

Sanuary 20, 1997 Project 304-015.1A

Mr. Timothy D. Johnson Tosco Northwest Company 601 Union Street, Suite 2500 Seattle, Washington 98101

Re: Oil/Water Separator
Closure Documentation
Tosco Service Station 11124
3315 High Street
Oakland, California

Dear Mr. Johnson:

Pacific Environmental Group, Inc. (PACIFIC) has prepared this letter for the Tosco Northwest Company (Tosco) to document the results of the oil/water separator closure activities at the site referenced above (Figure 1). The work described in this report was performed by PACIFIC at the request of Tosco. The field activities were completed on December 12, 1996, at the request of Gettler-Ryan, Inc., the contractor. The purpose of this work was to investigate the condition of soil beneath the base of the oil/water separator located on the service station property.

SUMMARY OF FIELD ACTIVITIES

On December 12, 1996, PACIFIC collected two soil samples (OWS-1, 0.5' and OWS-1, 2') from beneath the oil/water separator located in the floor of the vehicle service bay at the west side of the service station building (Figure 1 and Table 1). Soil samples OWS-1, 0.5' and OWS-1, 2' were collected immediately below the second stage of the separator and at depths of approximately 0.5 foot and 2 feet, respectively.

The samples were collected using hand auger equipment, and were retained in brass liners, sealed with Teflon® tape and plastic end caps, and stored on ice. The samples were later transported under chain-of-custody to a California State-certified laboratory. Each soil sample was analyzed for total recoverable petroleum hydrocarbons (TRPH)

and halogenated volatile organic compounds (HVOCs) by EPA Methods 418.1 and 8010, respectively. In addition, the soil samples were analyzed for total petroleum hydrocarbons calculated as gasoline (TPH-g) and benzene, toluene, ethylbenzene, and xylenes (BTEX compounds) by EPA Methods 8015 (modified) and 8020. Samples OWS-1, 0.5' and OWS-1, 2' were also analyzed for TPH calculated as diesel (TPH-d) with silica gel cleanup by the California DHS LUFT Method. Field and laboratory procedures are presented as Attachment A. Certified analytical reports and chain-of-custody documentation are presented as Attachment B.

FINDINGS

Oil/Water Separator Closure

Prior to collecting the soil samples, Gettler-Ryan removed the contents of the oil/water separator and steam cleaned the inside. Each stage of the separator was inspected and appeared to be in good and undamaged condition. The bottom of the separator was then broken out using an pneumatic hammer. The concrete at the base of the second stage was observed to be approximately 6 inches thick. Soil samples were then collected from below the second stage using hand auger equipment. Hydrocarbon staining and odors were encountered.

Soil Analytical Results

TRPH was detected in soil samples OWS-1, 0.5' and OWS-1, 2' at concentrations of 220 and 120 parts per million (ppm), respectively. A mixture of hydrocarbons in the TPH-g carbon range, exhibiting a chromatogram fingerprint not characteristic of gasoline, were detected in soil sample OWS-1, 0.5' at a concentration of 970 ppm, and in sample OWS-1, 2' at 750 ppm.

Benzene was not detected at concentrations above the laboratory method reporting limit (MRL). Other BTEX compounds were reported for both soil samples at concentrations up to 90 ppm (xylenes).

Hydrocarbons eluting in the diesel range (TPH-d), but having a chromatogram pattern similar to mineral spirits, were detected in samples OWS-1, 0.5' and OWS-1, 2' at concentrations of 45 and 150 ppm, respectively. In addition, heavy oil was detected in the samples at concentrations of 61 ppm (OWS-1, 0.5') and 1,400 ppm (OWS-1, 2').

Both soil samples contained concentrations of HVOCs. Tetrachloroethene (PCE) was detected at concentrations of 1.4 ppm in sample OWS-1, 0.5' and 0.29 ppm in sample OWS-1, 2'. In addition, methylene chloride, 1,1-dichloroethane, chlorobenzene, and

1,2-dichlorobenzene were detected at concentrations up to 9.2 ppm. Soil analytical data are presented in Table 1.

