Report

Supplemental Site Characterization

Tosco Service Station 5353

600 Westlake Avenue North

Seattle, Washington

October 3, 2001

RECEIVED
ENVIRONMENTAL DEPARTMENT
NORTHWEST REGION

For

Tosco Marketing Company

GeoEngineers

October 3, 2001

Consulting Engineers and Geoscientists

Tosco Marketing Company
3977 Leary Way Northeast
Seattle, Washington 98107

Attention Tim Johnson

We are pleased to submit four copies of our report "Supplemental Site Characterization, Tosco Service Station 5353, 600 Westlake Avenue North Seattle, Washington" Our services were completed in general accordance with our July 2001 Alliance Work Order We appreciate the opportunity to be of service to you Please contact us if you have questions regarding information presented in this report

Yours very truly,

GeoEngineers Inc

KSA

Kurt S Anderson, C P G
Principal

BPP D \C KS A pb sg
P Tosco 482351702 Finals 482351702R-s doc

GeoEngineers Inc
Plaza 600 Building
600 Stewart St Suite 1426
Seattle WA 98101
Telephone (206) 728-2674
Fax (206) 728-2732
www geoengineers com

CONTENTS

CONTENTS (CONT.)

REPORT
SUPPLEMENTAL SITE CHARACTERIZATION
TOSCO SERVICE STATION 5353
600 WESTLAKE AVENUE NORTH
SEATTLE, WASHINGTON
FOR
TOSCO MARKETING COMPANY

1.0 INTRODUCTION

1.1 BACKGROUND

This report presents the results of our supplemental site characterization services for the Tosco property (herein referred to as the "site") located at 600 Westlake Avenue North in Seattle Washington The location of the subject site relative to surrounding physical features is shown in Figure 1 The general layout of the site is shown in Figure 2

The site currently consists of a 76 gasoline service station including underground storage tank (UST) facilities, pump islands, convenience store and kiosk and an adjacent vacant parcel with a restaurant building (formerly Denny's) Waste oil and heating oil USTs were removed from the east side of the 76 service station building during June 2001 The waste oil and heating oil USTs were located immediately adjacent to four gasoline USTs (Figure 2) During the UST removal activities, Tosco s contractor inadvertently broke a fuel transmission line causing the release of gasoline in the vicinity of the former waste oil and heating oil USTs Free product was subsequently detected and removed from the UST excavation and from monitoring well MW-33 by Tosco s contractor on several occasions using a vacuum truck

The purpose of our supplemental site characterization services was to (1) evaluate the extent of soil contamination related to the June 2000 gasoline release (2) evaluate current soil conditions at the northwest and southeast portions of the site and (3) install monitoring wells on the former Denny's parcel

2.0 SCOPE OF SERVICES

Our scope of services included the following

1. Prepared a site and safety plan for use by GeoEngineers field staff at the site
2. Requested and coordinated a utility locate prior to subsurface exploration at the site
3. Located historic site monitoring wells MW-1, MW-2 MW-3 and MW-20 (Figure 2) Determine the condition of the monitoring wells and make repairs as necessary
4 Assessed the condition of monitoring well MW-45 and made repairs
5. Monitored the drilling of four exploratory borings to depths of 16 5 to 21 5 feet below ground surface (bgs) using hollow-stem auger drilling equipment Monitored the installation of 2-inch-diameter ground water monitoring wells in three of the borings
6. Obtained soil samples at approximately 2 5-foot-depth intervals from the exploratory borings for field screening of petroleum hydrocarbons Field screening consisted of conducting a water sheen test and headspace vapor screening using a TLV combustible vapor detector

7. Submitted up to three soil samples from each boring (eight samples total) for chemical analyses of benzene, toluene, ethylbenzene and xylene (BTEX), gasoline-, diesel- and heavy oil-range hydrocarbons by EPA and Ecology specified methods
8. Evaluated the field and laboratory data with regard to applicable Model Toxics Control Act cleanup levels

3.0 HISTORIC MONITORING WELLS

GeoEngineers attempted to locate historic monitoring wells MW-1, MW-2, MW-3 and MW-20 reportedly located along the north site boundary and between the service station building and former Denny's restaurant MW-3 was the only historic monitoring well located The surface monument of MW-3 was found to be damaged and was subsequently repaired Additionally, the surface monument and upper casing of historic monitoring well MW-45 were found to be damaged and were subsequently repaired

4.0 SUBSURFACE ASSESSMENT

4.1 GENERAL

GeoEngineers monitored the drilling of four soil borings (MW-50, MW-51, MW-52 and SB-1) at the site on July 17, 2001 The borings were completed using hollow stem auger drilling equipment The explorations were installed downgradient of the June 2000 gasoline release area and at the northwest corner of the site (Figure 2) The soil borings were drilled to depths ranging between 16 5 and 21 5 feet bgs Details of the field exploration program, including soil sampling procedures and logs for the borings are presented in Appendix A

Field screening was performed on soil samples obtained from the borings A description of the field screening methods is included in Appendix A Field screening results also are presented in the boring logs Evidence of petroleum-related soil contamination was observed in soil samples obtained from MW-50 from approximately 8 to 12 feet bgs and MW-52 at 11 feet bgs, based on field screening results

4 2 SOIL

Soil encountered beneath the site generally consists of fill material, including brown to gray silt and silty sand with varying amounts of gravel, wood and construction debris

Selected soil samples obtained from the borings on July 17, 2001 were submitted to North Creek Analytical Laboratories (NCA) of Everett, Washington for chemical analysis of benzene, toluene ethylbenzene and xylene BTEX by EPA Method 8021B, gasoline-range hydrocarbons by Ecology Method NWTPH-G and diesel- and heavy oil-range hydrocarbons by Ecology Method NWTPH-Dx with silica gel cleanup

Chemical analytical results for the soil samples are presented in Table 1 Laboratory reports are presented in Appendix B

4 3 GROUND WATER

Ground water was encountered in the borings during drilling at depths ranging between approximately 8 to 10 feet bgs on July 17, 2001 Monitoring wells were installed in three of the borings (MW-50 MW-51 and MW-52) upon completion of drilling Monitoring well construction details are included in the boring logs Surveying and sampling of the three new monitoring wells was not completed during this phase of work We understand that these three new monitoring wells will be surveyed and sampled during the next scheduled ground water monitoring event Based on historic ground water level measurements obtained from the site monitoring wells ground water at the site appears to flow to the northeast

5.0 CONCLUSIONS

Residual benzene and/or gasoline-range hydrocarbons were detected in soil (1) in the area between the June 2001 gasoline release area and the former Denny s restaurant (at 11 to 16 feet bgs), and (2) in the northwest corner of the site (at 11 feet bgs) Diesel- and heavy oil-range hydrocarbons were detected in soil in southeast portion of the site (at 11 feet bgs) According to the testing laboratory's review of the analytical chromatograms and distribution of benzene, toluene, ethylbenzene and xylene BTEX concentrations the gasoline-related soil contamination appears to be weathered, and likely is not the result of the 2001 gasoline release near the location of the recently removed heating oil and waste oil USTs Therefore based on the results of this study it appears that the immediate vacuuming of gasoline (after the release) was successful in controlling the migration of gasoline away from the release area The petroleum concentrations detected in soil samples tested during this study appears to be related to a large release that occurred at the site in 1980, not the 2001 release

6.0 LIMITATIONS

We have prepared this report for use by Tosco as part of their evaluation of environmental conditions at the subject site

Within the limitations of scope schedule and budget our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared No warranty or other conditions, express or implied, should be understood

Please refer to Appendix C titled "Report Limitations and Guidelines for Use" for additional information pertaining to the use of this report

We appreciate the opportunity to provide you with these services Please contact us if you have questions regarding information presented in this report or if you require additional services

Yours very truly,

GeoEngineers Inc

David A Cook
Senior Project Manager

KSA

Kurt S Anderson, C P G
Principal

BPP DAC KSA pb sg
P:\Tosco 482351702\Finals\482351702R-s doc

Attachments

Four copies submitted

TABLE 1

SUMMARY OF SOIL CHEMICAL ANALYTICAL DATA[1]

