: DJB DSB
REVIEWED BY:

Attn: Cy Ingraham

Modified Diesel Range Organics (DRO)
Parameter # 78919

	DRO	Qualifiers	Date Ext	Date Analyzed	Analytical No.
AOC1 BW-1	* 246.	D3 D4	05/05/95	05/09/95	39561
AOC1 S-2	266.	D3 D4	05/05/95	05/08/95	39562
AOC1 S-3	73.1	D3 D4	05/05/95	05/08/95	39563
AOC1 S-4	222.	D3 D4	05/05/95	05/08/95	39564
AOC1 S-1	96.9	D3 D4	05/05/95	05/09/95	39565
AOC1 E-1	257.	D3 D4	05/05/95	05/09/95	39566
AOC1 EE-1	X		05/05/95	05/09/95	39567
Reporting Limit	55.				
Units	mg/kg				

* = The detection limit for this sample is 160. mg/kg.

X = Analyzed but not detected.
Results calculated on a dry weight basis.

Qualifiers: Only above indicated qualifiers apply.

(D1) The chromatogram is characteristic for a fuel oil/diesel. (i.e. #1 or #2 Diesel, jet fuel, kerosene, aged or degraded diesel, etc.)
(D2) The chromatogram is not characteristic for diesel. It has the characteristics of a product which has significant peaks within the DRO window.
(D2A) The chromatogram is characteristic for a light petroleum product (i.e. gasoline, aged or degraded gasoline, mineral spirits, etc.)
(D2B) The chromatogram is characteristic for a heavier petroleum product other than diesel (i.e. motor oil, hydraulic oil, etc.)
(D3) The chromatogram is not characteristic for diesel or any single common petroleum product.
(D4) The chromatogram contained significant peaks outside the DRO window.
(D5) The chromatogram contained significant peaks and a raised baseline outside the DRO window.

The entire area within the DRO window was quantitated.

The replicate spike recovery of this batch of samples was found to be 108.% and 105.%.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/19/95
PREPARED BY: JCH
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC9 B-3 05/03/95	Qualifiers	Date Analyzed
EPA 8021A					
Benzene	mg/kg	0.0022	X		05/10/95
Ethylbenzene	mg/kg	0.0043	X		05/10/95
Methyl tert Butyl Ether	mg/kg	0.0085	X		05/10/95
Toluene	mg/kg	0.0085	X		05/10/95
1,2,4-Trimethylbenzene	mg/kg	0.0043	X		05/10/95
1,3,5-Trimethylbenzene	mg/kg	0.0043	X		05/10/95
m- & p-Xylene	mg/kg	0.0043	X		05/10/95
o-Xylene	mg/kg	0.0043	X		05/10/95
Analytical No.:			39554		

X = Analyzed but not detected.
Results calculated on a dry weight basis.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/19/95
PREPARED BY: JCH
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC7 BN-1 05/03/95	Qualifiers	Date Analyzed
EPA 8021A					
Benzene	mg/kg	0.0007	X		05/12/95
Bromobenzene	mg/kg	0.0019	X		05/12/95
Bromochloromethane	mg/kg	0.0031	X		05/12/95
Bromodichloromethane	mg/kg	0.0019	X	CSL SPH	05/12/95
Bromoform	mg/kg	0.0073	X		05/12/95
Bromomethane	mg/kg	0.014	X	CSL SPL DUP	05/12/95
n-Butylbenzene	mg/kg	0.0036	X		05/12/95
sec-Butylbenzene	mg/kg	0.0036	X		05/12/95
tert-Butylbenzene	mg/kg	0.0036	X		05/12/95
Carbon Tetrachloride	mg/kg	0.0019	X		05/12/95
Chlorobenzene	mg/kg	0.0073	X		05/12/95
Chlorodibromomethane	mg/kg	0.0019	X		05/12/95
Chloroethane	mg/kg	0.0073	X	CSL SPL DUP	05/12/95
Chloroform	mg/kg	0.0019	X		05/12/95
Chloromethane	mg/kg	0.0073	X	CSL DUP	05/12/95
o-Chlorotoluene	mg/kg	0.0036	X		05/12/95
p-Chlorotoluene	mg/kg	0.0036	X		05/12/95
1,2-Dibromo-3-chloropropane	mg/kg	0.048	X		05/12/95
1,2-Dibromoethane	mg/kg	0.0036	X		05/12/95
Dibromomethane	mg/kg	0.0019	X		05/12/95
1,2-Dichlorobenzene	mg/kg	0.0036	X		05/12/95
1,3-Dichlorobenzene	mg/kg	0.0036	X		05/12/95
1,4-Dichlorobenzene	mg/kg	0.0019	X		05/12/95
Dichlorodifluoromethane	mg/kg	0.0073	X	CSH SPL DUP	05/12/95
1,1-Dichloroethane	mg/kg	0.0019	X		05/12/95
1,2-Dichloroethane	mg/kg	0.0019	X		05/12/95
1,1-Dichloroethylene	mg/kg	0.0014	X		05/12/95
cis-1,2-Dichloroethylene	mg/kg	0.0019	X		05/12/95
trans-1,2-Dichloroethylene	mg/kg	0.0019	X	CSL	05/12/95
1,2-Dichloropropane	mg/kg	0.0019	X		05/12/95
1,3-Dichloropropane	mg/kg	0.0019	X	SPH	05/12/95
2,2-Dichloropropane	mg/kg	0.0073	X		05/12/95
1,1-Dichloropropene	mg/kg	0.0036	X		05/12/95
1,3-Dichloropropene	mg/kg	0.0019	X		05/12/95
Ethylbenzene	mg/kg	0.0036	X		05/12/95
Hexachlorobutadiene	mg/kg	0.0036	X		05/12/95
Isopropylbenzene	mg/kg	0.0036	X		05/12/95
p-Isopropyltoluene	mg/kg	0.0036	X		05/12/95