CONCLUSIONS

- Based on the analytical results for the two soil samples collected from hand auger Boring OWS-1, petroleum hydrocarbons are present in the soil below the oil/water separator. Soil samples collected at depths of 0.5 foot and 2 feet beneath the separator contained TRPH at concentrations of 220 and 120 ppm, respectively. In addition, a mixture of hydrocarbons in the TPH-g carbon range exhibiting a chromatogram fingerprint not characteristic of gasoline were detected in soil sample OWS-1, 0.5' at a concentration of 970 ppm, and in sample OWS-1, 2' at 750 ppm. Concentrations of toluene, ethylbenzene, and xylenes up to 90 ppm were reported for both soil samples.
- Hydrocarbons having a chromatogram pattern similar to mineral spirits, were detected in samples OWS-1, 0.5' and OWS-1, 2' at concentrations of 45 and 150 ppm, respectively. Heavy oil was also detected in sample OWS-1, 0.5' at a concentration of 61 ppm and in sample OWS-1, 2' at 1,400 ppm.
- Low concentrations of HVOCs were reported for both soil samples.
 PCE was detected at concentrations of 1.4 ppm in sample
 OWS-1, 0.5' and 0.29 ppm in sample OWS-1, 2'. In addition, methylene chloride, 1,1-dichloroethane, chlorobenzene, and 1,2-dichlorobenzene were detected at concentrations up to 9.2 ppm.

Should you have any questions regarding the contents of this letter, please call.

JOSEPH J. MUZZIO

Sincerely,

Pacific Environmental Group, Ing

Joseph Muzzio ~ Project Geologist

CEG 1672

Attachments:

Table 1 - Soil Analytical Data - Oil/Water Separator

Total Petroleum Hydrocarbons

(TPH as Gasoline, BTEX Compounds, TPH as Diesel, TRPH, and HVOCs)

Figure 1 - Site Map

Attachment A - Field and Laboratory Procedures

Attachment B - Certified Analytical Reports and Chain-of-Custody

Documentation

cc: Mr. Scott Hooton, British Petroleum Oil Company Mr. Kevin Graves, California Regional Water Quality Control Board,

San Francisco Bay Region

Mr. Kent Hem, Tosco Corporation

Table 1 Soil Analytical Data Oil/Water Separator

Total Petroleum Hydrocarbons

(TPH as Gasoline, BTEX Compounds, TPH as Diesel, TRPH, and HVOCs)

Tosco Service Station 11124 3315 High Street Oakland, California

Sample ID	Sample Depth (feet)	Date Sampled	TPH as Gasoline (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl- benzene (ppm)	Total Xylenes (ppm)	TPH as Diesel (ppm)	TRPH (ppm)	Tetrachloro- methane (PCE) (ppm)	Methylene Chloride (ppm)	1,1-Dichloro- ethane (ppm)	Chloro- benzene (ppm)	1,2-Dichloro benzene (ppm)
OWS-1, 0.5°	0.5	12/12/96	970 a	ND b	0.8	20	90	45 c	220	1	8,3	ND	0.77	9.2
OWS-1, 2°	2	12/12/96	750 a	ND b	0.6	16	73	150 d	120	0	2.6	0.05	0.13	1.7

TRPH = Total recoverable petroleum hydrocarbons

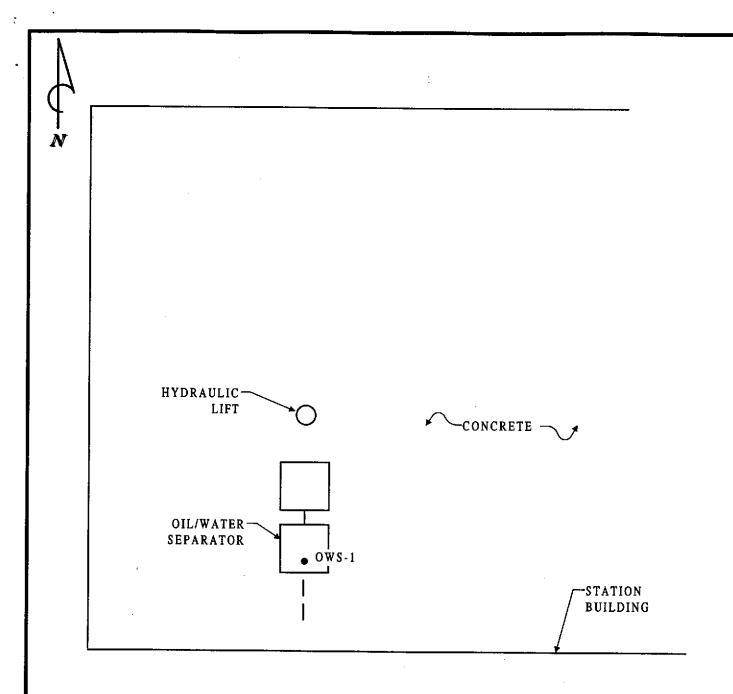
HVOCs = Halogenated volatile organic compounds

