Site 956

Draft Limited Site Characterization Report

For Limited Characterization of a Petroleum Release at the
DeBocks Texaco Facility,
Grandview, WA

Prepared For:

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Executive Summary

Alba Excavating, Inc. (AEI), Grandview, WA removed an Underground Storage Tank (UST) system in March, 1995 at the Debocks Texaco facility located at 100 West Main Street, Grandview, WA. White Shield, Inc. (WSI) performed closure site assessment services upon removal of the UST system. The WSI findings are documented in their UST Closure Site Assessment and Interim Remedial Action Report (May, 1995). The WSI closure site assessment found that petroleum hydrocarbon impacted soils remain beneath the original location of the fuel dispenser island location.

R. E. Powell Distributing Co. retained Sage Earth Sciences, Inc. (Sage) to perform limited site characterization services to determine the lateral extent of petroleum impacted soil and groundwater on the subject property. Sage collected soil and groundwater samples from five (5) completed soil borings and submitted them to Edge Analytical, Inc. (EAI), Burlington, WA for independent laboratory analysis. Sage performed the field activities on October 19 - 23, 1995 using a stainless steel soil auger.

To determine if groundwater and/or soil remediation is required, Sage compared the analytical results to the "Method A Cleanup Levels" (Cleanup Levels) of WAC 173-340-720 & 740. Based upon the analytical results, gasoline impacted soil and groundwater appears to extend beyond the northern, eastern and western property borders. Although no borings were established immediately adjacent to the southern property border, it is likely that gasoline impacted soil and/or groundwater extends beyond this property border.

The majority of gasoline impacted soil appears to be located at the northeast portion of the property. At the property borders, gasoline impacted soil appears to be limited to a "smear zone" located immediately adjacent to the groundwater surface.

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1.0 Introduction

1.1 Purpose

The purpose of this site investigation report is to describe findings associated with an investigation utilizing a total of five (5) completed, vertical soil borings to determine horizontal contamination extent at the DeBocks Texaco Facility, Grandview, WA. This limited investigation complies with regulatory requirements established by the Washington State Department of Ecology (WSDOE).

1.2 Previous Work

Alba Excavating, Inc. (AEI), Grandview, WA removed an Underground Storage Tank (UST) system on March 13, 1995. White Shield, Inc. (WSI) Grandview, WA. provided the tank decommissioning and site assessment services. WSI site assessment findings are identified in their UST Closure Site Assessment and Interim Remedial Action Report (May, 1995). The WSI closure site assessment found that petroleum impacted soils remain beneath the original location of the fuel dispenser island location.

1.3 Scope of Work

R.E. Powell Distributing Co. retained Sage Earth Sciences, Inc. (Sage) to provide limited soil and groundwater sampling services to determine the rough extent of petroleum impacted soil and/or groundwater on the subject property. Selected soil and groundwater samples were submitted to Edge Analytical, Inc. (EAI) Burlington, WA for independent laboratory analysis.