Analytical No.: 39557

X = Analyzed but not detected.
Results calculated on a dry weight basis.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/19/95
PREPARED BY: JCH
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC7 BN-1 05/03/95	Qualifiers	Date Analyzed
EPA 8021					
Methyl tert Butyl Ether	mg/kg	0.0073	X	CSL	05/12/95
Methylene Chloride	mg/kg	0.009	X	CSL	05/12/95
Naphthalene	mg/kg	0.0036	X		05/12/95
n-Propylbenzene	mg/kg	0.0036	X		05/12/95
Styrene	mg/kg	0.019	X		05/12/95
Tetrachloroethylene	mg/kg	0.0019	X		05/12/95
1,1,1,2-Tetrachloroethane	mg/kg	0.0019	X		05/12/95
1,1,2,2-Tetrachloroethane	mg/kg	0.0036	X		05/12/95
Toluene	mg/kg	0.0073	X		05/12/95
1,2,3-Trichlorobenzene	mg/kg	0.0036	X	SPH	05/12/95
1,2,4-Trichlorobenzene	mg/kg	0.0036	X	SPH	05/12/95
1,1,1-Trichloroethane	mg/kg	0.0019	X		05/12/95
1,1,2-Trichloroethane	mg/kg	0.0019	X		05/12/95
Trichloroethylene	mg/kg	0.0007	X		05/12/95
Trichlorofluoromethane	mg/kg	0.0036	X	SPL DUP	05/12/95
1,2,3-Trichloropropane	mg/kg	0.0073	X		05/12/95
1,2,4-Trimethylbenzene	mg/kg	0.0036	X		05/12/95
1,3,5-Trimethylbenzene	mg/kg	0.0036	X		05/12/95
Vinyl Chloride	mg/kg	0.0007	X	SPL DUP	05/12/95
m- & p-Xylene	mg/kg	0.0036	X		05/12/95
o-Xylene	mg/kg	0.0036	X		05/12/95
EPA 8080A					
PCB-1016	mg/kg	0.079	X	SCR	05/16/95
PCB-1221	mg/kg	0.079	X	SCR	05/16/95
PCB-1232	mg/kg	0.079	X	SCR	05/16/95
PCB-1242	mg/kg	0.079	X	SCR	05/16/95
PCB-1248	mg/kg	0.079	X	SCR	05/16/95
PCB-1254	mg/kg	0.079	X	SCR	05/16/95
PCB-1260	mg/kg	0.079	X	SCR	05/16/95
Date Extracted					05/10/95
Analytical No.:			39557		

X = Analyzed but not detected.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/19/95
PREPARED BY: JCH
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC3 SW-1 05/03/95	Qualifiers	Date Analyzed
EPA 8021A					
Benzene	mg/kg	0.0009	X		05/12/95
Bromobenzene	mg/kg	0.0025	X		05/12/95
Bromochloromethane	mg/kg	0.0037	X		05/12/95
Bromodichloromethane	mg/kg	0.0025	X	CSL SPH	05/12/95
Bromoform	mg/kg	0.01	X		05/12/95
Bromomethane	mg/kg	0.02	X	CSL SPL DUP	05/12/95
n-Butylbenzene	mg/kg	0.0049	X		05/12/95
sec-Butylbenzene	mg/kg	0.0049	X		05/12/95
tert-Butylbenzene	mg/kg	0.0049	X		05/12/95
Carbon Tetrachloride	mg/kg	0.0025	X		05/12/95
Chlorobenzene	mg/kg	0.01	X		05/12/95
Chlorodibromomethane	mg/kg	0.0025	X		05/12/95
Chloroethane	mg/kg	0.01	X	CSL SPL DUP	05/12/95
Chloroform	mg/kg	0.0025	X		05/12/95
Chloromethane	mg/kg	0.01	X	CSL DUP	05/12/95
o-Chlorotoluene	mg/kg	0.0049	X		05/12/95
p-Chlorotoluene	mg/kg	0.0049	X		05/12/95
1,2-Dibromo-3-chloropropane	mg/kg	0.065	X		05/12/95
1,2-Dibromoethane	mg/kg	0.0049	X		05/12/95
Dibromomethane	mg/kg	0.0025	X		05/12/95
1,2-Dichlorobenzene	mg/kg	0.0049	X		05/12/95
1,3-Dichlorobenzene	mg/kg	0.0049	X		05/12/95
1,4-Dichlorobenzene	mg/kg	0.0025	X		05/12/95
Dichlorodifluoromethane	mg/kg	0.01	X	CSH SPL DUP	05/12/95
1,1-Dichloroethane	mg/kg	0.0025	X		05/12/95
1,2-Dichloroethane	mg/kg	0.0025	X		05/12/95
1,1-Dichloroethylene	mg/kg	0.002	X		05/12/95
cis-1,2-Dichloroethylene	mg/kg	0.0025	X		05/12/95
trans-1,2-Dichloroethylene	mg/kg	0.0025	X	CSL	05/12/95
1,2-Dichloropropane	mg/kg	0.0025	X		05/12/95
1,3-Dichloropropane	mg/kg	0.0025	X	SPH	05/12/95
2,2-Dichloropropane	mg/kg	0.01	X		05/12/95
1,1-Dichloropropene	mg/kg	0.0049	X		05/12/95
1,3-Dichloropropene	mg/kg	0.0025	X		05/12/95
Ethylbenzene	mg/kg	0.0049	X		05/12/95
Hexachlorobutadiene	mg/kg	0.0049	X		05/12/95
Isopropylbenzene	mg/kg	0.0049	X		05/12/95
p-Isopropyltoluene	mg/kg	0.0049	X		05/12/95
Methyl tert Butyl Ether	mg/kg	0.01	X	CSL	05/12/95
Methylene Chloride	mg/kg	0.012	X	CSL	05/12/95
Naphthalene	mg/kg	0.0049	X		05/12/95
n-Propylbenzene	mg/kg	0.0049	X		05/12/95

Analytical No.: 39558

X = Analyzed but not detected.
Results calculated on a dry weight basis.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/19/95
PREPARED BY: JCH
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC3 SW-1 05/03/95	Qualifiers	Date Analyzed
EPA 8021					
Styrene	mg/kg	0.025	X		05/12/95
Tetrachloroethylene	mg/kg	0.0025	X		05/12/95
1,1,1,2-Tetrachloroethane	mg/kg	0.0025	X		05/12/95
1,1,2,2-Tetrachloroethane	mg/kg	0.0049	X		05/12/95
Toluene	mg/kg	0.01	X		05/12/95
1,2,3-Trichlorobenzene	mg/kg	0.0049	X	SPH	05/12/95
1,2,4-Trichlorobenzene	mg/kg	0.0049	X	SPH	05/12/95
1,1,1-Trichloroethane	mg/kg	0.0025	X		05/12/95
1,1,2-Trichloroethane	mg/kg	0.0025	X		05/12/95
Trichloroethylene	mg/kg	0.0009	X		05/12/95
Trichlorofluoromethane	mg/kg	0.0049	X	SPL DUP	05/12/95
1,2,3-Trichloropropane	mg/kg	0.01	X		05/12/95
1,2,4-Trimethylbenzene	mg/kg	0.0049	X		05/12/95
1,3,5-Trimethylbenzene	mg/kg	0.0049	X		05/12/95
Vinyl Chloride	mg/kg	0.0009	X	SPL DUP	05/12/95
m- & p-Xylene	mg/kg	0.0049	X		05/12/95
o-Xylene	mg/kg	0.0049	X		05/12/95
Analytical No.:			39558		

