MINNESOTA POLLUTION CONTROL AGENCY
TANKS AND SPILLS SECTION
ABOVE/BELOW GROUND RELEASE REPORT

4/89
RRS

Report taken by: DK.
Date/time occurred: Unk
Date/time of report: 6-12-89
Date/time discovered: 6-12-89

CALLER*
name: Ken Wingert
phone:
relationship to site: Mn. Petroleum

INSTALLATION*
name: Schrier Malting (Schreier) Hennepin County
street: 3600 Dight Ave. Ave.
city, zip: Minneapolis Mpls. 55406
Marvin Buchholz 721-6811

MATERIAL RELEASED/AMOUNT*
Fuel oil

LEAK # Leak00001184
USTIS # MNUST 000 1709
STATE OR FEDERAL
EMERGENCY DECLARED? YES/NO
RP/FF
VAPOR/WATER/OTHER
SITE INVESTIGATION - NO BUT NEEDED
ACTIVE: RP
ACTIVE: FF
CORRECTIVE ACTION - NO BUT NEEDED
ACTIVE: RP
ACTIVE: FF
ENFORCEMENT - NO/YES (documented)

SITUATION (HOW/WHY)
Tank Removal,
15000 Fuel oil.
2 Tanks Removed

SITE OWNER/RESPONSIBLE PARTY*
name: Schrier Malting
street:
city, zip:
contact person:
phone:

ACTIVITIES TO DATE (circle)*
tank removed, size 2-
age _____, contents _____
above ground/below ground
soil borings
digging, why? _____
contamination detected
odor, instrument, analysis
soil excavated yes
stockpiled properly
disposal arranged
samples collected
other (specify)

SITE OPERATOR*
name: Same.
street:
city, zip:
contact person:
phone:

INSTRUCTIONS GIVEN (circle)*
hire consultant - S.T.S.
submit report
staff will call
contact staff

AREAS AFFECTED*
surface water
groundwater
sanitary sewer
storm sewer
soil
wells _____
other _____

CONTACTS
Local Fire/Police _____
*Local Officials Karen Nordberg
Emergency Services _____
MPCA Region _____
MDA _____
MDOT _____
Other _____
ADDITIONAL INFO - continue on back

Minnesota Pollution Control Agency
520 Lafayette Road, Saint Paul, Minnesota 55155
Telephone (612) 296-6300

Celebrate MINNESOTA 1990

NOV 29 1989

Mr. Marvin Buckholz
Schreier Malting
3600 Dight Avenue
Minneapolis, Minnesota 55406

Dear Mr. Buckholz:

RE: Petroleum Tank Release Site Closure
Site: Schreier Malting, Minneapolis
Site ID#: LEAK00001184

The Minnesota Pollution Control Agency (MPCA) staff has determined that the cleanup performed in response to the petroleum tank release at the site referenced above has adequately addressed the petroleum contamination, and therefore the file regarding this release will be closed.

On June 12, 1989, a petroleum tank release was reported to the MPCA. Since then Schreier Malting has taken the following corrective action in response to the release:

During June 1989, a 15,000 gallon and a 550 gallon petroleum underground storage tanks were removed. After removal the tanks were observed to have pitting and corrosion, but no holes or visual leaks were found. Using a field instrument, about 68 cubic yards of petroleum contaminated soil, associated with piping leaks was excavated and transported to C.S. McCrossan for disposal. Schreier Malting's consultant estimates about 2 cubic yards of low level petroleum contaminated soil remains at the site because it was inaccessible due to concrete building foundations. The consultant used a field instrument to monitor the soil contamination during excavation and had soil samples taken and analyzed to verify the field instrument readings.

Based on the currently available information, we believe these actions have adequately addressed the petroleum tank release. Therefore, MPCA staff does not intend to require any more investigation or cleanup work in response to this release. However, the MPCA reserves the right to reopen this file and require additional work if in the future more work is determined to be necessary, and this letter does not release any party from liability for this contamination.

Because you performed the requested work, the state may reimburse you for a major portion of your costs. The Petroleum Tank Release Cleanup Act establishes a fund which in certain circumstances provides partial reimbursement for petroleum tank release cleanup costs. This fund is administered by the Petroleum Tank Release Compensation Board (Petro Board). More specific eligibility rules are available from the Petro Board (612/297-4017).

Thank you for your cooperation with the MPCA in responding to this petroleum tank release to protect the public health and the environment of the state of Minnesota. If you have any questions regarding this correspondence, please call me at 612/296-6293.

