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December 10, 2020

Cody Jones
Sec Properties dba Augusta Owner, LLC
701 5th Avenue Suite 5700
Seattle, WA 98104
(codyj@secprop.com)

Re: Opinion pursuant to WAC 173-340-515(5) on Remedial Action for the following Hazardous Waste Site:

- **Name:** Augusta Apartments
- **Address:** 4043 Roosevelt Way NE, Seattle, Washington
- **Facility/Site No.:** 94236937
- **VCP No.:** NW3278
- **Cleanup Site ID No.:** 12966

Dear Cody Jones:

The Washington State Department of Ecology (Ecology) received your request for an opinion on the *Groundwater Monitoring Well Installation and Chemical Injection Pilot Test Work Plan* (dated April 4, 2020) at the **Augusta Apartments** facility (Site). Since the request, the chemical injection pilot test was conducted in June 2020 and a report and a memorandum of understanding have been issued. This letter provides our opinion on all of these submittals. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW. This opinion applies only to the Site described below.

Description of the Site

The Site is defined by the nature and extent of contamination associated with the following releases:

- Total petroleum hydrocarbons in the gasoline (TPH-G), diesel (TPH-D), and heavy oil (TPH-O) ranges, toluene, ethylbenzene, xylenes, tetrachloroethene (PCE) cis-1,2-dichloroethene (cis-1,2-DCE), chlorobenzene, 1,2-dichlorobenzene, dibromochloromethane, 1,2-dibromo-3-chloropropane, 2- chlorotoluene, polychlorinated biphenols (PCBs) and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) into the Soil;

- TPH-G, TPH-D, TPH-O, benzene, toluene, ethylbenzene, xylenes (BTEX), cis-1,2-DCE, vinyl chloride and arsenic into the Groundwater.

- Total petroleum hydrocarbons, BTEX and volatile organic compounds into the Air.

Enclosure A includes a detailed description and diagrams of the Site, as currently known to Ecology.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel associated with this Site is affected by other sites.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. The Riley Group, Inc., 2020. *Memorandum of Understanding, Abbreviate Sampling and Analysis Plan (SAP), VCP No. NW3278.* October 26.

2. The Riley Group, Inc., 2020. *Groundwater Monitoring Well Installation and Chemical Injection Pilot Test Report, Augusta Apartments, 4041 Roosevelt Way Northeast, Seattle, Washington.* June 29.

3. The Riley Group, Inc., 2020. *Groundwater Monitoring Well Installation and Chemical Injection Pilot Test Work Plan, Augusta Apartments, 4041 Roosevelt Way Northeast, Seattle, Washington.* April 14.

A number of these documents are accessible in electronic format from the Site web page[1]. The complete records are kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. Visit our Public Records Request page[2] to submit a public records request or get more information about the process. If you require assistance with this process, you may contact the Public Records Officer at publicrecordsofficer@ecy.wa.gov or (360) 407-6040.

This opinion is void if any of the information contained in those documents is materially false or misleading.

[1] https://apps.ecology.wa.gov/gsp/Sitepage.aspx?csid=12966
[2] https://ecology.wa.gov/publicrecords

Opinion

Based on a review of the *Groundwater Monitoring Well Installation and Chemical Injection Pilot Test Work Plan* (work plan), Ecology has determined:

- Ecology agrees that the planned chemical injections proposed in the work plan will most likely result in reduced concentrations of Site contaminants in soil and groundwater.

- Figure 1 shows 27 proposed full scale injection points in addition to 11 pilot test injection points but the full scale injection points are not described in the text. Please provide the plan for a full scale implementation and if it is dependent on the results of the pilot test

Based on a review of the *Groundwater Monitoring Well Installation and Chemical Injection Pilot Test Report* (report) and the *Memorandum of Understanding, Abbreviate Sampling and Analysis Plan (SAP*), Ecology has determined:

- The work plan (page 3) states that packers would be used to seal the injection point boreholes to prevent daylighting of remedial fluid in the parking garage. The report does not indicate that packers were used and daylighting occurred in several locations. This was then remedied by installation of temporary injection point wells. For continuity, the report should state why packers were not used as planned.

- Proposed post-injection groundwater monitoring events in 2020 and 2021 are approximately 3 months apart which is consistent with quarterly monitoring. Please include TPH-D and TPH-O in the analysis of all quarterly groundwater samples.

- Please include monitoring well MW-10 in the planned quarterly post-remediation sampling to determine if the injections affect groundwater quality at the downgradient Site boundary. Based on previous analytical results, monitoring well MW-10 does not need to be further analyzed for total and dissolved arsenic as stated in a previous opinion letter (third bullet) dated March 22, 2018.

- Please include analysis for total and dissolved arsenic in monitoring wells MW-11 and MW-13 for further Site characterization.

- Figure 4 – The chemical injection area extends to the west without any active injection points shown. The chemical injection area is larger and the injection points further apart than what was shown in Figure 1 of the work plan. This deviation from the work plan should be explained in the report text.

- New monitoring wells MW-11 through MW-13 are helpful in delineating the downgradient extent of the petroleum hydrocarbon plume as well as documenting the expected shrinking of the plume following injections. Groundwater samples collected from some of the injection points indicate areas along the eastern Property boundary where the plume is more concentrated. Additional monitoring wells in these locations would help to demonstrate the effectiveness of the injections.

- Other Site monitoring wells including MW-1A, MW-2, MW-3A, MW-5 and MW-6 were to be sampled semi-annually. Figure 3 of the report shows these wells were last sampled in May 2019. Please provide the status of Site groundwater monitoring

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

3. State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/vcp. If you have any questions about this opinion, please contact me by phone at (425) 649-7064 or by email at heather.vick@ecy.wa.gov.

Sincerely,

Heather Vick, LHg
Toxics Cleanup Program, NWRO

Enclosure (1): A – Description and Diagrams of the Site

cc: Paul Riley, The Riley Group, LLC, (priley@riley-group.com)
Sonia Fernandez, VCP Coordinator, Ecology, (sonia.fernandez@ecy.wa.gov)

Enclosure A

Description and Diagrams of the Site

Site Description

This section provides Ecology's understanding and interpretation of Site conditions, and is the basis for the opinions expressed in the body of the letter.

Site: The Site is defined as total petroleum hydrocarbons in the gasoline (TPH-G), diesel (TPH-D), and heavy oil (TPH-O) ranges, toluene, ethylbenzene, xylenes, tetrachloroethene (PCE), cis-1,2-dichloroethene (cis-1,2-DCE), chlorobenzene, 1,2-dichlorobenzene, dibromochloromethane, 1,2-dibromo-3-chloropropane, 2-chlorotoluene and polychlorinated biphenyls (PCBs) and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) in soil; the Site is also defined as TPH-G, TPH-D, TPH-O, benzene, toluene, ethylbenzene, xylenes (BTEX), cis-1,2-DCE, vinyl chloride and arsenic in groundwater at 4043 Roosevelt Way NE in Seattle, Washington (Property) (**Figure 1**). In addition, the Site is defined as TPH, BTEX and volatile organic compounds into the Air.