Tosco Service Station 5353
600 Westlake Avenue North
Seattle, Washington

Sample Number[2]	Sample Depth (feet)	Field Screening Results[3]		Volatile Organic Compounds[4] (mg/kg)				Total Petroleum Hydrocarbons[5] (mg/kg)		
		Sheen	Headspace Vapors	B	E	T	X	Gasoline-Range	Diesel-Range	Heavy Oil-Range
MW-50-8 5	8 5	MS	200	0 133	0 585	<0 0500	0 151	29	18 5	35 9
MW-50-11	11 0	HS	600	0 696	4 98	0 891	8 41	354	<10 0	<25 0
MW-50-16	16 0	NS	<100	0 680	3 53	1 34	14 0	160	10 9	<25 0
MW-51-11	11 0	SS	<100	<0 0200	<0 0500	<0 0500	<0 100	<5 00	539	780
MW-51-13 5	13 5	NS	<100	0 0867	<0 156	<0 156	<0 312	23 1	140	204
MW-52-11	11 0	MS	1,000	0 207	0 973	0 433	2 55	157	<10 0	<25 0
MW-52-13 5	13 5	SS	<100	0 0450	<0 0500	<0 0500	0 276	<5 00	13 7	<25 0
SB-1-8 5	8 5	NS	<100	<0 0200	<0 0500	<0 0500	<0 100	<5 00	<10 0	<25 0

Notes

[1]Soil samples were collected on July 17, 2001 Analyses conducted by North Creek Analytical of Bothell Washington

[2]Approximate exploration locations are shown in Figure 2

[3]See Appendix B for a description of field screening methods NS=no sheen SS=slight sheen, MS=moderate sheen HS=heavy sheen

[4]Analyzed by EPA Method 8021B B=benzene E=ethylbenzene, T=toluene, X=xylenes

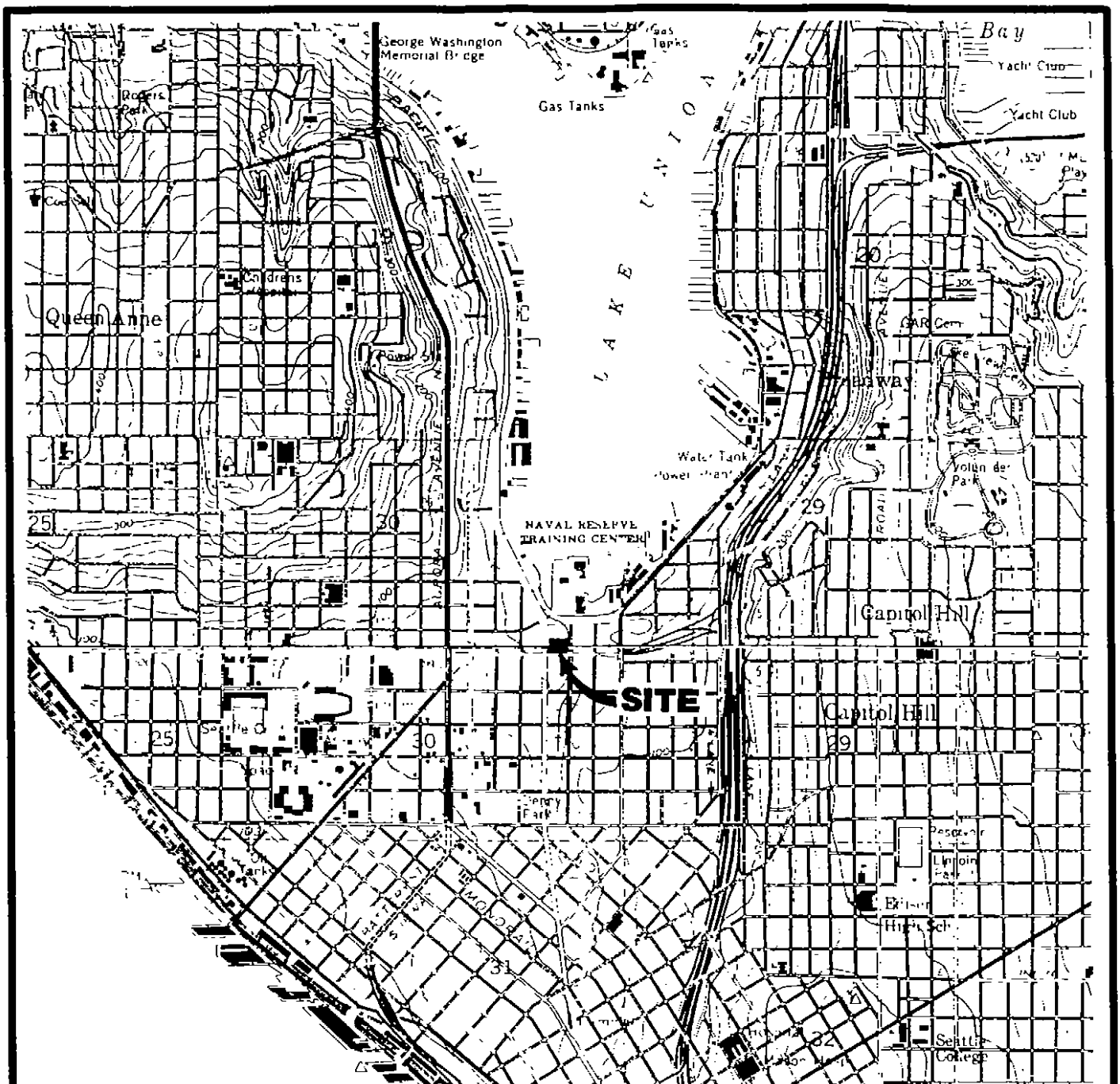
[5]Analyzed by Ecology Methods NWTPH-G or NWTPH-D extended

[6]Based on cleanup regulation amended August 1 2001

mg/kg = milligrams per kilogram

MTCA = Model Toxics Control Act

Shading indicates analyte exceeds MTCA Method A cleanup level



Reference USGS 7.5' topographic quadrangle maps "Seattle North, Wash.," photorevised 1968, and "Seattle South, Wash.," photorevised 1973

