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CLEANUP Action Plan

**14 ROY STREET
SEATTLE, WASHINGTON**

Prepared For:

Motion Financial Management Group

March 1999

Kleen Environmental, Inc.

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1.0 INTRODUCTION

Kleen Environmental, Inc. (Kleen) of Seattle, Washington, on behalf of the Motion Financial Management Group, prepared this document. The purpose of this document is to outline the proposed Cleanup Action Plan (CAP) for remediating petroleum and chlorinated solvent contaminated soil discovered at the 14 Roy Street site during previous investigations. In addition, this document presents plans for the installation of groundwater monitoring wells and the monitoring of groundwater quality at the site and off site.

The overall goal of this CAP is to provide an effective mechanism for protecting human health and the environment from contaminated site soils, while allowing future development of the property. The specific objectives of the proposed CAP are as follows:

- Excavate petroleum and chlorinated solvent contaminated soil (PCCS) at the former location of two 175-gallon underground chlorinated solvent vessels, the subsurface electrical vault, and the 4000-gallon PS-300 underground storage tank (UST);
- Bring site soil concentrations for the contaminants of concern (COC) into compliance with applicable soil cleanup levels as promulgated in the Washington State Department of Ecology Model Toxics Control Act (MTCA) Cleanup Regulations (Chapter 173-340 WAC);
- Develop a groundwater monitoring program to assess groundwater quality on- and off-site, establish groundwater quality standards for COC, and define a groundwater point of compliance; and
- Obtain a No Further Action (NFA) letter from the Washington State Department of Ecology (WDOE) for soil at site.

1.1 CAP AND ADDITIONAL PLANS

This CAP and the plans included within its appendices present a comprehensive description of the work to be accomplished, methods and approaches to conducting the work, and tentative schedules. These plans will help assure concurrence between Kleen, the MFM, and WDOE regarding the work to be accomplished, schedules, and deliverables.

Kleen, MFM, and WDOE will each have responsibilities during the Remedial Action (RA). These documents describe the overall scope of the project and will define the roles for each party. The MFM will be responsible for obtaining right of entry onto the property, public relations during and after the cleanup work, reviewing and

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property, public relations during and after the cleanup work, reviewing and approving proposed changes affecting scope, budget and payment of contractor invoices.

Kleen will be responsible for RA oversight, confirmation sampling and analysis, air and groundwater monitoring, and earthwork. Kleen will be responsible for performing the earthwork, waste disposal, temporary site security, and partial site restoration work.

WDOE will work with Kleen and MFM to assure that the work performed at the site meets the intent of the WDOE's Opinion Letter dated October 1, 1998. The CAP consists of the following appendices:

- A. Field Sampling and Analysis Plan.
- B. Quality Assurance Plan.
- C. Health And Safety Plan
- D. Equipment Decontamination Plan.
- E. Waste Management Plan.
- F. TCLP Results

1.2 PROJECT LOCATION AND DESCRIPTION

The site is located at 14 West Roy Street in Seattle, Washington (Figure 1). The site is physically located at the intersection of First Avenue and West Roy Street, approximately two blocks north-northwest of the Seattle Center. The site covers an area of approximately 17,500 square feet. Prior to November of 1997, approximately 80 percent of the property was occupied by Orestes Restaurant, while the remainder of the property was covered by an asphalt parking area.

Apartment complexes are located on the properties adjacent to the north and east, a vacant lot is adjacent to the west (former Unocal gasoline station), and a parking garage, church and bookstore are located adjacent to the south.

1.3 SITE HISTORY

Between 1955 and 1973, the site was occupied by Paramount Dry Cleaners. For a short period of time, the site was then occupied by a retail plant store, followed by a restaurant from approximately 1983 to 1992. In November of 1997, MFM demolished Orestes Restaurant. At present, the western portion of the site is currently unpaved while the eastern portion is an asphalt parking area.

