

Migizi Group

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May 18, 2022 Should be 2023

RE: Remedial Investigation Summary and Scope of Work

312 West Republican Street Seattle, Washington

To Whom it May Be Concerned:

Migizi Group, Inc. (MGI) is pleased to present this Remedial Investigation Summary and Scope of Work regarding Site remediation activities at the above referenced property in Seattle, Washington (Site, see Figure 1). The letter serves to document the historic conditions, UST decommissioning efforts, soil remediation completed to-date, and scope of work to complete petroleum-impacted soil remediation given the current Site conditions.

#### **PREVIOUS STUDIES**

To understand the history of the Site, MGI was provided a Phase II ESA prepared by SoundEarth Solutions (SES, dated June 2019). Some portions of the quoted text may refer to figures and / or data presented in the original report; the following is a summary provided as part of the SES Phase II ESA;

"Per the request of Re:form LLC, SoundEarth conducted a Phase II ESA subsurface investigation at the Property to investigate whether the RECs identified in the 2018 Phase I ESA resulted in impacts to the Property. Thirteen soil borings (P01 through P13) were advanced on the Property in suspect areas, including the interior of the former printing facility, the former furnace area, the underground storage tank area, and the former oil house location. Groundwater was encountered in borings P01 through P04 ranging in depths from 8 to 10.9 feet below ground surface (bgs). None of the soil, soil gas, or groundwater samples collected and analyzed contained detectable concentrations of chlorinated volatile organic compounds. Soil samples collected from borings P07 [directly adjacent south of the small UST along the alley], P08 [ap



proximately ten feet northeast of the small UST along the alley, inside the garage], and P10 [shown by SES as approximately ten feet southeast of the UST along the alley, inside the garage¹] contained chemicals of concern such as gasoline-range petroleum hydrocarbons, diesel-range petroleum hydrocarbons, oil-range petroleum hydrocarbons, benzene, toluene, ethylbenzene, or total xylenes at concentrations exceeding the Washington State Model Toxics Control Act Method A cleanup levels.

The results of the investigation suggest that the lateral extents of impacts have been defined, based on the absence of petroleum hydrocarbons in soil samples collected from borings P05, P06, P09, P11, and P13. Additional investigation may be necessary in order to define the vertical extent of the impacts but the absence of petroleum impacts in soil and groundwater samples collected from boring PG-1 at a depth of 20 feet bgs suggests that the vertical extent of impacts may be limited and do not appear to be widespread."

312 West Republican is situated on a slope, dropping approximately ten feet across the Property from the north, toward the south. The alley was filled in at some time in the past. Consequently, the surface of the ground above the 500-gallon UST and neighboring garage is approximately 6′ 4″ above the surface of inside the main structure. 'Below ground surface' (bgs) refers to elevation relative to the surface above the 500-gallon UST throughout this report.

Borings completed by SES surrounded a 500-gallon heating oil UST (along the alley, west of the garage) impacts were limited to the borings closest to the UST (see Figure 2 in the SES report dated June 6, 2019), which was in the southwest corner of the garage, along the alley (see Figure 2). On December 18, 2020, after having performed utility locating including ground penetrating radar, MGI attempted three more borings inside the garage, east of the UST(MGI-1, MGI-2, MGI-3. All three borings reached refusal at an approximate depth of 7.0 feet below grade. Soil samples were collected from each boring at terminal depth, or where contamination was considered most likely based upon field screening. None of the soil samples collected in the garage area were reported to contain concentrations of petroleum hydrocarbons exceeding MTCA method A cleanup levels. One sample (MGI-1-7') contained a detectable concentration of diesel-range petroleum hydrocarbons at 990 mg/kg.

#### ADDITIONAL SITE CHARACTERIZATION

MGI advanced three borings inside of the 312 W Republican main structure (south of the garage area), situated approximately five to fifteen feet laterally (depending on location) from the UST (see Figure 2). At a depth of one foot below the concrete pad, fill material and a second concrete pad was encountered. The drill rig was only able to reach a depth of 7.0 (relative to the exterior surface above the 500-gallon UST) feet due to refusal so no samples were collected.

MGI remobilized to the site on December 22, 2020, to continue borings in two locations to a depth sufficient to reach native soil under the second concrete pad, approximately 8.0 to 10.5 feet below grade (relative to the UST top elevation). Four soil samples (2180-B1-8', 2180-B2-8', 2180-B3-8',

<sup>&</sup>lt;sup>1</sup> In field observations based upon patches in the concrete suggest that this boring was likely situated inside the main structure, south of the garage.



