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June 10, 2021

Washington State Department of Ecology
Attn: Sonia Fernandez and Donna Musa
3190 160th Avenue Southeast
Bellevue, WA 98008

SUBJECT: *CLEANUP ACTION PLAN FOR THE FORMER SUNS MINI MART AND GAS SITE*
9506 19TH AVENUE SE, EVERETT, WASHNGTON
FACILITY ID #56571915
RELEASE ID #592193

Dear Ms. Fernandez and Ms. Musa,

Galloway Environmental, Inc. (GEI) is pleased to submit the enclosed Cleanup Action Plan (CAP) for the former Suns Mini Mart and Gas site located at 9506 19th Avenue Southeast in Everett, Washington. The CAP has been expanded to include key components of a Remedial Investigation and Feasibility Study (RI/FS).

After a detailed review of remedial action alternatives, *in-situ* remediation with microorganisms was the selected alternative. We expect the injection work to be completed by mid-to late-August. Confirmation soil and groundwater sampling and analyses will commence shortly after. We expect to conduct the groundwater monitoring for at least four quarters following the injections.

GEI is requesting Ecology to review the enclosed CAP and provide an opinion to the CAP. Upon concurrence with the CAP, GEI will immediately initiate the CAP.

If you have any questions regarding this submission, please contact me any time at (425)894-8607 or dylan@gallowayenvironmental.com.

Sincerely,

Dylan Galloway, REA
GALLOWAY ENVIRONMENTAL, INC.

Cleanup Action Plan

for the

FORMER SUNS MINI MART AND GAS SITE
9506 19TH AVENUE SOUTHEAST
EVERETT, WASHINGTON
FACILITY ID #56571915
CLEANUP SITE ID #12382

Prepared for
CASCADE BUILT
4111 East Madison Street, Suite 104
Seattle, Washington 98112

Prepared by
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April 27, 2021

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Attachments

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Acronyms and Abbreviations

Aerotech	Aerotech Environmental Consulting, Inc.
AOC	area of concern
ARAR	Applicable or Relevant and Appropriate Requirement
Arco	Arco Products Company
AS	air sparge
asl	above sea level
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CLARC	Cleanup Levels and Risk Calculation
COC	contaminant of concern
COPC	contaminant of potential concern
CUL	cleanup level
cy	cubic yards
˚C	degrees Celsius
DCA	Disproportionate Cost Analysis
DO	dissolved oxygen
ECC	Eco Compliance Corporation
Ecology	Washington State Department of Ecology
EM	electromagnetic
EMCON	EMCON Corporation
FS	Feasibility Study
G-Logics	G-Logics, Inc.
GEI	Galloway Environmental, Incorporated
GPR	ground-penetrating radar
HASP	Health and Safety Plan
HCl	hydrochloric acid
I5	Interstate 5
ID	identification
Limited Ph II TSI	Limited and Targeted Phase II Subsurface Investigation
LNAPL	light non-aqueous phase liquid
LTM	Long-Term Monitoring
LUC	Land-Use Control
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
mL	milliliter
mL/min	milliliters per minute
MTCA	Model Toxics Control Act
NWTPH-Gx	Northwest Total Petroleum Hydrocarbons as Gasoline Extended
%	Percent
PVI	petroleum vapor intrusion
PQL	laboratory practical quantitation limit
RAA	Remedial Action Alternative
RAO	remedial action objective
RCW	Revised Code of Washington
sf	square feet
SOW	scope of work
SR526	State Route 526

Acronyms and Abbreviations - *Continued*

SU	Standard Unit
SVE	soil vapor extraction
TPH-Gas	total petroleum hydrocarbons as gasoline
TPH-Oil	total petroleum hydrocarbons as oil
UIC	Underground Injection Control
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOA	volatile organic analysis
WUNC	Washington Utility Notification Center

Executive Summary

Galloway Environmental, Inc. (GEI) has prepared this Cleanup Action Work Plan (CAP) on behalf of Cascade Built for the Suns Mini Mart & Gas property addressed at 9506 19th Avenue Southeast in Everett, Washington. This CAP has been prepared to outline the scope of work (SOW) and methodologies that will be used to address residual contamination that is present at the Site due to historic release(s) of petroleum hydrocarbons from the former underground storage tank (UST) system. This Executive Summary is a brief summary of the Site and planned environmental actions. Detailed information is available within the body of the CAP.

Site Location and Description

The Site is addressed as 9506 19th Avenue Southeast in Everett, Washington and is situated in a commercial/retail setting. It is located on the western side of 19th Avenue SE and lies approximately 440 feet north of the intersection of 19th Avenue SE and 96th Place SE, 250 feet east of Interstate 5 (I5), and 0.6 miles south of State Route 526 (SR526). Snohomish County lists the Site to be associated with a 0.96 acre parcel of land (Parcel Number 28051800401700).

The Site ground surface is nearly entirely covered with impervious surfaces (on-site building and asphaltic/concrete pavement) and slopes to the north/northeast. It is currently improved with an irregular-shaped, two story, commercial structure totaling 2,846 square feet (sf) on the first floor and 3,728 sf on the second floor.

The structure was constructed in 1971 for use as retail fuel sales, convenience store, and restaurant. The former UST system associated with the fuel sales was comprised of three 10,000 gallon capacity gasoline USTs situated immediately south of the Site structure, one 550 gallon waste oil UST situated immediately south of the southwestern corner of the Site structure, and two fuel pump islands situated immediately east of the Site structure. In 1992, the original USTs and associated appurtenances were replaced with new USTs and equipment.