1.4 PROJECT BACKGROUND

Between June 1995 and January 1996, Clayton Environmental Consultants, Inc. (Clayton) investigated the subsurface soil and groundwater quality at the site. Clayton's activities and findings were as follows:

- Two soil borings were drilled at the site and three soil borings were drilled off-site. The on-site borings were installed between the former Unocal gasoline station and the former Orestes Restaurant. Off-site soil borings were located on the south side of West Roy Street;
- On-site soil borings (B1 and B2) were drilled to a depth 15 feet BGS, while off-site soil borings (B3, B4, and B5) were drilled to a depth of 15 to 19 feet BGS. One soil sample from each boring, collected near the water table, was analyzed for total petroleum hydrocarbons (TPHs), BTEX (benzene, toluene, ethylbenzene, and xylenes), and halogenated volatile organic compounds (HVOCs). Groundwater monitoring wells were installed in soil borings B1, B2, and B3 (MW-1, MW-2, and MW-3, respectively).
- BTEX and TPHs were not detected in soil samples or were at concentrations less than the applicable MTCA cleanup standards. HVOCs were only detected in soil boring B2. At a depth of approximately 11 feet BGS, perchloroethylene (PCE) and trichloroethylene (TCE) were detected in sample B2-S3 at concentrations of 2.3 mg/Kg and 0.04 mg/Kg, respectively.
- Groundwater monitoring wells MW-1 and MW-2 were screened between 5 and 15 BGS, while MW-3 was screened between 9 and 19 feet BGS. As of Clayton's last groundwater sampling event (January 4 and 5, 1996), HVOCs were detected in all three wells, while petroleum hydrocarbons were not detected. The HVOC concentrations were as follows:

Well No.	perchloroethylene (µg/L)	trichloroethylene (µg/L)	1,2-dichloropropane (µg/L)
MW-1	27	6.4	9.6
MW-2	340	17	nd
MW-3	120	42	nd

- A passive soil gas survey was conducted in December of 1995. Seven soil gas probes were installed at the site and five were installed off-site. Concentrations of perchloroethylene (PCE) and trichloroethylene (TCE) at the site ranged from non-detect to 3.5 ng/L and non-detect to 0.24 ng/L,

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respectively. Off-site concentrations of PCE and TCE ranged from 0.363 ng/L to 27.3 ng/L and non-detect to 0.363 ng/L, respectively.

Between December 1997 and March 1998, Quality Environmental Services Team, Inc. (QUEST) removed a 4000-gallon PS-300 oil underground storage tank (UST), an 860-gallon mineral spirits UST, and 175- and 200-gallon vessels containing PHs and HVOCs. Quest's activities and findings were as follows:

- A 4000-gallon PS-300 UST was removed from the Northwest portion of the Site. The integrity of the UST was good (no holes or cracks); however, water and oil were discovered in the UST. Groundwater entered the UST excavation pit at a depth of 10 feet BGS. The HVOC and TPH concentrations in stockpile soil samples were as follows:

Sample No.	PCE (mg/Kg)	TCE (mg/Kg)	cis 1,2-DCE (mg/Kg)	TPH-D (mg/Kg)	TPH-O (mg/Kg)
ASTOCK	140	0.956	0.712	148	166
BSTOCK	nd	nd	0.715	650	422

PCE = perchloroethene, TCE = trichloroethene, DCE = dichloroethene, TPH-D = diesel range TPHs, TPH-O = heavy oil range TPHs

HVOC and fuel compounds were also detected in the water and oil pumped from the UST.

- An 860-gallon UST containing mineral spirits was removed from the northwest corner of the site. The UST contained a mixture of product and water. A soil sample collected from the bottom of the UST excavation pit, at a depth of six feet BGS, contained aromatic hydrocarbons, and HVOCs. HVOCs were detected at the following concentrations:

Sample No.	PCE (mg/Kg)	TCE (mg/Kg)	cis 1,2- DCE (mg/Kg)	1,2-DCP (mg/Kg)	TPH-G (mg/Kg)
FS@6'	130	0.960	0.071	0.710	16,000

PCE = perchloroethene, TCE = trichloroethene, DCE = dichloroethene, DCP = Dichloropropane, TPH-G = gasoline range TPHs

- A 175-gallon and a 200-gallon underground vessel were removed from near the south side of the 860-gallon UST. Characterization of the liquid in the vessels showed that they contained aromatic hydrocarbons and HVOCs.

On August 7, 1998 Kleen conducted a supplemental site investigation. The purpose of this investigation was to fill in data gaps associated with the geology and subsurface soil quality at the site. Kleen excavated five tests pits and an electrical

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utility vault at the site. The depth of the test pits varied from approximately 3 to 9 feet below ground surface (bgs). Six soil samples were collected at the site.

Findings from Kleen's supplemental investigation indicated that contaminated soil was predominately confined to the western third of the site as associated with the former electrical vault, two former chlorinated solvent vessel, and a former 860 mineral spirits UST. In general contamination was associated with sandy soil that ranged in depth from near surface to a depth of approximately 10 to 15 feet bgs. Chlorinated hydrocarbons were detected in the soil along with mineral spirits. Concentrations of hydrocarbons were less than MTCA Method B soil cleanup levels. Positive results for TPHs exceeded MTCA Method A soil cleanup levels. TPH concentrations ranged from 109 mg/Kg to 10,619 mg/Kg.