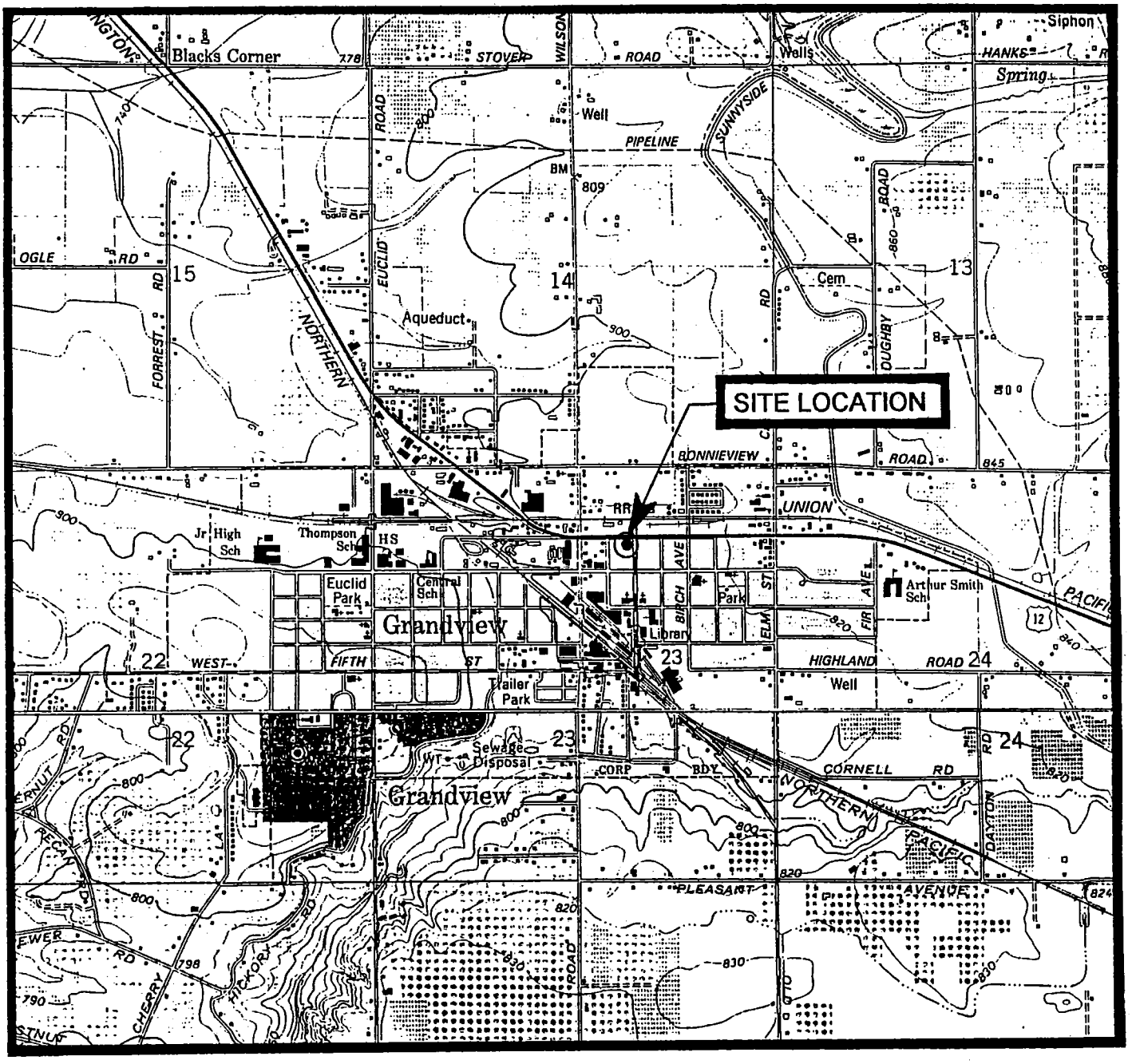
2.0 Background Information

2.1 Site Location

The facility is located at 100 West Main Street Grandview, WA. It is situated within the NW 1/4, of the NE 1/4, Section 23, Township 9 North, Range 23 East, of the Willamette Meridian. The location of the site is shown by Figure 1.

2.2 Site Description

The property is currently occupied by a service station at the location shown by Figure 2. The Sportcenter Tavern is located immediately south east of the property and the M&J Tavern is located immediately northwest of the site. Main Street is located immediately north of the site and Division Street lies immediately east of the property. An alley lies immediately south of the property.



SCALE 1:24000

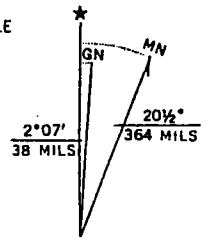
1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DOTTED LINES REPRESENT 5-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

