Minnesota Pollution Control Agency

June 1, 1994

Mr. Jessie Schwartz
W. Gordon Smith Company
7920 Wallace Road
Eden Prairie, Minnesota 55344

RE: Petroleum Tank Release Site File Closure
Site: W. Gordon Smith Mobil, 5717 Excelsior Boulevard, St. Louis Park
Site ID#: LEAK00007157

Dear Mr. Schwartz:

We are pleased to let you know that the Minnesota Pollution Control Agency (MPCA) Tanks and Spills Section (T&S) staff has determined that your investigation and/or cleanup has adequately addressed the petroleum tank release at the site listed above. Based on the information provided, the T&S staff has closed the release site file.

Closure of the file means that the T&S staff does not require any additional investigation and/or clean up work at this time or in the foreseeable future. Please be aware that file closure does not necessarily mean that all petroleum contamination has been removed from this site. However, the T&S staff has concluded that any remaining contamination, if present, does not appear to pose a threat to public health or the environment.

The MPCA reserves the right to reopen this file and to require additional investigation and/or cleanup work if new information or changing regulatory requirements make additional work necessary. If you or other parties discover additional contamination (either petroleum or non-petroleum) that was not previously reported to the MPCA, Minnesota law requires that the MPCA be immediately notified.

You should understand that this letter does not release any party from liability for the petroleum contamination under Minn. Stat. ch. 115C (1992) or any other applicable state or federal law. In addition, this letter does not release any party from liability for non-petroleum contamination, if present, under Minn. Stat. ch. 115B (1992), the Minnesota Superfund Law.

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 may provide partial reimbursement for petroleum tank release cleanup costs. This fund is administered by the Department of Commerce Petrofund Board. Specific eligibility rules are available from the Petrofund Board at 612/297-1119 or 612/297-4203.

If future development of this property or the surrounding area is planned, it should be assumed that petroleum contamination may still be present. If petroleum contamination is encountered during future development work, the MPCA staff should be notified immediately.

For specific information regarding petroleum contamination that may remain at this leaksite, please call the T&S File Request Program at 612/297-8499. The "Leak/Spill and Underground Storage Tank File Request Form" (T&S Fact Sheet #36) must be completed prior to arranging a time for file review.

Thank you for your response to this petroleum tank release and for your cooperation with the MPCA to protect public health and the environment. If you have any questions regarding this letter, please call me at 612/297-8591.

Sincerely,

E. Edwin Balcos

E. Edwin Balcos
Project Manager
Cleanup Unit II
Tanks and Spills Section

EEB:mk

cc: Beverly Flanagan, City Clerk, St. Louis Park
Bob Gill, Fire Chief, St. Louis Park
Lois Cheesaboro, Hennepin County Solid Waste Officer
Tom Greene, Applied Engineering, Inc., Wayzata

APPLIED ENGINEERING, INC.
2905 OAK LEA TERRACE
WAYZATA, MINNESOTA 55391-2533
FAX/TEL (612) 939-9095

MPCA TANKS AND SPILLS

PETROLEUM RELEASE

REMEDIAL INVESTIGATION REPORT

for:

W. Gordon Smith Mobil
5717 Excelsior Boulevard
St. Louis Park, Minnesota 55416

by:

Applied Engineering, Inc.
AE #4404

MPCA Site Leak #7157

March 24, 1994

1.0 CONTENTS

REMEDIAL INVESTIGATION REPORT WORKSHEET
Fact Sheet #6
Minnesota Pollution Control Agency
LUST Cleanup Program
April 1993

This worksheet documents specific information gathered during the remedial investigation (RI) and must be submitted with the RI/corrective action design (CAD) report to fulfill U.S. Environmental Protection Agency requirements. The purpose of the worksheet is to facilitate Minnesota Pollution Control Agency (MPCA) evaluation of site priority. **RI/CAD reports submitted without this worksheet, or with an incomplete worksheet, will be rejected as inadequate.**

Date form completed: 3-17-94

Site Information

Leak Number: 7157
Type of product released: GASOLINE, FUEL OIL, _____, _____
Source of release (circle all that apply): tanks lines dispenser (overfill) spill, (unknown)

Estimated volume of product released: UNKNOWN gal.
Date investigation field work initiated: 1-25-94
Date investigation field work completed: 2-4-94

Contaminated Soil

Date removed: 1-26-94
Volume removed: 101 cubic yd.
Treatment method for soil removed: THERMAL
Estimated volume of contaminated soil remaining above action levels: 30 to 80 cubic yd.

Ground Water

Ground water impacts? [yes(Y)/no(N)/suspected(S)]: N
Extent of ground water contamination defined? (Y/N): —

[If ground water is impacted, complete a ground water receptor survey in accordance with MPCA fact sheet #23. The results of the ground water receptor survey must be included in the RI/CAD report.]

Free Product

Free product observed (Y/N/S): N
(If yes or suspected, report to MPCA within 24 hours, submit free product worksheet within 45 days of discovery)
Maximum thickness of free product: — ft. (or tenths of ft. if less than 1 ft.)
Interim free product recovery method: —
Volume of free product recovered to date: — gal.

Drinking Water Impacts

Drinking water supply well(s) contaminated above detection limits? (Y/N/S): N
If yes, total number of houses affected: -
Drinking water well(s) contaminated above RALs? (Y/N/S): N
If yes, total number of houses above RALs: -
Alternative water supply start date: -

Vapor Risk Assessment

Complete a vapor risk assessment as per MPCA fact sheet #22
Was a vapor survey required? (Y/N): N
If no, explain:
NO ACCESSIBLE UTILITIES WERE IDENTIFIED AT RISK OF PETROLEUM VAPOR MIGRATION. THIS SITE DOES NOT HAVE A BASEMENT.