The Property corresponds to King County tax parcel number 1145000365 which is 1.07 acres in size. Prior to redevelopment in 2015, the Property formerly consisted of three adjoining tax parcels (1145000340, 1145000345 and 1145000365) which were then combined to form the current tax parcel (1145000365).

Area and Property Description: The Property is located in a densely-developed area southwest of the University of Washington. Surrounded by commercial and residential land uses, the Property is bordered to the north by Allegro I (apartments); to the east by Roosevelt Way NE, Campus Fine Dry Cleaning (dry cleaning business) and Portage Bay Grange Feed and Mercantile; to the south by Northeast Campus Parkway; and to the west by Allegro II (apartments) and 9th Avenue Northeast (**Figure 2**).

Campus Fine Dry Cleaning has used a petroleum-based dry cleaning fluid for the past 3 years. Before that, PCE was used as a dry cleaning solvent for at least the 17 years prior to conversion to the petroleum-based fluid. Campus Fine Dry Cleaning is associated with Facility Site ID No. 23892 (Cleanup Site ID No. 12678) which is named: PCE Plume Roosevelt & NE 41st Street.

Property History and Current Use: The three former parcels comprising the Property, associated former addresses, former uses and contaminants detected are provided in the following table:

Former Parcel No.	Former Address	Former Use/Dates	Contaminants Detected
1145000340	4101 Roosevelt Way NE	Apartments/1940 to 2000; vacant until redevelopment	Petroleum hydrocarbons in soil and groundwater; vinyl chloride in groundwater
1145000345	4057–4059 Roosevelt Way NE	Service garage and auto sales/1926 to 1966	Petroleum hydrocarbons in soil and groundwater
1145000365[1]	4041–4043 Roosevelt Way NE	Service garage and auto sales/1924 to ~1980s; Goodway Leasing to 1990s; Non-profit organization and ENG3 Corp (medical device assembly) until redevelopment	Petroleum hydrocarbons in soil and groundwater

[1]This is also the current parcel number for all of the above combined parcels.

Parcel number 1145000340 was first occupied by a single-family residence built in 1911 that was heated with an oil furnace located in the basement. The location of fuel storage for the furnace is unknown. In the early 1940's, the residence was converted to apartments. The apartment building was demolished in 2000; the parcel was vacant from 2000 until redevelopment in 2015. It is unknown if UST 2 removed during excavation which contained heating oil was the former fuel storage location for the furnace.

Parcel number 1145000345 was formerly occupied by one or more automobile repair garages from approximately 1926 to 1966. After 1966 and until redevelopment, the parcel was used for commercial businesses and offices. Former auto repair garages and commercial buildings on this parcel were demolished in 2006.

Parcel number 1145000365 originally had a single-family residence that was constructed before 1905. A commercial building built on the parcel in 1924 was originally heated by hot water and a coal stoker. Renovations were performed in 1930. The commercial building was used for automobile sales and garage services through at least the mid-1980s. An office building was constructed on the parcel in 1951 that was originally heated with an oil burner. Two electric hoists for trucks, a 500-gallon underground storage tank (UST), a pump island, a dip tank used for parts washing and evidence of welding/cutting activities were noted in historical records.

Sources of Contamination: For the cleanup, the Site was divided into ten areas based on contamination and sources encountered. The areas are listed in the table below:

Area	Description of Area	Number of USTs	Number of Hoists
1	Excavation in former service garage;	4	3
2	Former auto garage with 4 hoists	0	5
3	Former auto repair garage fueling area	1	
4	PCS and PCGW		
5	Remedial excavation		
5A	Former sump locations		
5B	Former auto repair garage	2	
6	Former auto repair garage and catch basin		
7	Former service garage	1	
9	Excavation of PCS		

PCS = Petroleum-contaminated soil
PCGW = Petroleum-contaminated groundwater

Area 1A (northeast portion of Area 1) was initially the location of UST3, and soil samples from that area were labeled with the A1A prefix. Area 8 (east central portion of Area 1) was the location of UST9, and soil samples were labeled with the A8 prefix. At the time these areas were identified, the extent of Area 1 was unknown, and both of these areas eventually became part of the much larger Area 1 remedial excavation which extended beyond the boundaries of both of these areas.

Potential sources of contamination on the Property included nine USTs that were removed from the Property and are listed in the following table:

Area No.	UST No.	Estimated Volume	Contents	Made of?	Decommissioning/ Removal Date
1	1	500 gallons	Gasoline?	Steel	July 2015
1	2	300 gallons	Heating oil?	Steel	July 2015
1	3	250 gallons	Waste oil?	Steel	July 2015
1	9	300 gallons	Gasoline/oil?	Steel	August 2015
3	4	500 gallons	Gasoline?	Steel	July 2015
5B	7	250 gallons	Waste oil?	Steel	July 2015
5B	8	250 gallons	Waste oil?	Steel	July 2015
7	5	250 gallons	Gasoline?	Steel	July 2015
None	6	400 gallons	Unknown	Steel	July 2015

In addition, eight known hydraulic hoists located in Areas 1 and 2 were encountered during mass excavation of the Property. In the RI and during mass excavation, TPH-D in soil at concentrations up to 31,000 mg/kg and TPH-O at concentrations up to 14,100 mg/kg were encountered in the vicinity of the hoists in Areas 1 and 2. The eight hoists were removed; confirmatory soil samples collected from the bottoms of the two areas containing the hoists were

analyzed for petroleum hydrocarbons and BTEX. The results of soil confirmation samples collected within approximately 5 feet and deeper than previous contaminated samples near the hoists contained concentrations of petroleum hydrocarbons below Method A or non-detectable.

Potential sources of contamination in each of the ten areas on the Property are listed in the following table:

Area	Potential Sources	Contaminants Detected/Suspected
1	UST1, UST2, UST3, UST9 and 3 hydraulic hoists	TPH-G, TPH-D, TPH-O, toluene, ethylbenzene, xylenes
2	Petroleum-contaminated soil (PCS) and 5 hydraulic hoists	TPH-G, TPH-D, TPH-O, xylenes
3	UST4, former gasoline pump and suspected former catch basin	TPH-G
4	PCS	Petroleum hydrocarbons
5	PCS	Petroleum hydrocarbons
5A	PCS and PCB-, cPAH-, lead- and cadmium-contaminated soil; two former sumps	Petroleum hydrocarbons, PCBs, cPAHs, lead and cadmium
5B	UST7 and UST8; PCS and PCE-, PCB- and cPAH-contaminated soil	PCE, PCBs and cPAHs in soil
6	PCS and a former catch basin	Petroleum hydrocarbons
7	UST5 and PCS	Petroleum hydrocarbons
9	PCS and cPAH-contaminated soil	Petroleum hydrocarbons

Surface geophysical surveys (ground-penetrating radar and electromagnetics) were conducted on the Property in 2012 to pinpoint the orientation of a known UST and to identify other suspect UST locations and potential areas of environmental concern. The geophysical surveys (electromagnetic and ground penetrating radar) identified several EM anomalies including an area of potentially disturbed soil and two possible USTs.