2180-B3-9') were collected and submitted for analysis by method NWTPH-Dx. None of the soil samples collected and analyzed were reported to contain concentrations of oil-range or diesel-range petroleum hydrocarbons above MTCA Method A cleanup levels.

MGI also collected one groundwater sample from the monitoring well situated in the alley (PG-1), situated only a few feet west of the UST. The sample was collected from the well on December 23, 2020 and submitted for analysis by method NWTPH-Dx. Groundwater from this well contained low levels of diesel range petroleum hydrocarbons (0.58 mg/L), just slightly in excess of the MTCA Method A cleanup level (0.5 mg/L).

Data collected confirmed by SES, which indicated the lateral distribution of petroleum hydrocarbons was limited due to refusal, to the upper extent of soil impacts. Excavation associated with the UST removal would later confirm impacts extending up to 14' bgs.

#### **UST REMOVAL AND ACCESSIBLE SIDEWALL SOIL SAMPLING**

In January 2021, MGI oversaw the decommissioning of the 500-gallon UST and removal of heating-oil impacted soil beneath and east of the UST (Rivers Edge Environmental Services). During UST removal, soil impacts were observed predominantly east of the UST (inside the garage enclosure).

A second 1,200-gallon UST, previously unreported, was identified situated approximately six feet east of the 500-gallon UST (inside of the garage). MGI properly decommissioned and removed both underground storage tanks (USTs) in mid-February 2021. The USTs were and a total of 63.66 tons of petroleum-impacted soil was removed for disposal.

#### 500-Gallon UST

The 500-gallon heating oil UST was removed first, as it was the only UST purportedly on-site. Concrete inside the garage and on the exterior of the garage was first removed, followed by the overburden. After the UST was removed, excavation of impacted soil proceeded and extended to a depth of 7 feet, six inches (7'6") bgs. For disposal characterization purposes, three soil samples were collected during excavation and analyzed by method NWTPH-Dx. Samples NWSW-5.5', SESW-5.5' and Base-6' were collected from the northwest sidewall (at a depth of 5.5 feet bgs), southeast sidewall (at a depth of 5.5 feet bgs) and excavation base (at a depth of 6 feet bgs), respectively. Laboratory analytical data indicated that samples NWSW-5.5' contained 1,700 mg/kg diesel and 860 mg/kg lube range petroleum hydrocarbons. Sample SESW-5.5' was reported to contain 15,000 mg/kg diesel and ND lube range petroleum hydrocarbons. Finally, disposal confirmation sample Base-6' was reported to contain 14,000 mg/kg diesel and ND lube range petroleum hydrocarbons.

The excavation extended in depth to 7'6" bgs; excavation deeper was not feasible due to the potential for undermining the alley. Five excavation limit samples were collected from around the 500-gallon UST. On February 18 and 19, 2021, sidewall samples were collected at the 500-gallon UST excavation limits. Soil samples were analyzed by method NW-HCID with NW-



TPHDx follow up, as required). Sample EXL-M-7′3″², situated under the base of the UST, reported a diesel range petroleum hydrocarbon concentration of 12,000 mg/kg and below laboratory practical quantification limits (ND) in the oil or lube range petroleum hydrocarbons. Sample NWSW-5.5′ was reported to contain diesel concentrations of 860 mg/kg and ND lube range petroleum hydrocarbons. Sample EXL-W-7′6″ (approximately 4′ west of the UST) was reported to have a diesel concentration of 12,000 mg/kg and ND for lube-range petroleum hydrocarbons. Sample EXL-WSW-7′6″ (situated approximately 4′ west southwest of the UST) was reported to contain 21,000 mg/kg diesel range and ND lube range petroleum hydrocarbons. Sample EXL-SW-7′6″ (situated approximately 4′ southwest of the UST) was reported to contain 14,000 mg/kg diesel and ND lube range petroleum hydrocarbons. Finally, sample EXL-E-7′ (situated approximately six feet east of the UST) was reported to contain ND concentrations of diesel or lube range petroleum hydrocarbons. It is likely that the preferential pathway caused by the second, deeper UST prevented impacts to soil at the elevation sampled east of the 500-gallon UST.