If yes, results:

Were vapor mitigation actions necessary? (Y/N): N
If yes, describe:

2.0 PURPOSE AND SCOPE

This report describes the remedial investigation performed by Applied Engineering, Inc. at 5717 Excelsior Boulevard, St. Louis Park, Minnesota based on MPCA guidelines. The purpose of the investigation was to:

- Determine the horizontal and vertical extent of remaining petroleum impacted soil and

- To assess possible impact on the groundwater

This work was performed by Applied Engineering, Inc. as authorized by Pump and Meter Service, Inc. Recommendations are based on the results of the excavation of five removed tanks and the results of thirteen soil borings.

3.0 BACKGROUND

3.1 Site Details

Site Location:	W. Gordon Smith Mobil 5717 Excelsior Boulevard St. Louis Park, MN 55416
Telephone:	612-927-8490
	NW1/4 of SE1/4 of SE1/4 of NW1/4 Township 117N Range 21W Section 21
Latitude:	N 44 deg 55' 14"
Longitude:	W 93 deg 21' 09"
County:	Hennepin
Tank Owner/Operator:	W. Gordon Smith Mobil Co.
Contact:	Jessie Schwartz
Mailing Address:	7920 Wallace Road Eden Prairie, 55344
Telephone:	612-937-2773
Property Owner:	Frank Lundberg American Legion, Post #282
Address:	5707 Excelsior Boulevard St. Louis Park, MN 55416

Consultant: Applied Engineering, Inc.
Contact: Thomas Greene
2905 Oak Lea Terrace
Wayzata, MN 55391
Telephone: 612-939-9095

3.2 Description of Site and Surrounding Area

The site is located in the southeast corner of the intersection of Excelsior Boulevard and Yosemite Avenue, on generally flat terrain. The surrounding area is a mix of commercial and residential properties.

Reference
Figure 1. Site Location Map

3.3 Chronology of Events and Rational for Work Performed

Pump and Meter Service, Inc. was hired by W. Gordon Smith Co. to remove the underground storage tanks at this location. W. Gordon Smith Co. owned the tanks and leased the property from the Frank Lundberg American Legion, Post #282. The tanks were removed due to expiration of the lease and a pending sale of the property. Upon discovery of petroleum impacted soil, Applied Engineering Inc. was hired by Pump and Meter Service, Inc. to document the remainder of the tank removal and to perform related environmental services.

On January 25 and 26, 1994, Pump and Meter Service, Inc. removed the five underground storage tanks located in two tank basins (gasoline/pump island, and fuel oil/used oil). Pump and Meter Service obtained the soil samples from beneath tank 1 prior to the arrival of Applied Engineering. During the excavation of tank #2, a release was identified and Applied Engineering was called on-site to document the remaining tank removal and to investigate the petroleum impact on the soil.

Petroleum impacted soil was confirmed beneath tanks 2 and 3. Excavation continued vertically in the gasoline tank basin until soil vapor headspace levels, analyzed with an HNU meter, were less than the MPCA action level guideline of 40 ppm for gasoline. Soil samples were collected from beneath the remaining tanks by Applied Engineering.

Petroleum impacted soil was also identified beneath the fuel oil tank. Excavation continued vertically to approximately 10 feet deep until restricted by cave-ins, the adjacent building, and overhead wires.

Soil borings were subsequently installed to determine the horizontal and vertical extent of petroleum impacted soil in both tank basins. Soil borings were installed February 2 - 4, 1994, by Traut Hydro-Tech as directed by Applied Engineering Hydrogeologist.

References

Figure 2. Site Layout Drawing
APPENDIX A - PETROLEUM IMPACTED SOIL: Excavation Report

3.4 Source and Volume of Release

The exact source of the releases and the volume released is unknown. Laboratory analyses indicate both fuel oil and gasoline constituents. Although no exact source of the releases were identified during the tank removal, the gasoline release appears to be the result of occasional overfills or line leaks as impacted soil was identified in the upper elevations near the surface on the west side of the tank basin and adjacent to the pump island.

Additionally, the owner recalled a vent line that was repaired several years ago near the east side of the tank basin. (This is consistent with the impacted soil identified in soil boring SB-3, located within several feet of the repair location.) During an overfill situation, a damaged vent line can also be the source of a release.

4.0 RESULTS

4.1 Excavation

During soil excavation, HNU levels ranged up to 200+ ppm, beyond the sensitivity range of the HNU meter. HNU levels from the bottom of the final gasoline basin excavation ranged from non-detectable to 35 ppm. HNU levels from the bottom of the fuel oil tank basin ranged from non-detectable to 14 ppm. No impacted soil was identified beneath the used oil tank.

Gasoline Tank Basin

Six soil samples were collected from the bottom of the gasoline tank basin. Non-detectable concentrations of gasoline range organics (GRO) or total petroleum hydrocarbon (TPH) were identified in all six samples. Toluene was detected in one sample and xylene was detected in two samples, however, concentrations were all less than 0.15

ppm. Benzene, toluene, ethylbenzene, xylene (BTEX), and methyl tertiary butyl ether (MTBE) concentrations were non-detectable in the remaining samples from the gasoline tank basin.