Arnold's Texaco

Arnold's Texaco is located approximately 250 feet southwest of the site at the intersection of West Roy Street and Queen Anne Avenue North (Figure 2). In 1986, GeoEngineer, Inc. (GEI) installed eight groundwater monitoring wells down gradient from the station (i.e., to the southwest). Dissolved petroleum hydrocarbons were discovered in the groundwater. Light non-aqueous phase liquid (NAPL) was intercepted in well MW-6 located just west of the station. At present, a groundwater pump and treat system is active at the station.

Former Unocal Gasoline Station

The Unocal gasoline station was formerly located directly west of the site at 700 Queen Anne Avenue North (Figure 2). Since 1986, GEI has conducted an ongoing investigation of subsurface soil and groundwater quality at the station. During this time, GEI has drilled nine soil borings, installed nine groundwater monitoring wells, excavated 16 test pits, and at minimum, has performed yearly groundwater quality monitoring. In February of 1992, GEI monitored the removal of six USTs from the station: two 12,000-gallon gasoline tanks, one 550-gallon heating oil tank, and one 500-gallon waste oil tank.

Petroleum contaminated soil and groundwater have been discovered throughout the station. Concentrations of TPHs and BTEX have been detected in both soil and groundwater at concentrations exceeding MTCA Method A groundwater cleanup standards. In addition, chlorinated solvents have been detected in two groundwater monitoring wells located near the former Orestes Restaurant. Free product has been detected in two wells located down gradient of the station.

Results from the most recent groundwater sampling event at the station (August and November 1997) indicated that depth to groundwater ranged from 7.6 to 17.5 feet BGS in August, and 7.6 to 18.2 feet BGS in November. Free product was detected in two off-site wells and dissolved petroleum hydrocarbons were detected in the

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remaining wells (six wells) at concentrations that exceed MTCA Method groundwater cleanup standards. HVOCs were also detected in the two monitoring wells located near the former Orestes. Concentrations of HVOCs exceeded both MTCA Methods A and B groundwater cleanup standards.

1.5 SELECTED REMEDY

MFM has selected a RA for the site that includes the following elements:

- Removal and off-site disposal of PCCS to Holnam in Seattle, Washington;
- Excavation of approximately 500 to 1,000 tons of PCCS;
- Application of MTCA Method A soil cleanup levels for gasoline and diesel range total petroleum hydrocarbons (TPHs) and Method B for Chlorinated hydrocarbons;
- Application of WDOE's Interim TPH Policy (i.e., using Method B risk based criteria) in areas of the site where TPHs in the soil do not pose a threat to groundwater quality, and the concentration of chlorinated hydrocarbons are below Method B cleanup levels;
- Future monitoring of groundwater on-site and off-site to ensure the continued effectiveness of the RA.

2.0 REMEDIAL ACTION TASKS

The following sections provide a breakdown of the work to be accomplished during the Remedial Action phase of the project.

2.1 RA Task

Startup

This task involves the following:

- Underground utility check and decommissioning
- The mobilization of site personnel and equipment;
- Establishment of the personnel decontamination area;
- Location of the on-site field screening lab; and
- Establishing procedures for managing runoff from the site.

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- Location of the on-site field screening lab; and
- Establishing procedures for managing runoff from the site.

Soil Excavation and Disposal

Approximately 500 to 1,000 tons of soil will be excavated at the site using a track-mounted backhoe. Soil requiring off-site disposal will be dug and immediately transferred to trucks for transportation and disposal at Holnam. Soil with concentrations of petroleum hydrocarbons less than applicable MTCA Method A and B soil cleanup levels will be stockpiled on site. The enduse of the stockpiled soil will be determined by future development and construction requirements at the site.