Sincerely,

Ronald R. Schwartz

Ronald R. Schwartz
Pollution Control Specialist Senior
Tanks and Spills Section
Hazardous Waste Division

RRS:kra

cc: Merry Keefe, City Clerk, Minneapolis
Ed Monteleone, Hennepin County Solid Waste Officer
Thomas Dickinson, Fire Chief, Minneapolis

STS Consultants Ltd.
Consulting Engineers

3650 Annapolis Lane
Minneapolis, Minnesota 55447
(612) 559-1900

November 2, 1989

Mr. Ken Wingard
Minnesota Petroleum Services, Inc.
5333 University Avenue N.E.
Minneapolis, MN 55421

STS Project #94800-XF

Re: Soil Borings to Determine the Vertical and Horizontal Limits of Petroleum Impacts at the Schreier Malt Co., 3600 Dight Avenue, Minneapolis, Minnesota.

Dear Mr. Wingard:

STS Consultants, Ltd. has completed the soil borings at the above referenced site. This report documents the work performed at the site and the results obtained.

Thank-you for the opportunity to assist you on this project. If you have any questions or require additional information, please contact us at 559-1900.

Sincerely,

STS CONSULTANTS, LTD.

Paul S. Gionfriddo, EIT
Assistant Project Engineer

Robert L. DeGroot, P.E.
Principal Engineer

PSG/dj
Encs.

Report

Project

Soil Borings to Determine the Vertical and Horizontal Limits
of Petroleum Impacts at the Schreier Malt Co., 3600 Dight Avenue
Minneapolis, Minesota

Client

Mr. Ken Wingard
Minnesota Petroleum Services, Inc.
5333 University Avenue S.E.
Minneapolis, Minnesota 55421

Project # 94800-XF

Date November 2, 1989

STS Consultants Ltd.
Consulting Engineers

3650 Annapolis Lane
Minneapolis, Minnesota 55441

(612) 559-1900

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Site Exploration
Schreier Malting Co.

INTRODUCTION

STS Consultants, Ltd. was contracted by Minnesota Petroleum Services, Inc. to provide engineering services associated with the removal of two underground storage tanks at the Schreier Malt Co. at 3600 Dwight Avenue, Minneapolis, Minnesota. The scope of services provided was limited to collecting soil samples for chemical analysis and documenting the tank removal process.

Two underground storage tanks were removed from the site on June 12, 1989. Details of site activities are documented in the "Tank Closure Documentation Report," STS Project #94800-XF, report dated July 27, 1989.

Petroleum impacted soil was identified during tank removal. Some petroleum impacted soil was excavated and transported to a hot mix asphalt facility for treatment. Complete removal of the petroleum impacted soil identified at the site was not accomplished due to site constraints.

Minnesota Pollution Control Agency (MPCA) regulations require that the vertical and horizontal limits be defined for any petroleum release. To comply with MPCA regulations, Minnesota Petroleum Services, Inc. retained STS Consultants, Ltd. to perform soil borings in the vicinity of the tank excavation to determine the vertical and horizontal limits of petroleum impacts remaining on site. Soil borings were conducted on September 12, 1989. This report documents the work performed at the site during the site exploration and the results obtained.

SITE EXPLORATION

Two underground storage tanks existed at the site. Due to the relatively large distance between the tank locations, the site was divided into two areas of concern. Site #1 was comprised of the 15,000 gallon underground storage tank located adjacent to the Schreier Malt Co. office. Site #2 was comprised of the 550 gallon underground storage tank and was located north of the Malt Co. grain elevators adjacent to the railroad tracks. The location of the underground storage tanks prior to removal is shown on Figure 1 in the Appendix.

The site exploration involved the use of four (4) soil borings to determine the vertical as well as horizontal limits of the petroleum impacted soil remaining at Site #2. The location of the soil borings is indicated on Figure 2 in the Appendix.

Soil borings were not conducted at Site #1. The lack of elevated HNU meter deflections recorded in the base of the tank excavation during tank removal at Site #1, the lack of evidence of tank leakage and site constraints proved soil borings unwarranted.

Drilling/Sampling Procedures

The drilling performed on the site was accomplished using a CME-75 truck mounted rotary drill rig utilizing 3-1/4 inch I.D. hollow stem augers. Soil borings are identified as B-1 through B-4. Their locations are shown on Figure 2 in the Appendix.

Soil samples were obtained at each 2-1/2 foot interval. The sampling was undertaken in general conformance with ASTM Specification D-1586 for Split-Barrel Sampling. Soil samples were classified in the field in accordance with the Unified Soil Classification System by the assistant project engineer. Field soil classifications were reviewed by the engineer in the STS laboratory. Boring logs showing the soil types are included in the Appendix.