At the conclusion of the excavation activities, it was clear that impacted soil extended in all directions (north, south, east, west and deeper than excavation allowed). In addition, it was clear that a second, previously undocumented UST existed east and deeper in elevation than the 500-gallon UST.

#### 1,200-Gallon UST

During removal of oil-impacted soil surrounding the 500-gallon UST, a second UST fill-port was discovered on the east side of the excavation. The top of the fill port was situated approximately three to four feet bgs. Additional soil was removed to the east of the 500-gallon UST, a 1,200-gallon heating oil UST was identified, situated approximately six to seven feet bgs. A disposal and progression soil sample was collected (DISP-2288-3-1) from within the UST excavation which was reported to contain 7,700 mg/kg of diesel range petroleum hydrocarbons and ND concentrations of lube range petroleum hydrocarbons, exceeding the MTCA Method A cleanup level (2,000 mg/kg).

On March 1 and 3, 2021, sidewall samples were collected from around the 1,200-gallon UST at the excavation limits. Samples collected at the north, south and east sidewalls contained concentrations of diesel-range petroleum hydrocarbons ranging from non-detect (UST2-NSW-12'6" and UST2-ESW-12'6") to 980 mg/kg (UST2-SSW-12'6") and a base sample at 760 mg/kg (UST2-BASE-13'). None of these samples collected from the excavation base, and north, south, and east sidewalls contained detectable concentrations of gasoline-range petroleum hydrocarbons. The west sidewall sample (UST2-WSW-12'6") contained concentrations of diesel-range petroleum hydrocarbons (12,000 mg/kg), gasoline-range petroleum hydrocarbons (5,500 mg/kg), benzene (0.46 mg/kg), ethylbenzene (13 mg/kg) and xylenes (65 mg/kg) above MTCA Method A cleanup levels. Excavation deeper than the aforementioned depths was not feasible

<sup>&</sup>lt;sup>2</sup> Sample nomenclature for this sample set include EXL, which refers to excavation limit, a directional indicator (M, for midpoint, S for south, WSW for west south-west, SW for southwest and E for east) as well as a bgs depth indicator (such as 7'6", for seven feet six inches below surface above the 500-gallon UST).



due to the potential for undermining the concrete slab inside of the garage and/or the main building footing.

#### **EXCAVATION BASE**

After UST and contaminated soil removal was complete, MGI remobilized to the Site on May 21, 2021 and advanced eleven borings (2383-B1 to 2383-B11) to a depth of ~12 feet below ground surface (bgs) under the area where the USTs and soil had been removed, as well as under the main building adjacent to the garage to the south (see Figure 2). Laboratory analytical data confirmed soil under the garage (where the USTs had been removed) does not exceed MTCA Method A cleanup levels. Diesel was found in excess of MTCA Method A cleanup levels to the south of the location where the 1,200-gallon UST was removed, indicating the contamination had migrated under the footing wall of the main building.

#### REMAINING SOIL IMPACTS – SOUTH

On May 21, 2021, seven samples were collected from five borings (2383-B1 to 2383-B5) advanced inside of the main structure. Five samples collected from four of the borings (2383-B1, 2383-B3, 2383-B4, 2383-B5) contained concentrations of diesel-range petroleum hydrocarbons above MTCA Method A cleanup levels, ranging from 3,300 mg/kg to 19,000 mg/kg. Although refusal of the drill auger occurred shallower than groundwater depths (due to an additional building footing encountered below the first), laboratory analytical data indicated that excavation of the remainder of the plume likely ends at an estimated 15 to 17 feet bgs (based upon the decreasing concentrations of soil samples collected at deeper elevations).

The following section describes the Scope of Work necessary to complete the remediation of petroleum impacted soil at the Site.