X = Analyzed but not detected.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/19/95
PREPARED BY: JCH
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC3 BW-2 05/03/95	Qualifiers	Date Analyzed
EPA 8021A					
Benzene	mg/kg	0.0008	X		05/12/95
Bromobenzene	mg/kg	0.0022	X		05/12/95
Bromochloromethane	mg/kg	0.0031	X		05/12/95
Bromodichloromethane	mg/kg	0.0022	X	CSL SPH	05/12/95
Bromoform	mg/kg	0.0084	X		05/12/95
Bromomethane	mg/kg	0.016	X	CSL SPL DUP	05/12/95
n-Butylbenzene	mg/kg	0.0042	X		05/12/95
sec-Butylbenzene	mg/kg	0.0042	X		05/12/95
tert-Butylbenzene	mg/kg	0.0042	X		05/12/95
Carbon Tetrachloride	mg/kg	0.0022	X		05/12/95
Chlorobenzene	mg/kg	0.0084	X		05/12/95
Chlorodibromomethane	mg/kg	0.0022	X		05/12/95
Chloroethane	mg/kg	0.0084	X	CSL SPL DUP	05/12/95
Chloroform	mg/kg	0.0022	X		05/12/95
Chloromethane	mg/kg	0.0084	X	CSL DUP	05/12/95
o-Chlorotoluene	mg/kg	0.0042	X		05/12/95
p-Chlorotoluene	mg/kg	0.0042	X		05/12/95
1,2-Dibromo-3-chloropropane	mg/kg	0.055	X		05/12/95
1,2-Dibromoethane	mg/kg	0.0042	X		05/12/95
Dibromomethane	mg/kg	0.0022	X		05/12/95
1,2-Dichlorobenzene	mg/kg	0.0042	X		05/12/95
1,3-Dichlorobenzene	mg/kg	0.0042	X		05/12/95
1,4-Dichlorobenzene	mg/kg	0.0022	X		05/12/95
Dichlorodifluoromethane	mg/kg	0.0084	X	CSH SPL DUP	05/12/95
1,1-Dichloroethane	mg/kg	0.0022	X		05/12/95
1,2-Dichloroethane	mg/kg	0.0022	X		05/12/95
1,1-Dichloroethylene	mg/kg	0.0016	X		05/12/95
cis-1,2-Dichloroethylene	mg/kg	0.0022	X		05/12/95
trans-1,2-Dichloroethylene	mg/kg	0.0022	X	CSL	05/12/95
1,2-Dichloropropane	mg/kg	0.0022	X		05/12/95
1,3-Dichloropropane	mg/kg	0.0022	X	SPH	05/12/95
2,2-Dichloropropane	mg/kg	0.0084	X		05/12/95
1,1-Dichloropropene	mg/kg	0.0042	X		05/12/95
1,3-Dichloropropene	mg/kg	0.0022	X		05/12/95
Ethylbenzene	mg/kg	0.0042	X		05/12/95
Hexachlorobutadiene	mg/kg	0.0042	X		05/12/95
Isopropylbenzene	mg/kg	0.0042	X		05/12/95
p-Isopropyltoluene	mg/kg	0.0042	X		05/12/95
Methyl tert Butyl Ether	mg/kg	0.0084	X	CSL	05/12/95
Methylene Chloride	mg/kg	0.011	X	CSL	05/12/95
Naphthalene	mg/kg	0.0042	X		05/12/95
n-Propylbenzene	mg/kg	0.0042	X		05/12/95
Analytical No.:			39559		

X = Analyzed but not detected.
Results calculated on a dry weight basis.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/19/95
PREPARED BY: JCH
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC3 BW-2 05/03/95	Qualifiers	Date Analyzed
EPA 8021					
Styrene	mg/kg	0.022	X		05/12/95
Tetrachloroethylene	mg/kg	0.0022	X		05/12/95
1,1,1,2-Tetrachloroethane	mg/kg	0.0022	X		05/12/95
1,1,2,2-Tetrachloroethane	mg/kg	0.0043	X		05/12/95
Toluene	mg/kg	0.0084	X		05/12/95
1,2,3-Trichlorobenzene	mg/kg	0.0042	X	SPH	05/12/95
1,2,4-Trichlorobenzene	mg/kg	0.0042	X	SPH	05/12/95
1,1,1-Trichloroethane	mg/kg	0.0022	X		05/12/95
1,1,2-Trichloroethane	mg/kg	0.0022	X		05/12/95
Trichloroethylene	mg/kg	0.0008	X		05/12/95
Trichlorofluoromethane	mg/kg	0.0042	X	SPL DUP	05/12/95
1,2,3-Trichloropropane	mg/kg	0.0084	X		05/12/95
1,2,4-Trimethylbenzene	mg/kg	0.0042	X		05/12/95
1,3,5-Trimethylbenzene	mg/kg	0.0042	X		05/12/95
Vinyl Chloride	mg/kg	0.0008	X	SPL DUP	05/12/95
m- & p-Xylene	mg/kg	0.0042	X		05/12/95
o-Xylene	mg/kg	0.0042	X		05/12/95

Analytical No.: 39559

X = Analyzed but not detected.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/19/95
PREPARED BY: JCH
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC1 BW-1 05/03/95	Qualifiers	Date Analyzed
EPA 8021A					
Benzene	mg/kg	0.0095	X	SH	05/10/95
Ethylbenzene	mg/kg	0.019	X	SH	05/10/95
Methyl tert Butyl Ether	mg/kg	0.037	X	SH	05/10/95
Toluene	mg/kg	0.037	X	SH	05/10/95
1,2,4-Trimethylbenzene	mg/kg	0.018	X	SH	05/10/95
1,3,5-Trimethylbenzene	mg/kg	0.018	X	SH	05/10/95
m- & p-Xylene	mg/kg	0.018	0.0776	SH	05/10/95
o-Xylene & Styrene	mg/kg	0.018	0.0418	SH	05/10/95
Analytical No.:			39561		