08/07/01

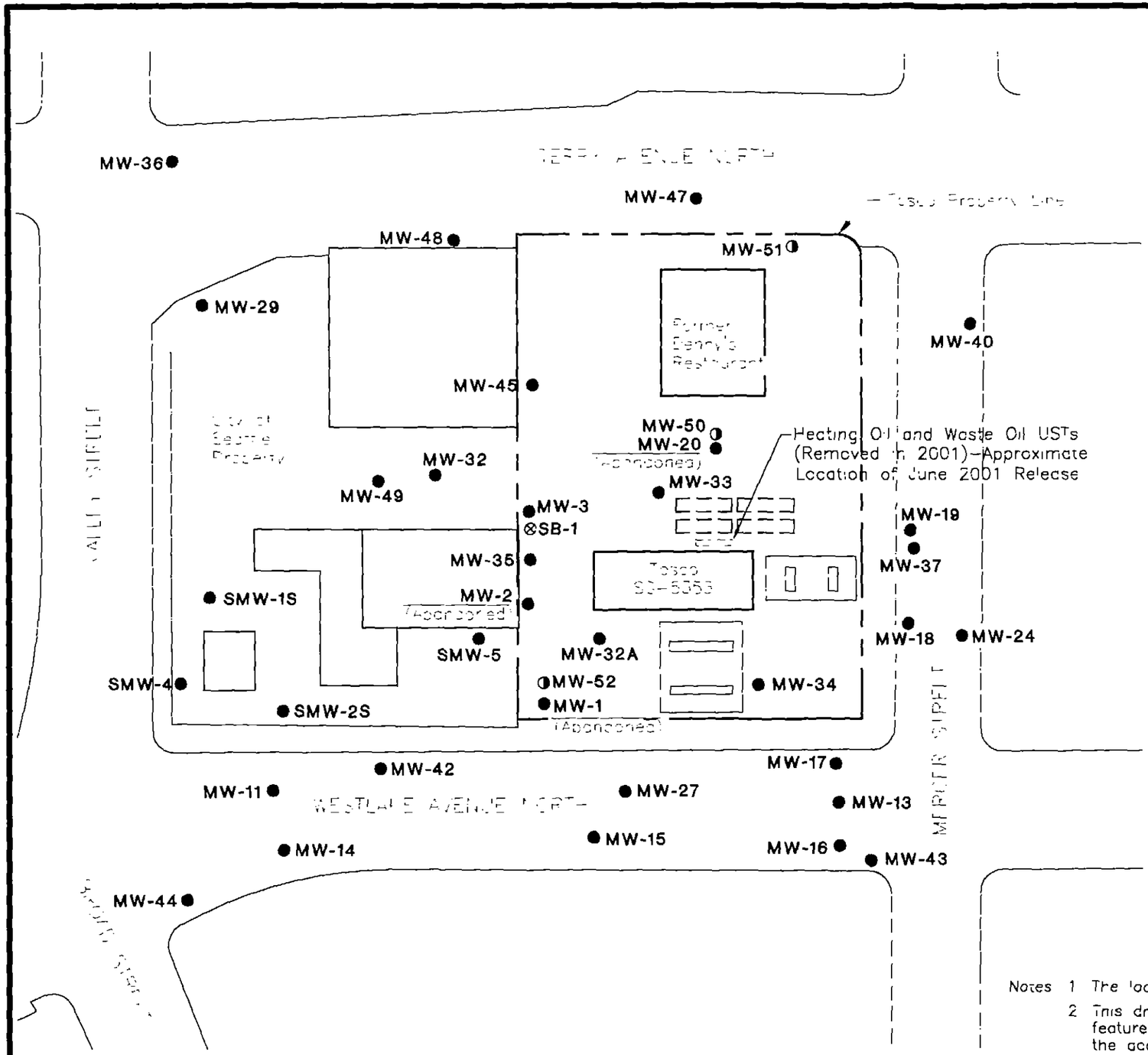
BPP SYF

4823-517-02

Geo Engineers

VICINITY MAP

FIGURE 1



EXPLANATION

- **MW-3** ● EXISTING MONITORING WELL
- **MW-50** ◑ MONITORING WELL INSTALLED JULY 2001
- **SB-1** ⊗ SOIL BORING INSTALLED JULY 2001
- UST UNDERGROUND STORAGE TANK

Notes
1. The locations of all features shown are approximate
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record.

GeoEngineers

SITE PLAN

FIGURE 2

REDMOND\P:\4823517\CAD\02\4823517G2A.DWG 09/13/01 DAC PB

APPENDIX A

FIELD PROCEDURES

APPENDIX A

FIELD PROCEDURES

SAMPLING PROCEDURES

Subsurface conditions at the site were evaluated by drilling four soil borings using equipment operated by Cascade Drilling of Woodinville, Washington A representative from our staff selected the boring locations and observed and classified the soil encountered Soil in the borings was visually classified in general accordance with American Society of Testing and Materials (ASTM) D2488-93, which is described in Figure A-1 A key to the boring log symbols is presented in Figure A-2 A detailed log was prepared for each boring The boring logs are presented in Figures A-3 through A-6

The borings were completed to depths ranging between 16 5 and 21 5 feet bgs Soil samples were obtained from the borings at approximately 2 5-foot-depth intervals using a Dames & Moore split spoon sampler The sampler was driven by a 300-pound hammer falling a vertical distance of approximately 30 inches The number of blows required to advance the sampler the final 12 inches or other specified distance is indicated to the left of the corresponding sample notations on the boring logs A stainless steel sleeve from each sampling interval was capped and kept cold in a cooler for potential chemical analysis Chain-of-custody procedures were observed during transport of the samples to the testing laboratory Samples that were submitted for chemical analysis are denoted in our boring logs with "CA "

The sampling equipment was decontaminated before each sampling attempt with a Liqui-Nox solution wash and a distilled water rinse

FIELD SCREENING OF SOIL SAMPLES

Soil samples obtained from the site were evaluated for the potential presence of petroleum contamination using field screening techniques Field screening results can be used as a general guideline to delineate areas of potential petroleum-related contamination in soils In addition, screening results are often used as a basis for selecting soil samples for chemical analysis The screening methods employed included (1) visual examination, (2) water sheen testing, and (3) headspace vapor testing using a Bacharach TLV Sniffer

Visual screening consists of inspecting the soil for stains indicative of petroleum-related contamination Visual screening is generally more effective when contamination is related to heavy petroleum hydrocarbons such as motor oil or when hydrocarbon concentrations are high Sheen screening is a more sensitive screening method that can be effective in detecting petroleum based products in concentrations lower than regulatory cleanup guidelines

Water sheen testing involves placing soil in water and observing the water surface for signs of sheen The results of water sheen testing on soil samples from the borings are presented on the test pit logs Sheens are classified as follows

No Sheen (NS)	No visible sheen on water surface
Slight Sheen (SS)	Light, colorless, dull sheen, spread is irregular, not rapid sheen dissipates rapidly
Moderate Sheen (MS)	Light to heavy sheen, may have some color/iridescence, spread is irregular to flowing, few remaining areas of no sheen on water surface
Heavy Sheen (HS)	Heavy sheen with color/iridescence spread is rapid, entire water surface may be covered with sheen

Headspace vapor screening involves placing a soil sample in a plastic bag Air is captured in the bag and the bag is shaken to expose the soil to the air trapped in the bag The probe of the Bacharach TLV Sniffer is inserted into the bag and the TLV Sniffer measures the concentration of combustible vapor in the sample bag headspace The TLV Sniffer is designed to quantify combustible gas concentrations in the 100 to 10 000 parts per million (ppm) range

MONITORING WELL CONSTRUCTION

Ground water monitoring wells were constructed in borings MW-50 through MW-52 at the completion of drilling Two-inch-diameter, Schedule 40 polyvinyl chloride (PVC) pipe was installed in the borings The lower portion of the PVC pipe is machine-slotted (0 02-inch slot width) to allow entry of water into the well casing Medium sand was placed in the borehole annulus surrounding the slotted portion of the well The well casings are secured with lockable compression caps and flush-grade monuments Monitoring well construction details are shown in Figures A-3 through A-6

The monitoring wells were developed by removing ground water from the wells with a submersible pump until the ground water appeared free of sediment

SOIL CUTTINGS AND PURGE/DECONTAMINATION WATER

Soil cuttings and purge/decontamination water was placed in secured, labeled 55-gallon drums The soil drums were subsequently transported by TPS Technologies to their Tacoma facility for permitted disposal/recycling The water drums will be disposed with ground water generated during future monitoring events

SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE GRAINED SOILS More Than 50% Retained on No 200 Sieve	GRAVEL More Than 50% of Coarse Fraction Retained on No 4 Sieve	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND More Than 50% of Coarse Fraction Passes No 4 Sieve	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE GRAINED SOILS More Than 50% Passes No 200 Sieve	*SILT AND CLAY* Liquid Limit Less Than 50	*INORGANIC*	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILT AND CLAY Liquid Limit 50 or More	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC CLAY, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT

NOTES

1 Field classification is based on visual examination of soil in general accordance with ASTM D2488-93

2 Soil classification using laboratory tests is in general accordance with ASTM D2487-98

3 Descriptions of soil density or consistency are based on interpretation of blow count data, visual appearance of soils, and/or test data

SOIL MOISTURE MODIFIERS

Dry - Absence of moisture, dusty, dry to the touch

Moist - Damp, but no visible water

Wet - Visible free water or saturated, usually soil is obtained from below water table

GeoEngineers

SOIL CLASSIFICATION SYSTEM

FIGURE A-1

f:\soils-1.doc

LABORATORY TESTS

CA Chemical Analysis

FIELD SCREENING TESTS

Headspace vapor concentration data given in parts per million

Sheen classification system

NS No Visible Sheen
SS Slight Sheen
MS Moderate Sheen
HS Heavy Sheen
NT Not Tested

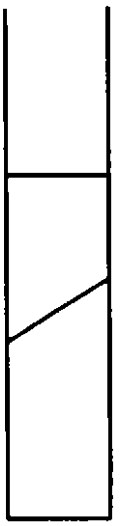
BLOW COUNT/SAMPLE DATA

Blows required to drive a 2 4-inch I D split-barrel sampler 12 inches or other indicated distances using a 300-pound hammer falling 30 inches

Blows required to drive a 1 5-inch I D (SPT) split-barrel sampler 12 inches or other indicated distances using a 140-pound hammer falling 30 inches

"P" indicates sampler pushed with weight of hammer or against weight of drill rig

SOIL GRAPH



SM Soil Group Symbol (See Note 2)

Distinct Contact Between Soil Strata

Gradual or Approximate Location of Change Between Soil Strata

Water Level

Bottom of Boring

22 Location of relatively undisturbed sample

12 Location of disturbed sample

17 Location of sampling attempt with no recovery

10 Location of sample obtained in general accordance with Standard Penetration Test (ASTM D-1586) procedures

26 Location of SPT sampling attempt with no recovery

Location of grab sample

NOTES

1 The reader must refer to the discussion in the report text, the Key to Boring Log Symbols and the exploration logs for a proper understanding of subsurface conditions
2 Soil classification system is summarized in Figure A-1