ppm = Parts per million

ND = Not detected at a concentration above the laboratory method reporting limit.

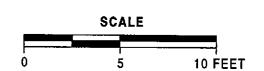
- a. The sample contains components eluting in the gasoline range that were quantified as gasoline. The chromatogram does not match the typical gasoline fingerprint.
- b. The method reporting limit (MRL) is elevated due to high analyte concentration requiring sample dilution.
- c. Quantified as diesel. The sample contained components that elute in the diesel range, but the chromatogram did not match the typical fingerprints. The patterns were similar to mineral spirits. the sample also contained a heavy oil at 61 ppm.
- d. Quantified as diesel. The sample contained components that elute in the diesel range, but the chromatogram did not match the typical fingerprints.

 The patterns were similar to mineral spirits. The sample also contained a heavy oil at 1,400 ppm.



LEGEND

OWS-1
• SOIL SAMPLE LOCATION AND DESIGNATION





PACIFIC ENVIRONMENTAL GROUP, INC. TOSCO SERVICE STATION 11124 3315 High Street Oakland, California

SITE MAP

FIGURE:

PROJECT: 304-015.1A

ATTACHMENT A FIELD AND LABORATORY PROCEDURES

ATTACHMENT A FIELD AND LABORATORY PROCEDURES

Hand-Auger Drilling Method

Soil Boring OWS-1 was completed using the hand-auger drilling method. This method utilizes a 3-inch diameter earth auger attached to a 4-foot long T-bar that is turned by hand. As the depth of the boring was increased, additional extension rods were attached. For the collection of soil samples, the auger was removed and replaced with a sampling devise, consisting of a steel penetration shoe attached to a extension rod and sliding hammer. The shoe was equipped with a brass sample retention liner, approximately 6 inches long and 2 inches in diameter. To collect soil samples, the shoe and liner were driven with the slide hammer into the undisturbed soil at the bottom of the borehole. After the sampler was driven into the soil, the shoe was removed from the boring and the sample liner was removed from the shoe and sealed on both ends with Teflon® tape and plastic end caps. The hand auger and sampling equipment were washed in a nonphosphatic cleaning solution and rinsed with deionized water prior to collecting each sample. Upon completion of the sampling, the boring was backfilled with soil cuttings.

The soil samples were stored at a temperature of less than 4 degrees Centigrade in an insulated container. The samples were later transported under chain-of-custody to a California State-certified laboratory.

Laboratory Procedure

Soil samples OWS-1, 0.5' and OWS-1, 2' were analyzed for total recoverable petroleum hydrocarbons (TRPH) and halogenated volatile organic compounds (HVOCs) by EPA Methods 418.1 and 8010, respectively. In addition, the soil samples were analyzed for total petroleum hydrocarbons calculated as gasoline (TPH-g) and benzene, toluene, ethylbenzene, and xylenes (BTEX compounds) by EPA Methods 8015 (modified) and 8020, respectively. The samples were also analyzed for TPH calculate as diesel (TPH-d) with silica gel cleanup by the California DHS LUFT Method. Certified analytical reports and chain-of-custody documentation are presented as Attachment B.