QUADRANGLE LOCATION



TM GRID AND 1978 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092

Figure 1. Site Location Map

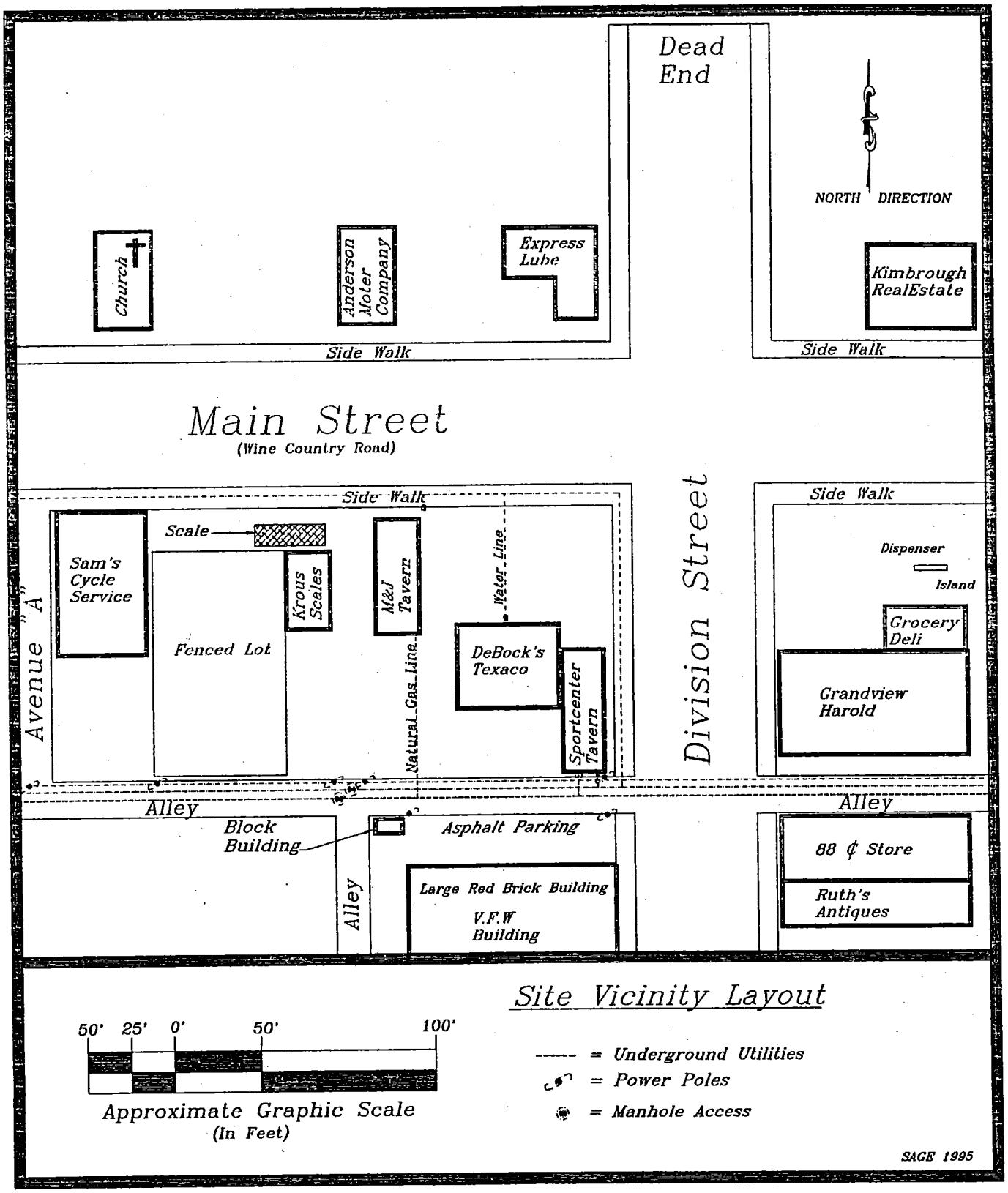


Figure 2. Site Vicinity Map

2.3 Soils Description

Visual inspection of soils within the soil borings found:

- Light brown, clayey, sandy, silt extending to depths of over seventeen (17) feet Below Ground Surface (BGS). This soil is classified as "ML" according to the Unified Soil Classification System (USCS). Medium to coarse sand units, varying in thickness from four (4) inches to one (1) foot, were encountered in Soil Borings #3, #4 and #5. Descriptions of soils encountered in each completed soil boring are provided by the Soil Excavation Profile (Appendix A).

3.0 Site Characterization

3.1 Soil Borings

Rodney Heit, an environmental assessor licensed by the International Fire Code Institute, provided limited soil and groundwater sampling services on October 19-23, 1995. Soil borings were established using a hand auger. Soil and groundwater sampling methods are described in Appendix B and sample descriptions are provided by Appendix C. Analytical methods and Quality Control procedures are described in Appendix D. The EAI analytical data reports are attached as Appendix E.