GeoEngineers

KEY TO BORING LOG SYMBOLS

FIGURE A-2

Project	Job Number	Location
Tosco - Westlake & Mercer	4823-517-02	Seattle, WA

Date Drilled	07/17/01	Logged By	GJA	Contractor	Cascade Drilling
Drill Method	4-1/4 inch ID HSA	Equipment	Mobile B-59	Drill Bit	
Sample Method	2 4 inch ID Split Barrel Sampler	Hammer Data	300 lb winch release	X-coordinate Y-coordinate	Not Determined Not Determined
Total Depth (ft)	21 5	*Elevation (ft)*	*Not Measured*	Datum System	Not Determined Not Determined

DEPTH IN FEET	% Recovery	Sample No	Blow Count	Sample	Graphic Log	USCS Group Symbol	Material Description	Headspace Vapor (ppm)	Sheen	Other Tests And Notes	DEPTH IN FEET
0						ASPHALT	4 inches asphalt				0
						SM	Gray silty fine to coarse sand with occasional gravel (moist, medium dense)				
	67	1	10	☒				100	NS		
5	67	2	22	☒				100	NS		5
	17	3	5	☒				100	NS	CA	
10							▽				10
	67	4	12	☒			Gray silty fine sand (wet, medium dense)	< 100	SS		
	67	5	10	☒				< 100	SS		
15	00	6	50/4"	□			No recovery - brick in shoe				15
							Gray silty fine sand with wood fragments (wet, very dense)				
	17	7	70	☒			Solid wood encountered from approximately 17 to 20 feet	100	SS		
20							Becomes medium dense				20
	17	8	13	☒				< 100	NS		
							Boring completed at 21 5 feet bgs on 7/17/01 Ground water observed at approximately 10 feet bgs				
25											25

Note See Figure A-2 for explanation of symbols

GEI ENVIRONMENTAL BORING LOG 4823517 GPJ GEI CORP GDT 7/30/01 4823-517-02

GeoEngineers

LOG OF BORING SB-1

FIGURE A-3

Project	Job Number	Location
Tosco - Westlake & Mercer	4823-517-02	Seattle, WA

Date Drilled	07/17/01	Logged By	GJA	Contractor	Cascade Drilling
Drill Method	4-1/4 inch ID HSA	Equipment	Mobile B-59	Drill Bit	
Sample Method	2.4 inch ID Split Barrel Sampler	Hammer Data	300 lb winch release	X-coordinate Y-coordinate	Not Determined Not Determined
Total Depth (ft)	19	Elevation (ft)	Not Measured	Datum System	Not Determined Not Determined
Total Well Depth (ft)		Monument Elevation Stickup (ft)		Casing Elevation Stickup (ft)	

DEPTH IN FEET	WELL SCHEMATIC	Sample No	Blows per foot	Sample	Graphic Log	USCS Group Symbol	Material Description	Headspace Vapor (ppm)	Sheen	Other Tests And Notes	DEPTH IN FEET
0	Steel surface monument Concrete					ASPHALT	4 inches asphalt				0
						SM	Gray silty fine to medium sand (moist, loose)				
						CONCRETE	Concrete				
	Bentonite seal					SM	Gray silty fine to medium sand (moist, loose)				
		1	8					100	NS		
5	2-inch, Schedule 40 PVC well casing					ML	Gray silt with occasional fine sand and gravel (moist, stiff)				5
		2	13					100	NS		
		3	10				Becomes wet with wood and creosote-like fragments	200	MS	CA	
10	Medium sand backfill 2-inch, Schedule 40 PVC, 20-inch slot width	4	50/6"				Gray silt with occasional gravel and concrete fragments (wet, hard)	600	HS	CA	10
		5	39				Contains wood fragments	200	SS		
15		6	16					100	NS	CA	15
		7	8				No recovery	100	NS		
20							Boring completed at 19 feet bgs on 7/17/01 Ground water observed at approximately 8 feet bgs				20
25											25

GEI WELL LOG 4823517.GPJ GEI_CORP.GDT 9/13/01 4823-517-02

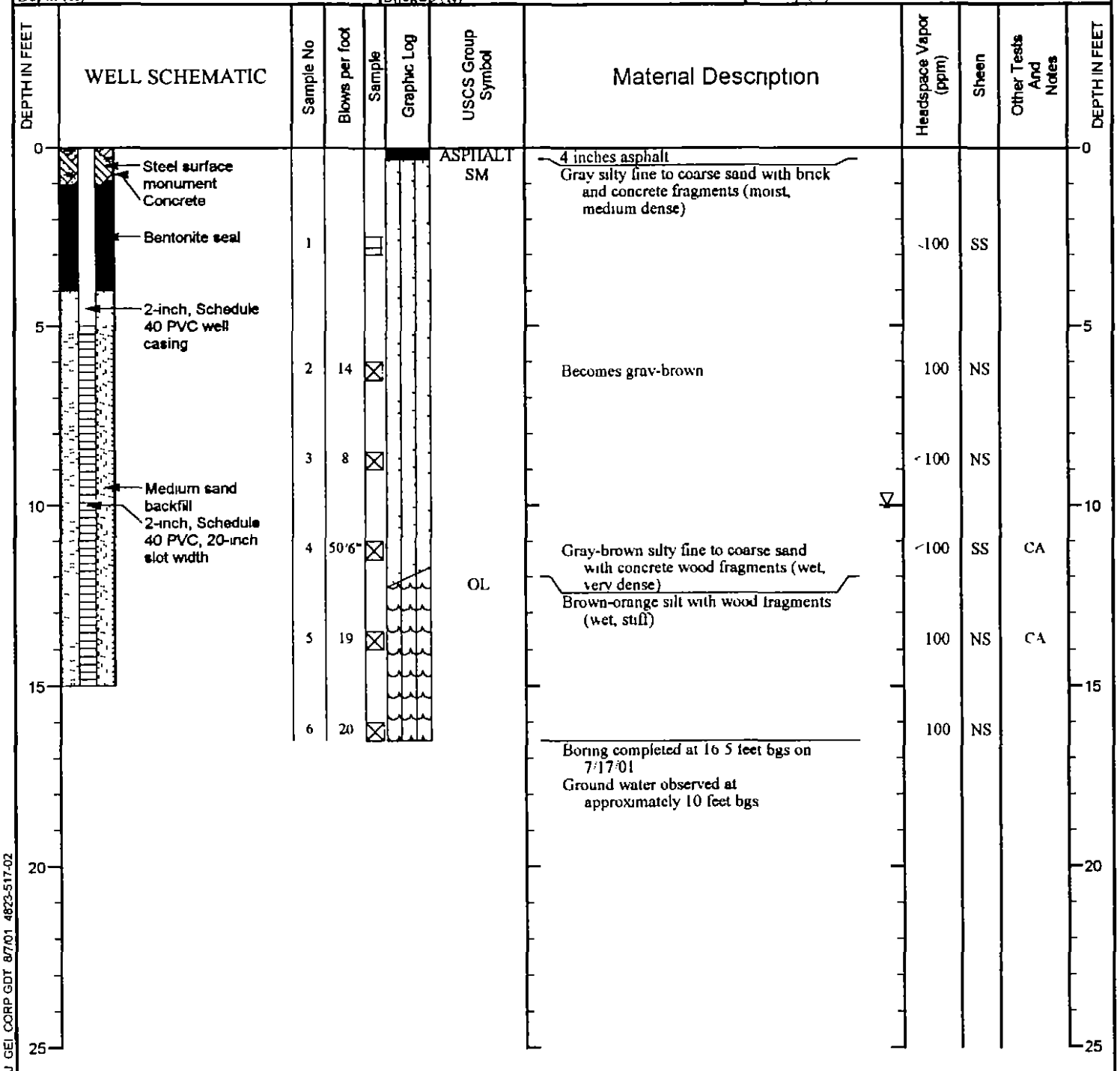
Geo Engineers

LOG OF BORING MW-50

FIGURE A-4

Project	Job Number	Location
Tosco - Westlake & Mercer	4823-517-02	Seattle, WA

Date Drilled	07/17/01	Logged By	GJA	Contractor	Cascade Drilling
Drill Method	4-1/4 inch ID HSA	Equipment	Mobile B-59	Drill Bit	
Sample Method	2 4 inch ID Split Barrel Sampler	Hammer Data	300 lb winch release	X-coordinate Y-coordinate.	Not Determined Not Determined
Total Depth (ft)	16 5	Elevation (ft)	Not Measured	Datum System	Not Determined Not Determined
Total Well Depth (ft)		Monument Elevation Stickup (ft)		Casing Elevation Stickup (ft)	