ATTACHMENT B

CERTIFIED ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION



December 27, 1996

Service Request No.: S9602183

Mr. Joe Muzzio PACIFIC ENVIRONMENTAL GROUP 2025 Gateway Place, Suite 440 San Jose, CA 95110

RE: TOSCO 11124/Oakland/304-015.1A

Dear Mr. Muzzio:

The following pages contain analytical results for sample(s) received by the laboratory on December 13, 1996. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 10, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Steven L. Green

Project Chemist

ustina V. Rayoun for

Acronyms

A2LA American Association for Laboratory Accreditation

ASTM American Society for Testing and Materials

BOD Biochemical Oxygen Demand

BTEX Benzene, Toluene, Ethylbenzene, Xylenes

CAM California Assessment Metals
CARB California Air Resources Board

CAS Number Chemical Abstract Service registry Number

CFC Chlorofluorocarbon
CFU Colony-Forming Unit
COD Chemical Oxygen Demand

DEC Department of Environmental Conservation
DEQ Department of Environmental Quality
DHS Department of Health Services
DLCS Duplicate Laboratory Control Sample

DMS Duplicate Matrix Spike
DOE Department of Ecology
DOH Department of Health

EPA U. S. Environmental Protection Agency

ELAP Environmental Laboratory Accreditation Program

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

IC Ion Chromatography

ICB Initial Calibration Blank sample

ICP Inductively Coupled Plasma atomic emission spectrometry

ICV Initial Calibration Verification sample

J Estimated concentration. The value is less than the MRL, but greater than or equal to

the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.

LUFT Laboratory Control Sample
LUFT Leaking Underground Fuel Tank

M Modified

MBAS Methylene Blue Active Substances

MCL Maximum Contaminant Level. The highest permissible concentration of a

substance allowed in drinking water as established by the U. S. EPA.

MDL Method Detection Limit
MPN Most Probable Number
MRL Method Reporting Limit

MS Matrix Spike

MTBE Methyl tert-Butyl Ether

NA Not Applicable
NAN Not Analyzed
NC Not Calculated

NCASI National Council of the paper industry for Air and Stream Improvement
ND Not Detected at or above the method reporting/detection limit (MRL/MDL)

NIOSH National Institute for Occupational Safety and Health

NTU Nephelometric Turbidity Units

ppb Parts Per Billion ppm Parts Per Million

PQL Practical Quantitation Limit
QA/QC Quality Assurance/Quality Control
RCRA Resource Conservation and Recovery Act

RPD Relative Percent Difference SIM Selected Ion Monitoring

SM Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992

STLC Solubility Threshold Limit Concentration

SW Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846,

3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.

TCLP Toxicity Characteristic Leaching Procedure

TDS Total Dissolved Solids

TPH Total Petroleum Hydrocarbons

tr Trace level. The concentration of an analyte that is less than the PQL but greater than or equal

to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.

TRPH Total Recoverable Petroleum Hydrocarbons

TSS Total Suspended Solids

TTLC Total Threshold Limit Concentration

VOA Volatile Organic Analyte(s) ACRONLST.DOC -7/14/95

Analytical Report

Client:

TOSCO

Service Request: L9604976

Project:

TOSCO 11124/Oakland/#304-015.1A

Date Collected: 12/12/96 Date Received: 12/13/96

Sample Matrix: Soil

Date Extracted: 12/19/96

Date Analyzed: 12/19/96

Total Recoverable Petroleum Hydrocarbons (TRPH)

EPA Method 418.1 Units: mg/Kg (ppm)

Sample Name	Lab Code	MRL	Result
OWS-1, 0.5'	L9604976-001	10	220
OWS-1, 2'	L9604976-002	10	120
Method Blank	L961219-MB	10	ND

Analytical Report

Client:

TOSCO

Project:

TOSCO 11124/Oakland/304-015.1A

Sample Matrix: Soil

Service Request: \$9602183 Date Collected: 12/12/96 Date Received: 12/13/96 Date Extracted: 12/18/96

Halogenated Volatile Organic Compounds EPA Methods 5030/8010 Units: mg/Kg (ppm) As Received Basis