#### **SCOPE OF WORK**

The scope of work for this project involves:

- 1. Contractor should have the necessary endorsements to handle, transport and assist in the disposal of soil containing contaminants of concern (CoC) in excess of Ecology cleanup criteria. Only one confirmed detection of gasoline (5,500 mg/kg) and one detection of benzene (0.46 mg/kg) were reported in soil samples MGI analyzed. Generally, the impacts consists of diesel- and oil-range petroleum hydrocarbons, roughly an order of magnitude above MTCA method A CUL of 2,000 mg/kg.
- 2. Contractor shall remove clean (e.g. non-impacted) soil from over the top of the oil-impacted soil (overburden). MGI estimates that this volume will be approximately 40 to 60 yards of material. The clean overburden will be placed on visqueen plastic and sampled in accordance with Washington State Department of Ecology (Ecology) guidelines for the excavation and decommissioning of USTs prior to re-use.
- 3. Contractor shall perform the removal of the oil-impacted soil, situated south of the garage (at the north end of the main structure) from an elevation of approximately 7 to 12 feet bgs. Petroleum impacted soil will be placed on visqueen plastic for characterization prior to disposal. Alternately, the contractor may decide to 'direct load' the soil into a transport.
- 4. Transport and disposal of soil to a subtitle D landfill or, alternatively, the soil may be transported to a facility licensed for recycling. Facilities such as Heidelberg Materials can provide recycling options which reduce the end-client's liability. Terms and Conditions for the facility selected for disposal will be evaluated as part of this project.
  - a. All available analytical data will be provided to the recipient of the soil (Appendix 1).
  - b. Copies of all Bills of Lading will be provided to MGI.
  - c. Soil analytical data from soil borings indicates that 70 to 100 yards of material, impacted with petroleum impacts is expected to be removed from the excavation.
  - d. MGI will sample the excavation to confirm the vertical and lateral limits of the excavation has reached elevations and distances sufficient to have completely removed soil impacted with heating oil at concentrations in excess of MTCA Method A cleanup criteria.



#### 5. Backfill and compaction:

- a. Contractor will use clean, quarried crushed rock to backfill the area where the impacted material was removed. Material should be compacted with a vibrating backhoe or trackhoe attachment to prevent unnecessary settling of backfill material. No specific compaction parameters are required by MGI.
- Contractor may use the 'clean' overburden soil to infill the top 6-feet within the soil
  excavation areas. Backhoe compactor should be used to compact the soil in 1-foot lifts.
  - i. MGI will provide sample analysis of the overburden stockpile material.
- 6. Restore surface areas to a relatively flat surface. No improvements about vegetation or gardening are required.
- 7. Contractor must provide its terms and conditions for this project. The terms and conditions must provide client with protection from all liability associated with the project, including but not limited to strict liability under the Model Toxics Control Act for transportation and disposal of regulated materials, and adequate proof of insurance. Contract terms and insurance will be a material consideration for this project.

#### 8. Notes:

- a. Contractor should utilize rubber tracks to prevent unnecessary damage to surfaces.
- Contractor is required to advise upon, communicate and procure all necessary trade permit to perform the work.
- c. Space is at a premium at the subject property. Contractor is responsible to deciding the type and size of equipment necessary to perform the soil removal work described herein.
- d. Power and water may not be available at the Site.
- e. No restroom facilities will be provided at the Site.
- f. All workers should be HAZWOPER trained.
- g. MGI recommends walking the Site prior to preparing your bid estimate and written questions presented to Jason Souza at <a href="mailto:JSouza@Mizizigroup.com">JSouza@Mizizigroup.com</a>.



#### **CLOSING**

This document has been prepared with the best available data. Some variations to the elevations and depth may be observed in the field. MGI will be on the subject property during the excavation.

Bids are to be prepared in a Lump Sum basis, based upon the Scope of Work described herein.

Attachments: Figure 1 – Site Location Plan

Figure 2 – Boring Location Plan

Table 1 – Soil Analytical Data Summary

Table 2 - Groundwater Analytical Data Summary

Respectfully submitted,

Migizi Group, Inc.