Fuel Oil Tank Basin

Two soil samples were collected from the fuel oil/used oil tank basin, one from beneath each tank. No hydrocarbons were detected in the sample from beneath the used oil tank. Diesel range organics of 5600 ppm were identified in the sample from soil excavated from beneath the fuel oil tank at 11 feet deep. This soil was excavated and placed in the stockpile. A final sample could not be collected from the bottom of the excavation due to cave-ins.

Soil Treatment

One hundred one (101) cubic yards of petroleum impacted soil were removed from the site and hauled to Maple Grove for thermal treatment by C. S. McCrossan. The tanks were transported to Determan Welding, Fridley, Minnesota for disposal. No new tanks were installed.

Reference

APPENDIX A - PETROLEUM IMPACTED SOIL: Excavation Report

4.2 Soil Borings

Soil Boring Locations

Soil borings were installed around the two excavation areas in an attempt to more adequately define the horizontal and vertical extent of the petroleum impacted soil and to determine whether groundwater may have been impacted.

Seven soil borings, SB-1 to SB-7, were placed in the gasoline tank and pump island area. SB-1 was placed at the point of the highest concentrations observed during the excavation.

Six soil borings, SB-8 to SB-13, were placed in the fuel oil tank area. SB-8 was installed within four feet of the middle of the removed fuel oil tank. It could not be installed through the center of the fuel oil tank basin due to the presence of two overhead electrical wires.

References

Figure 2. Site Layout Drawing
APPENDIX B - REFERENCE INFORMATION: Soil Borings

Soil Stratigraphy

The primary surficial deposit identified in all borings is sand. The sand was observed in varying layers of fine, medium, and coarse grain, from grade to approximately 33 to 42 feet deep. This sand is underlain by a layer of stiff gray clay, observed to be at least 10 feet thick in SB-12.

References

Figure 2. Site Layout Drawing
APPENDIX A - PETROLEUM IMPACTED SOIL: Soil Boring Logs

Groundwater

No groundwater was encountered. No significant moisture was encountered in the soil borings near the gasoline tank basins. At the deeper depths near the fuel oil tank basin, moist, but less than saturated, soil was encountered in the soil borings at the sand and clay interface.

The soil borings were terminated between 32 feet and 47 feet deep due to diminishing HNU levels and to avoid penetrating the confining layer of gray clay.

Soil Vapor Headspace (HNU) Levels

Gasoline Tank Basin

The highest detected HNU level was 120 ppm at 5-7 feet deep in SB-2, located on the north side of the gasoline tank basin excavation. HNU levels in this same boring decreased to 21 ppm at 10-12 feet deep, and continued decreasing to non-detectable at 35-37 feet deep.

The second highest level detected was 98 ppm between 10-12 feet in SB-3, located on the northeast corner of the gasoline tank basin excavation. HNU levels in this same boring decreased to 17.2 ppm at 15-17 feet deep, and continued decreasing to 5.8 ppm at 35-37 feet deep.

HNU levels in SB-1, located near the middle of the gasoline tank basin excavation, were similar to those identified in SB-2 and SB-3. The highest level in SB-1 was 88 ppm at 13-15 feet deep. HNU levels decreased to non-

detectable at 29-31 feet deep, and remained non-detectable to the end of the boring at 35 feet deep.

HNU levels were non-detectable in peripheral borings SB-4, SB-5, SB-6, and SB-7, with the exception of 0.2 ppm in SB-7 from 10-12 feet deep. These borings bracketed the gasoline tank basin excavation to the west, north, south and east respectively.

Fuel Oil Tank Basin

HNU levels in the six borings (SB-8 to SB-13), located near the fuel oil tank basin excavation, ranged from non-detectable to 5.8 ppm. The highest HNU level (5.8 ppm) was identified in SB-10, located approximately 10 feet east northeast from the removed fuel oil tank, at a depth of 25-27 feet.

References

Table 1. Soil Boring Headspace Analyses
Figure 2. Site Layout Drawing
APPENDIX A - PETROLEUM IMPACTED SOIL: Soil Boring Logs
APPENDIX B - REFERENCE INFORMATION: Soil Borings

Laboratory Soil Analyses

Eighteen soil boring samples were selected for laboratory analysis. Generally, the soil samples submitted to the laboratory were collected from the locations where the highest HNU levels in each boring were identified and also from the bottom of each boring.

As a cost saving measure, soil samples from SB-4 to SB-7 were not submitted for laboratory analysis, since HNU levels were all non-detectable, (with the exception of 0.2 ppm in SB-7 at 10-12 feet).

Only one sample from SB-11 at 35-37 feet with an HNU level of 0.1 ppm, was submitted for laboratory analysis. The rest of the soil samples had non-detectable HNU levels in this boring. One additional sample was submitted from SB-1 at 21-23 feet where HNU levels indicated a secondary peak.

The seven samples from the gasoline tank basin area were analyzed for GRO and lead. The remaining eleven samples from the fuel oil tank area, SB-8 to SB-13, were analyzed for DRO. All samples were analyzed for BTEX, and MTBE.

Gasoline Tank Basin

The highest GRO concentration identified was 1400 ppm in SB-1 at 13-15 feet deep. Benzene concentrations in this same sample were non-detectable. GRO concentrations in the remaining six samples from the gasoline tank area borings ranged from non-detectable to 46 ppm, and benzene ranged from non-detectable to 0.84 ppm.