Sage attempted to establish a total of thirteen (13) soil borings at various locations throughout the subject site. However, underground conditions (rocks and debris) prohibited completion of all but five (5) of these borings. A discussion of each soil boring is presented below. The soil boring and sampling locations are shown by Figure 3. Soil removed from each boring was placed in a barrel for temporary storage at the site. Each boring was abandoned by filling the annulus with bentonite up to a depth of two (2) feet BGS. The remainder of open annulus was filled with concrete.

3.1.1 Soil Boring #1

Soil Boring #1 (SB#1) was attempted at the original location of the fuel dispenser island as shown by Figure 3. Upon attaining a depth of five (5) feet BGS, Sage encountered objects which prevented further boring at this location. Since adequate depths were not attained at this location the boring was abandoned and no samples were collected. Review of WSI documentation indicates that petroleum impacted soil extended from the ground surface down to depths greater than fourteen and one-half (14.5) feet BGS.

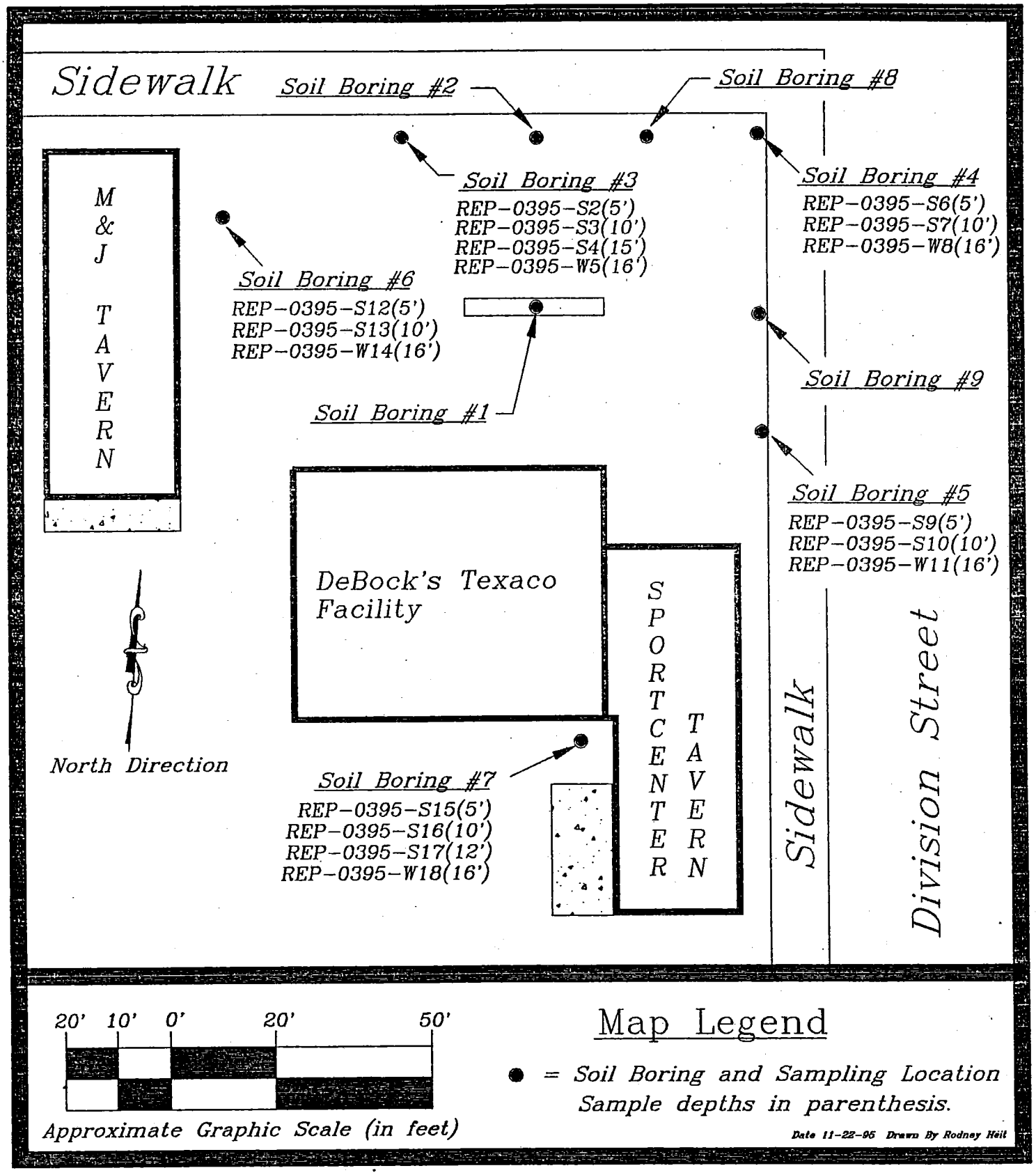


Figure 3. Soil Boring and Sampling Locations

3.1.2 Soil Boring #2

Soil Boring #2 (SB#2) was attempted along the northern property border at the location shown by Figure 3. Upon attaining a depth of eight (8) feet BGS, Sage encountered objects which prevented further boring at this location. No stained soil was encountered within this soil boring. Since adequate depths were not attained at this location the boring was abandoned and no samples were collected.

3.1.3 Soil Boring #3

Soil Boring #3 (SB#3) was established along the northern property border at the location shown by Figure 3. Stained soils were encountered at a depth of ten (10) feet BGS. Sage collected two (2) soil samples (REP-0395-S2, S3 and S4) at depths of five (5), ten (10) and fifteen (15) feet BGS. In addition, Sage collected one (1) groundwater sample (REP-0395-W5) from the boring.

Analysis of soil sample REP-0395-S3 found no detectable petroleum hydrocarbons. However, analysis of soil sample REP-0395-S4 found:

gasoline range petroleum hydrocarbons at a concentration of 1,800 parts per million (ppm),
no detectable (less than 0.1 ppm) benzene,
no detectable (less than 0.1 ppm) toluene,
