FINAL
ENVIRONMENTAL SITE ASSESSMENTS
AND
RBCA EVALUATION

for

2805 West Commodore Way
Seattle, Washington

Prepared for

Time Oil Company

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Prepared by

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ACRONYMS AND ABBREVIATIONS

ASKO	ASKO Hydraulic, Inc.
ASTM	American Society for Testing Materials
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
DRO	diesel-range organics
EPA	U.S. Environmental Protection Agency
ESA	Environmental Site Assessment
Foster Wheeler Environmental	Foster Wheeler Environmental Corporation
mg/kg	milligrams per kilogram
MTCA	Model Toxics Control Act
NWTPH-Dx	Northwest total petroleum hydrocarbon-diesel
NWTPH-Gx	Northwest total petroleum hydrocarbon-gasoline
Property	2805 West Commodore Way
TCE	trichloroethene
TOC	Time Oil Company
UST	underground storage tank
VOC	volatile organic compound

EXECUTIVE SUMMARY

On behalf of the Time Oil Company (TOC), Foster Wheeler Environmental Corporation conducted a series of investigations at 2805 West Commodore Way, Seattle, Washington. The property has been used for light industrial activities (automobile maintenance, marine engine, and hydraulic equipment repair) since the late 1960s. In August 2000, a Phase I Environmental Site Assessment (ESA) was conducted on the property. The findings of this investigation were documented in the *Environmental Site Assessment: Phase I at 2805 West Commodore Way, Seattle, Washington*, published on August 25, 2000 (Appendix A). The Phase I ESA did not identify any registered underground storage tanks (USTs) associated with the property but did recommend additional subsurface activities in order to determine the condition of soil beneath the steam-cleaning area, drum storage shed, and the former heating oil UST.

In November 2000, soil borings were drilled in the three areas identified in the Phase I ESA. The findings of this investigation were documented in the *Final Environmental Site Assessment: Phase II at 2805 West Commodore Way, Seattle Washington,* published on April 6, 2001 (Appendix B). The Phase II report concluded that contaminant concentrations beneath the former heating oil UST and steam-cleaning area were below regulatory action levels. Subsurface contamination was detected at a depth of 2 to 5 feet below ground surface near the oil storage rack. Because the contamination is at least 20 feet from groundwater, with clean soil in between, and capped by 4 inches of concrete, no future activities were recommended.

To support the conclusions and recommendations of the Phase II ESA, a risk-based evaluation of the affected soil was conducted to refine the evaluation and to give spatial consideration of the data. The evaluation concluded that, when spatially averaged, the Model Toxics Control Act (MTCA) Method A Cleanup Levels or MTCA Method B Ingestion Cleanup Levels have been met and are therefore considered unlikely to pose a potential health risk at the property.

1. INTRODUCTION

1.1 BACKGROUND

Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) has been retained by the Time Oil Company (TOC) to conduct Method Toxics Control Act (MTCA) evaluation at 2805 West Commodore Way in Seattle, Washington (Figure 1). The property is owned by TOC and is located within a 1/4-mile radius.

This report, prepared for the sole use of TOC, presents the results of the MTCA evaluation of the property located at 2805 West Commodore Way (the Property), shown in Figure 1. The format of this report is generally consistent with the recommended format in "Standard Practice for Environmental Site Assessment: Phase I," issued by the American Society for Testing Materials (ASTM) Standard E 1527-97.

1.2 PURPOSE

In August 2000, Foster Wheeler Environmental completed Phase I Environmental Site Assessments (ESAs) at seven properties along West Commodore Way owned by TOC. The Phase I ESA for 2805 West Commodore Way (Appendix A) recommended additional investigation to assess subsurface conditions in three specific areas of the site. In November and December 2000, Foster Wheeler Environmental installed six soil borings. The results of the analytical data showed petroleum products and volatile organic compounds (VOCs) in two borings at concentrations above a point-by-point comparison of the MTCA Method A Unrestricted Land Use Cleanup Levels. This risk-based MTCA Method A Evaluation was conducted to refine the evaluation and give spatial consideration of the data.

1.3 SITE BACKGROUND

The site at 2805 West Commodore Way is zoned as an industrial area (Figure 1). There are two buildings on the site. The main building is used for fabricating metal parts; a smaller building is used to store oil drums (Figure 2). The majority of the ground surface at the site is paved. The southern boundary of the site slopes toward the Burlington Northern rail line. Each day there are approximately 25 workers on site involved in metals machining and fabricating activities.