X = Analyzed but not detected.
Results calculated on a dry weight basis.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/19/95
PREPARED BY: JCH
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC1 S-2 05/03/95	Qualifiers	Date Analyzed
EPA 8021A					
Benzene	mg/kg	0.0011	0.013		05/10/95
Ethylbenzene	mg/kg	0.005	X		05/10/95
Methyl tert Butyl Ether	mg/kg	0.01	X		05/10/95
Toluene	mg/kg	0.01	X		05/10/95
1,2,4-Trimethylbenzene	mg/kg	0.005	X		05/10/95
1,3,5-Trimethylbenzene	mg/kg	0.005	X		05/10/95
m- & p-Xylene	mg/kg	0.005	X		05/10/95
o-Xylene	mg/kg	0.005	X		05/10/95
Analytical No.:			39562		

X = Analyzed but not detected.
Results calculated on a dry weight basis.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/19/95
PREPARED BY: JCH
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC1 S-3 05/03/95	Qualifiers	Date Analyzed
EPA 8021A					
Benzene	mg/kg	0.0026	X	SH	05/10/95
Ethylbenzene	mg/kg	0.0051	X	SH	05/10/95
Methyl tert Butyl Ether	mg/kg	0.01	X	SH	05/10/95
Toluene	mg/kg	0.01	X	SH	05/10/95
1,2,4-Trimethylbenzene	mg/kg	0.0051	X	SH	05/10/95
1,3,5-Trimethylbenzene	mg/kg	0.0051	0.0069	SH	05/10/95
m- & p-Xylene	mg/kg	0.0051	0.0065	SH	05/10/95
o-Xylene	mg/kg	0.0051	X	SH	05/10/95
Analytical No.:			39563		

X = Analyzed but not detected.
Results calculated on a dry weight basis.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRAZE9401
SAMPLED BY: Client
DATE REC'D: 05/05/95
REPORT DATE: 05/19/95
PREPARED BY: JCH
REVIEWED BY:

Attn: Cy Ingraham

Qualifier Descriptions

CSL	Check standard for this analyte exhibited a low bias. Sample results may also be biased low. Non-detects were verified by comparison with a low standard.
SPH	The matrix spike included with this analytical batch had a high recovery. Since that sample matrix appears similar to your sample, your result may also be high.
SPL	The matrix spike included with this analytical batch had a low recovery. Since that sample matrix appears similar to your sample, your result may also be low.
DUP	Result of duplicate analysis in this quality assurance batch exceeds the limits for precision. Sample results may also show a degree of variability.
CSH	Check standard for this analyte exhibited a high bias. Sample results may also be biased high. Non-detects were verified by comparison with a low standard.
SCR	Determination for indicated parameter is based on comparison of sample to a low standard at this equivalent concentration.
SH	Recovery of surrogate was high. Result for sample may also be biased high.

QUALITY ASSURANCE

Sample Receipt Report

Client: Short Date Rec'd: 5/5/95

Analytical No.: 39552 Thru 39567

Check all deviations from EPA or WDNR sample protocol.

[ ] Sample(s) received at ____°C which is above the EPA and WDNR limit of 4°C.

[ ] VOC vial(s) received with headspace. Explain: _____

[ ] Sample(s) received in bottles not furnished by Enviroscan. Preservation method, if used, is unknown.

[ ] Sample(s) not properly preserved per EPA/WDNR protocol for the following: _____

[ ] Sample(s) received beyond EPA holding time for: _____

[ ] Sample date/time not supplied by client. Actual holding time unknown.

[ ] GRO/DRO (circle appropriate) sample(s) exceed 20 gm, but are within the WDNR stated 1.2 gm tolerance allowed for average vial weight. Sample(s) over-weight: _____

[ ] GRO/DRO (circle appropriate) sample(s) exceed 20 gm. Sample(s) over-weight: _____

[X] Other: Customer provided pre-tared weight Used. Sample data provided on Sample per bottle

Client _____ (contact name) notified of the above deviation(s) on ___/___/___ at ___:___ am/pm by _____ (signature) and the client ordered:

[ ] Proceed with analyses as ordered.

[ ] Proceed with analyses after taking the following corrective action: _____

[ ] Do NOT proceed with analyses.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

REQUEST FOR SERVICES

303 W. MILITARY RD. ROTHSCHILD, WI 54474 1-800-338-SCAN

REPORT TO:
Name: SEH Cy Igrand
Company: SEH
Address: 421 Frenette dr.
Chippewa Falls WI 54729
Phone: (715) 720-6200
P.O. #
Project # FRAZE9401 Quote #

BILL TO: (if different from Report To info):
Name: Frazer Ship yard Inc.
Company: " "
Address: 3rd + Clough st
Superior WI
Phone: (715) 394-7797

Sample Type
(Check all that apply)
- [ ] Groundwater
- [ ] Wastewater
- [x] Soil/Solid
- [ ] Drinking Water
- [ ] Oil
- [ ] Vapor
- [ ] Other

Turnaround Time
- [ ] Normal
- [ ] Rush (Pre-approved by Lab)

Date Needed 5 Jun 95
Approved By

ANALYTICAL REQUESTS
(use separate sheet if necessary)

LAB USE ONLY	DATE	TIME	No. of Containers COMP	GRAB	SAMPLE ID	DRO	PVOC	VOC	PCB's		REMARKS
14039562	5/3/95	11:30		2	AOC 1 S-2 ✓	X	X				
14039563	5/3/95			2	AOC 1 S-3 ✓	X	X				
14039564	5/3/95			X	AOC 1 S-4 ✓	X					TS
14039565	5/3/95			X	AOC 1 S-1 ✓	X					TS
14039566	5/3/95			X	AOC 1 E-1 ✓	X					TS
14039567	5/3/95			X	AOC 1 EE 1 ✓	X					TS

SHORT FRASERSH

Del'v: Hand (Comm) Rec'd on ice
Ship. Cont. OK? (Y) N N/A
Samples leaking? Y (N) N/A
Seals OK? (Y) N N/A
Rec'd on ice? (Y) N N/A ___°C