Fuel Oil Tank Basin

DRO, BTEX, and MTBE concentrations were non-detectable in all of the samples submitted from the fuel oil tank basin area borings, with the exception of SB-8. One sample submitted from SB-8 at 20-22 feet identified toluene at 0.06 ppm and xylene at 0.05 ppm.

References

Table 2. Soil Boring Sample Laboratory Analyses
Table 3. Soil Boring Laboratory Analyses Summary
Figure 2. Site Layout Drawing
Appendix A - PETROLEUM IMPACTED SOIL: Soil Boring Logs
Appendix B - REFERENCE INFORMATION: Soil Borings

4.3 Groundwater

Groundwater was not encountered in the soil borings as deep as 47 feet. Soil samples from the bottom of the soil borings indicated relatively low or non-detectable hydrocarbon concentrations. Based on this information and a discussion with MPCA Project Manager, Edwin Balcos, a Groundwater Receptor Survey is not being submitted.

4.4 Hydrogeologic County Atlas Information

Based on the Hennepin County Geologic Atlas, Plate 5 of 9, Quaternary Hydrogeology, (Kanivetsky, 1989) the regional water table elevation at the site is approximately 875 feet above sea level, and the groundwater flow direction is to the east southeast. Also based on the Hennepin County Geological Atlases, the water table at the site is estimated to be at approximately 35 feet below grade.

The absence of identified groundwater in the soil borings may be due to geologic differences at this specific site compared to the regional geology, and possibly due to seasonally fluctuating groundwater elevations.

General Stratigraphy based on County Geologic Atlas:

Based on the Hennepin County Geologic Atlas, Plate 3 of 9, Surficial Geology, (Meyer/Hobbs, 1989) soil near the site consists of Outwash of the Des Moines Lobe and Grantsburg Sublobe Deposits. This outwash consists of "sand, loamy sand, and gravel; overlain by loess less than 4 feet thick."

Based on Plate 2 of 9, Bedrock Geology, and Plate 4 of 9, Depth to Bedrock: bedrock consisting of St. Peter Sandstone is located at 110 feet deep.

The above stratigraphy is generally consistent with that identified in the soil borings.

Susceptibility to Contamination based on County Geologic Atlas:

Based on the Hennepin County Geologic Atlas, Plate 7 of 9, Sensitivity of Ground-Water Systems to Pollution, (Piegat, 1989) the water table near the site has a "high" susceptibility rating. The susceptibility of the Prairie Du Chien-Jordan Aquifer at the site is rated at "medium".

4.5 Vapor Risks

No accessible utilities such as storm or sanitary sewers were identified at risk of vapor migration. Also, this site does not have a basement.

4.6 On-Site Wells

No wells are known to exist at this site.

5.0 DISCUSSION

5.1 Petroleum Impacted Soil

Soil Profile:

Soil from grade to 35 feet deep consists of brown sand with fine to coarse grains. This sand is underlain by stiff gray clay, which should act as a confining layer to the underlain drinking water aquifers.

Petroleum Impacted Soil:

Gasoline Tank Basin

Approximately 96 cubic yards of petroleum impacted soil were removed from the gasoline tank basin excavation. Stockpile samples indicate GRO concentrations up to 1700 ppm were removed.

The highest remaining GRO concentration identified was 1400 ppm in SB-1, located near the middle of the gasoline tank basin excavation, at a depth of 13-15 feet deep. This corresponds to the approximate depth of the bottom of the excavation. No hydrocarbons were detected in this same boring at 21-23 feet deep. Benzene was identified at a concentration of 0.29 ppm in the sample taken from the bottom of the boring, 33-35 feet deep.

Since soil samples from the bottom of the excavation and the two deeper samples from SB-1 all had non-detectable hydrocarbon concentrations, it appears the quantity of petroleum impacted soil is a relatively small. HNU levels in SB-1 decrease to less than 2 ppm at 19 feet deep, six feet below the highest laboratory identified concentration.

The six soil borings surrounding the gasoline tank basin all had low or non-detectable HNU levels, or GRO concentrations below 50 ppm. This indicates that the horizontal petroleum migration is generally limited to the excavation boundary. Samples taken from soil borings SB-2 and SB-3, located just outside of the excavation area to the north and northeast, had GRO concentrations up to 46 ppm.

Based on the above results, it is estimated that approximately 30 to 80 cubic yards of petroleum impacted soil remain in place with hydrocarbon concentrations above 50 ppm.

Fuel Oil Tank Basin

A total of approximately five cubic yards of petroleum impacted soil were removed from the fuel oil tank basin excavation. Laboratory analyses of a sample excavated from beneath the fuel oil tank at a depth of 11 feet indicates a DRO concentration of 5600 ppm. No additional sampling was accomplished beneath this point due to cave-ins and drilling equipment limitations.

HNU soil samples from all six borings surrounding the tank basin indicated petroleum impacted soil exists at depths ranging from 16 to 47 feet deep. Therefore samples from each boring were submitted for laboratory analysis. HNU levels in SB-8, located four feet northeast of the fuel

oil tank basin, remained fairly constant throughout the boring, ranging from 0.1 to 0.4 ppm to a depth of 47 feet.

DRO, BTEX and MTBE concentrations were non-detectable in all of the soil borings with the exception of SB-8. Relatively low concentrations of toluene and xylene were identified in SB-8, at a depth of 20-22 feet. All constituents analyzed were non-detectable in SB-8 at 45-47 feet deep, the bottom of the boring. In our experience, the above apparent conflicts in HNU levels and laboratory results are not uncommon for sand samples such as these.