GEI WELL LOG 4823517.GPJ GEI_CORP.GDT 8/7/01 4823-517-02

Geo Engineers

LOG OF BORING MW-51

FIGURE A-5

Project	Job Number	Location
Tosco - Westlake & Mercer	4823-517-02	Seattle, WA

Date Drilled	07/17/01	Logged By	GJA	Contractor	Cascade Drilling
Drill Method	4-1/4 inch ID HSA	Equipment	Mobile B-59	Drill Bit	
Sample Method	2 4 inch ID Split Barrel Sampler	Hammer Data	300 lb winch release	X-coordinate Y-coordinate	Not Determined Not Determined
Total Depth (ft)	19	Elevation (ft)	Not Measured	Datum System	Not Determined Not Determined
Total Well Depth (ft)		Monument Elevation Stickup (ft)		Casing Elevation Stickup (ft)	

DEPTH IN FEET	WELL SCHEMATIC	Sample No	Blows per foot	Sample	Graphic Log	USCS Group Symbol	Material Description	Headspace Vapor (ppm)	Sheen	Other Tests And Notes	DEPTH IN FEET
0	Steel surface monument Concrete					ASPHALT	5 inches asphalt				0
	Bentonite seal					SM	Brown silty fine to coarse sand with occasional gravel (moist, medium dense)				
		1	18	☒				< 100	NS		
5	2-inch, Schedule 40 PVC well casing	2	35	☒			Gray silty fine to medium sand with wood fragments (moist, dense)	100	NS		5
		3	8	☒			Becomes loose	100	NS		
10	Medium sand backfill 2-inch Schedule 40 PVC, 20-inch slot width	4	11	☒			Gray silty fine sand with wood fragments (wet, medium dense)	1,000	MS	CA	10
		5	5	☒			Gray silty fine sand (wet, loose)	< 100	SS	CA	
15		6	8	☒				350	SS		15
		7	8	☒				150	NS		
20							Boring completed at 19 feet bgs on 7/17/01 Ground water observed at approximately 9 5 feet bgs				20
25											25

GEI WELL LOG 4823517 GPJ GEI_CORP GDT 8/7/01 4823-517-02

Geo Engineers

LOG OF BORING MW-52

FIGURE A-6

APPENDIX B

CHEMICAL ANALYTICAL DATA

APPENDIX B

CHEMICAL ANALYTICAL DATA

SAMPLES

Chain-of-custody procedures were followed during the transport of the field samples to the accredited analytical laboratory The samples were held in cold storage pending extraction and/or analysis The analytical results and quality control records are included in this appendix

ANALYTICAL DATA REVIEW

The laboratory maintains an internal quality assurance program as documented in its laboratory quality assurance manual The laboratory uses a combination of blanks, surrogate recoveries, duplicates, matrix spike recoveries matrix spike duplicate recoveries, blank spike recoveries and blank spike duplicate recoveries to evaluate the analytical results The laboratory also uses data quality goals for individual chemicals or groups of chemicals based on the long-term performance of the test methods The data quality goals were included in the laboratory reports The laboratory compared each group of samples with the existing data quality goals and noted any exceptions in the laboratory report Any data quality exceptions documented by the accredited laboratory were reviewed by GeoEngineers and are addressed in the data quality exception section of this appendix

DATA QUALITY EXCEPTION SUMMARY

Based on our data quality review, it is our opinion that the analytical data are of acceptable quality for their intended use in this report

Seattle
Spokane
Portland
Bend

1 August, 2001

AUG 20 2001

Dave Cook
Geo Engineers - Seattle
600 Stewart Street, Suite 1420
Seattle, WA 98101

RE TOSCO #5353

Enclosed are the results of analyses for samples received by the laboratory on 07/18/01 14 20 If you have any questions concerning this report, please feel free to contact me

Sincerely,

Scott A Woerman
Project Manager

www.ncalabs.com

Seattle
Spokane
Portland
Bend

Geo Engineers - Seattle	Project TOSCO #5353	
600 Stewart Street Suite 1420	Project Number 4823-517-02	**Reported**
Seattle WA 98101	Project Manager Dave Cook	08/01/01 17:03

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-50-11	B1G0431-01	Soil	07/17/01 12:00	07/18/01 14:20
MW-50-16	B1G0431-02	Soil	07/17/01 12:00	07/18/01 14:20
MW-51-11	B1G0431-03	Soil	07/17/01 12:00	07/18/01 14:20
MW-51-13.5	B1G0431-04	Soil	07/17/01 12:00	07/18/01 14:20
MW-52-11	B1G0431-05	Soil	07/17/01 12:00	07/18/01 14:20
MW-52-13.5	B1G0431-06	Soil	07/17/01 12:00	07/18/01 14:20
MW-50-8.5	B1G0431-09	Soil	07/17/01 12:00	07/18/01 14:20
SB-1-8.5	B1G0431-10	Soil	07/17/01 12:00	07/18/01 14:20

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Scott A. Woerman, Project Manager

www.ncalabs.com

Seattle 11720 North Creek Pkwy N Suite 400 Bothell WA 98011-8244
425-420-9200 fax 425-420-9210
Spokane Suite 115 Mission Park Drive Suite B Spokane WA 99202-4776
509-924-9200 fax 509-924-9290
Portland 9405 SW Nimbus Avenue Beaverton OR 97008-7132
800-950-2110 fax 503-906-9210
Bend 1565 SE Wilson Avenue Suite 107 Bend OR 97702-7814
541-330-4080 fax 541-382-7588

Geo Engineers - Seattle	Project TOSCO #5353	
600 Stewart Street, Suite 1420	Project Number 4823-517-02	**Reported**
Seattle WA, 98101	Project Manager Dave Cook	08/01/01 17:03

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
MW-50-11 (B1G0431-01) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Gasoline Range Hydrocarbons	**354**	20.0	mg/kg dry	4	1G24022	07/24/01	07/25/01	NWTPH-Gx/8021B	
Benzene	**0.696**	0.0800	"	"	"	"	"	"	I-05
Toluene	**0.891**	0.200	"	"	"	"	"	"	
Ethylbenzene	**4.98**	0.200	"	"	"	"	"	"	
Xylenes (total)	**8.41**	0.400	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)		*50-147*	%		"		"	"	S-05
Surrogate: 4-BFB (PID)		*54-123*	%		"	"	"	"	S-05
MW-50-16 (B1G0431-02) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Gasoline Range Hydrocarbons	**160**	10.0	mg/kg dry	2	1G24022	07/24/01	07/25/01	NWTPH-Gx/8021B	
Benzene	**0.680**	0.0400	"	"	"	"	"	"	
Toluene	**1.34**	0.100	"	"	"	"	"	"	
Ethylbenzene	**3.53**	0.100	"	"	"	"	"		
Xylenes (total)	**14.0**	0.200	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*157 %*	*50-147*			"		"		S-04
Surrogate: 4-BFB (PID)	*121 %*	*54-123*			"		"		
MW-51-11 (B1G0431-03) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Gasoline Range Hydrocarbons	ND	5.00	mg/kg dry	1	1G24022	07/24/01	07/24/01	NWTPH-Gx/8021B	
Benzene	ND	0.0200	"	"	"	"	"		
Toluene	ND	0.0500	"	"	"	"	"		
Ethylbenzene	ND	0.0500	"	"	"	"	"	"	
Xylenes (total)	ND	0.100	"	"	"	"	"	"	
Surrogate: 4-BFB (FID)	*81.8 %*	*50-147*			"	"	"	"	
Surrogate: 4-BFB (PID)	*90.1 %*	*54-123*			"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Scott A. Woerman, Project Manager

www ncalabs com

Seattle
Spokane
Portland
Bend

Geo Engineers - Seattle	Project TOSCO #5353	
600 Stewart Street, Suite 1420	Project Number 4823-517-02	**Reported**
Seattle WA 98101	Project Manager Dave Cook	08/01/01 17 03