Soil samples were examined with an HNU Photoionization Meter utilizing a 10.2 eV lamp calibrated to a benzene reference. Soils were removed from the split barrel sampler and placed in clean glass sample containers. The samples were then agitated and an HNU deflection was obtained in the jar from the head space above the soil sample.

Three (3) soil samples were collected for chemical analysis. Soil samples were obtained from depths at which petroleum impact would likely occur. The sample selection was also based upon HNU meter deflection readings. Samples were sent to Interpoll Laboratories, Circle Pines, Minnesota using the STS Chain of Custody Record.

EXPLORATION RESULTS

Soil Conditions - Site #2

Soil borings B-1, B-2, and B-3 were conducted outside the perimeter of the site #2 tank excavation. Site #2 is located north of the Schreier Malt Co. building.

Soil boring B-1 was conducted approximately 25 feet south of tank excavation. A large void was encountered upon boring through approximately six inches of concrete. The void extended to a depth approximately 10 feet below the ground surface.

Soil boring B-2 was conducted approximately 10 feet east of the tank excavation. The soil encountered consisted of a silty sand fill and silty clayey sand fill (Unified Classification SM-SC). The fill material was encountered to a depth of approximately 10 feet below the ground surface. Split spoon refusal was noted at approximately 10 feet. Split spoon refusal was interpreted to be due to the basement of an abandoned building. When completed, the boring was backfilled with cuttings.

Soil boring B-3 was conducted approximately 50 feet north of the tank excavation. A sandy silt topsoil was encountered to a depth approximately 2.5 feet below the ground surface. Beneath the topsoil, concrete rubble existed to a depth approximately five feet below the ground surface. The concrete rubble prohibited extending the boring beyond 5 feet in depth. Soil boring B-3 was backfilled with the cuttings.

Soil boring B-4 was conducted in the tank excavation area. From the ground surface to a depth approximately 10 feet below the ground surface the soil consisted of a silty clayey sand fill (Unified Classification SM-SC). An abandoned basement slab exists at approximately 10 feet below the ground surface. Drilling continued through the slab. Slab thickness was estimated to be 3 to 4 inches. The basement slab was underlain by a fine to medium sand (Unified Classification SP) to a depth approximately 21 feet below the ground

surface. Beneath the sand layer, a clayey sand (Unified Classification SC) was encountered. This clayey sand extended to the end of the soil boring at 22.5 feet below the ground surface. Soil boring B-4 was backfilled to the ground surface with a neat cement grout. The neat cement grout serves to seal the soil boring to prevent the vertical migration of contaminants through the soil.

A description of the soils encountered in borings B-1 through B-4 is shown on the boring logs located in the Appendix. These boring logs represent an interpretation of the soils encountered at the site. Variations in soil can be expected between boring location.

The HNU survey that was conducted on soil samples obtained during drilling operations revealed no HNU meter deflections above background levels in soil borings B-1, B-2, and B-3. Background levels were determined to be 0 to 1 ppm. Elevated HNU meter deflections were recorded in soil samples obtained from soil boring B-4. The complete record of HNU meter deflections is included on the boring logs in the Appendix.

Soil Conditions - Site #1

Soil encountered during tank removal at Site #1 consisted of a sand fill (Unified Classification SP). During tank removal the soil was scanned with an HNU photoionization meter for petroleum impacts. No HNU meter deflections exceeding background levels were observed in the base of the tank excavation or along the sides of the excavation.

Elevated HNU meter deflections were recorded in the tank piping trench at a depth approximately 2 feet below the ground surface. HNU meter deflections of 100 ppm were recorded in samples obtained from the piping trench. The soil encountered in the piping trench consisted of a sand fill (SP). A clay layer underlying the sand encountered in the piping trench. No HNU meter deflections exceeding background levels were recorded in the clay material.

Chemical Samples

Three soil samples representative of in-place conditions were obtained from soil boring B-4 from depths below the existing basement slab to determine the concentration of petroleum impacts which may have migrated through the slab. The samples were shipped to Interpoll Laboratories, Circle Pines, Minnesota using the STS Field Chain of Custody Record. Samples were analyzed for benzene, ethylbenzene, toluene, xylene (BETX) and total petroleum hydrocarbons as fuel oil Laboratory test results and photoionization readings are summarized in Table 1. A copy of the complete laboratory test results is included in the Appendix.