Laboratory analyzed soil boring samples indicate non-detectable hydrocarbon concentrations. However, based on excavation sample results, some petroleum impacted soil probably remains beneath the removed fuel oil tank. Soil boring SB-8 was located within four feet of the fuel oil tank basin and the low to non-detectable petroleum hydrocarbon concentrations suggest the volume of any remaining petroleum impacted soil to be relatively small.

Reference
Figure 3. Petroleum Impacted Soil Remaining in Place

5.2 Groundwater

Groundwater

Groundwater was not encountered during the boring installation, therefore, there does not appear to be an impact on the groundwater.

Potential Future Migration

The remaining petroleum impacted soil in the gasoline tank basin, and possibly beneath the fuel oil tank basin, may continue to leach deeper into the soil, acting as a source of potential future groundwater impact. However, the leaching will be minimized as a result of the removal of 101 cubic yards of petroleum contaminated soil and due to the asphalt paving over the gasoline tank area.

The clay encountered around 37 feet deep should act as a confining layer for any deeper aquifers, thus reducing the potential of future groundwater impact.

6.0 CONCLUSIONS

6.1 Magnitude and Extent of Petroleum Impacted Soil

Magnitude

Gasoline Tank Basin

Near the gasoline tank basin, the highest magnitude of petroleum impacted soil identified is GRO at 1400 ppm, in a soil boring installed near the center of the gasoline tank basin at a depth of 13-15 feet. No benzene was detected at this same location.

Fuel Oil Tank Basin

The highest identified magnitude of petroleum impacted soil beneath the fuel oil tank was 5600 ppm at 11 feet deep. However, this soil was removed, and a bottom sample was not collected due to cave-ins. Low to non-detectable petroleum hydrocarbon concentrations were identified in all of the laboratory analyzed samples taken from borings surrounding the fuel oil tank basin.

Extent

Gasoline Tank Basin

Based on the results of the soil borings, petroleum impacted soil remains within the perimeter of the gasoline tank basin excavation at depths up to 37 feet. Approximately 30 to 80 cubic yards is estimated to remain in place with GRO concentrations above 50 ppm.

Fuel Oil Tank Basin

The horizontal extent of any remaining petroleum impacted soil appears to be limited to the excavation boundary.

6.2 Vapor Survey

Based on the location and the hydrocarbon concentrations remaining in the soil, no utilities or basements are identified at a significant vapor risk.

6.5 Potential Future Petroleum Migration

The potential for future petroleum migration to a drinking water aquifer appears relatively low due to the relatively small volume of impacted soil remaining in place, and the confining layer of clay observed at 37 feet deep.

6.6 Overall

MPCA guidelines normally call for additional investigation or remediation when soil hydrocarbon concentrations exceed 50 ppm in sandy soil. However, in this specific case, it appears the work accomplished to date has adequately characterized the site and any additional investigation or remediation would not appear to be cost effective.

7.0 RECOMMENDATIONS

Based on the above conclusions, it is recommended that no further action be taken.

This report represents opinion based on accepted analytical and industry standards and MPCA guidelines. However, beyond this, no warranty is expressed or implied.

Signature: Lifeng Guo Date 3-24-94

Lifeng Guo
Hydrogeologist

Signature: Thomas A. Greene Date 3-24-94

Thomas A. Greene, P.E.
Project Manager

TABLES

Table 1. Soil Headspace Analyses

Boring #	Depth (feet)	HNU Level (ppm)
SB-1 *	13-15	88
SB-1	15-17	59
SB-1	17-19	70
SB-1	19-21	1.2
SB-1 *	21-23	2.4
SB-1	23-25	0.8
SB-1	25-27	0.6
SB-1	27-29	0.4
SB-1	29-31	ND
SB-1	31-33	ND
SB-1 *	33-35	ND
SB-2 *	5-7	120
SB-2	10-12	21
SB-2	15-17	15.2
SB-2	20-22	7.2
SB-2	25-27	0.6
SB-2	30-32	0.6
SB-2 *	35-37	ND
SB-3	5-7	56
SB-3 *	10-12	98
SB-3	15-17	17.2
SB-3	20-22	7.2
SB-3	25-27	6.2
SB-3	30-32	7.8
SB-3 *	35-37	5.8
SB-4	5-7	ND
SB-4	10-12	ND
SB-4	15-17	ND
SB-4	20-22	ND
SB-4	25-27	ND
SB-4	30-32	ND

Boring #	Depth (feet)	HNU Level (ppm)
SB-5	5-7	ND
SB-5	10-12	ND
SB-5	15-17	ND
SB-5	20-22	ND
SB-5	25-27	ND
SB-5	30-32	ND
SB-6	5-7	ND
SB-6	10-12	ND
SB-6	15-17	ND
SB-6	20-22	ND
SB-6	25-27	ND
SB-6	30-32	ND
SB-7	5-7	ND
SB-7	10-12	0.2
SB-7	15-17	ND
SB-7	20-22	ND
SB-7	25-27	ND
SB-7	30-32	ND
SB-8	10-12	0.3
SB-8	15-17	0.2
SB-8 *	20-22	0.4
SB-8	25-27	0.2
SB-8	30-32	0.1
SB-8	35-37	0.2
SB-8	40-42	0.3
SB-8 *	45-47	0.1
SB-9	5-7	ND
SB-9	10-12	ND
SB-9	15-17	0.2
SB-9 *	20-22	4.9
SB-9	25-27	3.1
SB-9	30-32	1.1
SB-9 *	35-37	ND