TOC acquired the site in 1946. Historical photographs indicate that the site was undeveloped in 1936. Originally, the site was divided into smaller lots. In 1946, the site had been cleared and was used by TOC for the staging of empty 55-gallon drums. The current facility on site was constructed in the late 1960s to service TOC's vehicles. Between 1974 and 1979, the site was used for marine and truck engine rebuilding and contained a warehouse and machine shop. In 1979, ASKO Hydraulic, Inc. (ASKO) began fabricating metal parts in the main building.

According to a representative for ASKO, several changes have occurred at the site since the time the facility was originally built. An oil storage shed was added around 1996. Before 1996, petroleum products were stored in 55-gallon drums on a rack in the area. The change was made in response to state regulations and local fire marshal directives. In addition, a small (<500 gallons) heating oil underground storage tank (UST) was removed outside the northwest corner of the building. No reports were available regarding the removal of this UST. However, the King County Department of Design, Construction, and Land Use has a permit application from 1964 on file for the installation of two 550-gallon USTs. The presence of a second UST could not be confirmed. No previous investigations have been conducted at the facility.

2. PHASE II INVESTIGATION AND RESULTS

2.1 INVESTIGATION

Six soil borings were advanced in three areas of the Property (Figure 3).

Area 1: Steam-cleaning Area—An outdoor bermed steam-cleaning area, used for cleaning tools, is located near the southeast corner of the main building. Oily water is collected in an open drain and transferred to an oil/water separator located inside the main building. One soil boring (SB-40) was completed in this area to a depth of 15 feet to evaluate the subsurface conditions. Groundwater was not encountered during boring activities.

Area 2: Former Heating Oil UST—During the employee interview process, it was discovered that a 500-gallon or smaller heating oil UST had been removed outside of the northeast corner of the building. There were no records or reports available to confirm this action or what the subsurface conditions were at the time of removal. Subsequently, three soil borings (SB-46, SB-47, and SB-48) were completed in this

area to a depth of 25 feet to evaluate the subsurface conditions. Groundwater was not encountered at SB-47 or SB-48. Groundwater was encountered in SB-46 at a depth of 25 feet below ground surface (bgs) based on the saturated sample, though no free-standing water was detected in the boring. The depth of water in SB-46 was consistent with the regional trends, and the boring was not advanced further.

Area 3: Oil and Solvent Storage Area—An oil and solvent storage area is located just northeast of the steam-cleaning area. Two soil borings (SB-49, SB-50) were completed in this area to a depth of 15 feet to evaluate the subsurface conditions. Groundwater was not encountered.

None of the soil borings drilled at the site penetrated the shallow aquifer. Based on information from adjoining properties, the shallow aquifer beneath the site was found at approximately 25 feet bgs. The aquifer consists of fine- to well-sorted sand with some silt. The aquifer is approximately 20 feet thick and is underlain by dense, gray silt and clay. Groundwater beneath the site is believed to flow to the north toward the Ship Canal. There are no wells on the site, nor were groundwater samples collected during this investigation.

The samples were analyzed for the following contaminants:

- Gasoline; benzene, toluene, ethylbenzene, and xylene (BTEX), using NWTPH-Gx and U.S. Environmental Protection Agency (EPA) Method 8021B;
- Diesel and oil, using NWTPH-Dx;
- Total metals, using EPA 6010A/7000A series; and
- VOCs, using EPA Method 8260B.

2.2 CLEANUP CRITERIA

The analytical results were compared to the MTCA Cleanup Criteria, effective August 15, 2001. For this site, only soil cleanup levels are being evaluated. Groundwater samples were not collected at the site because contaminated soil was not found within 15 feet of the water table.

There are two types of soil cleanup levels: unrestricted land use levels and industrial land use levels. According to the MTCA Cleanup Regulation 173-340-2000, "unrestricted site use" means that restrictions on the use of the site or natural resources affected by releases

of hazardous substances from the site are not required to ensure continued protection of human health and the environment.