Physiographic Setting: The Site is located within the Puget Sound Lowland Physiographic Province, a north-south trending structural and topographic depression that is bordered by the Olympic Mountains to the west and by the Cascade Mountain foothills to the east. The Puget Sound Lowland is underlain by Tertiary volcanic and sedimentary bedrock, and has been filled to the present day land surface with Pleistocene-aged glacial and non-glacial sediments.

The Site is located at the south end of the North Seattle Drift Upland sub-physiographic province. Elevations on the Property range from approximately 110 to 125 feet above mean sea level. The land surface on the Property slopes to the south.

Surface/Storm Water System: The closest surface water body to the Site is Portage Bay, a freshwater embayment between the Montlake Cut and Lake Union, approximately 800 feet to the south. Storm water runoff on and in the vicinity of the Property disperses via sheet flow to catch basins connected to the City of Seattle storm water collection system.

Ecological Setting: The land surface of the Property and most of the surrounding area is covered by buildings, asphalt or concrete. The Site is located approximately 150 feet north of Peace Park, a small (less than 1 acre), lenticular-shaped Seattle city park.

Geology: The Site is underlain by dense glacial till and indurated, glacially overridden silt. Minor amounts of fill occur on the Property related to development and utility installations.

Groundwater: Groundwater occurs as a perched zone within the upper weathered glacial till. Groundwater was encountered at depths of approximately 4 to 10 feet below ground surface (bgs) on the Site. Pre- and post-Property development water level elevation data show flow directions in the perched zone to the south and south/southwest.

In 2012, monitoring wells MW-1 through MW-6 were installed to depths up to 37 feet bgs. All of the wells had 10-foot long screens except MW-6 which has a 15-foot screen.

In 2015, monitoring wells MW-1 and MW-3 were removed during Site remediation and replaced with MW-1A and MW-3A respectively. Monitoring wells MW-7, MW-8 and MW-9 were also installed post-remediation in 2015.

In 2016, monitoring well MW-10 was installed to assess groundwater conditions at the south end of the Property and the potential for off-Site contaminant migration. In 2020, monitoring wells MW-11, MW-12 and MW-13 were installed using a Geoprobe limited access drill rig in the floor of the parking garage for further Site characterization and to assess the effects of chemical injections.

Localized, shallow groundwater flow on the Property is affected by a sub-slab drainage system that was installed directly below the foundation of the two apartment buildings. The sub-slab drainage system consists of two sections, one to drain the north half of the east building and the other to drain the west building and south half of the east building. The drains are set at an elevation of 96 feet above mean sea level (msl); the elevation of the finished floor of the parking garage is at 98 feet msl. The sub-slab drainage system was designed and installed to control water levels beneath the building. Water levels in at least one monitoring well, MW-1A, are affected by the sub-slab drainage system. All water from the system is currently discharged via the storm sewer outfall situated near the southeast corner of the Property. The discharge is in accordance with Seattle Department of Construction & Inspections Permit No. 6491797 which allowed for discharge to both the storm water and sanitary sewers.

Water Supply: Drinking water is supplied to the Property by Seattle Public Utilities which obtains water from the Cedar and Tolt River watersheds. No water supply wells are located within a 0.5-mile radius of the Site, according to Ecology's well log database.

Release and Extent of Soil and Groundwater Contamination:

Former Parcel Numbers 1145000340 and 1145000345

In 1998, a Phase I Environmental Site Assessment (ESA) was conducted on the two parcels. At that time, the northern parcel (0340) was occupied by an apartment building. The central parcel (0345) was occupied by three buildings used for office space and vehicle storage. The Phase I ESA identified the following recognized environmental conditions in connection with the two parcels:

- At least one abandoned UST and several out of service underground hydraulic hoists were observed.
- Petroleum hydrocarbons were encountered in soil on the adjacent parcel to the west during construction of Allegro II apartments. The contamination appeared to have originated from beneath the northern parcel (0345).
- During construction of the Allegro I apartments on the adjacent parcel to the north, approximately 1,572 cubic yards of petroleum-contaminated soil was removed. An undetermined amount of petroleum-contaminated soil was left in place between the Allegra I's building foundation and the north parcel (0340) boundary. Due to proximity and gradient toward parcel 0340, a potential existed for petroleum impacts on the Property.

Former Parcel Number 1145000365 (southernmost parcel).

In 1998, a Preliminary Subsurface Assessment consisted of advancement of three soil borings (B-1 to B-3) in the parking lot located in the southern part of the parcel. Three soil and one groundwater samples were collected and submitted for analysis of TPH-G, TPH-D, TPH-O and BTEX. None of the samples contained detectable concentrations of the analytes.

A Preliminary Environmental Assessment and Limited Asbestos Survey was conducted in 2001. The findings were that the potential for USTs to exist on the Property based on the historical land use of an automobile service garage and observed asphalt patches. A Phase II investigation was recommended. The parcel was further investigated in 2001. Six soil borings (HC-1 through HC-6) were advanced to depths ranging from 16 to 31 feet bgs; three of the borings were converted to monitoring wells (HC-1, HC-2 and HC-3) screened from 20 to 30 feet bgs. In addition, a grab groundwater sample was collected from soil boring HC-6. Selected soil samples were analyzed for TPH-G, total petroleum hydrocarbons in the diesel range (TPH-D) in soil boring HC-6 from 5 to 20.5 feet bgs, and RCRA 8 metals in soil boring HC-3 at 5 to 6 feet bgs.

The groundwater samples were analyzed for TPH-G, TPH-D and volatile organic compounds. Monitoring well HC-1 contained 4.7 micrograms per liter (μg/L) of naphthalene, which is below the Method A cleanup level. The groundwater sample collected in soil boring HC-6 contained 1.1 μg/L of xylenes and 1.3 μg/L of 1,2,4-trimethylbenzene which are both below applicable cleanup levels.

Former Parcel Numbers 1145000340, 1145000345 and 1145000365

A Phase I ESA conducted in 2012 on the Property identified the following recognized environmental conditions:

Former Parcel Number 1145000340
1. *Suspected heating oil UST.* The former apartments on this parcel were heated using an oil burning furnace but unknown if fuel was stored in a UST or an aboveground storage tanks (AST). An unknown metal pipe was observed in a ditch on the northern boundary of the Property. A former or abandoned UST was considered a potential risk to the Property.
Former Parcel Number 1145000345
1. *Historical Automobile Service Garage.* Two former buildings on the parcel were occupied by automobile service garages. At least six abandoned hydraulic hoists and two sumps were observed.
2. *Suspected USTs.* Numerous indications of potential former or abandoned USTs were observed on the Property as well as noted in historical information. Numerous concrete and asphalt patches, as well as holes in the concrete, were observed. A former gasoline pump was documented.
3. *Suspected heating oil USTs.* The two former auto service garages were historically heated by oil burners but unknown if fuel was stored in USTs or ASTs.
Former Parcel Number 1145000365
1. *Historical Automobile Service Garages*. Two existing buildings on the Property were historically operated by automobile service garages.
2. *Suspect USTs.* A 500-gallon UST (unknown contents), a parts washing dip tank and a pump were noted in historical records to have been located in the existing office building. It is unknown if the dip tank was a UST or an AST.
3. *Suspect Heating Oil USTs*. The existing office building on the Property was historically heated by an oil burner. It is unknown if fuel was stored in a UST or an AST. A former or abandoned heating oil UST was potentially present on the Property.
4. *Former UW Forest Resources.* The University of Washington Forest Resources department reportedly generated hazardous waste on the Property between 1993 and 1999, but the type of waste and related handling practices are unknown.
Off-Property
1. *Petroleum-Contaminated Soil.* Petroleum-contaminated soil at concentrations exceeding cleanup levels was reported by others in soldier piles drilled just outside the western boundary of parcel 0365 during construction of the Allegro II apartments.
2. *Dry Cleaner and Historical Gas Station.* The northeast and east adjacent property across Roosevelt Way NE has been occupied by a dry cleaner since 1967. Prior to the dry cleaner, a gas station was located on the property. A gas station was also located on a second adjacent property to the east.
3. *North Adjoining Property (formerly Kelly's Automotive).* A former auto repair facility was located on a north-adjoining property which is upgradient of the Property. Release of petroleum products and the presence of a waste oil UST was documented.

A Remedial Investigation was conducted in two phases in 2012 and consisted of the following investigative activities:

- Geophysical surveys were performed in locations on the Property where USTs and other potential detectable features may be present in the subsurface. Geophysical surveys consisted of electromagnetic and ground-penetrating radar techniques. The surveys identified several geophysical anomalies including two potential USTs.
- Seven soil borings were advanced to depths of 20 to 41 feet bgs; six of the borings were completed as monitoring wells MW-1 through MW-6.
- Fourteen test probes (P-1 and P-3 through P-15) were advanced on former parcel numbers 1145000340 and 1145000345 to refusal, which ranged from 12.5 to 19 feet bgs.
- Three test probes (P-16, P-17 and P-18) were advanced inside the building on the eastern portion of former parcel number 1145000365 and one probe (P-2) on former parcel number 1145000345, using limited-access probe technology to refusal, which occurred at depths ranging from 4 to 8 feet bgs.
- Soil and groundwater samples were collected for laboratory analysis.
- The tops of casings and monument elevations of three existing monitoring wells and six new monitoring wells were surveyed.

Soil containing concentrations of COCs exceeding Method A cleanup levels was encountered in 10 separate locations on the Property designated as Areas 1, 2, 3, 4, 5, 5A, 5B, 6, 7, and 9.

Soil containing TPH-G and TPH-D at concentrations exceeding Method A cleanup levels remains on the east side of the Property between the shoring wall and the Property boundary.

TPH-G and TPH-D concentrations in soil above MTCA Method A cleanup levels were also detected immediately east of the Property in test pit A8-TP-8, indicating that the Site extended off the Property.

In 2020, soil samples were collected from below the water table in chemical injection point borings (**Figures 3 and 4**). The soil samples contained TPH-G at concentrations up to 2,300 milligrams per kilogram (mg/kg) exceeding Method A, TPH-D at concentrations up to 24,000 mg/kg exceeding Method A, TPH-O at concentrations up to 950 mg/kg below Method A. The soil samples also contained benzene, ethylbenzene and xylenes at concentrations exceeding Method A cleanup levels.
Groundwater samples collected from some of the injection point borings (**Figure 4**) contained TPH-G at concentrations up to 1,600 µg/L exceeding Method A, TPH-D at concentrations up to 5,600 µg/L, and TPH-O at concentrations up to 1,200 µg/L exceeding Method A. Ethylbenzene and xylenes were detected in some samples at concentrations below Method A.

Removal of USTs and Hydraulic Hoists

Nine USTs (see table in Sources of Contamination section above) and 12 hydraulic hoists were decommissioned and removed from the Site during the 2015 remedial action. UST3 and UST9 were discovered during redevelopment. The USTs were pumped and rinsed, and the contents were disposed of off the Property.

Eight of the hydraulic hoists were removed with environmental oversight and confirmational soil sampling, including three hoists located in Area 1 and four hoists located in Area 2. The eighth hoist was located east of Area 2.

Four additional hydraulic hoists in Areas 1 and 2 were reportedly removed but without environmental oversight and confirmational sampling; the exact former locations of those hoists are unknown.

Excavation of Contaminated Soil

Contaminated soil was encountered in 10 areas on the Property as described in the tables above (Sources of Contamination) and shown on Figure 2 in the Site Diagrams. The selected remedial alternative for remediating contaminated soil on the Property was direct mass excavation with off-Property disposal at a licensed and permitted facility.

A total of approximately 15,982 tons of contaminated soil were excavated and removed from the Site. The final maximum depth of the excavation was approximately 30.5 feet bgs. The remedial action included final confirmation soil sampling to demonstrate compliance with MTCA cleanup levels. The majority of contaminated soil removal occurred at or above the elevation of the redevelopment subgrade (98 feet above mean sea level), which corresponds to a depth of approximately 21 feet bgs on the north side of the Property and 10 feet on the south side of the Property. In Areas 1, 2 and 3, over-excavation of contaminated soil below the planned redevelopment subgrade was needed. In Area 1, contaminated soil at concentrations above cleanup levels was left in place between the east shoring wall and the Property boundary. Contamination above cleanup levels also remains in place east of the Property line. A summary of the remedial action in each area is provided in the table below:

Area	Sources Removed	Contaminants Detected > CULs	Maximum Depth (feet bgs)	Total Soil Samples/ Confirmation Soil Samples
1	UST1, UST2, UST3, UST9; 3 hoists	TPH-G, TPH-D, TPH-O, ethylbenzene, xylenes and naphthalenes	18	143/68
2	Four hoists	TPH-O	18	29/13
3		TPH-G & dibromochloromethane	30.5	42/31
4	PCS	TPH-G	18	24/22
5	PCS	TPH-O	2	1/1
5A	Former sumps	TPH-D, TPH-O, cPAHs, PCBs, cadmium and lead	7	13/10

Area	Sources Removed	Contaminants Detected > CULs	Maximum Depth (feet bgs)	Total Soil Samples/ Confirmation Soil Samples
5B	UST7 and UST8	TPH-G, TPH-D, TPH-O, cPAHs & PCBs (UST7)	12	34/19
6		TPH-G	4	11/10
7		TPH-G and TPH-D	18.5	12/5
9		TPH-G and TPH-O	7	11/7
None	UST6	None		

Note: Area 1 was the location of a former garage and contained UST1, UST2, UST3 and UST9 and three former hoists.

Soil Vapor Monitoring:

In a 2017 vapor intrusion assessment, two ambient air samples (IA-1 and IA-1B) and a soil vapor probe sample (SV-1) were collected. The samples were analyzed for gasoline- and diesel-range total petroleum hydrocarbon fractions (C5-8 (aliphatics), C9-12 (aliphatics) and C9-10 (aromatics); naphthalene and xylenes.