Boring #	Depth (feet)	HNU Level (ppm)
SB-10	5-7	ND
SB-10	10-12	ND
SB-10	15-17	3.9
SB-10	20-22	4.9
SB-10 *	25-27	5.8
SB-10	30-32	4.7
SB-10 *	35-37	5.6
SB-11	5-7	ND
SB-11	10-12	ND
SB-11	15-17	ND
SB-11	20-22	ND
SB-11	25-27	ND
SB-11	30-32	ND
SB-11 *	35-37	0.1
SB-11	40-42	ND
SB-12	5-7	ND
SB-12	10-12	ND
SB-12	15-17	ND
SB-12	20-22	4.2
SB-12	25-27	3.2
SB-12	30-32	3.8
SB-12	35-37	2.2
SB-12 *	40-42	5.6
SB-12 *	45-47	4.0
SB-13	20-22	0.8
SB-13 *	30-32	1.2
SB-13 *	40-42	0.2

* These Samples were sent to the laboratory for analysis

Table 2. Soil Sample Laboratory Analyses

Sample Code	Depth (feet)	GRO	DRO	Benzene	Ethyl benzene	Toluene	Xylene	MTBE	Pb
SB-1	13-15	1400	-	ND	0.72	ND	34	ND	7.5
SB-1	21-23	ND	-	ND	ND	ND	ND	ND	6.8
SB-1	33-35	ND	-	0.29	ND	ND	ND	ND	9.2
SB-2	5-7	46	-	ND	0.41	0.32	3.9	ND	6.5
SB-2	35-37	ND	-	0.84	ND	ND	ND	ND	5.3
SB-3	10-12	16	-	ND	0.24	0.37	1.6	ND	5.2
SB-3	35-37	23	-	0.18	2.9	0.19	9.2	ND	6.9
SB-8	20-22	-	ND	ND	ND	0.06	0.05	ND	-
SB-8	45-47	-	ND	ND	ND	ND	ND	ND	-
SB-9	20-22	-	ND	ND	ND	ND	ND	ND	-
SB-9	35-37	-	ND	ND	ND	ND	ND	ND	-
SB-10	25-27	-	ND	ND	ND	ND	ND	ND	-
SB-10	35-37	-	ND	ND	ND	ND	ND	ND	-
SB-11	35-37	-	ND	ND	ND	ND	ND	ND	-
SB-12	40-42	-	ND	ND	ND	ND	ND	ND	-
SB-12	45-47	-	ND	ND	ND	ND	ND	ND	-
SB-13	30-32	-	ND	ND	ND	ND	ND	ND	-
SB-13	40-42	-	ND	ND	ND	ND	ND	ND	-

Concentrations shown in parts per million
ND = Not detected
GRO = Gasoline range organics, * TPH as gasoline
DRO = Diesel range organics
MTBE= Methyl tertiary butyl ether
Pb = Lead
"-" = Not analyzed

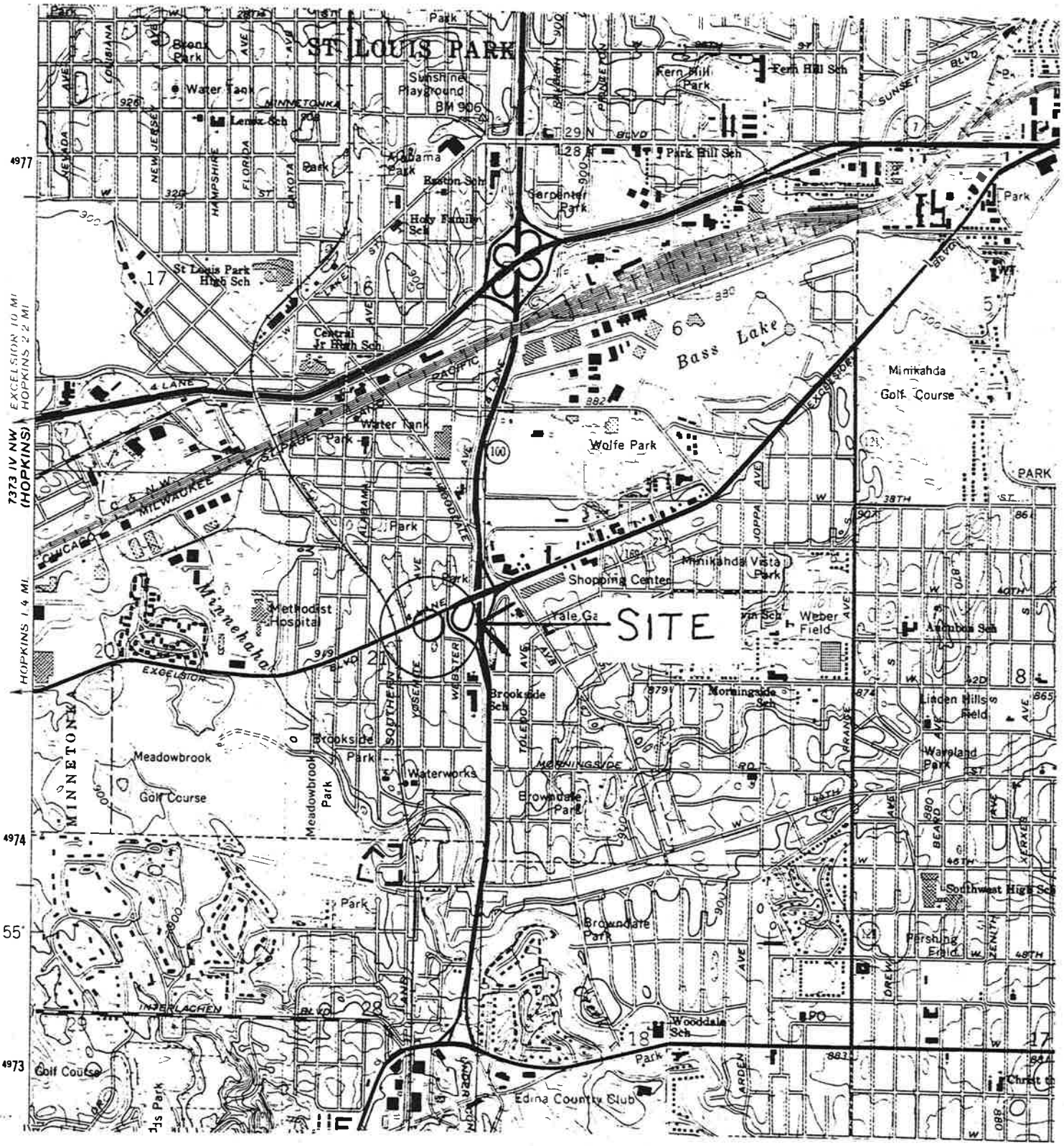
Table 3. Soil Sample Laboratory Analyses Summary
Those Constituents Identified in Laboratory Analyses