The same regulation identifies "industrial properties" as properties that are or have been characterized by, or are to be committed to, traditional industrial uses such as processing or manufacturing of materials, marine terminal and transportation areas and facilities, fabrication, assembly, treatment, or distribution of manufactured products, or storage of bulk materials, that are either

- Zoned for industrial use by a city or county conducting land use planning under Chapter 36.70A RCW; or
- Zoned for industrial use and adjacent to properties currently used or designated for industrial purposes, in counties not planning under Chapter 36.70A RCW and the cities within them.

However, many of the MTCA Method A Soil Cleanup Levels for unrestricted and industrial uses are identical because many of the cleanup levels are based on concentrations that are protective of groundwater and independent of land use (unrestricted versus industrial).

2.3 METHOD COMPARISON RESULTS

The following sections describe the analytical results relative to applicable risk-based action levels.

2.3.1 Steam-cleaning Area

One boring was completed at the steam-cleaning area:

- SB-40

Trichloroethene (TCE) was detected at a depth of 10 feet bgs at a concentration of 0.170 milligrams per kilogram (mg/kg), which is above the MTCA Method A Unrestricted Land Use Cleanup Levels representing soil levels that are protective of groundwater. Since groundwater beneath the site is not used for drinking water, the more applicable cleanup level would be the MTCA Method B Ingestion Cleanup Level for exposure based on soil ingestion. The MTCA Method B Ingestion Cleanup Level is based on the potential for site workers to come in

contact with, and ingest impacted soil. When compared to the MTCA Method B Cleanup Level (91 mg/kg), the site concentration is well below the cleanup level.

TPH as gasoline was detected at a depth of 10 feet bgs at a concentration (8.05 mg/kg) which is below the MTCA Method A Unrestricted Land Use Cleanup Level (30 mg/kg). Metals were not detected above the MTCA Method A Unrestricted Land Use Cleanup Level. Diesel, motor oil, or other VOC analytes were not detected above the method reporting limit.

The method detection limits (0.100 mg/kg) for three chemicals (benzene, methylene chloride, and trichloroethene) exceeded the MTCA Method A Unrestricted Land Use Cleanup Level. The MTCA Method A Cleanup Levels are 0.03 mg/kg, 0.02 mg/kg, and 0.03 mg/kg, respectively, and are based on protection of groundwater. However, the detection limits do not exceed the MTCA Method B Ingestion Cleanup Levels.

2.3.2 Former Heating Oil UST Area

Three borings were completed in this area:

- SB-46, SB-47, and SB-48

  Diesel was detected at a depth of 2 feet bgs and at 10 feet bgs in boring SB-46, at concentrations of 90.8 mg/kg and 10.7 mg/kg, respectively. Oil was also detected at a depth of 2 feet bgs in SB-46 at a concentration of 147 mg/kg. None of the detected concentrations of diesel and oil exceeded the MTCA Method A Unrestricted Land Use Cleanup Level. Gasoline was not detected above the MTCA Method A Cleanup Level. VOCs were not detected above the method reporting limit. Petroleum-impacted soil was not detected in contact with the groundwater.

2.3.3 Oil and Solvent Storage Area

Two borings were completed in this area:

- SB-49

  Gasoline, diesel, oil, and xylenes were detected (using EPA Method 8021B) in SB-49 at a depth of 2 feet bgs, at concentrations exceeding the MTCA Method A Cleanup Level. Gasoline, diesel, oil, and xylene were also detected (using

EPA Method 8021B) at a depth of 5 feet bgs; however, only gasoline and xylenes exceeded the MTCA Method A Cleanup Levels. At a depth of 10 feet bgs, gasoline and xylene were not detected above the reporting limit (5.00 mg/kg for gasoline and 0.100 mg/kg for xylene). Diesel-range organics (DRO) and oil exceeded the MTCA Method A Cleanup Levels at the shallow interval but were below the MTCA Method A Cleanup Level at depths of 5 feet bgs and deeper. The spatial average concentrations of all samples collected from SB-49 and SB-50 are 95 mg/kg for gasoline; 396 mg/kg for diesel; 623 mg/kg for oil; and 5.3 mg/kg for xylene. The averages are calculated using the measured values and the reporting limit if not detected. The spatial averages are for each of the analytes below the MTCA Method A Cleanup Levels.