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
MW-51-13 5 (B1G0431-04) Soil Sampled 07/17/01 12 00 Received 07/18/01 14 20									
Gasoline Range Hydrocarbons	**23 1**	15 6	mg kg dry	1	1G24022	07 24 01	07 26 01	NWTPH-Gx 8021B	G
Benzene	**0 0867**	0 0624	"	"	"			"	
Toluene	ND	0 156	"	"	"	"	"	"	
Ethylbenzene	ND	0 156	"	"	"	"	"	"	
Xylenes (total)	ND	0 312	"	"	"	"	"	"	
Surrogate 4-BFB (FID)	*54 1 %*	*50-147*			"	"	"	"	
Surrogate 4-BFB (PID)	*55 4 %*	*54-123*			"			"	
MW-52-11 (B1G0431-05) Soil Sampled 07/17/01 12 00 Received 07/18/01 14 20									
Gasoline Range Hydrocarbons	**157**	20 0	mg kg dry	4	1G24022	07 24 01	07 25 01	NWTPH-Gx 8021B	
Benzene	**0 207**	0 0800	"	"	"	"	"	"	I-0
Toluene	**0 433**	0 200	"	"	"	"	"	"	I-0
Ethylbenzene	**0 973**	0 200	"	"	"		"	"	
Xylenes (total)	**2 55**	0 400	"	"	"	"	"		
Surrogate 4-BFB (FID)	*186 %*	*50-147*			"	"		"	S-0
Surrogate 4-BFB (PID)	*120 %*	*54-123*			"	"	"	"	
MW-52-13 5 (B1G0431-06) Soil Sampled 07/17/01 12 00 Received 07/18/01 14 20									
Gasoline Range Hydrocarbons	ND	5 00	mg kg dry	1	1G24022	07 24 01	07 24 01	NWTPH-Gx 8021B	
Benzene	**0 0450**	0 0200	"	"	"	"	"	"	
Toluene	ND	0 0500	"	"	"	"	"	"	
Ethylbenzene	ND	0 0500	"	"	"	"	"	"	
Xylenes (total)	**0 276**	0 100	"	"	"	"	"	"	
Surrogate 4-BFB (FID)	*77 9 %*	*50-147*			"	"	"	"	
Surrogate 4-BFB (PID)	*90 6 %*	*54-123*			"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document This analytical report must be reproduced in its entirety

Scott A Woerman, Project Manager

Seattle
Spokane
Portland
Bend
www ncalabs com

Geo Engineers - Seattle	Project TOSCO #5353	
600 Stewart Street, Suite 1420	Project Number 4823-517-02	**Reported**
Seattle WA 98101	Project Manager Dave Cook	08/01/01 17 03

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-50-8 5 (B1G0431-09) Soil Sampled 07/17/01 12 00 Received 07/18/01 14 20									
Gasoline Range Hydrocarbons	**28 9**	5 00	mg kg dry	1	1G24022	07 24 01	07 24 01	NWTPH-Gx 8021B	
Benzene	**0 133**	0 0200	"		"	"	"	"	
Toluene	ND	0 0500			"				
Ethylbenzene	**0 585**	0 0500	"	"	"	"	"	"	
Xylenes (total)	**0 151**	0 100	"	"	"	"	"		
Surrogate 4-BFB (FID)	*113 %*	*50-147*			"			"	
Surrogate 4-BFB (PID)	*114 %*	*54-123*			"	"		"	
SB-1-8 5 (B1G0431-10) Soil Sampled 07/17/01 12 00 Received 07/18/01 14 20									
Gasoline Range Hydrocarbons	ND	5 00	mg kg dry	1	1G24022	07 24 01	07 25 01	NWTPH-Gx 8021B	
Benzene	ND	0 0200	"	"	"	"	"	"	
Toluene	ND	0 0500	"	"	"	"	"		
Ethylbenzene	ND	0 0500	"	"	"		"	"	
Xylenes (total)	ND	0 100	"	"	"	"		"	
Surrogate 4-BFB (FID)	*80 3 %*	*50-147*			"	"			
Surrogate 4-BFB (PID)	*90 6 %*	*54-123*			"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document This analytical report must be reproduced in its entirety

Scott A Woerman Project Manager

Seattle
Spokane
Portland
Bend
www ncalabs com

Geo Engineers - Seattle	Project TOSCO #5353	
600 Stewart Street, Suite 1420	Project Number 4823-517-02	**Reported**
Seattle WA, 98101	Project Manager Dave Cook	08/01/01 17 03

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	N
MW-50-11 (B1G0431-01) Soil Sampled 07/17/01 12 00 Received 07/18/01 14 20									
Diesel Range Hydrocarbons	ND	10 0	mg kg dry	1	1G19001	07 19 01	07 28 01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	25 0	"	"	"	"	"	"	
Surrogate 2-FBP	*73 0 %*	*50-150*			"	"	"	"	
Surrogate Octacosane	*81 6 %*	*50-150*			"	"			
MW-50-16 (B1G0431-02) Soil Sampled 07/17/01 12 00 Received 07/18/01 14 20									
Diesel Range Hydrocarbons	**10 9**	10 0	mg kg dry	1	1G19001	07 19 01	07 28 01	NWTPH-Dx SG	D-
Lube Oil Range Hydrocarbons	ND	25 0	"	"		"	"	"	
Surrogate 2-FBP	*79 3 %*	*50-150*				"	"	"	
Surrogate Octacosane	*86 4 %*	*50-150*			"	"	"	"	
MW-51-11 (B1G0431-03) Soil Sampled 07/17/01 12 00 Received 07/18/01 14 20									
Diesel Range Hydrocarbons	**539**	30 0	mg kg dry	3	1G19001	07 19 01	07 30 01	NWTPH-Dx SG	D-
Lube Oil Range Hydrocarbons	**780**	75 0	"	"	"	"	"	"	
ogate 2-FBP	*94 1 %*	*50-150*				"	"	"	
Surrogate Octacosane	*104 %*	*50-150*			"	"	"	"	
MW-51-13 5 (B1G0431-04) Soil Sampled 07/17/01 12 00 Received 07/18/01 14 20									
Diesel Range Hydrocarbons	**140**	31 2	mg kg dry	1	1G19001	07 19 01	07 28 01	NWTPH-Dx SG	D
Lube Oil Range Hydrocarbons	**204**	78 0	"	"	"	"	"	"	
Surrogate 2-FBP	*81 3 %*	*50-150*				"	"	"	
Surrogate Octacosane	*88 2 %*	*50-150*			"	"	"	"	
MW-52-11 (B1G0431-05) Soil Sampled 07/17/01 12 00 Received 07/18/01 14 20									
Diesel Range Hydrocarbons	ND	10 0	mg kg dry	1	1G19001	07 19 01	07 28 01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	25 0	"	"	"	"	"	"	
Surrogate 2-FBP	*75 8 %*	*50-150*			"	"		"	
Surrogate Octacosane	*85 4 %*	*50-150*				"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain custody document This analytical report must be reproduced in its entirety

Scott A Woerman Project Manager

www.ncalabs.com

Seattle
Spokane
Portland
Bend

Geo Engineers - Seattle	Project TOSCO #5353	
600 Stewart Street, Suite 1420	Project Number 4823-517-02	**Reported**
Seattle WA, 98101	Project Manager Dave Cook	08/01/01 17:03

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up

North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
MW-52-13.5 (B1G0431-06) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Diesel Range Hydrocarbons	**13.7**	10.0	mg/kg dry	1	1G19001	07/19/01	07/28/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*74.8%*	*50-150*				"	"	"	
Surrogate: Octacosane	*83.7%*	*50-150*			"	"		"	
MW-50-8.5 (B1G0431-09) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Diesel Range Hydrocarbons	**18.5**	10.0	mg/kg dry	1	1G19001	07/19/01	07/28/01	NWTPH-Dx SG	D-03
Lube Oil Range Hydrocarbons	**35.9**	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*80.0%*	*50-150*			"	"	"		
Surrogate: Octacosane	*88.6%*	*50-150*			"	"	"	"	
SB-1-8.5 (B1G0431-10) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Diesel Range Hydrocarbons	ND	10.0	mg/kg dry	1	1G19001	07/19/01	07/28/01	NWTPH-Dx SG	
Lube Oil Range Hydrocarbons	ND	25.0	"	"	"	"	"	"	
Surrogate: 2-FBP	*74.4%*	*50-150*						"	
Surrogate: Octacosane	*81.4%*	*50-150*			"	"	"	"	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Scott A. Woerman, Project Manager

www.ncalabs.com

Seattle
Spokane
Portland
Bend

Geo Engineers - Seattle	Project TOSCO #5353	
600 Stewart Street Suite 1420	Project Number 4823-517-02	**Reported**
Seattle WA, 98101	Project Manager Dave Cook	08/01/01 17:03