Comments:

CHAIN OF CUSTODY RECORD

SAMPLERS: *(Signature)* Chris Halle

RELINQUISHED BY: *(Signature)*	DATE/TIME	RECEIVED BY: *(Signature)*
Chris Halle	5/4/95 5:00pm	Lori Priegel
RELINQUISHED BY: *(Signature)*	DATE/TIME	RECEIVED BY: *(Signature)*
RELINQUISHED BY: *(Signature)*	DATE/TIME	RECEIVED FOR LABORATORY BY: *(Signature)* [signature] — DATE/TIME 5/5/95 10:12 AM

REQUEST FOR SERVICES

303 W. MILITARY RD. ROTHSCHILD, WI 54474 1-800-338-SCAN

REPORT TO:
Name: SEH Cy Ingrah
Company: SEH
Address: 421 Frenette dr, Chippewa falls WI 54729
Phone: (715) 720 6200
P.O. #
Project # FRAZE9401 Quote # ~~[illegible]~~ 3422-0

BILL TO: (if different from Report To info):
Name: Frazer Ship yard Inc
Company: "
Address: 3rd + Clough St. Superior WI
Phone: (715) 394 7787

Sample Type (Check all that apply)
- [ ] Groundwater
- [ ] Wastewater
- [x] Soil/Solid
- [ ] Drinking Water
- [ ] Oil
- [ ] Vapor
- [ ] Other

Turnaround Time
- [x] Normal
- [ ] Rush (Pre-approved by Lab)

Date Needed 5-26-95
Approved By

ANALYTICAL REQUESTS (use separate sheet if necessary)

LAB USE ONLY	DATE	TIME	No. of Containers COMP	No. of Containers GRAB	SAMPLE ID	DRO Soil DRO	PVOC	VOC	PCBs		REMARKS
14039552	5/3/95	10:15		1	AOC9 B-1	X					TS
14039553	5/3/95	10:25		1	AOC9 B-2	X					TS
14039554	5/3/95	10:00		2	AOC9 B-3	X	X				
14039555	5/3/95			1	AOC7 SS-1	X					TS
14039556	5/3/95			1	AOC7 SS-2	X					ts
14039557	5/3/95			3	AOC7 BN-1	X		X	X		
14039558	5/3/95			2	AOC3 SW-1	X		X			
14039559	5/3/95			2	AOC3 BW2	X		X			
14039560	5/3/95			1	AOC3 SW-4	X					TS
14039561	5/3/95			2	AOC1 BW-1	X	X				

SHORT FRASEROH

Del'v: Hand Comm
Ship. Cont. OK? (Y) N N/A — Rec'd on Ice
Samples leaking? Y (N) N/A
Seals OK? (Y) N N/A
Rec'd on ice? (Y) N N/A __ °C

Comments:

CHAIN OF CUSTODY RECORD

SAMPLERS: (Signature) [signature]

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	5/4/95 5:00	Tori [signature]

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED FOR LABORATORY BY: (Signature)	DATE/TIME
		[signature]	5/5/95 10:12 AM

REQUEST FOR SERVICES

303 W. MILITARY RD. ROTHSCHILD, WI 54474 1-800-338-SCAN

REPORT TO:
Name: Cy Iganl
Company: SEH Inc
Address: 421 Frenette dr.
Chippewa Falls 54729
Phone: (715) 720 6200
P.O. #
Project # Quote #

BILL TO: (if different from Report To info):
Name: Frazer Shipyard Inc.
Company: "
Address: 3rd + Clough St.
Superior WI 5
Phone: (715) 394 7787

Sample Type
(Check all that apply)
- ☐ Groundwater
- ☐ Wastewater
- ☐ Soil/Solid
- ☐ Drinking Water
- ☐ Oil
- ☐ Vapor
- ☐ Other

Turnaround Time
- ☐ Normal
- ☐ Rush (Pre-approved by Lab)

Date Needed
Approved By

ANALYTICAL REQUESTS
(use separate sheet if necessary)

LAB USE ONLY	DATE	TIME	No. of Containers COMP	No. of Containers GRAB	SAMPLE ID	Dry Weight Sorsample sent on 5/4/95					REMARKS
	5/3/95			1	AOC9 B-1	X					
				1	AOC9 B-2	X					
				1	AOC7 SS-1	X					
				1	AOC7 SS-2	X					
				1	AOC3 [redacted]W4	X					
				1	AOC1 S-4	X					
				1	AOC12S-1	X					
				1	AOC1 E1	X					
				1	AOC1 EE1	X					

Del'v: Hand Comm.
Ship. Cont. OK? Y N N/A
Samples leaking? Y N N/A
Seals OK? Y N N/A
Rec'd on ice? Y N N/A °C

Comments:

CHAIN OF CUSTODY RECORD

SAMPLERS: *(Signature)* Chris Falk

RELINQUISHED BY: *(Signature)*	DATE/TIME	RECEIVED BY: *(Signature)*
Chris Falk	5/11/95 12:00	
RELINQUISHED BY: *(Signature)*	DATE/TIME	RECEIVED BY: *(Signature)*
RELINQUISHED BY: *(Signature)*	DATE/TIME	RECEIVED FOR LABORATORY BY: *(Signature)* DATE/TIME
		Lee Shelly 5/15/95 9:30 am

ENVIROSCAN

ENVIRONMENTAL AND
ANALYTICAL SERVICES

September 6, 1995

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

RECEIVED
SEP 7 1995
SHORT, ELLIOTT, HENDRICKSON
CHIPPEWA FALLS, WI

Attn: Cy Ingraham

Re: FRASE9401.00

Please find enclosed the analytical results for the samples received August 25, 1995.

The VOC analysis was completed using a modified EPA Method 8021.

The chain of custody document is enclosed.

If you have any questions about the results, please call. Thank you for using Enviroscan Corp. for your analytical needs.

Sincerely,

Enviroscan Corp.