ethylbenzene at a concentration of 1.7 ppm,
xylenes at a concentration of 4.1 ppm and
no detectable (less than 25 ppm) total lead.

Comparison of the analytical results (Appendix E) with the Method A soil Cleanup Levels (Cleanup Levels) of WAC 173-340-740 (Appendix F) indicates that remedial action is required at this location to reduce gasoline range petroleum hydrocarbon concentrations to acceptable levels.

Analysis of groundwater sample REP-0395-W5 found:

gasoline range petroleum hydrocarbons at a concentration of 67.4 ppm,
benzene at a concentration of 4.2 ppm,
no detectable (less than 1.2 ppm) toluene,
ethylbenzene at a concentration of 1.58 ppm,
xylenes at a concentration of 3.43 ppm and
total lead at a concentration of 0.064 ppm.

Comparison of the analytical results (Appendix E) with the Method A Groundwater Cleanup Levels (Cleanup Levels) of WAC 173-340-720 (Appendix F) indicates that remedial action is required at this location to reduce gasoline, benzene, ethylbenzene, xylene and total lead concentrations to acceptable levels.

3.1.4 Soil Boring #4

Soil Boring #4 (SB#4) was established at the northeast corner of the subject property as shown by Figure 3. Stained soils were encountered at a depth of eleven (11) feet BGS. Sage collected two (2) soil samples (REP-0395-S6 and S7) at depths of five (5) and ten (10) feet BGS. In addition, Sage collected one (1) groundwater sample (REP-0395-W8) from the boring.

Analysis of soil sample REP-0395-S7 found:

gasoline range petroleum hydrocarbons at a concentration of 326 parts per million (ppm),
no detectable (less than 0.1 ppm) benzene,
no detectable (less than 0.1 ppm) toluene,
no detectable (less than 0.3 ppm) ethylbenzene,
no detectable (less than 0.1 ppm) xylenes and
no detectable (less than 25 ppm) total lead.

Comparison of the analytical results (Appendix E) with the Cleanup Levels (Appendix F) indicates that remedial action is required at this location to reduce gasoline range petroleum hydrocarbon concentrations to acceptable levels.

Analysis of groundwater sample REP-0395-W8 found:

gasoline range petroleum hydrocarbons at a concentration of 53.1 ppm,
benzene at a concentration of 0.16 ppm,
toluene at a concentration of 0.83 ppm,
ethylbenzene at a concentration of 1.25 ppm,
xylenes at a concentration of 5.8 ppm and
total lead at a concentration of 0.047 ppm.