Ethylbenzene; toluene; 1,2,4-trimethylbenzene; 1,3,5-trimethylbenzene; m,p-xylene; and o-xylene were detected in SB-49 at a depth of 2 feet bgs using EPA Method 8260B. In addition to these analytes, p-isopropyltoluene was detected at a depth of 5 feet bgs using EPA Method 8260B. Ethylbenzene, m,p-xylene, and o-xylene were detected in SB-49 at depths of 2 feet bgs and 5 feet bgs, at concentrations above the MTCA Method A Cleanup Levels. However, when compared to MTCA Method B Ingestion Cleanup Levels, the concentrations do not exceed cleanup levels. There are no MTCA Method A Cleanup Levels for 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and p-isopropyltoluene. At 10-foot and 15-foot-depth interval sampling, none of the analytes were detected above the method-reporting limit in SB-49. The difference in the analytical results between the two analytical methods could be attributable to the non-homogeneity of the soil samples or to the differences between the two analytical methods. The soil samples for VOC analysis were collected first, followed by the sample containers for gasoline and BTEX. If the contaminated interval in the recovered sample is small, then sample jars for different analysis may contain soil from unequally impacted intervals of the recovered sample. This can lead to disparity in the analytical results when similar analytes are run using different methods.

- SB-50

  None of the analytes were detected above the method reporting limits in SB-50.

3. CONCLUSIONS

3.1 CONCLUSIONS

Based on the samples collected, there is limited subsurface petroleum- and solvent-impacted soil above the MTCA Method A Cleanup Levels for unrestricted land use at 2805 Commodore Way in two of the six soil borings. Solvent-impacted soil was identified near the steam-cleaning area in SB-40 (TCE at 0.170 mg/kg, at a depth of 10 feet bgs). The TCE concentration detected in SB-40 does not exceed the MTCA Method B Ingestion Cleanup Level, which represents a more appropriate cleanup standard for the site. Petroleum-impacted soil was identified near the drum storage area in SB-49 at depths of 2 feet (gasoline, diesel, oil, and xylenes) and 5 feet bgs (gasoline and xylenes). When the concentrations measured in SB-49 and SB-50 for each depth interval are spatially averaged, the MTCA Method A Cleanup Levels and MTCA Method B Ingestion Cleanup Levels are not exceeded.

Based on the analytical results from the Phase II ESA (Appendix B) conducted in December 2000, the MTCA evaluation shows that residual petroleum- and solvent-impacted soil beneath 2805 West Commodore Way, when spatially averaged, does not exceed the MTCA Method A or MTCA Method B Cleanup Levels, and is, therefore, considered unlikely to pose a potential risk at the site.

3.2 ASSUMPTIONS AND LIMITATIONS

This report is based on the following assumptions and limitations:

- The MTCA evaluation is limited to the analytical data generated during the Phase II investigation.
- The MTCA evaluation is limited to the potential chemicals associated with current activities; any future changes may require additional evaluation.
- Groundwater samples were not collected at the site because contaminated soil was not detected within 15 vertical feet of the water table.
- It is assumed that the groundwater elevation will not rise and come into contact with the petroleum-impacted soil remaining at the site.

4. REFERENCES

Foster Wheeler Environmental (Foster Wheeler Environmental Corporation). 2000. *Environmental Site Assessment: Phase I at 2805 West Commodore Way, Seattle, Washington.* Prepared for Time Oil Company. August 2000.

Foster Wheeler Environmental. 2001. *Final Environmental Site Assessment: Phase II at 2805 West Commodore Way, Seattle, Washington.* Prepared for Time Oil Company. April 2001.

TABLES

Table 1. Analytical Results for Chemicals Exceeding MTCA Method A (mg/kg) Using NWTPH-GX/BTEX Analytical Method

Sample	Gasoline	Xylene	Diesel	Oil	TCE
MTCA[1]	***100***	***9***	***2,000***	***2,000***	***0.03***
MTCA B – Ingestion	na	***160,000***	na	na	***91***
Analytical Method	8021B	8021B	8021B	8021B	8060B
Steam-cleaning Area					
SB-40-2	< 5.00	< 0.100	< 10.0	< 25.0	< 0.100
SB-40-5	< 5.00	< 0.100	< 10.0	< 25.0	< 0.100
SB-40-10	8.05	< 0.100	< 10.0	< 25.0	***0.170***
SB-40-15	< 5.00	< 0.100	< 10.0	< 25.0	< 0.100
Oil Storage Area					
SB-49-2	***264***	***18.6***	***2,770***	***4,350***	< 0.100
SB-49-5	***467***	***23.7***	339	485	< 0.100
SB-49-10	< 5.00	< 0.100	< 10.0	< 25.0	< 0.100
SB-49-15	< 5.00	< 0.100	< 10.0	< 25.0	< 0.100
SB-50-2	< 5.00	< 0.100	< 10.0	< 25.0	< 0.100
SB-50-5	< 5.00	< 0.100	< 10.0	< 25.0	< 0.100
SB-50-10	< 5.00	< 0.100	< 10.0	< 25.0	< 0.100
SB-50-15	< 5.00	< 0.100	< 10.0	< 25.0	< 0.100