During a previous sampling event, Kleen collected worst case scenario soil samples from the site to determine whether PCCS at the site designates as hazardous waste. Using the EPA's Toxics Characteristic Leach Procedure (TCLP), results for volatile organic compounds indicate that the soil does not designate as a hazardous waste per WAC 173-360-90(8). TCLP results are presented in Appendix F

There are three primary areas of soil excavation planned for the site (Figure 3):

- Area 1: Former Subsurface Electrical Vault – Soil in the cavity is contaminated with petroleum and chlorinated hydrocarbons. Contaminated soil in this area is believed to be the primary source for groundwater contamination on- and off-site. Historically, the vault was open to the surface and anecdotal evidence suggest the solvents may have been dumped in the vault.
- Area 2: Former Subsurface Chlorinated Solvent Vessel and an 860 gallon UST – A 200- and an 175-gallon vessel containing chlorinated solvents were discovered in this area during a previous site investigation. In addition, an 860-gallon UST containing mineral spirits was also discovered. Soil in the UST cavity is contaminated with petroleum and chlorinated hydrocarbons.
- Area 3: Former 4000-gallon UST - Soil in the UST cavity is contaminated with petroleum and chlorinated hydrocarbons. Soil in the cavity contains some of the highest concentrations of chlorinated hydrocarbons discovered at the site. Because the cavity is underlain by thick units of silt and clay, contaminated soil does not pose a threat to groundwater quality but may be a threat to human health via direct soil contact

Other areas that may be excavated, depending on the number of tons previously removed, will include the potentially contaminated soil underlying the former product line that connected Areas 2 and 3, and potentially contaminated soil discovered near on-site monitoring wells MW-1 and MW-2.

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Dewatering

If groundwater or surface water entering the excavation prohibits soil removal or contains visible petroleum product, the water will be pumped to on-site Baker™ tank for later characterization and disposal.

Groundwater Monitoring Wells

After site RA activities have been completed and the site has been developed, three to four groundwater monitoring wells will be installed on- and/or off-site. The wells will be sampled until at least four consecutive annual quarters of test results are below applicable MTCA groundwater levels. Prior to the installation of monitoring wells, Kleen will prepare a groundwater monitoring well installation plan and a groundwater sampling and analysis plan to MFM and WDOE for review.

3.0 CLEANUP LEVEL FOR SOIL AND GROUNDWATER

3.1 Soil Cleanup Levels

Compliance with MTCA soil cleanup regulations will be based on Method A and B soil cleanup levels (Chapter 173-340-740(2) & (3) WAC}. Soil cleanup levels for the site are as follows:

Contaminants of Concern	Method A Cleanup Standard (mg/Kg)	Method B Cleanup Standard (mg/Kg)
perchloroethylene	NA	19.6
trichloroethylene	NA	90.9
1,2-dichloropropane	NA	14.7
cis 1,2-dichloroethylene	NA	800
trans 1,2-dichloroethylene	NA	1600
vinyl chloride	NA	0.526
benzene	NA	34.5
toluene	NA	16,000
ethylbenzene	NA	8000
xylene	NA	160,000
TPH-gasoline range	100.0	NA
TPH-diesel range	200.0	NA
TPH-heavy oil range	200.0	NA

NA = not applicable under present scenario

Should a significant volume of petroleum contaminated soil be intercepted at the site, and it is determined that it does not pose a threat to groundwater quality, WDOE's Interim TPH Policy may be applied to establish Method B risk based cleanup levels for TPHs.

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Interim TPH Policy may be applied to establish Method B risk based cleanup levels for TPHs.

3.2 Groundwater Cleanup Levels

Compliance with MTCA groundwater cleanup regulations will be based on Method A and B cleanup levels (Chapter 173-340-740(2) & (3) WAC}. Groundwater cleanup levels for the site are as follows:

Contaminants of Concern	Method A Cleanup Standard (µg/L)	Method B Cleanup Standard (µg/L)
perchloroethylene	NA	.0885
trichloroethylene	NA	.398
1,2-dichloropropane	NA	.0643
cis 1,2-dichloroethylene	NA	17.5
trans 1,2-dichloroethylene	NA	35.0
vinyl chloride	NA	.0023
total petroleum hydrocarbons	1000	NA

NA = not applicable under present scenario

4.0 COMPLIANCE WITH CLEANUP LEVELS

4.1 Soil Compliance

The decision as to whether site soils comply with a cleanup level will be based on three criteria:

- The upper 95% confidence limit on the true population mean calculated from the sampling data cannot exceed the cleanup level;
- No sample concentration can exceed twice the cleanup level; and
- Less than 10% of the samples can exceed the cleanup level.

If the sample data set is not normal or log-normally distributed, the UCL will be calculated using non-parametric methods.

4.2 Groundwater Compliance

5.0 REMEDIAL ACTION SUBMITTALS TO WDOE

5.1 REMEDIAL ACTION COMPLETION REPORT

The RA Completion Report will document the completion of the Remedial Action at the 14 Roy Street site. The following topics will be covered in the Report:

- Project Description, Purpose, and Background
- Soil Removal Areas and Depths
- Confirmation Sampling and Analysis
- Compliance with Cleanup Standards
- Site Restoration and Future Landuse
- Off-Site Disposal
- Conclusions

6.0 REMEDIAL ACTION SCHEDULE

Kleen anticipates that Remedial Action will begin in late November of 1998. The RA should be completed within five days. The Remedial Action Completion Report should be completed by January 1, 1999.