Jason D. Souza

Principal Scientist

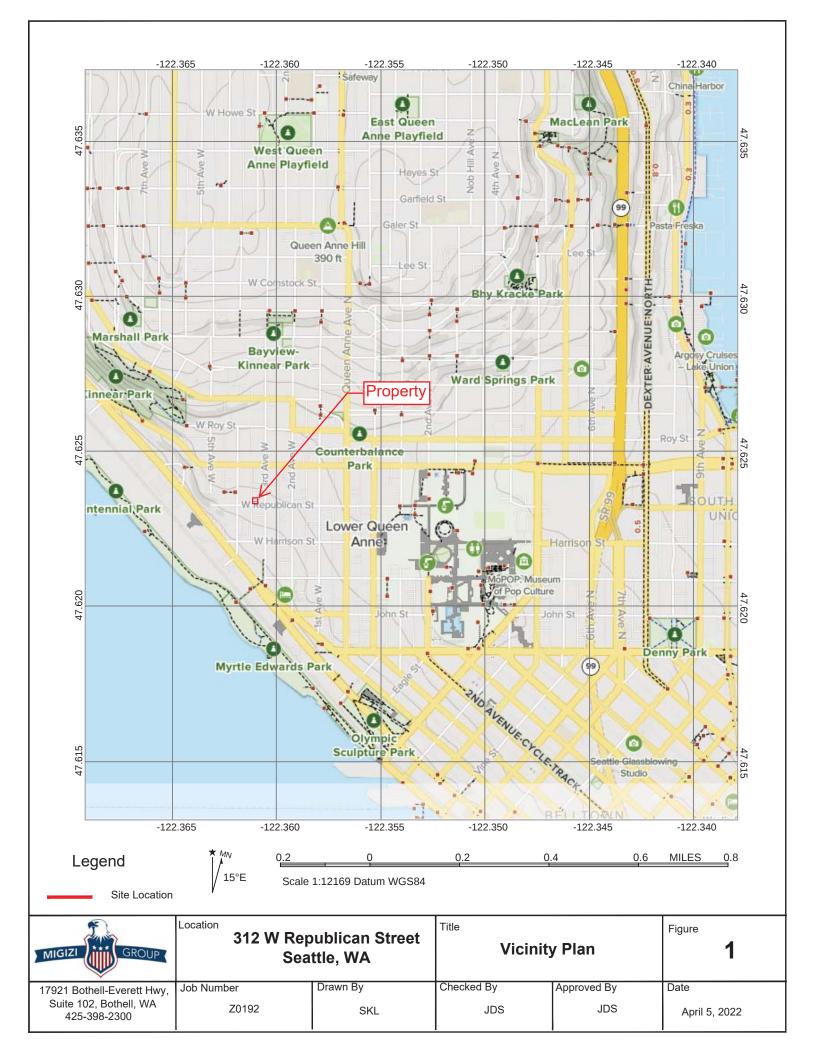


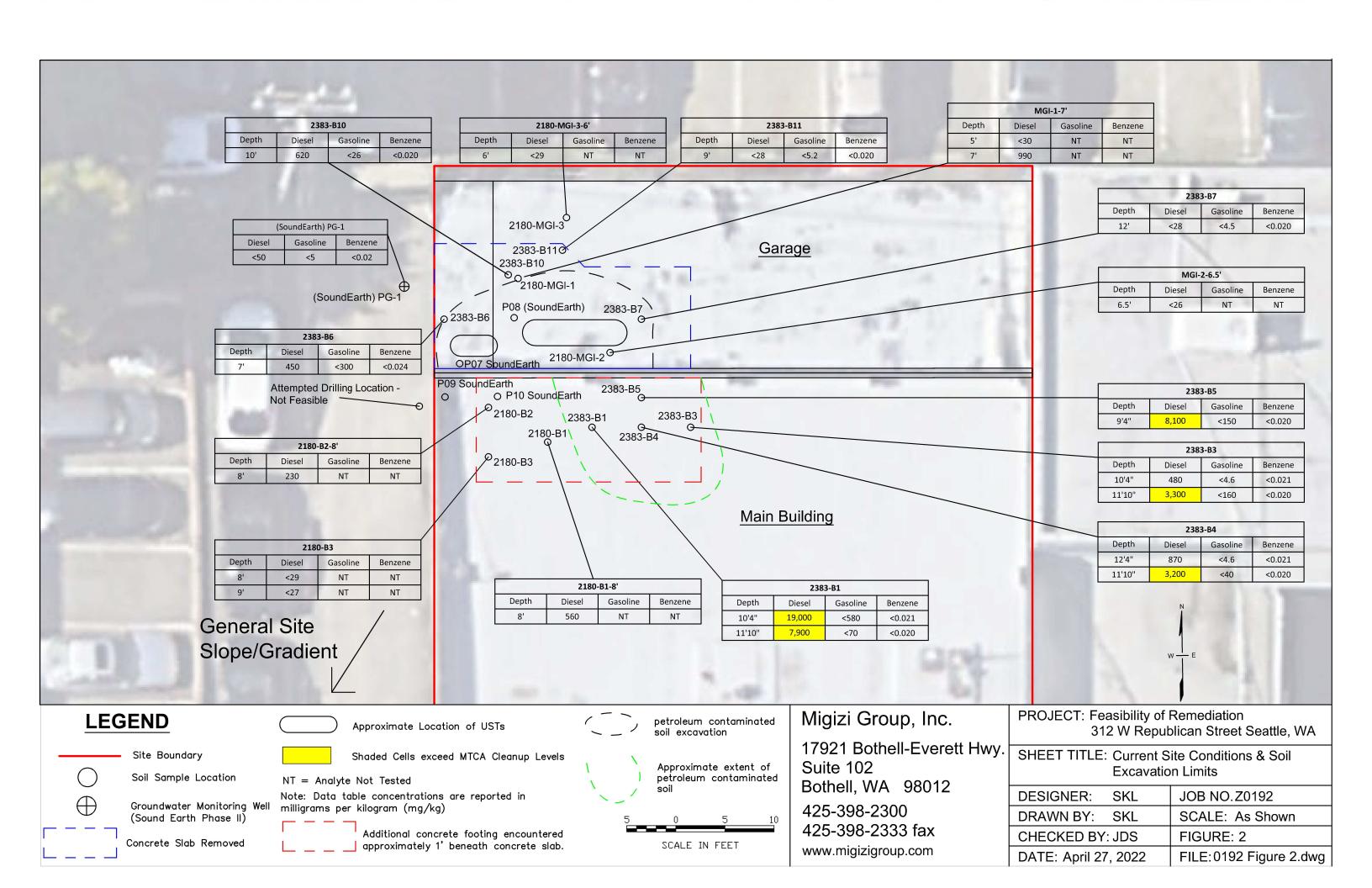
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## **FIGURES**