Table 1
Summary of Soil Chemical Analysis
From Soil Boring B-4

Sample Number	Depth (feet)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylene (ppm)	TPH as Fuel Oil (ppm)	HNU (ppm)
S-6	10-11.5	<0.06	<0.11	0.20	1.1	350	5
S-7	12.5-14.0	<0.06	<0.11	<0.05	<0.28	9.7	2
S-10	21.0-22.5	<0.06	<0.11	<0.05	<0.28	<1.3	0

< = less than

During tank removal three soil samples were obtained for chemical analysis. Analysis included BETX and TPH as fuel oil and TPH as gasoline. Soil sample T1-D2 was obtained from the piping trench at tank site #1. Sample T1-D12 was obtained in the base of the tank excavation at tank site #1. Soil sample T2-D9 was obtained from the base of the tank excavation at tank site #2. Table #2 summarizes the results of the laboratory analysis and photoionization readings. A copy of the complete laboratory test results is included in the Appendix.

Table 2
Summary of Chemical Analysis
From Tank Excavations

Sample No.	Depth (ft.)	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	Xylene (ppm)	TPH as Gasoline (ppm)	TPH as Fuel Oil (ppm)	HNU (ppm)
T1-D2	2	< 0.12	0.44	0.99	0.94	64	850	100
T1-D12	12	< 0.12	< 0.12	< 0.12	< 0.12	< 1.0	11	0
T2-D9	9	< 0.12	< 0.12	< 0.12	< 0.12	3.4	1300	50

< = less than

Groundwater Conditions

Groundwater was not encountered while conducting soil borings B-1, B-2, and B-3. Groundwater was identified at approximately 20.4 feet below ground surface in soil boring B-4. No unusual odor or product sheen was noted on the groundwater surface.

CONCLUSIONS

Site #2

Based on data obtained from the four soil borings conducted at tank site #2 and the data obtained during the tank removals, it appears that the impacts observed are the result of leakage from the underground storage tank system. The impacts observed appear to be the result of spillage during tank filling and fuel dispensing operations.

The depth at which impacts were observed provide evidence as to the source of the petroleum release. During the tank removals at the site, elevated HNU meter deflections were recorded beneath the dispenser pad at tank site #2. Strong petroleum odors and discolored soils were also observed in the soils beneath the dispenser pad. Elevated HNU meter deflections recorded from surface samples and observations of discolored soils provide direct evidence of spillage during tank filling and fuel dispensing operations.

Some petroleum impacted soil was removed during tank removal. Complete removal was not accomplished due to site constraints. Site constraints consist of a basement slab and building foundation walls. The basement slab and foundation walls are the remnants of a building that previously existed on the site. Conversations with employees of the Schreier Malt Co. indicated that a grain elevator existed on the site and that a tunnel or basement existed along the west side of the building which provided access to the grain elevators for servicing and cleaning. It is STS understanding that the grain elevator was destroyed by fire. It appears that a portion of the basement/tunnel was blocked off and the underground storage tank installed in the space created. Drilling performed at the site appears to confirm the existence of the tunnel. Soil boring B-1 was drilled in to a large void. In soil borings B-2, B-3 and B-4, a concrete basement slab was encountered approximately 10 feet below the ground surface. Concrete rubble and fill soils were also encountered while conducting these soil borings.

Based on data obtained while conducting the soil borings it appears that the petroleum impacts observed at the site have been contained by the foundation walls and basement slab. Migration of petroleum products through the basement slab has occurred. This conclusion is supported by the HNU meter deflections and chemical test results from soil samples obtained from soil boring B-4. Chemical analysis of soil sample B-4, S-6 obtained below the basement slab has yielded levels of ethylbenzene, xylene and TPH above detection limits. Levels of benzene and toluene for sample B-4, S-6 did not exceed detection limits. Analysis of soil sample B-4, S-7 showed slightly elevated levels of TPH. Levels of BETX for sample B-4, S-7 did not exceed detection limits. Chemical test results for soil sample B-4, S-10 showed no BETX or TPH above detection limits. Chemical test results and HNU meter deflections indicate no impacts from petroleum products below approximately 14 feet. The foundation walls and basement slab appear to have restricted the vertical and horizontal migration of petroleum products.

No indications of impacts to the groundwater was identified. No petroleum-like odors or product sheen was observed on the groundwater surface. Groundwater was identified in soil boring B-4 at a depth approximately 20.4 feet below the ground surface. Chemical analysis of the soil samples obtained from soil boring B-4 have yielded no BETX or TPH above detection limits below a depth of approximately 14 feet. This yields approximately 6 feet of non-impacted soil between the groundwater and impacted soils.