Michael P. Melotik
Analytical Chemist

303 West Military Road Rothschild, WI 54474 (715) 359-7226
An Affiliate of the Black Clawson Co.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 08/25/95
REPORT DATE: 09/06/95
PREPARED BY: MPM
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC8 HAX-1 08/23/95	Qualifiers	Date Analyzed
EPA 160.3					
Total Solids	%	-	96.94		08/28/95
EPA 8021					
Benzene	mg/kg	0.01	X		09/03/95
Bromobenzene	mg/kg	0.027	X		09/03/95
Bromochloromethane	mg/kg	0.052	X	SPH	09/03/95
Bromodichloromethane	mg/kg	0.027	X	SPH	09/03/95
Bromoform	mg/kg	0.11	X		09/03/95
Bromomethane	mg/kg	0.22	X	CSH SPH	09/03/95
n-Butylbenzene	mg/kg	0.054	0.104	CSH	09/03/95
sec-Butylbenzene	mg/kg	0.054	X		09/03/95
tert-Butylbenzene	mg/kg	0.054	X		09/03/95
Carbon Tetrachloride	mg/kg	0.027	X		09/03/95
Chlorobenzene	mg/kg	0.11	X		09/03/95
Chlorodibromomethane	mg/kg	0.027	X		09/03/95
Chloroethane	mg/kg	0.11	X	CSH	09/03/95
Chloroform	mg/kg	0.027	X		09/03/95
Chloromethane	mg/kg	0.11	X	CSH	09/03/95
o-Chlorotoluene	mg/kg	0.054	X		09/03/95
p-Chlorotoluene	mg/kg	0.054	X		09/03/95
1,2-Dibromo-3-chloropropane	mg/kg	0.72	X		09/03/95
1,2-Dibromoethane	mg/kg	0.054	X		09/03/95
Dibromomethane	mg/kg	0.027	X		09/03/95
1,2-Dichlorobenzene	mg/kg	0.054	X		09/03/95
1,3-Dichlorobenzene	mg/kg	0.054	X		09/03/95
1,4-Dichlorobenzene	mg/kg	0.027	X	CSH	09/03/95
Dichlorodifluoromethane	mg/kg	0.11	X	CSH SPH	09/03/95
1,1-Dichloroethane	mg/kg	0.027	X		09/03/95
1,2-Dichloroethane	mg/kg	0.027	X		09/03/95
1,1-Dichloroethylene	mg/kg	0.022	X		09/03/95
cis-1,2-Dichloroethylene	mg/kg	0.027	X		09/03/95
trans-1,2-Dichloroethylene	mg/kg	0.027	X		09/03/95
1,2-Dichloropropane	mg/kg	0.027	X		09/03/95
1,3-Dichloropropane	mg/kg	0.027	X	SPH	09/03/95
2,2-Dichloropropane	mg/kg	0.11	X		09/03/95
1,1-Dichloropropene	mg/kg	0.054	X		09/03/95
1,3-Dichloropropene	mg/kg	0.027	X		09/03/95
Ethylbenzene	mg/kg	0.054	X		09/03/95
Hexachlorobutadiene	mg/kg	0.054	X		09/03/95
Isopropylbenzene	mg/kg	0.054	X		09/03/95
p-Isopropyltoluene	mg/kg	0.054	X	CSH	09/03/95
Methyl tert Butyl Ether	mg/kg	0.11	X	DUP	09/03/95
Methylene Chloride	mg/kg	0.14	X		09/03/95
Naphthalene	mg/kg	0.054	0.240	CSH	09/03/95
n-Propylbenzene	mg/kg	0.054	X		09/03/95
Analytical No.:			47955		

X = Analyzed but not detected.
Results calculated on a dry weight basis.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 08/25/95
REPORT DATE: 09/06/95
PREPARED BY: MPM
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC8 HAX-1 08/23/95	Qualifiers	Date Analyzed
Styrene	mg/kg	0.27	X		09/03/95
Tetrachloroethylene	mg/kg	0.027	X		09/03/95
1,1,1,2-Tetrachloroethane	mg/kg	0.027	X		09/03/95
1,1,2,2-Tetrachloroethane	mg/kg	0.054	X		09/03/95
Toluene	mg/kg	0.11	X		09/03/95
1,2,3-Trichlorobenzene	mg/kg	0.054	X	CSH	09/03/95
1,2,4-Trichlorobenzene	mg/kg	0.054	X	CSH	09/03/95
1,1,1-Trichloroethane	mg/kg	0.027	X		09/03/95
1,1,2-Trichloroethane	mg/kg	0.027	X		09/03/95
Trichloroethylene	mg/kg	0.01	X		09/03/95
Trichlorofluoromethane	mg/kg	0.054	X		09/03/95
1,2,3-Trichloropropane	mg/kg	0.11	X		09/03/95
1,2,4-Trimethylbenzene	mg/kg	0.054	0.0665	CSH SPH	09/03/95
1,3,5-Trimethylbenzene	mg/kg	0.054	X	CSH	09/03/95
Vinyl Chloride	mg/kg	0.01	X		09/03/95
m- & p-Xylene	mg/kg	0.054	0.194		09/03/95
o-Xylene & Styrene	mg/kg	0.054	0.131	DUP	09/03/95