### **TALBES**



# Table 1 - Soil Analysis Data UST Investigation 312 W Republican Street, Seattle, WA Migizi Group, Inc. Project Number P2383-B21

All concentrations are in milligrams per kilogram (mg/kg)

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			NWTF	PH-DX	NWTPH-Gx	H-Gx BTEX (EPA Method 8021B)				PAHs				
Sample ID	Depth (ft. bgs)	Sample Date	Diesel Range Organics	Lube Oil Range Organics	Gasoline- Range Organics	Benzene	Toluene	Ethyl- benzene	Xylenes	Naphthalene	1-Methylnaphthalene	2-Methylnaphthalene	Lead (Pb)	PCBs
MGI-1-7'	7	12/18/20	990	<64	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
MGI-1-5'	5	12/18/20	<30	<61	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
MGI-2-6.5'	6.5	12/18/20	<26	<53	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
MGI-3-6'	6	12/18/20	<29	<59	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2180-B1-8'	8	12/22/20	560	140	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2180-B2-8'	8	12/22/20	230	140	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2180-B3-8'	8	12/22/20	<29	<57	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2180-B3-9'	9	12/22/20	<27	<54	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
OB-1	Above Tank	02/18/21	<30	100	<24**	NT	NT	NT	NT	NT	NT	NT	NT	NT
OB-2	Above Tank	02/18/21	<57**	<110**	<23**	<0.020	<0.057	<0.057	<0.114	<0.0075	<0.0075	<0.0075	NT	NT
OB-3	Above Tank	02/18/21	<56**	<110**	<23**	NT	NT	NT	NT	NT	NT	NT	NT	NT
NWSW-5.5	5.5	02/18/21	1,700	860	<150**	NT	NT	NT	NT	NT	NT	NT	NT	NT
SESW-5.5	5.5	02/18/21	15,000	<660	<2,300**	NT	NT	NT	NT	NT	NT	NT	NT	NT
Base-6	6	02/18/21	14,000	<660	<2,900**	NT	NT	NT	NT	NT	NT	NT	NT	NT
EXL-M-7'3"	7.25	02/19/21	12,000	<360	<3,200**	NT	NT	NT	NT	NT	NT	NT	NT	NT
EXL-W-7'6"	7.5	02/19/21	12,000	<370	<3,800**	NT	NT	NT	NT	NT	NT	NT	NT	NT
EXL-WSW-7'6"	7.5	02/19/21	21,000	<580	<4,300**	NT	NT	NT	NT	NT	NT	NT	NT	NT
EXL-SW-7'6"	7.5	02/19/21	14,000	<450	<3,000**	NT	NT	NT	NT	NT	NT	NT	NT	NT
EXL-NE-6'9"	6.75	02/19/21	<56**	<120**	<24**	NT	NT	NT	NT	NT	NT	NT	NT	NT
EXL-E-7'	7	02/19/21	<30	<60	<24**	NT	NT	NT	NT	NT	NT	NT	NT	NT
DISP-2288-3-1	N/A	03/01/21	7,700	<780	<63	NT	NT	NT	NT	NT	NT	NT	NT	NT
UST2-NSW-12'6"	12.5	03/01/21	<58	<120	<23	NT	NT	NT	NT	NT	NT	NT	NT	NT
UST2-BASE-13'	13	03/01/21	760	<100	<72	NT	NT	NT	NT	NT	NT	NT	NT	NT
UST2-SSW-12'6"	12.5	03/01/21	980	<120	<42	NT	NT	NT	NT	NT	NT	NT	NT	NT