Site #1

Soil borings were not conducted in the vicinity of the 15,000 gallon underground storage tank excavation (Site #1). During the removal of the 15,000 gallon tank petroleum impacted soils were identified in the soil adjacent to the supply lines. The petroleum impacted soils identified in this area were excavated and disposed of in accordance with MPCA rules. It appears that some product migration has occurred at the site. Petroleum impacted soil was identified beneath the building foundation and concrete slab. Based on data obtained in the field during tank removal it is estimated that less than 2 cubic yards of impacted

soil remains on-site. A clay layer encountered beneath the sand fill in the piping trench appears to have limited the vertical migration of the petroleum impacts identified. Clay soils tend to be relatively impermeable thus retarding the migration of fluids through them.

Petroleum impacted soil was not identified in the soil along the sides of the tank excavation nor in the base of the tank excavation. The lack of petroleum odors, lack of visual observations of discolored soils and the negative results of the chemical analysis of soil sample T1-D12 confirm this conclusion.

Groundwater was not encountered during the removal of the 15,000 gallon underground storage tank at site #1.

RECOMMENDATIONS

Site #2

The petroleum impacts observed at Site #2 appear to be the direct result of leakage from the underground storage tank system. Vertical migration of petroleum products was restricted by the foundation walls and basement slab of an abandoned building. Migration of petroleum product through the slab has occurred. The depth of this migration was determined to be approximately 14 feet which correlates with approximately 4 feet below the basement slab. Chemical analysis has yielded no BETX and only slightly elevated levels of TPH in soil samples obtained at this depth. No BETX or TPH was recorded in sample B-4, S-10 obtained at approximately 10 to 12 feet below the basement slab.

Groundwater was identified at approximately 11 feet below the basement slab. Soil sample B-4, S-10, corresponding to the depth of groundwater, yield no BETX and TPH above detection limits. It appears that the slightly elevated levels of petroleum constituents identified in soil samples obtained directly beneath the basement slab are minor. Further remediation does not appear to be warranted.

Site #1

The petroleum impacts observed at site #1 appear to be the direct result of piping failure and spillage during fuel dispensing/filling operations. Petroleum impacted soil has been removed to the greatest extent possible. Horizontal migration of petroleum product has occurred. Based on measurements obtained during the tank removal an estimated 2 cubic yards of impacted soil remains on-site. This soils is inaccessible beneath the building slab. Vertical migration of petroleum products appears to have been limited by a clay layer encountered beneath the piping trench.

Groundwater has not been identified at site #1. It appears that the remaining petroleum impacted soil at site #1 is minor. Further remediation does not appear to be warranted.