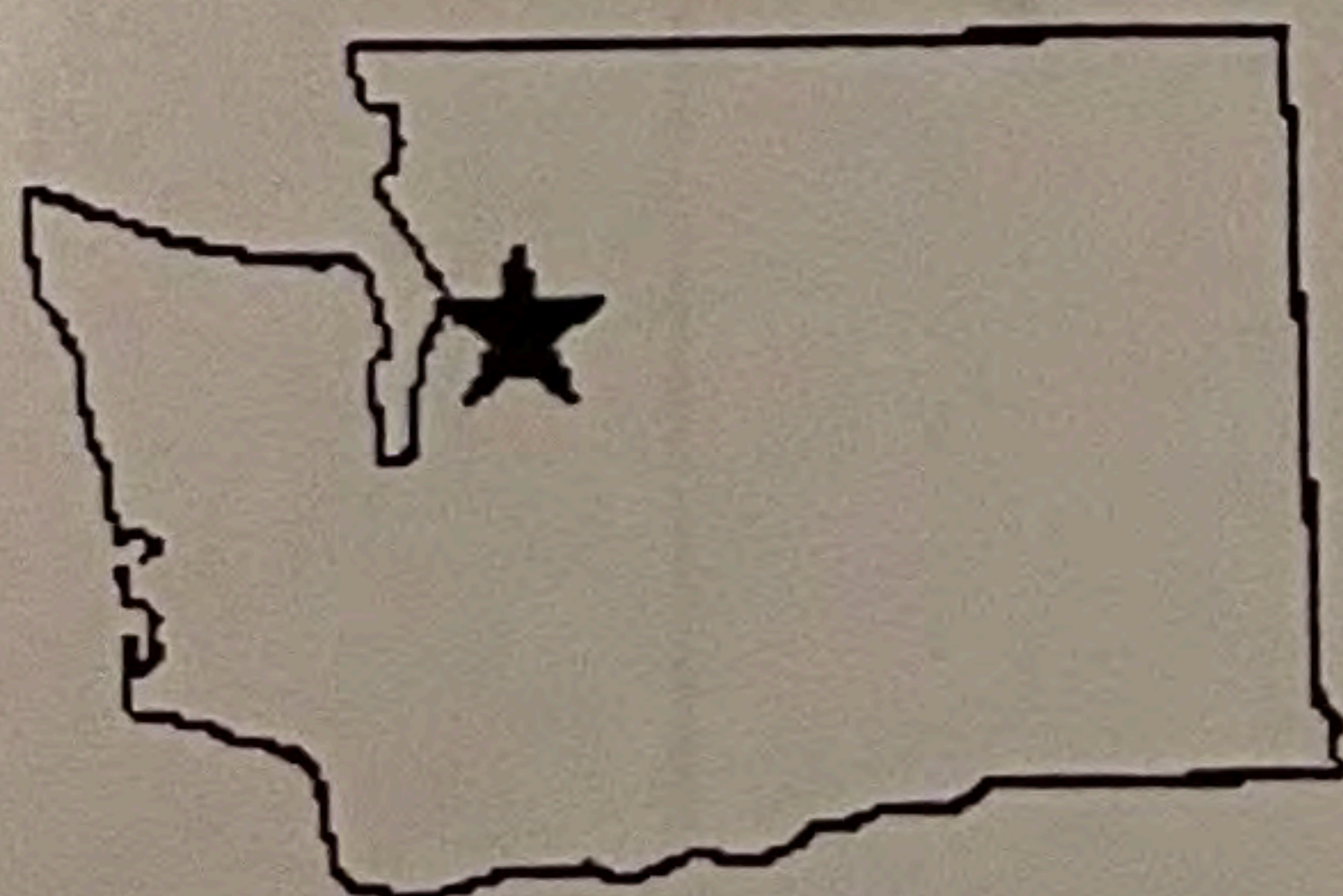
7.0 REFERENCES

Washington State. 1995. Dangerous Waste Regulations. Chapter 173-303 WAC. Publication No. 92-91 Amended November 1995.

Washington State. The Model Toxics Control Act Cleanup Regulations. Chapter 173-340 WAC. Publication No. 94 Amended January 1996.

Washington State Department of Ecology. 1995. Guidance on Sampling and Data Analysis Methods. Publication No.94-49.