Sample IA-1, collected inside the underground parking garage, contained m,p-xylene and naphthalene at concentrations exceeding MTCA Method B indoor air cleanup levels. Sample IA-1B, collected outdoors in an area considered to be background, also contained naphthalene at a concentration above the Method B indoor air cleanup level.

Soil vapor probe SV-1 was located between the shoring wall and the Property line in the area of contaminated soil exceeding cleanup levels left in place. The sample contained 540 micrograms per cubic meter ($\mu g/m^3$) of C5-C8 aliphatics and 36 $\mu g/m^3$ of xylenes; neither of which exceeded soil vapor screening levels.

Soil Vapor Intrusion Protective Measures Implemented During Construction:

A subgrade *Stego Wrap* vapor barrier was installed beneath most of the concrete slab floor of the parking garage as well beneath areas of the two Augusta Apartments buildings that extend outside the footprint of the parking garage. *Stego Wrap* is an ASTM E 1745 Class A polyolefin vapor barrier that provides near zero permanence and exceeds requirements for puncture resistance and tensile strength. In addition, two vapor barrier/waterproofing products, Coreflex

60 and Voltex DS, were placed vertically on walls along the perimeter of the subterranean parking garage.

Coreflex™ 60 used for water proofing and as a vapor barrier was installed along the eastern wall of the parking garage from elevations 96 to 100.5 feet msl (approximate seasonal high water table). This material was installed as a precaution to prevent groundwater contaminated with vinyl chloride from migrating from the east onto the Property.

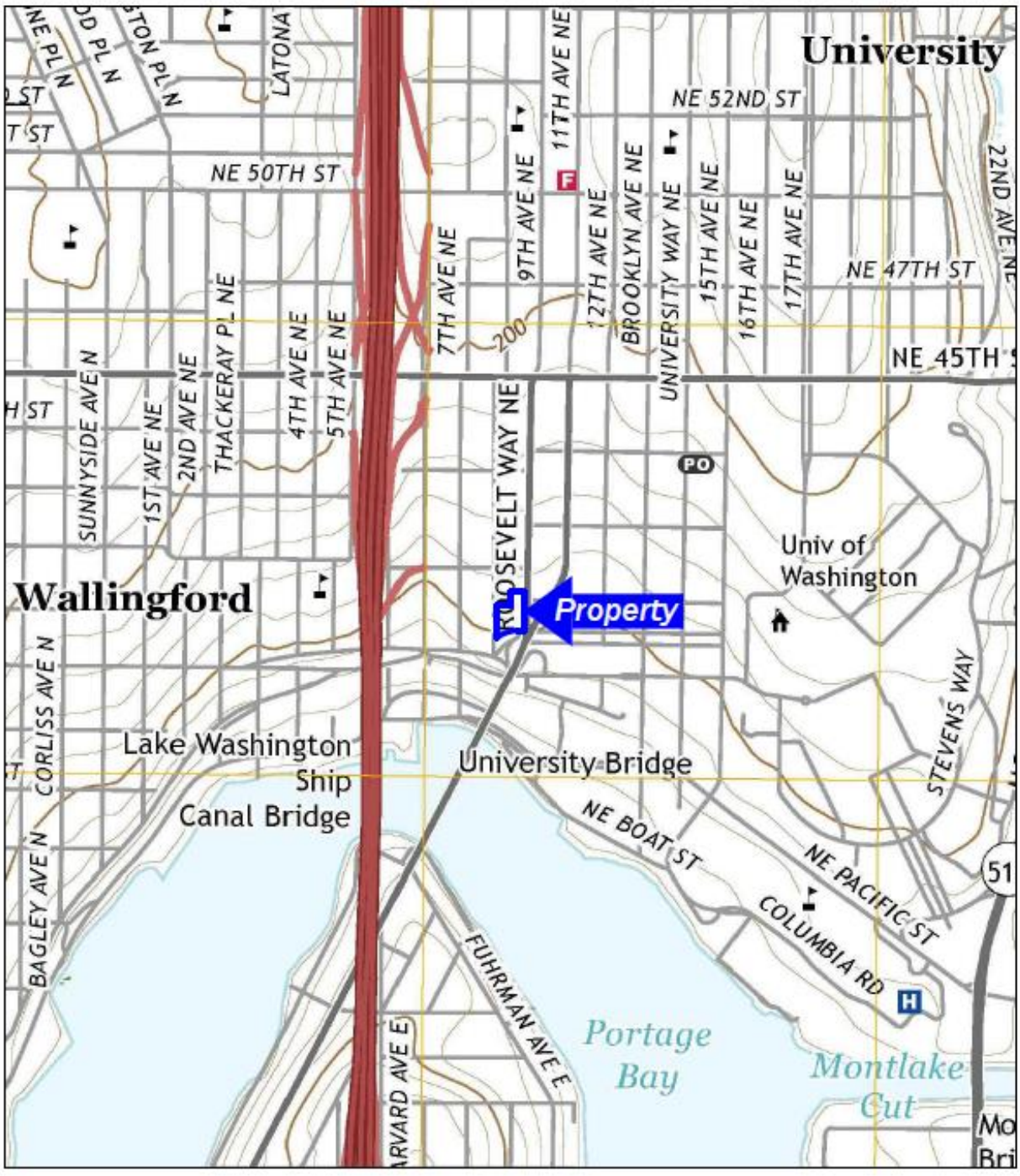
Remedial Chemical Injections

A remedial chemical injection pilot test was conducted in June 2020 which consisted of

installing 10 temporary chemical injection points in the floor of the underground parking garage. Installation of four additional injection points was abandoned due to drilling refusal at shallow depths.

Approximately 2,000 gallons of remedial fluid (Petrofix/water mixture) were injected into the shallow, perched water-bearing zone. Petrofix consists of a micron-activated carbon (1 to 2 microns) combined with both slow- and quick-release inorganic electron acceptors (sulfate and nitrate combination). The micron-activated carbon is supposed to remove dissolved phase hydrocarbons by adsorption. The injected electron acceptors stimulate anaerobic biodegradation.