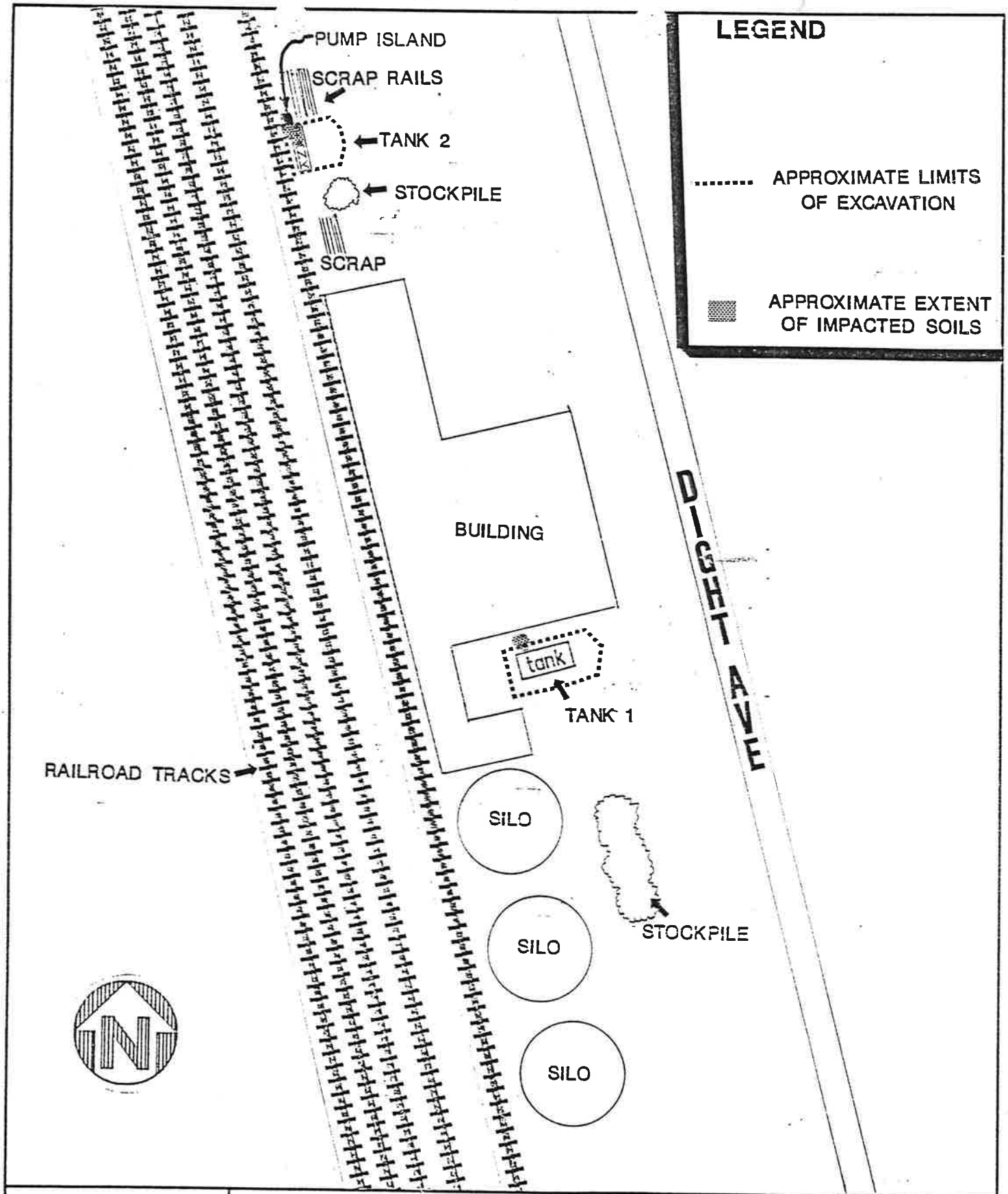
GENERAL QUALIFICATIONS

This report has been prepared in accordance with generally accepted engineering practices to assist the owner in evaluation of the site. No other warranty, expressed or implied, is made. The scope of this report is limited to the specific project and the location described herein and our description of the project represents our understanding of the significant aspects in reference to the site.

APPENDIX

Figure 1 - Tank Location Diagram
Figure 2 - Soil Boring Lacation Diagram
Soil Boring Logs
Chemical Test Results

BRUNING 521880



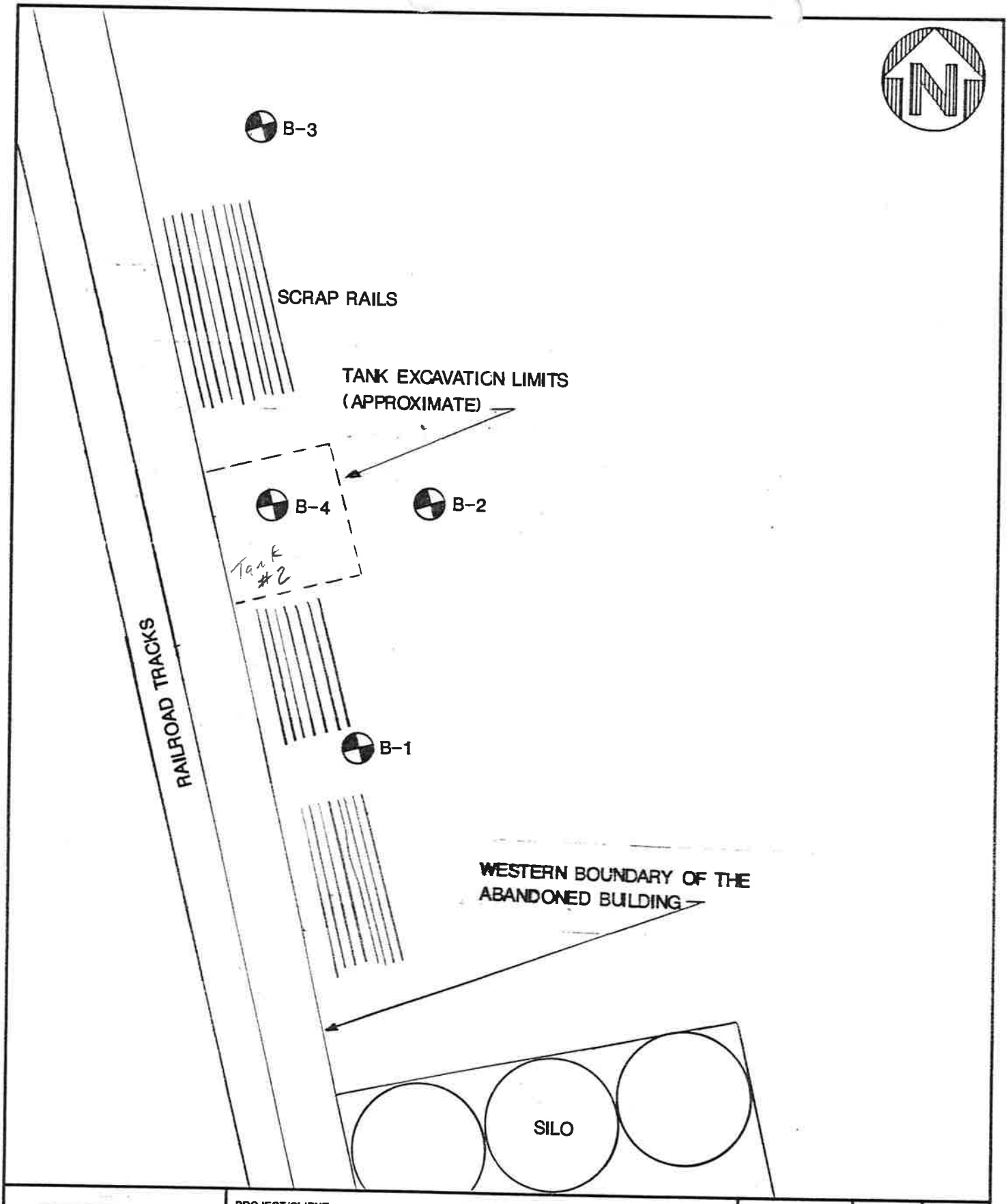
STS Consultants Ltd.
Consulting Engineers