Notes:

Detections above MTCA Method A cleanup levels are shown in ***bold italics.***

[1] MTCA Method A cleanup levels for soil (unrestricted land use)

TCA – Trichloroethene

NA – Not Available

FIGURES

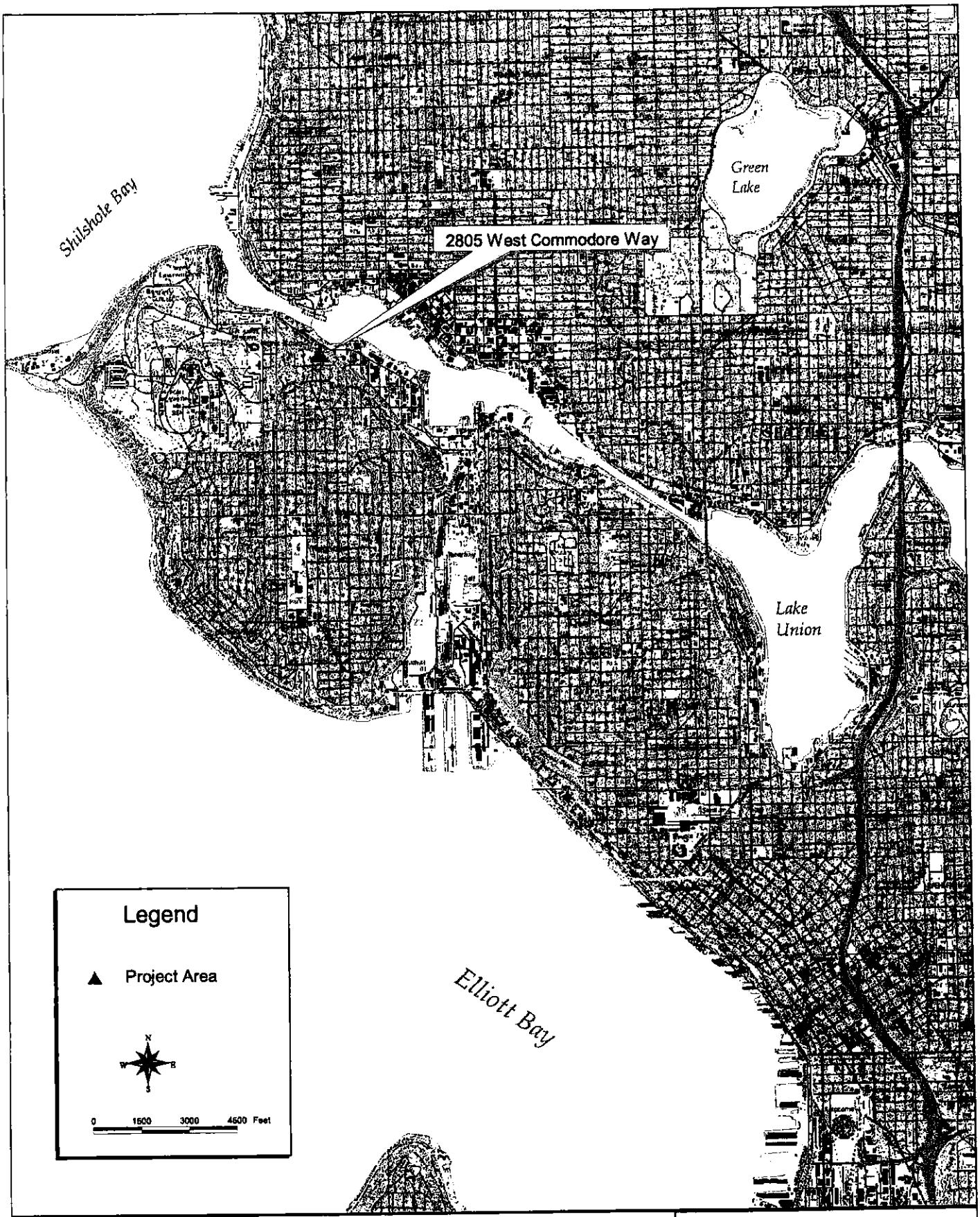

Figure 1

Time Oil Company
MTCA Evaluation

Location of Property at
2805 West Commodore Way

abe 's c:\projects\time_oil\vic_map.apr June 2002

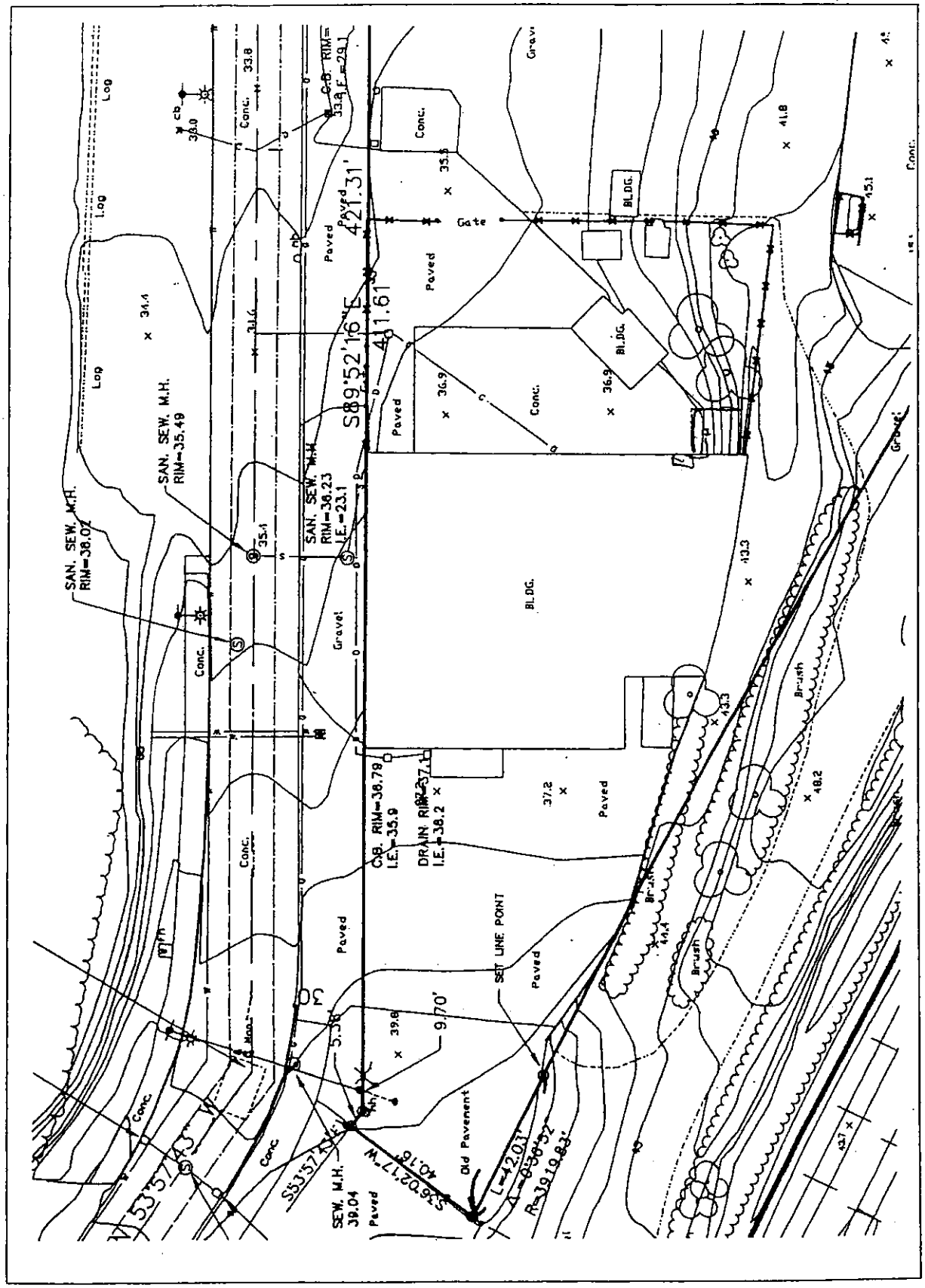