Comparison of the analytical results (Appendix E) with the Cleanup Levels (Appendix F) indicates that remedial action is required at this location to reduce gasoline, benzene, toluene, ethylbenzene, xylene and total lead concentrations to acceptable levels.

3.1.5 Soil Boring #5

Soil Boring #5 (SB#5) was established at the eastern property border as shown by Figure 3. Stained soils were encountered at a depth of nine and one-half (9.5) feet BGS. Sage collected two (2) soil samples (REP-0395-S9 and S10) at depths of five (5) and ten (10) feet BGS. In addition, Sage collected one (1) groundwater sample (REP-0395-W11) from the boring.

Analysis of soil sample REP-0395-S10 found:

gasoline range petroleum hydrocarbons at a concentration of 117 ppm,
no detectable (less than 0.1 ppm) benzene,
no detectable (less than 0.1 ppm) toluene,
no detectable (less than 0.3 ppm) ethylbenzene and
no detectable (less than 0.1 ppm) xylenes.

Comparison of the analytical results (Appendix E) with the Cleanup Levels (Appendix F) indicates that remedial action is required at this location to reduce gasoline range petroleum hydrocarbon concentrations to acceptable levels.

Analysis of groundwater sample REP-0395-W11 found:

gasoline range petroleum hydrocarbons at a concentration of 55.6 ppm,
no detectable (less than 0.05 ppm) benzene,
toluene at a concentration of 0.34 ppm,
ethylbenzene at a concentration of 1.42 ppm,
xylenes at a concentration of 4.87 ppm and
total lead at a concentration of 0.145 ppm.

Comparison of the analytical results (Appendix E) with the Cleanup Levels (Appendix F) indicates that remedial action is required at this location to reduce gasoline, toluene, ethylbenzene, xylene and total lead concentrations to acceptable levels.

3.1.6 Soil Boring #6

Soil Boring #6 (SB#6) was established at the northwestern property corner as shown by Figure 3. Stained soils were encountered at a depth of twelve (12) feet BGS. Sage collected two (2) soil samples (REP-0395-S12 and S13) at depths of five (5) and ten (10) feet BGS. In addition, Sage collected one (1) groundwater sample (REP-0395-W14) from the boring.

Analysis of soil sample REP-0395-S13 found:

no detectable (less than 20 ppm) gasoline range petroleum hydrocarbons,
no detectable (less than 0.1 ppm) benzene,
no detectable (less than 0.1 ppm) toluene,
no detectable (less than 0.3 ppm) ethylbenzene and
no detectable (less than 0.1 ppm) xylenes.

Comparison of the analytical results (Appendix E) with the Cleanup Levels (Appendix F) indicates that no remedial action is required at this sampling location.

Analysis of groundwater sample REP-0395-W14 found:

gasoline range petroleum hydrocarbons at a concentration of 185 ppm,
benzene at a concentration of 3.48 ppm,
toluene at a concentration of 1.89 ppm,
ethylbenzene at a concentration of 2.44 ppm,
xylenes at a concentration of 5.73 ppm and
total lead at a concentration of 0.096 ppm.

Comparison of the analytical results (Appendix E) with the Cleanup Levels (Appendix F) indicates that remedial action is required at this location to reduce gasoline, benzene, toluene, ethylbenzene, xylene and total lead concentrations to acceptable levels.

3.1.7 Soil Boring #7

Soil Boring #7 (SB#7) was established near the southeastern corner of the service station building as shown by Figure 3. Stained soils were encountered at a depth of twelve (12) feet BGS. Sage collected three (3) soil samples (REP-0395-S15, S16 and S17) at depths of five (5), ten (10) and twelve (12) feet BGS. In addition, Sage collected one (1) groundwater sample (REP-0395-W17) from the boring.

Analysis of soil sample REP-0395-S16 found:

no detectable (less than 20 ppm) gasoline range petroleum hydrocarbons,
no detectable (less than 0.1 ppm) benzene,
no detectable (less than 0.1 ppm) toluene,
no detectable (less than 0.3 ppm) ethylbenzene and
no detectable (less than 0.1 ppm) xylenes.

Comparison of the analytical results (Appendix E) with the Cleanup Levels (Appendix F) indicates that no soil remediation is required at this sampling location.