PROJECT/CLIENT

SITE LAYOUT DIAGRAM
SCHREIER MALT COMPANY
3600 DIGHT AVENUE SOUTH
MINNEAPOLIS, MINNESOTA

PREPARED FOR MIDWEST PETROLEUM SERVICES

DRAWN BY	SJC	
CHECKED BY	RLD	
APPROVED BY		
SCALE NONE	FIGURE NO. 1	
STS DRAWING NO. 94800XF		



STS Consultants Ltd.
Consulting Engineers

PROJECT/CLIENT

SOIL BORING LOCATION DIAGRAM
SCHREIER MALT COMPANY
3600 DIGHT AVE.
MINNEAPOLIS, MN.

DRAWN BY	PG	
CHECKED BY		
APPROVED BY		
SCALE 1"=20'	FIGURE NO. 94800-XF	
STS DRAWING NO. 2		

STS Consultants Ltd.

OWNER

LOG OF BORING NUMBER: B-1

PROJECT NAME: Schreier Malt Company

ARCHITECT-ENGINEER

SITE LOCATION: 3600 Dight Avenue
Minneapolis, Minnesota

DEPTH / ELEVATION	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	HNU (ppm)	UNCONFINED COMPRESSIVE STRENGTH TONS FT²: 1 2 3 4 5 / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % / 10 20 30 40 50 / STANDARD PENETRATION BLOWS/FT 10 20 30 40 50
SURFACE ELEVATION					4.0 to 6.0" concrete		
5.0					VOID - bored into an abandonded tunnel/basement		
10.0					Building basement at 8.0 feet. HNU Meter utilizes a 10.2 ev lamp calibrated to a Benzene Referral. End of boring at 8.0 feet. No samples obtained.		
15.0							
20.0							
25.0							
30.0							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS OR WD	BORING STARTED 9/12/89	STS OFFICE Minnesota	
WL	BCR ACR	BORING COMPLETED 9/12/89	DRAWN BY CYO	SHEET NO. 1 OF 1
WL		RIG 75 CME FOREMAN G.D.	APP'D BY PSG	STS JOB NO. 94800-XF

BL: 1-983

STS Consultants Ltd.

OWNER

LOG OF BORING NUMBER: B-2

PROJECT NAME: Schreier Malt Company

ARCHITECT-ENGINEER

SITE LOCATION: 3600 Dight Avenue
Minneapolis, Minnesota

DEPTH / ELEVATION	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	HNU (ppm)	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50) / STANDARD PENETRATION BLOWS/FT (10 20 30 40 50)
SURFACE ELEVATION							
	1	AS			Sandy silt with gravel - black - (fill/topsoil) - (ML)	0	
	2	SS			Silty clayey sand, little gravel - brown and black - moist - medium dense - (SM-SC) - (fill)	0	⊗ 21
5.0	3	SS				0	⊗ 9
	4	SS			Silty fine to coarse sand, trace gravel - brown - moist - medium dense - (SM) - (fill)	0	⊗ 12
10.0	5	SS			Silty fine to coarse sand, trace gravel - brown and black- moist - medium dense - (SM-SC) - (fill)	0	⊗ 12
					End of boring at 10.0 feet. Spoon refusal at 10.0 feet. Building basement at 10.0 feet. Boring backfilled to ground surface with cuttings. HNU meter utilized a 10.2 ev lamp calibrated to a Benzene Referral		
15.0							
20.0							
25.0							
30.0							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION MAY BE GRADUAL.