Concentrations in ppm	SB-1 13'-15'	SB-1 21'-23'	SB-1 33'-35'	SB-2 5'-7'	SB-2 35'-37'	SB-3 10'-12'	SB-3 35'-37'	SB-8 20'-22'
GRO	1400	ND	ND	46	ND	16	23	-
Benzene	ND	ND	0.29	ND	0.84	ND	0.18	ND
Ethylbenzene	0.72	ND	ND	0.41	ND	0.24	2.9	ND
Toluene	ND	ND	ND	0.32	ND	0.37	0.19	0.06
Xylene	34	ND	ND	3.9	ND	1.6	9.2	0.05
Lead	7.5	6.8	9.2	6.5	5.3	5.2	6.9	-

Concentrations shown in parts per million
ND = Not detected
GRO = Gasoline range organics, * TPH as gasoline
DRO = Diesel range organics
MTBE= Methyl tertiary butyl ether
Pb = Lead
"-" = Not analyzed

FIGURES

Figure 1. Site Location Map



MINNEAPOLIS SOUTH, MINN.

N4452.5—W9315/7.5
PHOTOINSPECTED 1977
1967
PHOTOREVISED 1972
AMS 7373 IV NE - SERIES V872

QUADRANGLE LOCATION

Figure 2. Site Layout Drawing

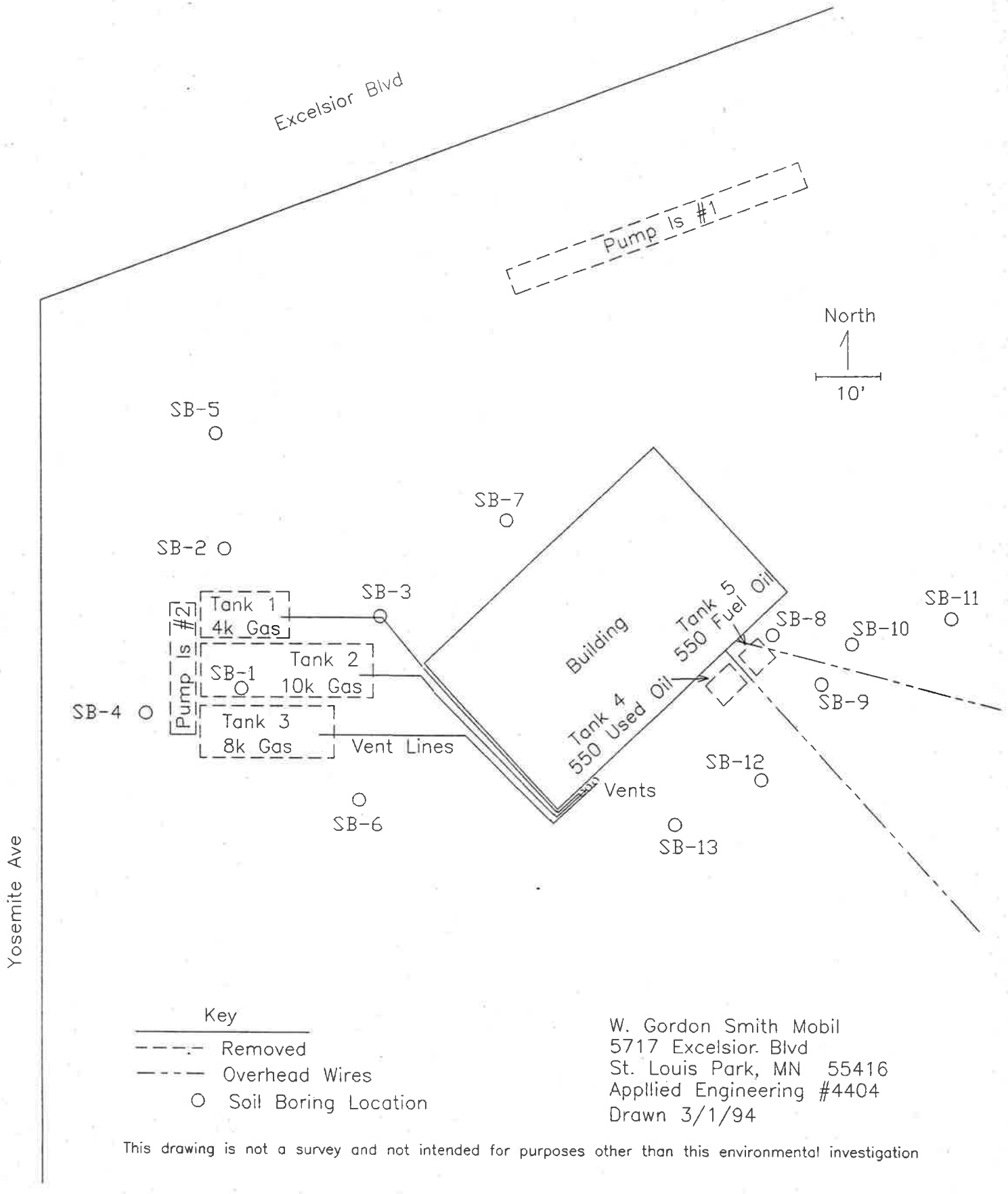
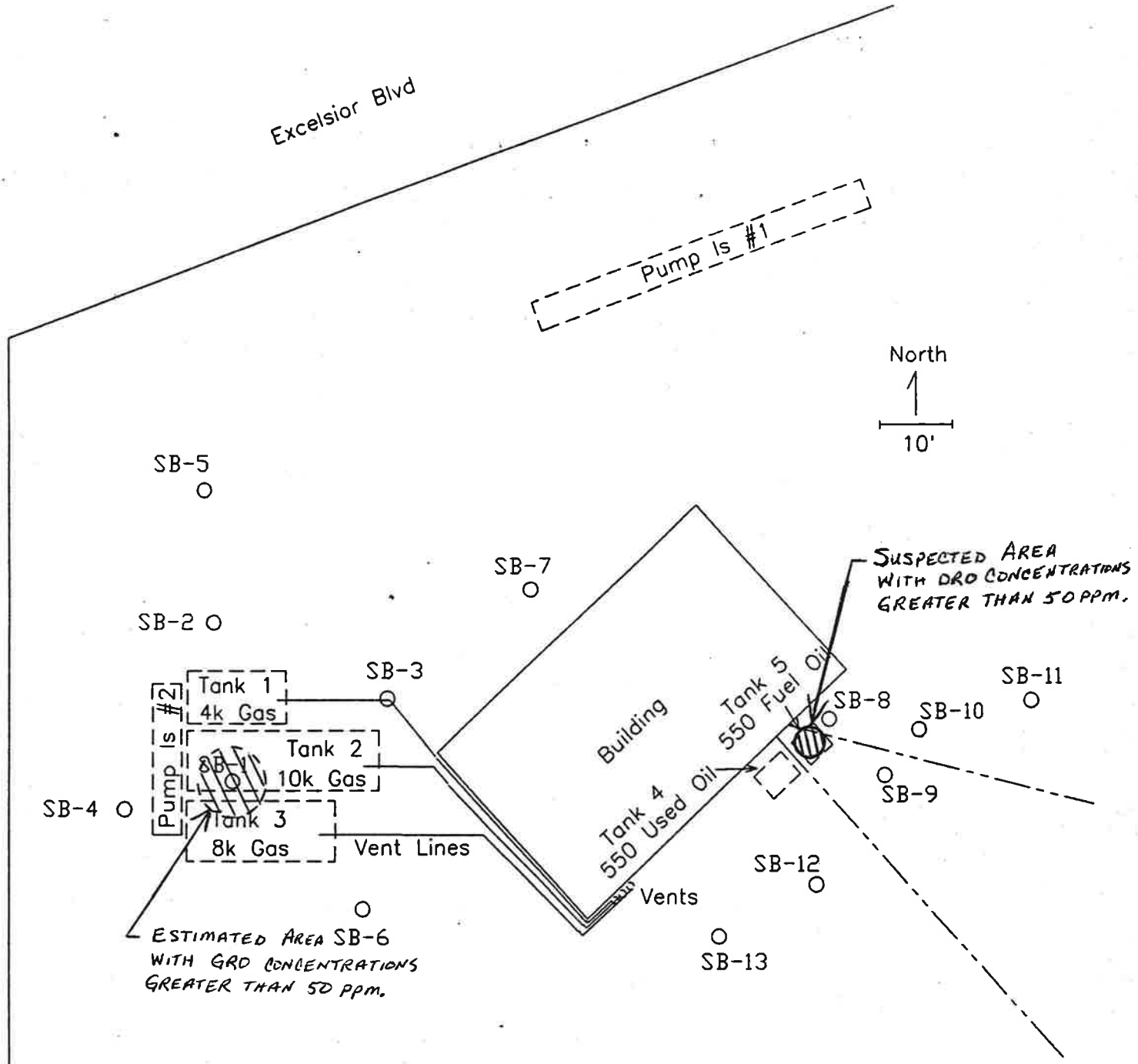


Figure 3. Petroleum Impacted Soil Remaining in Place



Key

- Removed
- Overhead Wires
- Soil Boring Location

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This drawing is not a survey and not intended for purposes other than this environmental investigation