Analysis of soil sample REP-0395-S17 found:

gasoline range petroleum hydrocarbons at a concentration of 426 ppm,
no detectable (less than 0.1 ppm) benzene,
no detectable (less than 0.1 ppm) toluene,
no detectable (less than 0.3 ppm) ethylbenzene,
no detectable (less than 0.1 ppm) xylenes and
no detectable (less than 25 ppm) total lead.

Comparison of the analytical results (Appendix E) with the Cleanup Levels (Appendix F) indicates that soil remediation is required at this sampling depth to reduce gasoline range petroleum hydrocarbon concentrations to acceptable levels.

Analysis of groundwater sample REP-0395-W18 found:

gasoline range petroleum hydrocarbons at a concentration of 111 ppm,
benzene at a concentration of 0.14 ppm,
toluene at a concentration of 2.08 ppm,
ethylbenzene at a concentration of 1.53 ppm,
xylenes at a concentration of 6.93 ppm and
total lead at a concentration of 0.037 ppm.

Comparison of the analytical results (Appendix E) with the Cleanup Levels (Appendix F) indicates that remedial action is required at this location to reduce gasoline, benzene, toluene, ethylbenzene, xylene and total lead concentrations to acceptable levels.

3.1.8 Soil Boring #8

Soil Boring #8 (SB#8) was attempted along the northern property border at the location shown by Figure 3. Sage encountered an object which prevented further boring at a depth of eight and one-half (8.5) feet BGS. No stained soils were encountered at this soil boring location. Since adequate depths were not attained at this location the boring was abandoned and no samples were collected.

3.1.9 Soil Boring #9

Soil Boring #9 (SB#9) was established along the eastern property border at the location shown by Figure 3. This boring was established to a depth of approximately nine (9) feet BGS. Stained soil and petroleum odors were encountered at this depth but additional depths were not attained due to the presence of an object which prevented further boring. Since adequate depths were not attained at this location the boring was abandoned and no samples were collected.

3.2 Extent of Impacted Soil

Petroleum impacted soils were encountered in all soil borings in which groundwater was encountered. The lateral extent of petroleum impacted soil can not be determined unless permission is obtained to establish soil borings on adjacent properties. However, based upon soil borings established on the subject property, impacted soils that exist on adjacent properties appear to be limited to a "smear zone" immediately adjacent to the groundwater surface.

Using data obtained from on-site soil borings, Sage constructed a map showing the extrapolated depth of the impacted soil surface. This map is shown by Figure 4. Depths to the top of the impacted soil plume were not extrapolated for depths beyond twelve (12) feet BGS. Additional soil borings must be established if this information is desired. The data indicates that petroleum impacted soil underlies the majority of the service station building and the northern portion of the Sport Center tavern.

3.3 Extent of Impacted Groundwater

The lateral extent of petroleum impacted groundwater could not be determined due to the lack of off-site data. However, the data collected indicates that petroleum impacted groundwater extends north, east and west of the subject property. Sage suspects that impacted groundwater also exists beyond the southern property border.

4.0 Recommendations

Based upon the analytical results, remedial action is necessary to reduce petroleum hydrocarbon concentrations in the soil and groundwater. Soil conditions, such as those found at the subject site, restrict implementation of *in-situ* (in-place) remediation techniques such as groundwater extraction and *in-situ* bioremediation. This is due to the low permeability which restricts injection or extraction of vapors and liquids.

Excavation and treatment of accessible petroleum impacted soil is likely to be the most effective method to reduce hydrocarbon concentrations in site soils. Based on the extrapolated data, it appears that soils readily accessible for excavation is limited to the northern portion of the subject property. Removal of this soil will require removal of the existing service station canopy. Sage recommends transport of the impacted soil to a permitted facility or to a site approved by the local Health District. The soil could then be treated using landfarming and/or bioremediation techniques. The lowermost portion of the remedial excavation should be backfilled with permeable material such as gravel. This will facilitate extraction of petroleum impacted groundwater, via an extraction well(s), for treatment and subsequent permitted discharge.

Downgradient impacted soil and groundwater could be allowed to naturally degrade and attenuate. However, Sage recommends assisting these naturally occurring processes through addition of oxygen and nutrients as needed. Sage also recommends installation of at least three (3) groundwater monitoring wells to facilitate collection of groundwater samples and to determination of hydrogeologic conditions

5.0 Limitations

In performance of this project, Sage Earth Sciences has conducted its activities in accordance with current regulatory guidelines. The conclusions and recommendations are based upon our field observations and independent laboratory analyses. Since the scope of work for this project is limited to partial characterization of a petroleum hydrocarbon release, this document does not imply that the property is free of other environmental constraints.