		Sample Name: Lab Code: Date Analyzed:	OWS-1, 0.5' S9602183-001 C 12/20/96	OWS-1, 2' \$9602183-002 12/18/96	Method Blank S961218-SB1 12/18/96
Analyte	MRL				
Dichlorodifluoromethane (CFC 12)	0.1		<0.5	ND	ND
Chloromethane	0.1		<0.5	ND	ND
Vinyl Chloride	0.05		<0.25	ND	ND
Bromomethane	0.05		< 0.25	ND	ND
Chloroethane	0.05		<0.25	ND	ND
Trichlorofluoromethane (CFC 11)	0.05		<0.25	ND	ND
1,1-Dichloroethene	0.05		<0.25	ND	ND
Trichlorotrifluoroethane (CFC 113)	0.05		<0.25	ND	ND
Methylene Chloride	0.05		8.3	2.6	ND
trans-1,2-Dichloroethene	0.05		< 0.25	ND	ND
cis-1,2-Dichloroethene	0.05		<0.25	ND	ND
1,1-Dichloroethane	0.05		<0.25	0.05	ND
Chloroform	0.05		<0.25	ND	ND
1,1,1-Trichloroethane (TCA)	0.05		<0.25	ND	ND
Carbon Tetrachloride	0.05		< 0.25	ND	ND
1,2-Dichloroethane	0.05		< 0.25	ND	ND
Trichloroethene (TCE)	0.05		< 0.25	ND	ND
1,2-Dichloropropane	0.05		< 0.25	ND	ND
Bromodichloromethane	0.05		< 0.25	ND	ND
2-Chloroethyl Vinyl Ether	0.5		<2.5	ND	ND
trans-1,3-Dichloropropene	0.05		< 0.25	ND	ND
cis-1,3-Dichloropropene	0.05		<0.25	ND	ND
1,1,2-Trichloroethane	0.05		<0.25	ND	ND
Tetrachloroethene (PCE)	0.05		1.4	0.29	ND
Dibromochloromethane	0.05		<0.25	ND	ND
Chlorobenzene	0.05		0.77	0.13	ND
Bromoform	0.05		<0.25	ND	ND
1,1,2,2-Tetrachloroethane	0.05		<0.25	ND	ND
1,3-Dichlorobenzene	0.1		<0.5	ND	ND
1,4-Dichlorobenzene	0.1		<0.5	ND	ND
1,2-Dichlorobenzene	0.1		9.2	1.7	ND

Analytical Report

Client:

TOSCO

TOSCO 11124/Oakland/304-015.1A

Project: Sample Matrix:

Soil

Service Request: \$9602183

Date Collected: 12/12/96 Date Received: 12/13/96

Date Extracted: 12/23/96
Date Analyzed: 12/23, 25/96

BTEX and TPH as Gasoline EPA Methods 5030/8020/California DHS LUFT Method As Received Basis

	Analyte: Units: Method Reporting Limit:	TPH as Gasoline mg/Kg (ppm)	Benzene mg/Kg (ppm) 0.005	Toluene mg/Kg (ppm) 0.005	Ethyl- benzene mg/Kg (ppm) 0.005	Xylenes, Total mg/Kg (ppm) 0.005
Sample Name	Lab Code					
OWS-1, 0.5'	S9602183 - 001	970 X	<0.5 C	0.8	20	90
OWS-1, 2'	S9602183-002	750 X	<0.5 C	0.6	16	73
Method Blank	S961223-SB1	ND	ND	ND	ND	ND

C

The MRL is elevated due to high analyte concentration requiring sample dilution.

X

The sample contains components eluting in the gasoline range that were quantitated as gasoline.

The chromatogram does not match the typical gasoline fingerprint.

Analytical Report

Client:

TOSCO

Project:

TOSCO 11124/Oakland/304-015.1A

Sample Matrix: Soil

Service Request: \$9602183

Date Collected: 12/12/96

Date Received: 12/13/96 Date Extracted: 12/18/96

Date Analyzed: 12/18/96

TPH as Diesel California DHS LUFT Method/Silica Gel Clean-Up Units: mg/Kg (ppm) As Received Basis

Sample Name	Lab Code	MRL	Result
OWS-1, 0.5'	S9602183-001	1	45A, B
OWS-1, 2'	S9602183-002	1	150A, C
Method Blank	S9601218-SB1	1	ND

Α Quantitated as diesel. The samples contained components that eluted in the diesel range, but the chromatogr did not match the typical fingerprints. The patterns look like mineral spirits. В The sample also contained a heavy oil at 61 ppm. C The sample also contained a heavy oil at 1400 ppm.