Figure 1-2. Layout of Property at 2805 West Commodore Way

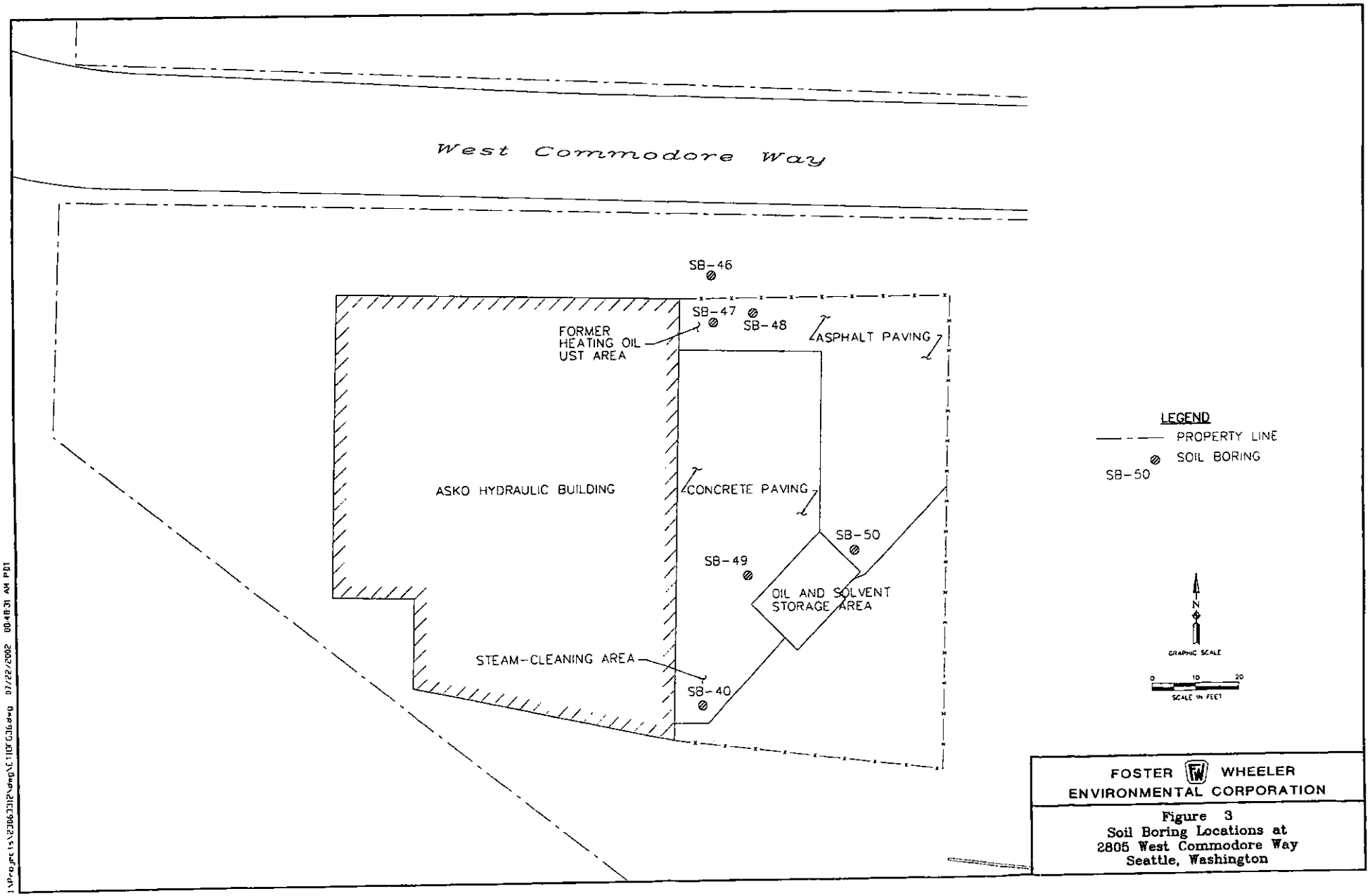

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Figure 3
Soil Boring Locations at
2805 West Commodore Way
Seattle, Washington