Physical Parameters by APHA/ASTM/EPA Methods
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Note
MW-50-11 (B1G0431-01) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Dry Weight	75.9	1.00	%	1	1G25040	07/25/01	07/26/01	BSOPSPL003R07	
MW-50-16 (B1G0431-02) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Dry Weight	75.9	1.00	%	1	1G25040	07/25/01	07/26/01	BSOPSPL003R07	
MW-51-11 (B1G0431-03) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Dry Weight	62.6	1.00	%	1	1G25040	07/25/01	07/26/01	BSOPSPL003R07	
MW-51-13.5 (B1G0431-04) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Dry Weight	32.1	1.00	%	1	1G25040	07/25/01	07/26/01	BSOPSPL003R07	
MW-52-11 (B1G0431-05) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Dry Weight	85.9	1.00	%	1	1G25040	07/25/01	07/26/01	BSOPSPL003R07	
MW-52-13.5 (B1G0431-06) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Dry Weight	78.3	1.00	%	1	1G25040	07/25/01	07/26/01	BSOPSPL003R07	
W-50-8.5 (B1G0431-09) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Dry Weight	76.0	1.00	%	1	1G25040	07/25/01	07/26/01	BSOPSPL003R07	
SB-1-8.5 (B1G0431-10) Soil Sampled 07/17/01 12:00 Received 07/18/01 14:20									
Dry Weight	87.7	1.00	%	1	1G25040	07/25/01	07/26/01	BSOPSPL003R07	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Scott A. Woerman, Project Manager

Seattle
Spokane
Portland
Bend
www ncalabs com

Geo Engineers - Seattle	Project TOSCO #5353	
600 Stewart Street Suite 1420	Project Number 4823-517-02	**Reported**
Seattle WA 98101	Project Manager Dave Cook	08/01/01 17 03

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1G24022: Prepared 07/24/01 Using EPA 5030B (MeOH)										
Blank (1G24022-BLK1)										
Gasoline Range Hydrocarbons	ND	5 00	mg kg							
Benzene	ND	0 0200	"							
Toluene	ND	0 0500	"							
Ethylbenzene	ND	0 0500	"							
Xylenes (total)	ND	0 100	"							
Surrogate 4-BFB (FID)	*3 82*		"	*4 00*		*95 5*	*50-14?*			
Surrogate 4-BFB (PID)	*4 14*		"	*4 00*		*104*	*54-123*			
LCS (1G24022-BS1)										
Gasoline Range Hydrocarbons	20 7	5 00	mg kg	25 0		82 8	80-120			
Surrogate 4-BFB (FID)	*4 09*			*4 00*		*102*	*50-14?*			
?S (1G24022-BS2)										
ızene	0 504	0 0200	mg kg	0 500		101	80-120			
Toluene	0 538	0 0500	"	0 500		108	80-120			
Ethylbenzene	0 555	0 0500	"	0 500		111	80-120			
Xylenes (total)	1 71	0 100	"	1 50		114	80-120			
Surrogate 4-BFB (PID)	*4 46*		"	*4 00*		*112*	*54-123*			
LCS Dup (1G24022-BSD1)										
Gasoline Range Hydrocarbons	23 6	5 00	mg kg	25 0		94 4	80-120	13 1	40	
Surrogate 4-BFB (FID)	*4 41*		"	*4 00*		*110*	*50-14?*			
LCS Dup (1G24022-BSD2)										
Benzene	0 493	0 0200	mg kg	0 500		98 6	80-120	2 21	40	
Toluene	0 517	0 0500	"	0 500		103	80-120	3 98	40	
Ethylbenzene	0 552	0 0500	"	0 500		110	80-120	0 542	40	
Xylenes (total)	1 68	0 100	"	1 50		112	80-120	1 77	40	
Surrogate 4-BFB (PID)	*4 25*		"	*4 00*		*106*	*54-123*			

The results in this report apply to the samples analyzed in accordance with the chain of custody document This analytical report must be reproduced in its entirety

Scott A Woerman, Project Manager

Seattle
Spokane
Portland
Bend

www.ncalabs.com

Geo Engineers - Seattle	Project TOSCO #5353	
600 Stewart Street, Suite 1420	Project Number 4823-517-02	**Reported**
Seattle WA 98101	Project Manager Dave Cook	08/01/01 17:03

Volatile Petroleum Products and BTEX by NWTPH-Gx and EPA 8021B - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1G24022. Prepared 07/24/01 Using EPA 5030B (MeOH)										
Matrix Spike (1G24022-MS1)					Source B1G0509-01					
Gasoline Range Hydrocarbons	700	50.0	mg/kg dry	27.0	964	-978	53-120			Q-0
Surrogate: 4-BFB (FID)	*0.00*		"	*4.32*			*50-147*			*S-01*
Matrix Spike (1G24022-MS2)					Source B1G0431-03					
Benzene	0.721	0.0200	mg/kg dry	0.798	ND	88.6	64-130			
Toluene	0.752	0.0500	"	0.798	ND	94.2	66-130			
Ethylbenzene	0.791	0.0500	"	0.798	ND	97.5	72-130			
Xylenes (total)	2.43	0.100	"	2.39	ND	99.5	73-130			
Surrogate: 4-BFB (PID)	*4.79*		"	*6.39*		*75.0*	*54-123*			
Matrix Spike Dup (1G24022-MSD1)					Source B1G0509-01					
Gasoline Range Hydrocarbons	821	50.0	mg/kg dry	27.0	964	-530	53-120	15.9	40	Q-02
Surrogate: 4-BFB (FID)	*0.00*		"	*4.32*			*50-147*			*S-01*
Matrix Spike Dup (1G24022-MSD2)					Source B1G0431-03					
Benzene	0.695	0.0200	mg/kg dry	0.798	ND	85.3	64-130	3.67	40	
Toluene	0.733	0.0500	"	0.798	ND	91.9	66-130	2.56	40	
Ethylbenzene	0.783	0.0500	"	0.798	ND	96.5	72-130	1.02	40	
Xylenes (total)	2.40	0.100	"	2.39	ND	98.3	73-130	1.24	40	
Surrogate: 4-BFB (PID)	*5.90*		"	*6.39*		*92.3*	*54-123*			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Scott A. Woerman, Project Manager

www.ncalabs.com

Seattle [illegible]
Spokane [illegible]
Portland [illegible]
Bend [illegible]

Geo Engineers - Seattle	Project TOSCO #5353	
600 Stewart Street, Suite 1420	Project Number 4823-517-02	**Reported**
Seattle WA 98101	Project Manager Dave Cook	08/01/01 17:03

Semivolatile Petroleum Products by NWTPH-Dx with Acid/Silica Gel Clean-up - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1G19001: Prepared 07/19/01 Using EPA 3550B										
Blank (1G19001-BLK1)										
Diesel Range Hydrocarbons	ND	10.0	mg/kg							
Lube Oil Range Hydrocarbons	ND	25.0	"							
Surrogate: 2-FBP	*8.12*		"	*10.0*		*75.9*	*50-150*			
Surrogate: Octacosane	*9.15*		"	*10.0*		*85.8*	*50-150*			
LCS (1G19001-BS1)										
Diesel Range Hydrocarbons	54.6	10.0	mg/kg	66.7		81.9	50-150			
Surrogate: 2-FBP	*8.71*		"	*10.0*		*87.4*	*50-150*			
LCS Dup (1G19001-BSD1)										
Diesel Range Hydrocarbons	54.7	10.0	mg/kg	66.7		82.0	50-150	0.183	50	
Surrogate: 2-FBP	*8.14*		"	*10.0*		*76.1*	*50-150*			
Duplicate (1G19001-DUP1)					**Source: B1G0388-01**					
Diesel Range Hydrocarbons	1460	110	mg/kg dry		1610			9.77	50	
Lube Oil Range Hydrocarbons	ND	275	"		ND			34.3	50	
Surrogate: 2-FBP	*15.0*		"	*12.0*		*125*	*50-150*			
Surrogate: Octacosane	*10.4*		"	*12.0*		*86.7*	*50-150*			