UST2-ESW-12'6"	12.5	03/01/21	<56	<110	<23	NT	NT	NT	NT	NT	NT	NT	NT	NT
UST2-WSW-12'6"	12.5	03/03/21	12,000	<410	5,500	0.46	<0.56	13	65	18	28	42	<5.6	NT
QC1	N/A	03/03/21	<28	260	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
QC2	N/A	03/03/21	<41	750	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
QC3	N/A	03/03/21	<28	280	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
2383-B1-10'4"	10'4"	05/21/21	19,000	<1,200	<580	<0.021	<0.11	0.13	<0.32	2.6	9.5	11	NT	<0.57
2838-B1-11'10"	11'10"	05/21/21	7,900	<680	<70	<0.020	<0.080	<0.080	<0.160	NT	NT	NT	NT	NT
2383-B3-10'4"	10'4"	05/21/21	480	<150	<4.6	<0.020	<0.046	<0.046	<0.092	NT	NT	NT	NT	NT
2383-B3-11'10"	11'10"	05/21/21	3,300	<470	<160	<0.021	<0.11	<0.11	<0.220	NT	NT	NT	NT	NT
2383-B4-12'4"	12'4"	05/21/21	870	<160	<59	<0.020	<0.089	<0.089	<0.178	NT	NT	NT	NT	NT
2383-B4-11'10"	11'10"	05/21/21	3,200	<430	<40	<0.020	<0.095	<0.095	<0.190	NT	NT	NT	NT	NT
2383-B5-9'4"	9'4"	05/21/21	8,100	<930	<150	<0.020	<0.085	<0.085	<0.170	NT	NT	NT	NT	NT
2383-B6-7'	7'	05/21/21	450	<59	<300	<0.024	<0.12	0.35	0.20	NT	NT	NT	NT	NT
2383-B7-12'	12'	05/21/21	<28	<55	<4.5	<0.020	<0.045	<0.045	<0.090	NT	NT	NT	NT	NT
2383-B10-10'	10'	05/21/21	620	300	<26	<0.020	<0.047	<0.047	<0.094	NT	NT	NT	NT	NT
2383-B11-9' 9' 05/21/21			<28	<55	<5.2	<0.020	<0.052	<0.052	<0.104	NT	NT	NT	NT	NT
MTCA Method A Cleanup Levels			2,000	2,000	100 / 30*	0.03	7	6	9	5	34	NE		250

Notes:

< = Less than the laboratory practical quantitation limit

BOLD = Result exceeds the reporting limit

BOLD and Shaded = Result exceeds Cleanup Levels
MTCA = Model Toxics Control Act
NWTPH = Northwest Total Petroleum Hydrocarbon

IMTPH = Northwest Total Petroleum Hydrocarbon
PAHs = Polycyclic aromatic hydrocarbons
PCBs = Polychlorinated biphenyl (Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260)
N/A = Not Applicable

\* = When benzene is present
NT = Not Tested

\*\* = NWTPH Hydrocarbon Identification (HCID) Analysis

# Table 2 - Groundwater Analysis Data UST Investigation 312 W Republican Street, Seattle, WA Migizi Group, Inc. Project Number P2180-B20

All concentrations are in milligrams per kilogram (mg/L)

	Const.	NWTPH-DX					
Sample ID	Sample Date	Diesel Range Organics	Lube Oil Range Organics				
MW-1	12/23/20	0.58	<0.24				
MTCA Method A Clo	eanup Levels	0.5	0.5				

#### Notes:

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