WL DRY	WS OR WD	BORING STARTED 9/12/89	STS OFFICE Minnesota
WL	BCR ACR	BORING COMPLETED 9/12/89	DRAWN BY CYO / SHEET NO. 1 OF 1
WL		RIG 75 CME FOREMAN G.D.	APP'D BY PSG / STS JOB NO. 94800-XF

BL: 1-983

STS Consultants Ltd.

OWNER

LOG OF BORING NUMBER B-3

PROJECT NAME Schreier Malt Company

ARCHITECT-ENGINEER

SITE LOCATION 3600 Dight Avenue
Minneapolis, Minnesota

DEPTH / ELEVATION	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	HNU (ppm)	UNCONFINED COMPRESSIVE STRENGTH TONS FT.² (1 2 3 4 5); PLASTIC LIMIT %; WATER CONTENT %; LIQUID LIMIT %; STANDARD PENETRATION BLOWS/FT (10 20 30 40 50)
SURFACE ELEVATION							
	1	AS			Sandy silt, trace gravel, trace roots - dark brown - topsoil/fill	0	
	2	SS			Concrete rubble - no sample recovery		⊗ 9
5.0					End of boring at 5.0 feet. Auger and spoon refusal at 5.0 feet. Boring backfilled to the ground surface with cuttings. HNU Meter utilized a 10.2 eV lamp calibrated to a Benzene Referral.		
10.0							
15.0							
20.0							
25.0							
30.0							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION MAY BE GRADUAL

WL DRY	WS OR WD	BORING STARTED 9/12/89	STS OFFICE Minnesota
WL	BCR ACR	BORING COMPLETED 9/12/89	DRAWN BY CYO / SHEET NO. 1 OF 1
WL		RIG 75 CME FOREMAN G.D.	APP'D BY PSG / STS JOB NO. 94800-XF

BL: 1-983

STS Consultants Ltd.

OWNER

LOG OF BORING NUMBER B-4

PROJECT NAME Schreier Malt Company

ARCHITECT-ENGINEER

SITE LOCATION 3600 Dight Avenue
Minneapolis, Minnesota

DEPTH / ELEVATION	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	DESCRIPTION OF MATERIAL	HNU (ppm)	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % (10 20 30 40 50) / STANDARD PENETRATION BLOWS/FT (10 20 30 40 50)
SURFACE ELEVATION							
	1	AS			Silty sand - dark brown to black - (SM) topsoil/fill	1	
	1A	AS					
	2	SS			Silty clayey sand, trace gravel - dark brown - moist - loose - (SM-SC) - (fill)	0	⊗ 6
5.0	3	SS				0	⊗ 9
	4	SS				2	⊗ 7
10.0	5	SS				90	⊗ 5/3
	6	SS			Abandonded basement slab approximately 3" thick at 10.0 feet. Sandy clay - dark brown - moist - stiff to very stiff - (CL-SC)	5	⊗ 9
	7	SS				2	⊗ 11
15.0	8	SS			Fine to medium sand, trace silt, trace gravel - brown - moist - loose to medium dense - (SP)	2	⊗ 7
	9	SS			Clayey sand - brown - moist - medium dense - (SC)	2	⊗ 15/11
	10	SS				0	⊗ 13
25.0					End of boring at 22.5 feet. Boring backfilled with cement grout to the ground surface. HNU meter utilizes a 10.2 ev lamp calibrated to a Benzene Referral		
30.0							

THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY LINES BETWEEN SOIL TYPES. IN SITU, THE TRANSITION MAY BE GRADUAL.

WL	WS OR WD	BORING STARTED 9/12/89	STS OFFICE Minnesota
WL	BCR ACR	BORING COMPLETED 9/12/89	DRAWN BY CYO / SHEET NO. 1 OF 1
WL 20.4 feet AB		RIG 75 CME FOREMAN G.D.	APP'D BY PSG / STS JOB NO. 94800-XF

BL: 1-983