QA/QC Report

Client:

TOSCO

Project: TOS

TOSCO 11124/Oakland/304-015.1A

Sample Matrix: Soil

Date Collected: 12/12/96
Date Received: 12/13/96
Date Extracted: 12/18/96

Date Analyzed: NA

Surrogate Recovery Summary
Halogenated Volatile Organic Compounds
EPA Methods 5030/8010

Sample Name	Lab Code	Percent Recovery 4-Bromofluorobenzene
OWS-1, 0.5'	\$9602183-001	92
OWS-1, 2'	S9602183-002	109
Method Blank	S961218-SB1	92

CAS Acceptance Limits: 74-125

QA/QC Report

Client:

TOSCO

Project:

Sample Matrix: Soil

TOSCO 11124/Oakland/304-015.1A

Service Request: \$9602183 Date Collected: 12/12/96

Date Received: 12/13/96

Date Extracted: NA Date Analyzed: NA

Surrogate Recovery Summary TPH as Gasoline/BTEX EPA Methods 5030/8020/California DHS LUFT Method

Sample Name	Lab Code	PID Detector Percent Recovery 4-Bromofluorobenzene	FID Detector Percent Recovery α,α,α-Trifluorotoluene	
OWS-1, 0.5'	\$9602183-001	111	103	
OWS-1, 2'	\$9602183-002	110	101	
Method Blank	\$961223-\$B1	100	91	

CAS Acceptance Limits:

51-137

51-137

QA/QC Report

Client:

TOSCO

Service Request: \$9602183

Project:

TOSCO 11124/Oakland/304-015.1A

Date Collected: 12/12/96

Sample Matrix: Soil

Date Received: 12/13/96

Date Extracted: NA Date Analyzed: 12/18/96

Surrogate Recovery Summary TPH as Diesel California DHS LUFT Method/Silica Gel Clean-Up

Sample Name	Lab Code	Percent Recovery p-Terphenyl
OWS-1, 0.5'	S9602183-001	104
OWS-1, 2'	S9602183-002	97
Method Blank	S9601218-SB1	80

CAS Acceptance Limits: 41-140

Pacific Environmental Group, Inc. 59602183 Chain of Custody PG I UFI 2025 Gateway Place #440, San Jose CA 95110 PROJECT No. 304-015-1A Phone 408 441-7500 Fax 408 447-75-39 Facility Address: 3315 HIGH 95. pristmo Facility No. 70500 11124 Billing Refence Number: PACIFIC Point of Contact: VOK MUZZID Sampler: MAPK WWEIK CLIENT engineer: Tin Worth Son Laboratory Name: Comments: W-water G-grab S=soll D-disc. Container Sample Sampling Sampling Cont. Size Sample LD. Time (ml) Preserv. Matrix Type Z BRASS 12/12/86 OWS-1,05 G 12/12/16 OWS-Z, 05 Z BRASS ζ 6 12/12/10 14417 OWS-Z, Z' 12/12/16 6 > 1401-10 Condition of Sample: Temperature Received: Mail original Analytical Report to: Turnaround Time: Pacific Environmental Group (,60 Priority Rush (1 day) Relinquished by Time Beceived by Date Time 2025 Gateway Place #440 16:05 San Jose, CA 95110 Rush (2 days) 12/13/46 16:05 Relinquished by MARK KINCIR Time Received by 620 Contra Costa Blvd. #209 Pleasant Hill, CA 94523 Expedited (5 days) telinquished by Date Time Received by Date Time 26725 Jeronimo Rd. #576C Mission Viejo, CA 92822 Standard (10 days) relinguished by Date Time Received by laboratory Date TIM9 4020 148th Ave NE #B Redmond, WA 98052 As Contracted