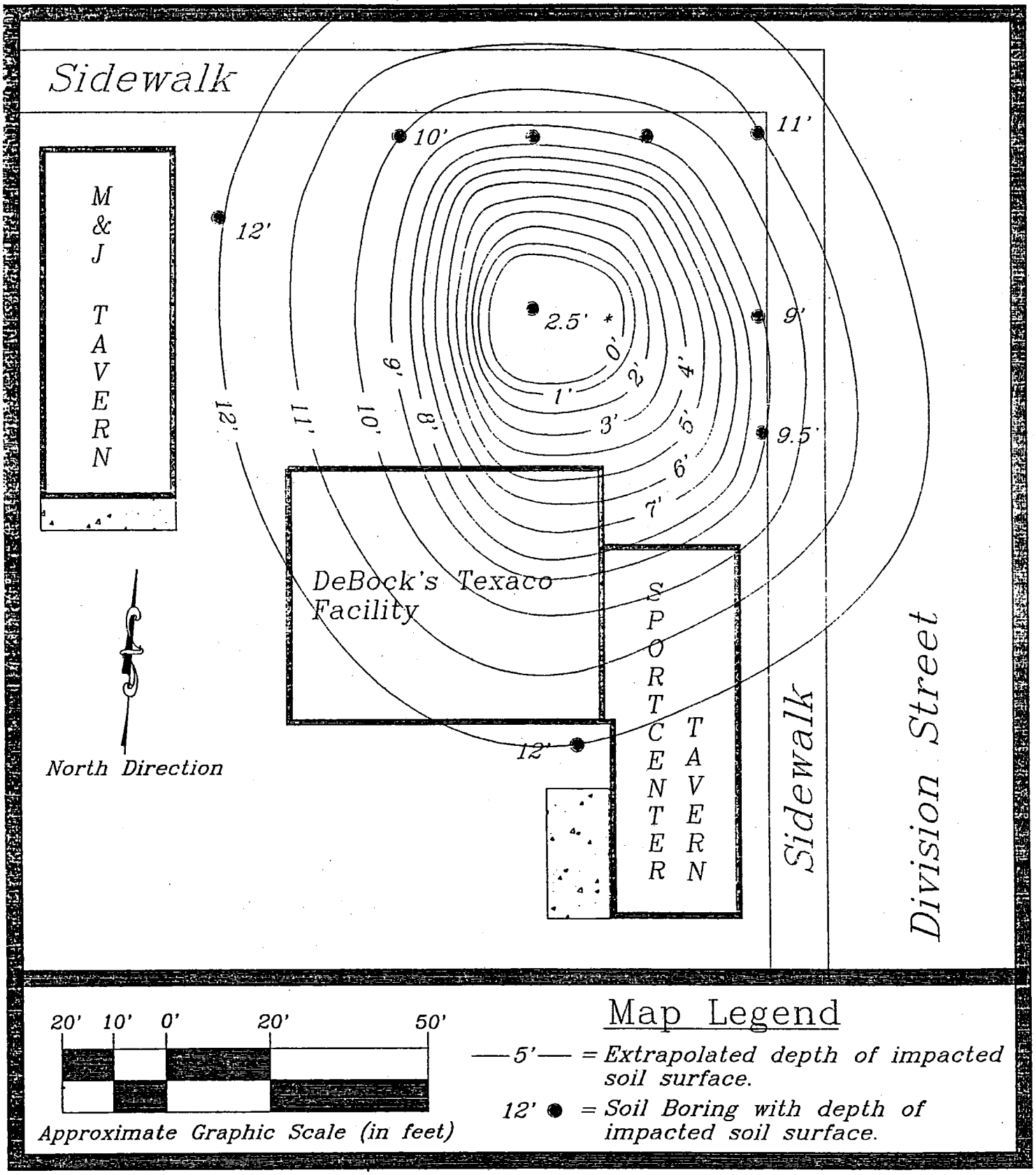


Figure 4. Extrapolated Depth of Impacted Soil Surface