Analytical No.: 47955

X = Analyzed but not detected.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 08/25/95
REPORT DATE: 09/06/95
PREPARED BY: MPM
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC8 HAX-2 08/23/95	Qualifiers	Date Analyzed
EPA 160.3					
Total Solids	%	-	94.51		08/28/95
EPA 8021					
Benzene	mg/kg	0.053	X		09/03/95
Bromobenzene	mg/kg	0.13	X		09/03/95
Bromochloromethane	mg/kg	0.249	X	SPH	09/03/95
Bromodichloromethane	mg/kg	0.13	X	SPH	09/03/95
Bromoform	mg/kg	0.53	X		09/03/95
Bromomethane	mg/kg	1.1	X	CSH SPH	09/03/95
n-Butylbenzene	mg/kg	0.26	3.24	CSH	09/03/95
sec-Butylbenzene	mg/kg	0.26	0.910		09/03/95
tert-Butylbenzene	mg/kg	0.26	0.557		09/03/95
Carbon Tetrachloride	mg/kg	0.13	X		09/03/95
Chlorobenzene	mg/kg	0.53	X		09/03/95
Chlorodibromomethane	mg/kg	0.13	X		09/03/95
Chloroethane	mg/kg	0.53	X	CSH	09/03/95
Chloroform	mg/kg	0.13	X		09/03/95
Chloromethane	mg/kg	0.53	X	CSH	09/03/95
o-Chlorotoluene	mg/kg	0.26	X		09/03/95
p-Chlorotoluene	mg/kg	0.26	X		09/03/95
1,2-Dibromo-3-chloropropane	mg/kg	3.5	X		09/03/95
1,2-Dibromoethane	mg/kg	0.26	X		09/03/95
Dibromomethane	mg/kg	0.13	X		09/03/95
1,2-Dichlorobenzene	mg/kg	0.26	X		09/03/95
1,3-Dichlorobenzene	mg/kg	0.26	X		09/03/95
1,4-Dichlorobenzene	mg/kg	0.13	X	CSH	09/03/95
Dichlorodifluoromethane	mg/kg	0.53	X	CSH	09/03/95
1,1-Dichloroethane	mg/kg	0.13	X		09/03/95
1,2-Dichloroethane	mg/kg	0.13	X		09/03/95
1,1-Dichloroethylene	mg/kg	0.11	X		09/03/95
cis-1,2-Dichloroethylene	mg/kg	0.13	X		09/03/95
trans-1,2-Dichloroethylene	mg/kg	0.13	X		09/03/95
1,2-Dichloropropane	mg/kg	0.13	X		09/03/95
1,3-Dichloropropane	mg/kg	0.13	X	SPH	09/03/95
2,2-Dichloropropane	mg/kg	0.53	X		09/03/95
1,1-Dichloropropene	mg/kg	0.26	X		09/03/95
1,3-Dichloropropene	mg/kg	0.13	X		09/03/95
Ethylbenzene	mg/kg	0.26	1.24		09/03/95
Hexachlorobutadiene	mg/kg	0.26	X		09/03/95
Isopropylbenzene	mg/kg	0.26	X		09/03/95
p-Isopropyltoluene	mg/kg	0.26	0.469	CSH	09/03/95
Methyl tert Butyl Ether	mg/kg	0.53	X	DUP	09/03/95
Methylene Chloride	mg/kg	0.66	X		09/03/95
Naphthalene	mg/kg	0.26	5.11	CSH	09/03/95
n-Propylbenzene	mg/kg	0.26	0.658		09/03/95

Analytical No.: 47956

X = Analyzed but not detected.
Results calculated on a dry weight basis.

All analyses conducted in accordance with Enviroscan Quality Assurance Program.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 08/25/95
REPORT DATE: 09/06/95
PREPARED BY: MPM
REVIEWED BY: MPM

Attn: Cy Ingraham

	Units	Reporting Limit	AOC8 HAX-2 08/23/95	Qualifiers	Date Analyzed
Styrene	mg/kg	1.3	X		09/03/95
Tetrachloroethylene	mg/kg	0.13	X		09/03/95
1,1,1,2-Tetrachloroethane	mg/kg	0.13	X		09/03/95
1,1,2,2-Tetrachloroethane	mg/kg	0.26	X		09/03/95
Toluene	mg/kg	0.53	X		09/03/95
1,2,3-Trichlorobenzene	mg/kg	0.26	X	CSH	09/03/95
1,2,4-Trichlorobenzene	mg/kg	0.26	X	CSH	09/03/95
1,1,1-Trichloroethane	mg/kg	0.13	X		09/03/95
1,1,2-Trichloroethane	mg/kg	0.13	X		09/03/95
Trichloroethylene	mg/kg	0.053	X		09/03/95
Trichlorofluoromethane	mg/kg	0.26	X		09/03/95
1,2,3-Trichloropropane	mg/kg	0.53	X		09/03/95
1,2,4-Trimethylbenzene	mg/kg	0.26	2.01	CSH S1H S2H	09/03/95
1,3,5-Trimethylbenzene	mg/kg	0.26	0.696	CSH	09/03/95
Vinyl Chloride	mg/kg	0.053	X		09/03/95
m- & p-Xylene	mg/kg	0.26	6.45		09/03/95
o-Xylene & Styrene	mg/kg	0.26	3.02	DUP	09/03/95
Analytical No.:			47956		

X = Analyzed but not detected.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 08/25/95
REPORT DATE: 09/01/95
PREPARED BY: MPM
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC12 HA-1 08/23/95	Qualifiers	Date Analyzed
EPA 160.3					
Total Solids	%	-	89.75		08/28/95
EPA 8021					
Benzene	mg/kg	0.056	X		08/28/95
Ethylbenzene	mg/kg	0.111	0.0491		08/28/95
Methyl tert Butyl Ether	mg/kg	0.028	X		08/28/95
Toluene	mg/kg	0.028	X		08/28/95
1,2,4-Trimethylbenzene	mg/kg	0.028	X		08/28/95
1,3,5-Trimethylbenzene	mg/kg	0.11130	0.0387		08/28/95
m- & p-Xylene	mg/kg	0.11130	0.0313		08/28/95
o-Xylene & Styrene	mg/kg	0.028	X		08/28/95
Analytical No.:			47957		

X = Analyzed but not detected.
Results calculated on a dry weight basis.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 08/25/95
REPORT DATE: 09/01/95
PREPARED BY: MPM
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC12 HA-2 08/23/95	Qualifiers	Date Analyzed
EPA 160.3					
Total Solids	%	-	90.20		08/28/95
EPA 8021					
Benzene	mg/kg	0.058	X		08/28/95
Ethylbenzene	mg/kg	0.115	0.0568		08/28/95
Methyl tert Butyl Ether	mg/kg	0.028	X		08/28/95
Toluene	mg/kg	0.230	0.0560		08/28/95
1,2,4-Trimethylbenzene	mg/kg	0.115	0.0794		08/28/95
1,3,5-Trimethylbenzene	mg/kg	0.115	0.0718		08/28/95
m- & p-Xylene	mg/kg	0.115	0.0685		08/28/95
o-Xylene & Styrene	mg/kg	0.115	0.0401		08/28/95
Analytical No.:			47958		

X = Analyzed but not detected.
Results calculated on a dry weight basis.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 08/25/95
REPORT DATE: 09/01/95
PREPARED BY: MPM
REVIEWED BY:

Attn: Cy Ingraham

	Units	Reporting Limit	AOC12 HA-3 08/23/95	Qualifiers	Date Analyzed
EPA 160.3					
Total Solids	%	-	78.02		08/28/95
EPA 8021					
Benzene	mg/kg	0.064	X		08/28/95
Ethylbenzene	mg/kg	0.128	0.0604		08/28/95
Methyl tert Butyl Ether	mg/kg	0.032	X		08/28/95
Toluene	mg/kg	0.256	0.0777		08/28/95
1,2,4-Trimethylbenzene	mg/kg	0.128	0.0802		08/28/95
1,3,5-Trimethylbenzene	mg/kg	0.032	X		08/28/95
m- & p-Xylene	mg/kg	0.128	0.092		08/28/95
o-Xylene & Styrene	mg/kg	0.128	0.0793		08/28/95
Analytical No.:			47959		

X = Analyzed but not detected.
Results calculated on a dry weight basis.