Site Diagrams



USGS, 2017, Seattle North, Washington
7.5-Minute Quadrangle

Approximate Scale: 1"=1000'
0 500 1000 2000
N

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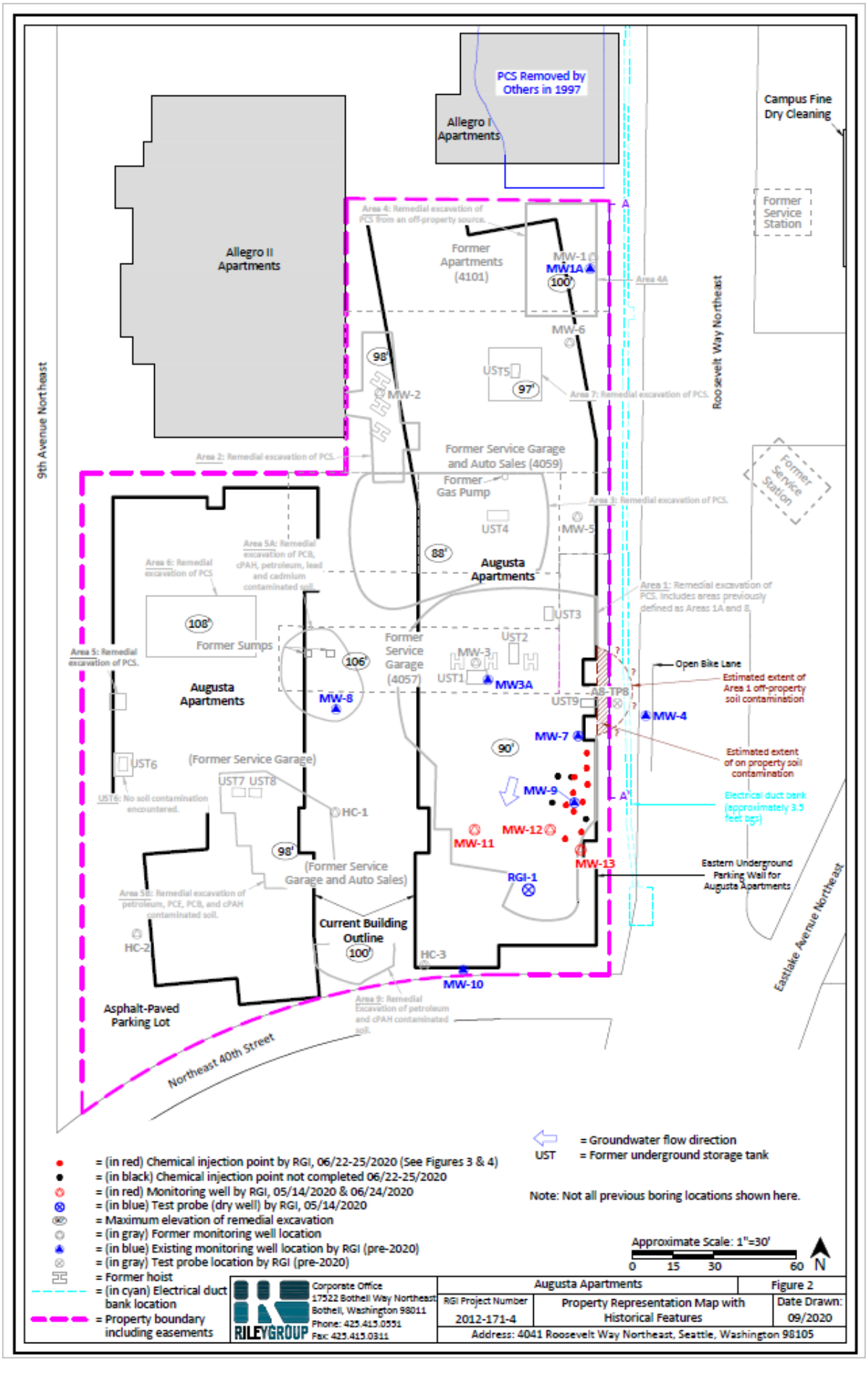
Augusta Apartments		Figure 1
RGI Project Number 2012-171-4	Property Vicinity Map	Date Drawn: 09/2020
Address: 4041 Roosevelt Way Northeast, Seattle, Washington 98105		


PCS Removed by Others in 1997
Allegro I Apartments
Campus Fine Dry Cleaning
Allegro II Apartments
Former Service Station
Area 4: Remedial excavation of PCS from an off-property source.
Former Apartments (4101)
MW-1
MW1A
100'
Area 4A
MW-6
98'
MW-2
UST5
97'
Area 7: Remedial excavation of PCS.
9th Avenue Northeast
Roosevelt Way Northeast
Area 2: Remedial excavation of PCS.
Former Service Garage and Auto Sales (4059)
Former Gas Pump
Area 3: Remedial excavation of PCS.
UST4
MW-5
88'
Augusta Apartments
Area 6: Remedial excavation of PCS
Area 5A: Remedial excavation of PCB, cPAH, petroleum, lead and cadmium contaminated soil.
Area 1: Remedial excavation of PCS. Includes areas previously defined as Areas 1A and B.
UST3
108'
Former Sumps
Area 5: Remedial excavation of PCS.
Former Service Garage (4057)
MW-3
UST2
106'
UST1
MW3A
Open Bike Lane
Estimated extent of Area 1 off-property soil contamination
Augusta Apartments
MW-8
AB-TP8
UST9
MW-4
MW-7
90'
UST6
(Former Service Garage)
Estimated extent of on property soil contamination
UST7 UST8
MW-9
UST6: No soil contamination encountered.
HC-1
Electrical duct bank (approximately 3.5 feet bgs)
MW-12
MW-11
98'
MW-13
(Former Service Garage and Auto Sales)
RGI-1
Eastern Underground Parking Wall for Augusta Apartments
Area 5B: Remedial excavation of petroleum, PCE, PCB, and cPAH contaminated soil.
Current Building Outline
100'
HC-2
HC-3
MW-10
Eastlake Avenue Northeast
Asphalt-Paved Parking Lot
Area 9: Remedial Excavation of petroleum and cPAH contaminated soil.
Northeast 40th Street
= Groundwater flow direction
UST = Former underground storage tank
= (in red) Chemical injection point by RGI, 06/22-25/2020 (See Figures 3 & 4)
= (in black) Chemical injection point not completed 06/22-25/2020
= (in red) Monitoring well by RGI, 05/14/2020 & 06/24/2020
= (in blue) Test probe (dry well) by RGI, 05/14/2020
= Maximum elevation of remedial excavation
= (in gray) Former monitoring well location
= (in blue) Existing monitoring well location by RGI (pre-2020)
= (in gray) Test probe location by RGI (pre-2020)
= Former hoist
= (in cyan) Electrical duct bank location
= Property boundary including easements
Note: Not all previous boring locations shown here.
Approximate Scale: 1"=30'
0 15 30 60
N
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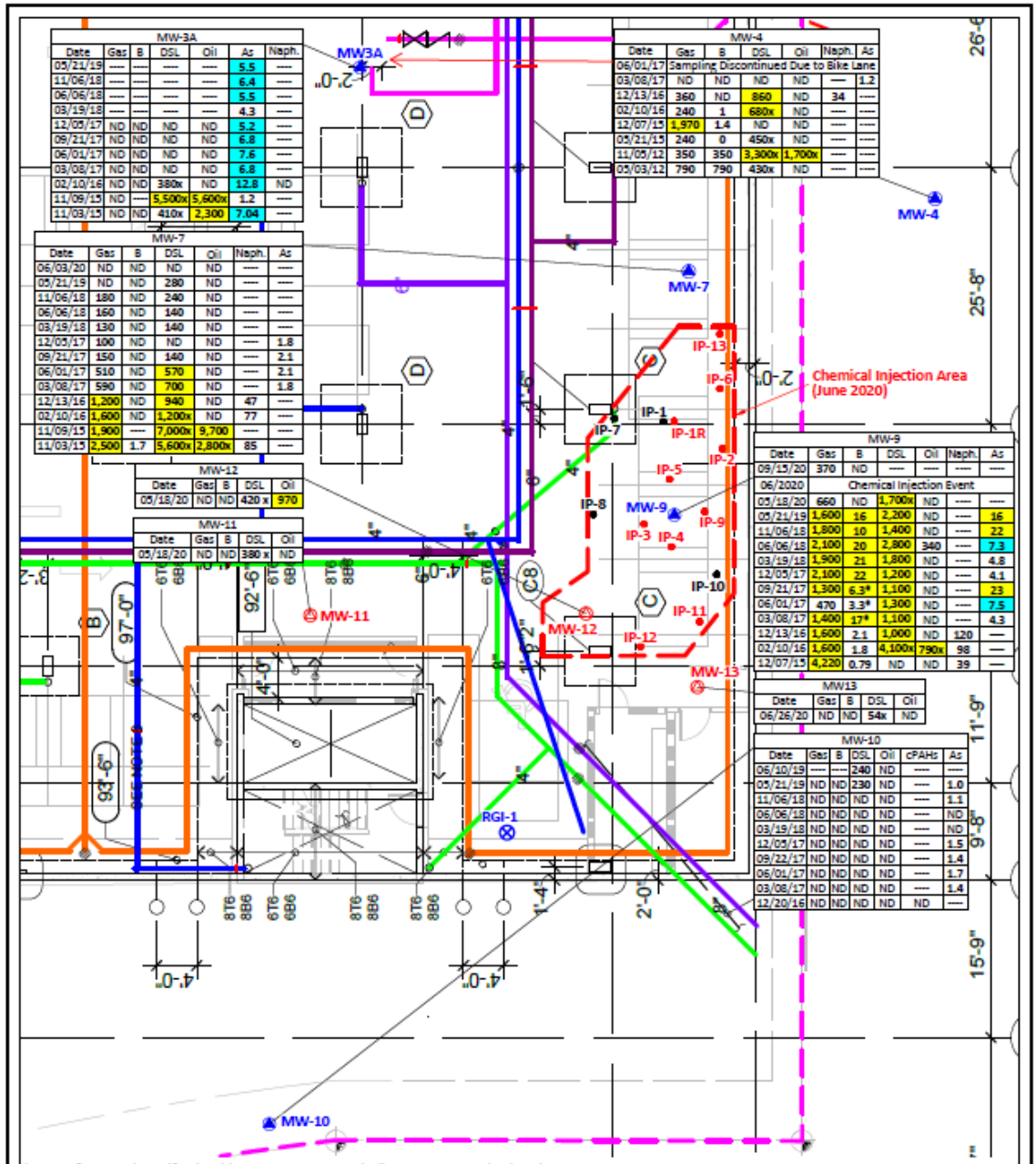
Augusta Apartments
Figure 2
RGI Project Number
2012-171-4
Property Representation Map with Historical Features
Date Drawn:
09/2020
Address: 4041 Roosevelt Way Northeast, Seattle, Washington 98105