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Scott A. Woerman, Project Manager

www.ncalabs.com

Seattle
Spokane
Portland
Bend

Geo Engineers - Seattle	Project IOSCO #5353	
600 Stewart Street Suite 1420	Project Number 4823-517-02	**Reported**
Seattle WA 98101	Project Manager Dave Cook	08/01/01 17:03

Physical Parameters by APHA/ASTM/EPA Methods - Quality Control
North Creek Analytical - Bothell

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1G25040 Prepared 07/25/01 Using Dry Weight										
Blank (1G25040-BLK1)										
Dry Weight	100	1.00	%							

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Scott A. Woerman, Project Manager

www.ncalabs.com

Seattle
Spokane
Portland
Bend

Geo Engineers - Seattle	Project TOSCO #5353	
600 Stewart Street Suite 1420	Project Number 4823-517-02	**Reported**
Seattle WA 98101	Project Manager Dave Cook	08/01/01 17:03

Notes and Definitions

D-08	Results in the diesel organics range are primarily due to overlap from a gasoline range product
D-09	Results in the diesel organics range are primarily due to overlap from a heavy oil range product
G-03	The total hydrocarbon result in this sample is primarily due to an individual compound eluting in the volatile hydrocarbon range. Identification and quantitation by EPA method 8021B or 8260B is recommended
I-06	The analyte concentration may be artificially elevated due to coeluting compounds or components
Q-02	The spike recovery for this QC sample is outside of NCA established control limits due to sample matrix interference
S-01	The surrogate recovery for this sample is not available due to sample dilution required from high analyte concentration and/or matrix interferences
S-02	The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample
S-04	The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
'	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

nca™
North Creek Analytical, Inc.
Environmental Laboratory Network
www.ncalabs.com

18939 120th Avenue N.E., Suite 101, Bothell WA 98011-9508 (425) 420-9200 FAX 420-9210
East 11115 Montgomery, Suite B, Spokane, WA 99206-4776 (509) 924-9200 FAX 290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-9210
20332 Empire Avenue, Suite F-1, Bend, OR 97701-5711 (541) 383-9310 FAX 382-7588

TOSCO CHAIN OF CUSTODY REPORT

B1G0431

TOSCO INFORMATION

Facility Number # ~~1045~~ SS# 5353
Site Address 600 Westlake Ave N
City, State, ZIP Seattle WA
Project/AWO Code
Tosco Manager Tim Johnson
FACILITY TYPE (check one) ☐ BP/Ⓚ ☐ Terminal/Bulk Plant
☐ Brown Bear ☒ Former 76 Site ☐ Other

CONSULTANT INFORMATION

Firm GEI Project# 4823-517-02
Address: Plaza 600 Building
600 Stewart St, Ste 1420
Seattle WA 98101
Phone (206) 728-2674 Fax (206) 728-2732
Project Manager Dave Cook E-mail: dcook@geoengineers.com
Sample Collection by GJA

Quality Assurance Data Level: ☐ A ☒
A Standard Summary
B Standard + Chromatograms

Laboratory Turnaround Days: ☒ 5 ☐ 3 ☐ 2 ☐ 1
10 Day - Standard

☐ OR ☐ WA ☐ AK ☒ NW Series ☐ ID

SAMPLE INDENTIFICATION	SAMPLING DATE / TIME	MATRIX (W,S,O)	# OF CON TAINERS	TPH-HCID	TPH-Gas	BTEX EPA 8021 Mod.	TPH-Gas + BTEX	TPH-Diesel	TPH-Diesel Extended	TPH-Diesel-Ext. w/SG Cleanup	Halogen Volatiles EPA 8021	Pesticides/PCBs or PCBs Only	GC/MS Volatiles EPA 8260	GC/MS Semi Vols EPA 8270	PAH's 8270 SIM or 8310	Lead	Total or Dissolved	TCLP or RCRA Metals (8)	NCA SAMPLE NUMBER
1 MW-50-11	7/17/01	S	1				X			X									01
2 MW-50-16		S	1				X			X									02
3 MW-51-11		S	1				X			X									03
4 MW-51-13.5		S	1				X			X									04
5 MW-52-11		S	1				X			X									05
6 MW-52-13.5		S	1				X			X					REVISED				06
7 ~~SB-1-11~~		S	1				X			X					DAC 7/20/01				07
8 ~~SB-1-18.5~~		S	1				X			X									08
9 MW-50-9.5							X			X									09
10 SB-1-9.5							X			X									10

	Relinquished by	Firm	Date & Time	Received by	Firm	Date & Time
1		GEI	7/19/01 900		NCA	7/20/01 13:10
2.						
3						

Comments:
WICS
3.0

Page 1 of 1

Comments:

APPENDIX C

REPORT LIMITATION AND GUIDELINES FOR USE

APPENDIX C

REPORT LIMITATION AND GUIDELINES FOR USE[1]

This appendix provides information to help you manage your risks with respect to the use of this report

ENVIRONMENTAL SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES, PERSONS AND PROJECTS

This report has been prepared for use by Tosco, their authorized agents and regulatory This report is not intended for use by others, and the information contained herein is not applicable to other sites

GeoEngineers structures our services to meet the specific needs of our clients For example an environmental site assessment or remedial action study conducted for a property owner may not fulfill the needs of a prospective purchaser of the same property Because each environmental study is unique, each environmental report is unique, prepared solely for the specific client and project site No one except Tosco should rely on this environmental report without first conferring with GeoEngineers This report should not be applied for any purpose or project except the one originally contemplated

THIS ENVIRONMENTAL REPORT IS BASED ON A UNIQUE SET OF PROJECT-SPECIFIC FACTORS

This report has been prepared for use by Tosco, their authorized agents and regulatory GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report Unless GeoEngineers specifically indicates otherwise do not rely on this report if it was

- not prepared for you,
- not prepared for your project
- not prepared for the specific site explored or
- completed before important project changes were made

If important changes are made after the date of this report, GeoEngineers should be given the opportunity to review our interpretations and recommendations and provide written modifications or confirmation as appropriate

RELIANCE CONDITIONS FOR THIRD PARTIES

If a lending agency or other parties intend to place legal reliance on the product of our services we require that those parties indicate in writing their acknowledgement that the scope of services provided, and the general conditions under which the services were rendered, are understood and accepted by them We also require that any third party placing legal reliance on this product agree in writing to limit our professional liability to $50,000 or the amount of our

[1] Developed based on material provided by ASFE, Professional Firms Practicing in the GeoSciences, www asfe org

fees on the project whichever is more This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions

ENVIRONMENTAL REGULATIONS ARE ALWAYS EVOLVING

Some substances may be present in the site vicinity in quantities or under conditions that may have led, or may lead to contamination of the subject site, but are not included in current local, state or federal regulatory definitions of hazardous substances or do not otherwise present current potential liability GeoEngineers cannot be responsible if the standards for appropriate inquiry, or regulatory definitions of hazardous substance, change or if more stringent environmental standards are developed in the future

SUBSURFACE CONDITIONS CAN CHANGE

This environmental report is based on conditions that existed at the time the study was performed The findings and conclusions of this report may be affected by the passage of time, by manmade events such as construction on or adjacent to the site by new releases of hazardous substances or by natural events such as floods earthquakes, slope instability or ground water fluctuations Always contact GeoEngineers before applying this report to determine if it is still applicable

MOST ENVIRONMENTAL FINDINGS ARE PROFESSIONAL OPINIONS

Our interpretations of subsurface conditions are based on field observations and chemical analytical data from the sampling locations at the site documented in this report Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken GeoEngineers reviewed field and laboratory data and then applied our professional judgment to render an opinion about subsurface conditions throughout the site Actual subsurface conditions may differ – sometimes significantly – from those indicated in this report There is always a potential that areas of contamination exist in portions of the site that were not sampled or tested during this or previous studies Our report, conclusions and interpretations should not be construed as a warranty of the subsurface conditions

DO NOT REDRAW THE EXPLORATION LOGS

Environmental scientists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data To prevent errors or omissions, the logs included in an environmental report should never be redrawn for inclusion in other design drawings Only photographic or electronic reproduction is acceptable, but recognize that separating logs from the report can elevate risk

READ THESE PROVISIONS CLOSELY

Some clients, design professionals and contractors may not recognize that the geoscience practices (geotechnical engineering, geology and environmental science) are far less exact than

other engineering and natural science disciplines This lack of understanding can create unrealistic expectations that could lead to disappointments claims and disputes GeoEngineers includes these explanatory "limitations" provisions in our reports to help reduce such risks Please confer with GeoEngineers if you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or site