ANALYTICAL REPORT

Short Elliott Hendrickson, Inc.
421 Frenette Drive
Chippewa Falls , WI 54729

CUST NUMBER: FRASE9401.0
SAMPLED BY: Client
DATE REC'D: 08/25/95
REPORT DATE: 09/06/95
PREPARED BY: MPM
REVIEWED BY:

Attn: Cy Ingraham

Qualifier Descriptions

SPH	The matrix spike included with this analytical batch had a high recovery. Since that sample matrix appears similar to your sample, your result may also be high.
CSH	Check standard for this analyte exhibited a high bias. Sample results may also be biased high. Non-detects were verified by comparison with a low standard.
DUP	Result of duplicate analysis in this quality assurance batch exceeds the limits for precision. Sample results may also show a degree of variability.
S1H	Matrix spike recovery of this sample was high. Result for sample may also be biased high.
S2H	Matrix spike duplicate recovery of this sample was high. Result for sample may also be biased high.

REQUEST FOR SERVICES

303 W. MILITARY RD. ROTHSCHILD, WI 54474 1-800-338-SCAN

REPORT TO:
Name: Cy Ingraham
Company: SEH Inc.
Address: 421 Frenette Dr.
Chippewa Falls, WI 54729
Phone: (715) 720-6200
P.O. # 3741-5
Project # FRASE 9401.00 Quote # ~~1644-0~~ 3423-021-0412

Fed Ex # 3075861622

BILL TO: (if different from Report To info):
Name: Fraser Shipyard Inc.
Company: " " "
Address: 3rd & Clough St.
Superior, WI
Phone: (715) 394-7787

Sample Type (Check all that apply)
- [ ] Groundwater
- [ ] Wastewater
- [x] Soil/Solid
- [ ] Drinking Water
- [ ] Oil
- [ ] Vapor
- [ ] Other

Turnaround Time
- [ ] Normal
- [x] Rush (Pre-approved by Lab)

Date Needed ~~9-14-95~~ 9-1-95
Approved By

ANALYTICAL REQUESTS (use separate sheet if necessary)

LAB USE ONLY	DATE	TIME	No. of Containers COMP	No. of Containers GRAB	SAMPLE ID	~~GROSS~~ GROUT	EPA 8021 - Full (SERL)	EPA 8021 - S - PVOC (VOC Run)	Dry Weight (Total Solids)		REMARKS
11047955	8/23/95	11:30 AM		2	AOC 8 HA-1	X		X			8" depth
11047956	8/23/95	12:00 PM		2	AOC 8 HA-2	X		X			12" depth
11047957	8/23/95	12:15 AM		2	AOC 12 HA-1	✓	X	X			18" depth
11047958	8/23/95	12:30 PM		2	AOC 12 HA-2	✓	X	X			18" depth
11047959	8/23/95	12:45 PM		2	AOC 12 HA-3	✓	X	X			12" depth
SHORT	FRASERSH										

Del'v: Hand (Comm)
Ship. Cont. OK? (Y) N N/A
Samples leaking? Y (N) N/A
Seals OK? (Y) N N/A
Rec'd on ice? (Y) N N/A ___°C

Comments:

CHAIN OF CUSTODY RECORD

SAMPLERS: *(Signature)* [signature]

RELINQUISHED BY: *(Signature)*	DATE/TIME		RECEIVED BY: *(Signature)*
[signature]	8-24-95	10:00 AM	

RELINQUISHED BY: *(Signature)*	DATE/TIME		RECEIVED BY: *(Signature)*

RELINQUISHED BY: *(Signature)*	DATE/TIME		RECEIVED FOR LABORATORY BY: *(Signature)*	DATE/TIME	
			[signature]	8/25/95	11:45am

Appendix C

Standard Operating Procedures

Well Development, Stabilization and Sampling

Groundwater monitoring wells are developed and sampled according to WDNR guidelines outlined in NR 141.21. Wells which cannot be purged dry are surged and purged for 30 minutes prior to well development using a bottom-loading disposable plastic bailer. Ten well volumes are removed from the well during development. Wells that can be purged dry are bailed slowly to avoid agitation. The well is purged dry twice and allowed to recover prior to sampling. Following development, water is collected from the well using a bottom sampling bailer and placed in laboratory supplied sample bottles. The sample bottles are placed in an ice-filled cooler, stored under refrigerated conditions and sent to the laboratory following chain-of-custody procedures.

Sampling procedures used after the initial round of groundwater monitoring follow WDNR guidelines outlined in PUBL-WR-168. In low permeability formations, the well is bailed dry using a disposable plastic bailer. The well is sampled after a sufficient volume of water is present in the well for the required analyses. In high permeability formations, four well volumes are bailed from the well prior to sampling.

Groundwater Sampling Procedures

Monitoring Wells

Groundwater samples are collected from monitoring wells after initial well development following WDNR Guidelines contained in PUBL-WR-16887, "Groundwater Sampling Procedures".

Wells that can be Purged Dry

(1) Pump or bail the well dry.

(2) Allow the well to recover after purging.

(3) Purge the well a second time (if time permits).

(4) Collect the water sample as soon as there is a sufficient volume of water for the intended analysis.

Wells that Cannot be Purged Dry

(1) Remove four well volumes.

(2) Purge wells by bailing as near the water surface as possible. Disposable bailers are used to purge and collect water samples. Bailer rope is kept as clean as possible during purging and sampling activities. Water samples are collected from the bottom of the bailer and poured into laboratory provided glass containers. Sample bottles are filled until a positive meniscus is formed at the brim of the container. Agitation and turbulence is avoided while filling the sample bottles. Disposable nitrile gloves are worn while collecting samples. Sample bottles are tightly sealed after filling, placed on ice in a cooler, repacked in the office, and sent to the laboratory following chain of custody protocol.

Private Water Supplies

Water samples are collected prior to entering any treatment system and from a tap as close as possible to the well. The tap is opened and water allowed to run at least five minutes before sampling. Sample collection procedures follow those previously described in the previous section.