MW-3A						
Date	Gas	B	DSL	Oil	As	Naph.
05/21/19	----	----	----	----	5.5	----
11/06/18	----	----	----	----	6.4	----
06/06/18	----	----	----	----	5.5	----
03/19/18	----	----	----	----	4.3	----
12/05/17	ND	ND	ND	ND	5.2	----
09/21/17	ND	ND	ND	ND	6.8	----
06/01/17	ND	ND	ND	ND	7.6	----
03/08/17	ND	ND	ND	ND	6.8	----
02/10/16	ND	ND	380x	ND	12.8	ND
11/09/15	ND	----	5,500x	5,600x	1.2	----
11/03/15	ND	ND	410x	2,300	7.04	----

MW-4						
Date	Gas	B	DSL	Oil	Naph.	As
06/01/17	Sampling Discontinued Due to Bike Lane					
03/08/17	ND	ND	ND	ND	----	1.2
12/13/16	360	ND	860	ND	34	----
02/10/16	240	1	680x	ND	----	----
12/07/15	1,970	1.4	ND	ND	----	----
05/21/15	240	0	450x	ND	----	----
11/05/12	350	350	3,300x	1,700x	----	----
05/03/12	790	790	430x	ND	----	----

MW-7						
Date	Gas	B	DSL	Oil	Naph.	As
06/03/20	ND	ND	ND	ND	----	----
05/21/19	ND	ND	280	ND	----	----
11/06/18	180	ND	240	ND	----	----
06/06/18	160	ND	140	ND	----	----
03/19/18	130	ND	140	ND	----	----
12/05/17	100	ND	ND	ND	----	1.8
09/21/17	150	ND	140	ND	----	2.1
06/01/17	510	ND	570	ND	----	2.1
03/08/17	590	ND	700	ND	----	1.8
12/13/16	1,200	ND	940	ND	47	----
02/10/16	1,600	ND	1,200x	ND	77	----
11/09/15	1,900	----	7,000x	9,700	----	----
11/03/15	2,500	1.7	5,600x	2,800x	85	----

MW-12				
Date	Gas	B	DSL	Oil
05/18/20	ND	ND	420 x	970

MW-11				
Date	Gas	B	DSL	Oil
05/18/20	ND	ND	380 x	ND

MW-9						
Date	Gas	B	DSL	Oil	Naph.	As
09/15/20	370	ND	----	----	----	----
06/2020	Chemical Injection Event					
05/18/20	660	ND	1,700x	ND	----	----
05/21/19	1,600	16	2,200	ND	----	16
11/06/18	1,800	10	1,400	ND	----	22
06/06/18	2,100	20	2,800	340	----	7.3
03/19/18	1,900	21	1,800	ND	----	4.8
12/05/17	2,100	22	1,200	ND	----	4.1
09/21/17	1,300	6.3*	1,100	ND	----	23
06/01/17	470	3.3*	1,300	ND	----	7.5
03/08/17	1,400	17*	1,100	ND	----	4.3
12/13/16	1,600	2.1	1,000	ND	120	----
02/10/16	1,600	1.8	4,100x	790x	98	----
12/07/15	4,220	0.79	ND	ND	39	----

MW13				
Date	Gas	B	DSL	Oil
06/26/20	ND	ND	54x	ND

MW-10						
Date	Gas	B	DSL	Oil	cPAHs	As
06/10/19	----	----	240	ND	----	----
05/21/19	ND	ND	230	ND	----	1.0
11/06/18	ND	ND	ND	ND	----	1.1
06/06/18	ND	ND	ND	ND	----	ND
03/19/18	ND	ND	ND	ND	----	ND
12/05/17	ND	ND	ND	ND	----	1.5
09/22/17	ND	ND	ND	ND	----	1.4
06/01/17	ND	ND	ND	ND	----	1.7
03/08/17	ND	ND	ND	ND	----	1.4
12/20/16	ND	ND	ND	ND	ND	----

*Drawn from WP's Wolfe Plumbing Waste System Asbuilts - Augusta, 12/14/16 Sheet S2.0.

Note: Other underground utilities identified during RGI's utility locate are not shown here.