Washington State Department of Ecology Toxics Cleanup Program. 1992. Statistical Guidance for Ecology Site Managers. Publication No. 92-54.



SOURCE: USGS 7.5 MINUTE TOPOGRAPHIC SURVEY MAPS OF
SEATTLE NORTH QUADRANGLE.

Kleen ENVIRONMENTAL TECHNOLOGIES, INC.

**Figure 1
USGS MAP**

**14 ROY STREET ROY STREET PROJECT
PROPERTY LOCATED AT
WEST 14 ROY STREET
SEATTLE, WASHINGTON**

PROJECT NO.: 7043

DESIGNED BY: TJC

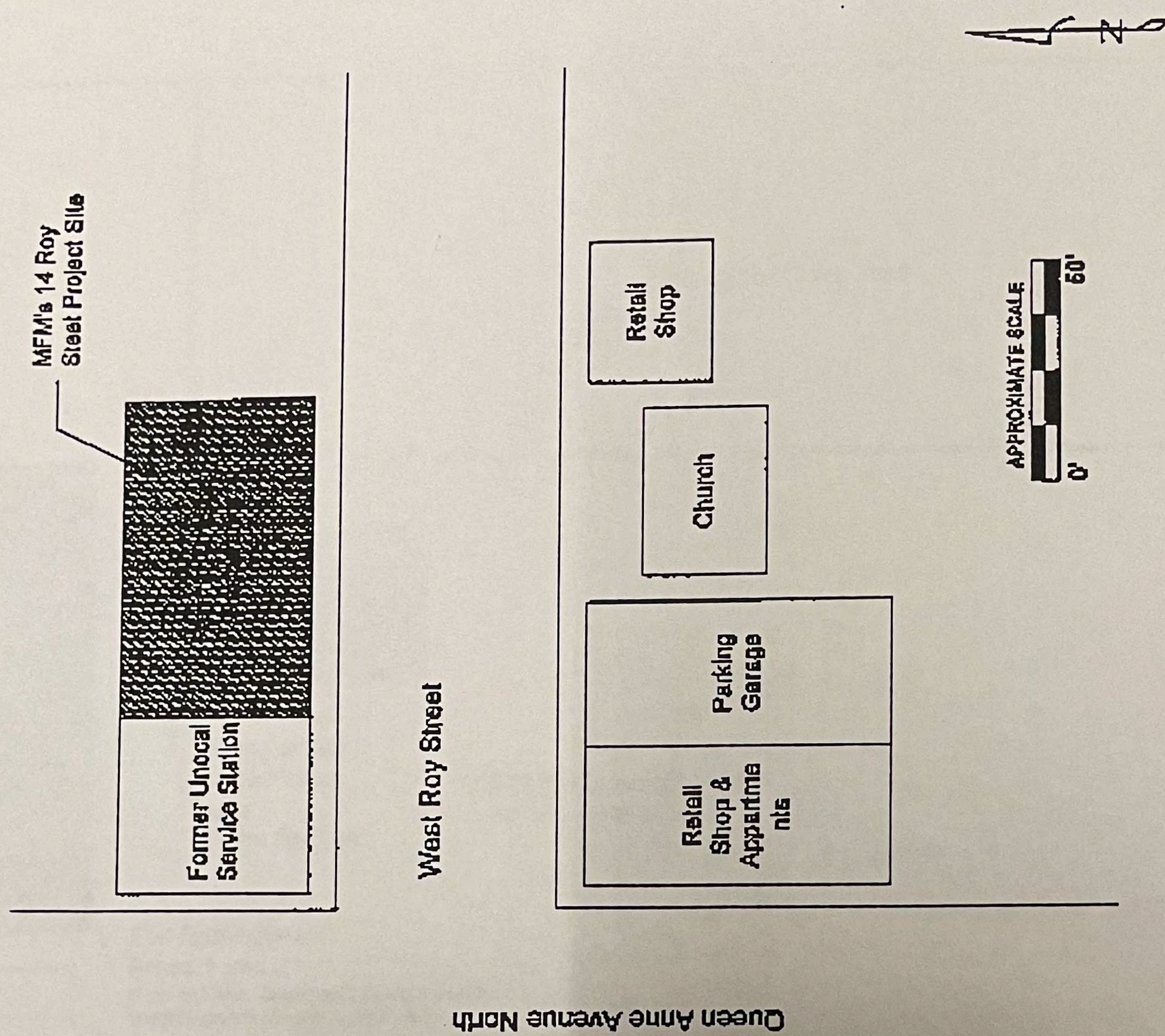
SCALE: 1:24,000

FILE: FIG1.VSD

DRAWN BY: TJC

DATE: 7/20/98

CHECKED BY:



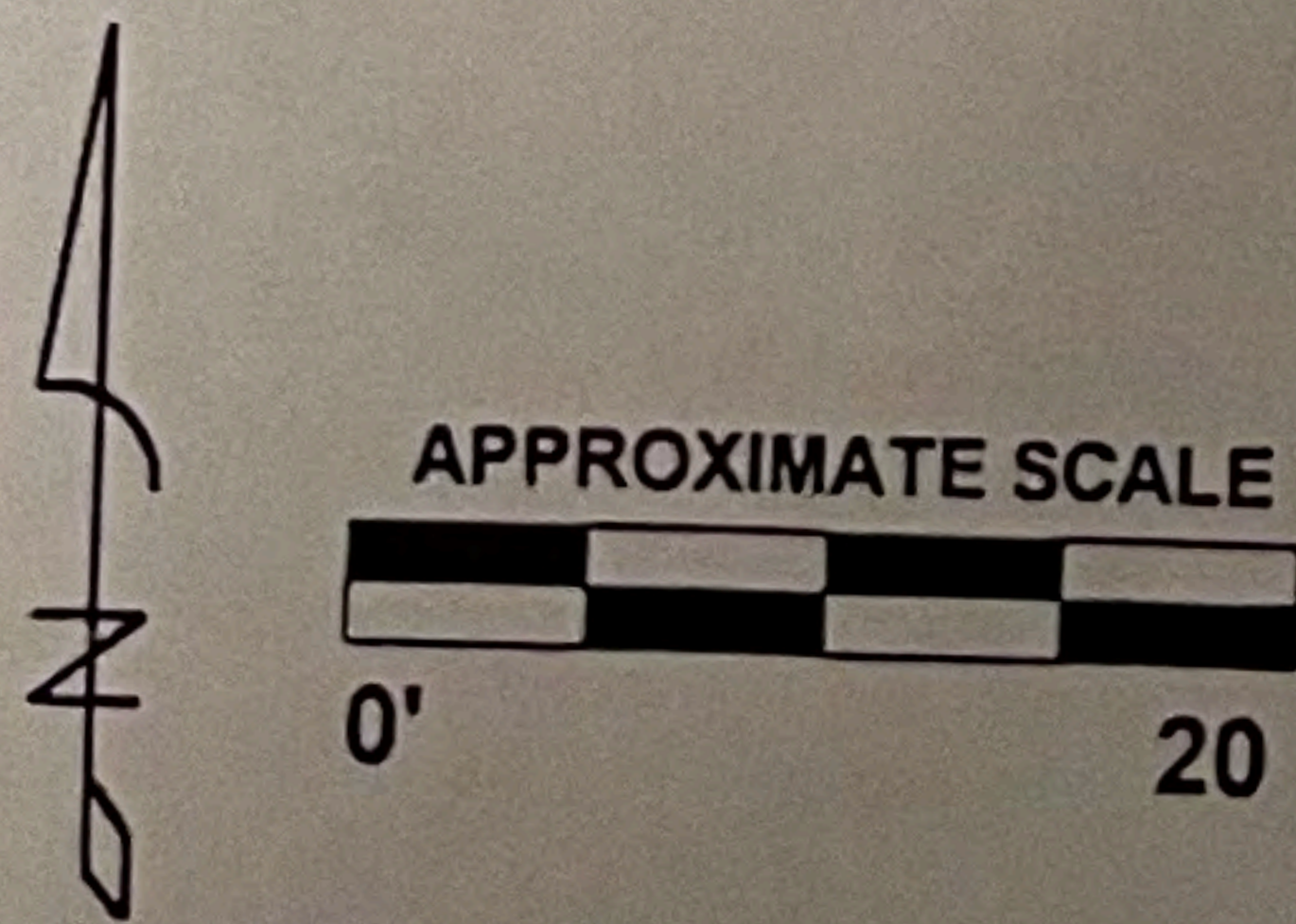
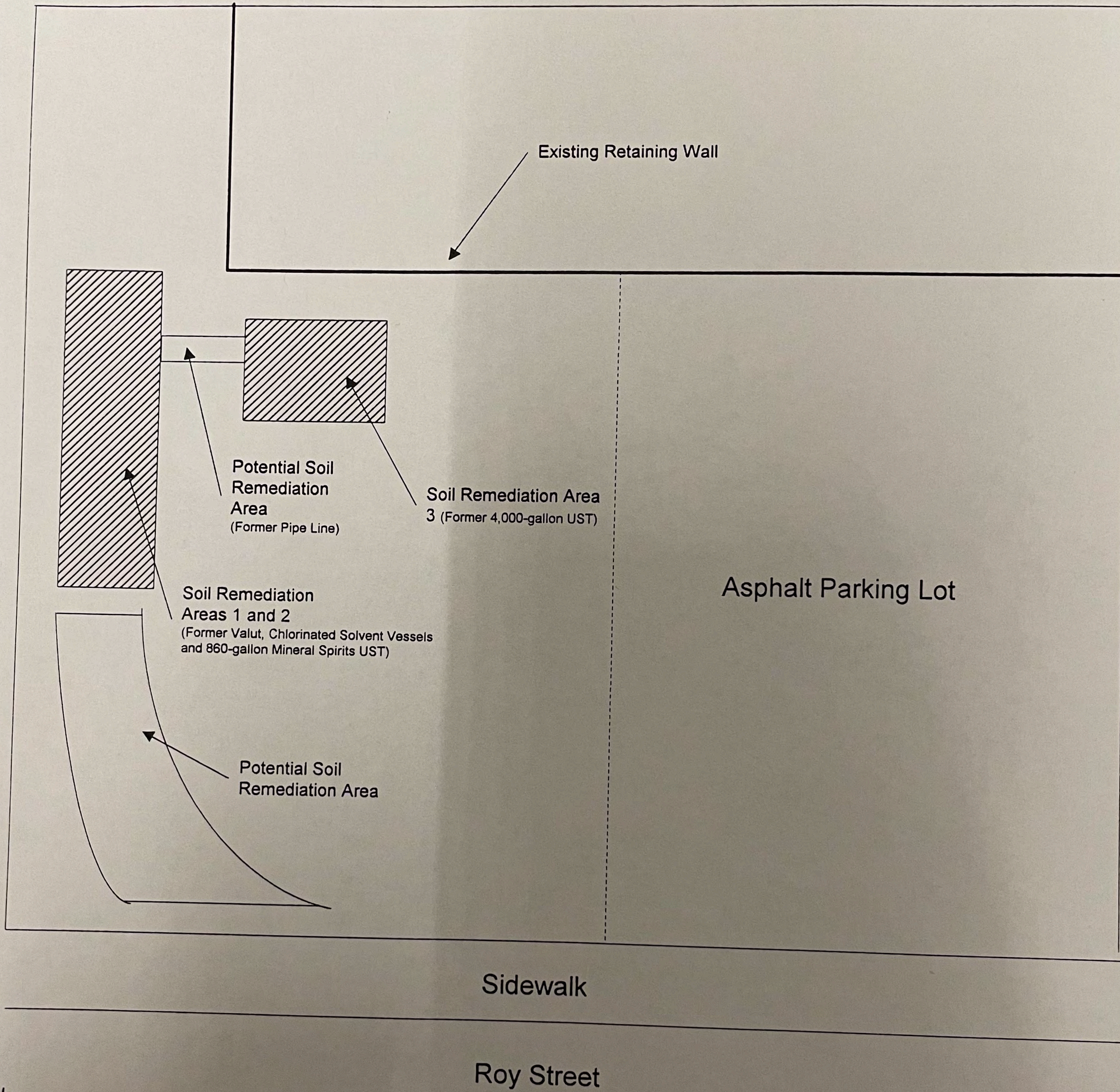
NOTE: ALL
LOCATIONS AND
DIMENSIONS ARE
APPROXIMATE

Figure 2
SITE AND SURROUNDING AREA

14 ROY STREET PROJECT
PROPERTY LOCATED AT
WEST 14 ROY STREET
SEATTLE, WASHINGTON

Kleen ENVIRONMENTAL TECHNOLOGIES, INC.

PROJECT NO.: 7043	SCALE: 1" = 20'	FILE: Fig4.vsd
DESIGNED BY: TJG	DATE: 7/20/98	CHECKED BY:
DRAWN BY: TJG		



Kleen ENVIRONMENTAL, INC.

PROJECT NO.: 7043

DESIGNED BY: TJC

DRAWN BY: TJC

SCALE: 1" = 20'

DATE: 11/3/98

FILE: Fig3b.vsd

CHECKED BY:

Figure 3
SOIL REMEDIATION AREAS
14 ROY STREET PROJECT
PROPERTY LOCATED AT
14 ROY STREET
SEATTLE, WASHINGTON