= Groundwater concentrations in ug/L;

Gas = Gasoline total petroleum hydrocarbons (TPH)
B = Benzene
DSL/Oil = Diesel/oil TPH
As = Dissolved arsenic
cPAH = Carcinogenic polynuclear aromatic hydrocarbons
Naph. = Naphthalenes
x = The sample chromatographic pattern does not represent fuel standard.
ND = Not detected at concentrations exceeding laboratory detection limits
Yellow highlight indicates concentrations exceeded the applicable MTCA Cleanup Level.
Blue highlight indicates an arsenic concentration that exceeds the Method A Cleanup Level, but is considered representative of background arsenic groundwater concentrations in Washington State as documented in the Draft Natural Background Groundwater Arsenic concentrations in Washington State dated May 2014 by Ecology. See Table 2 for historical groundwater data.

= (in blue) Test probe (dry temp well) by RGI, 05/14/2020
= (in red) Groundwater monitoring well by RGI, 05/14/2020 & 06/24/2020
= (in red) Chemical injection point by RGI, 06/22-25/2020
= (in black) Chemical injection point not completed 06/22-25/2020
= (in blue) Existing groundwater monitoring well by RGI (pre-2020)

Approximate Scale: 1"=10'
0 5 10 20
N

Footing Drains
Contaminated Footing Drains
Sand/Oil
Waste/Sewer
Storm
Pump Discharge
Clean out

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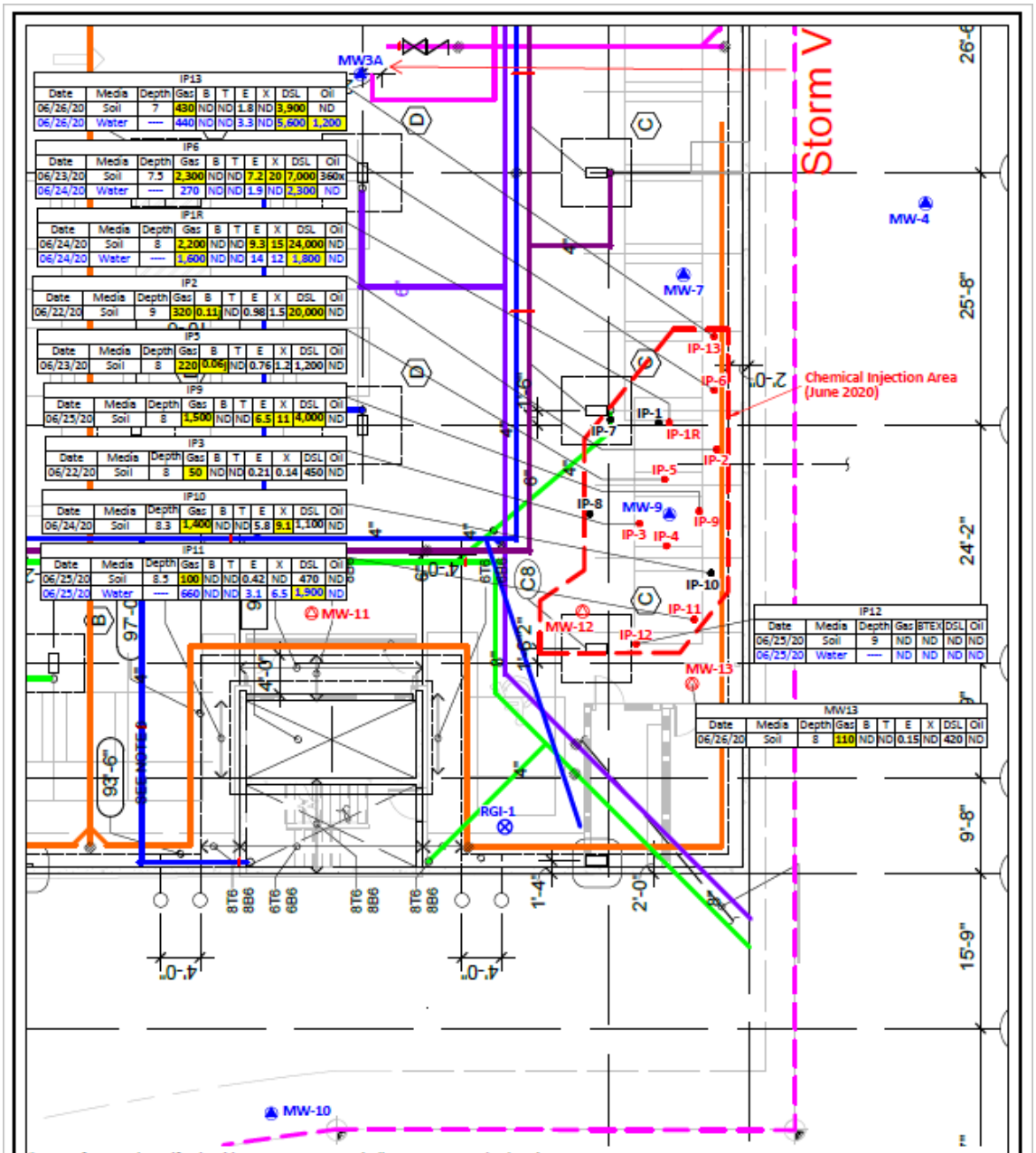
Augusta Apartments		Figure 3
RGI Project Number: 2012-171-4	Summary of Groundwater Monitoring Well Results Prior to, During, and Following the Chemical Injection Event	Date Drawn: 09/2020
Address: 4041 Roosevelt Way Northeast, Seattle, Washington 98105		



*Drawn from WP's Wolfe Plumbing Waste System Asbuilts - Augusta, 12/14/16 Sheet S2.0.

Note: Other underground utilities identified during RGI's utility locate are not shown here.

= Soil Analytical Results in mg/kg (in black); Groundwater Analytical Results in ug/L (in blue);

Depth = Feet below ground surface
Gas = Gasoline total petroleum hydrocarbons (TPH)
BTEX = Benzene, toluene, ethylbenzene, xylenes
DSL/Oil = Diesel/oil TPH
j = The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.
x = The sample chromatographic pattern does not resemble the standard used for fuel quantitation.
ND = Not detected above laboratory detection limits
Bold results indicate concentrations above laboratory detection limits
Bold and highlighted results (if any) indicate concentrations above MTCA Soil Cleanup Levels

= (in blue) Test probe (dry temp well) by RGI, 05/14/2020
= (in red) Groundwater monitoring well by RGI, 05/14/2020 & 06/24/2020
= (in red) Chemical injection point by RGI, 06/22-25/2020
= (in black) Chemical injection point not completed 06/22-25/2020
= (in blue) Existing groundwater monitoring well by RGI (pre-2020)

Approximate Scale: 1"=10'
0 5 10 20
N

Footing Drains
Contaminated Footing Drains
Sand/Oil
Waste/Sewer
Storm
Pump Discharge
Clean out

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Augusta Apartments		Figure 4
RGI Project Number	Soil and Groundwater Analytical Results	Date Drawn:
2012-171-4	Obtained During Chemical Injection Pilot Test	09/2020
Address: 4041 Roosevelt Way Northeast, Seattle, Washington 98105		