The Site use for retail gasoline sales was terminated in October 2013 at which time the USTs were removed from the Site.

Summary of Site Environmental Actions

Several environmental actions have been performed at the Site between 1992 and 2020. A brief background summary of each is provided below. The individual reports for each action should be reviewed for the full context of the work completed during each action. It should be noted that additional actions, reports, and/or data may have been generated for the Site which are not incorporated into this summary.

- In 1992, the Site's original four USTs were removed from the Site. After the removal of the USTs, soil samples that were collected from the UST excavations and stockpiled soils resulted in contaminants of concern (COCs) at concentrations exceeding their respective Model Toxics Control Act (MTCA) Cleanup Levels (CULs). In response to the confirmation of COCs, approximately 90 cubic yards (cy) of soils impacted with total petroleum hydrocarbons as gasoline (TPH-Gas) and 60 cy of soils impacted with total petroleum hydrocarbons as oil (TPH-Oil) were removed from the site for disposal at the Rabanco Roosevelt Regional Landfill. The USTs were replaced with three new 10,000 gallon gasoline-containing USTs.

  EMCON Corporation (EMCON) conducted an exploratory investigation at the Site on behalf of Arco to delineate the extent of residual Site contamination. Based on laboratory analytical results from the investigation, EMCON estimated residual contamination to extend no further than 10 feet below ground surface (bgs) and total no more than 10 cy.

- In 2013, the three gasoline-containing USTs were removed from the Site. Eco Compliance Corporation (ECC) prepared an environmental report to document the environmental conditions for the Site after the removal of the USTs. During the removal process, fuel reportedly released from product lines into the UST excavation, made contact with excavation sidewalls and water that was retained within the excavation. The product was reportedly left in place. Laboratory analyses of the soil samples that were collected by ECC confirmed the presence of contamination within the UST excavation.

  In 2014, Aerotech Environmental Consulting, Inc. (Aerotech) conducted a Limited and Targeted Phase II Targeted Subsurface Investigation (Limited Ph II TSI). The Limited Ph II TSI included

advancing four borings in the general vicinity of the fuel dispenser islands and 8 borings in the general vicinity of the former USTs. Aerotech collected 14 soil samples and one water sample during the investigation. Aerotech directed the laboratory to analyze 8 of the 14 soil samples and the water sample for at least one of the contaminants of potential concern (COPCs). Laboratory analyses of the samples that were collected by Aerotech confirmed the presence of gasoline and gasoline constituents at concentrations exceeding their respective MTCA Method A CULs. This generally included concentrations exceeding their respective MTCA Method A CULs included the soil samples collected near the western fuel pump island and the soil and water samples collected near the eastern extent of the former UST location.

- In 2015, G-Logics, Inc. (G-Logics) conducted a Subsurface Investigation and Remedial Effort for the Site to further investigate and remove the Site contamination. The subsurface investigation included advancing six borings in the vicinity of the dispenser islands and excavating 8 test pits. Laboratory analyses of the samples that were collected by G-Logics confirmed the presence of gasoline and gasoline constituents at concentrations exceeding their respective MTCA Method A CULs. Based on these data, the confirmed Site contamination was determined to generally extend within the areas of eastern portion of the former UST location, the western fuel pump island, and the former product line, just south of the fuel pump islands. Following the trench excavations, G-Logics installed 2-inch diameter air sparge (AS) and soil vapor extraction (SVE) piping where the fuel product piping was removed between the fuel pump islands and the location of the former USTs. Removal of contaminated soils was abandoned due to concern for structural stability of the on-site structure.
- In 2016, G-Logics published a second report pertaining to a Subsurface Investigation and Remedial Effort for the Site. Much of the report is a duplicate to the report published for their 2015 work with the addition of supplemental data and findings from the subsequent work in 2016. The subsequent work generally included advancement of nine borings (GLB-7 through GLB-15) at the Site. Laboratory analyses of soil samples that were collected by G-Logics confirmed the presence of gasoline and gasoline constituents at concentrations exceeding their respective MTCA Method A CULs.

  G-Logics directed the drilling contractor to install permanent groundwater monitoring wells in four of the borings. This included one well in the southern portion of the site, immediately east of the former USTs, one well along the eastern property boundary, south of the fuel pump islands, one immediately north of the western fuel pump island, and one well in the northern portion of the site, north of the fuel pump islands.

  Between March 14, 2016 and March 17, 2016, G-Logics collected groundwater samples from each well for laboratory analyses. Laboratory analyses of the groundwater samples collected from the southern, southeastern, and central wells resulted in the detections of TPH-Gas and BTEX at concentrations exceeding their respective MTCA Method A CUL. G-Logics also conducted an elevation survey of the wells to define the groundwater gradient at the Site. Based on the groundwater elevations, the groundwater at the Site was confirmed to flow to the northeast.
- In 2020, GEI collected groundwater samples from each of the four existing groundwater monitoring wells for laboratory analyses of gasoline and gasoline constituents. Laboratory analyses resulted in the detections of TPH-Gas in the groundwater samples collected from GMW-2 (GEI's MW-3), GMW-3 (GEI's MW-2), GMW-4 (GEI's MW-1) at concentrations of 6,600 μg/L, 470 μg/L, and 21,000 μg/L, respectively.

  Benzene was detected in the groundwater samples collected from GMW-2 (GEI's MW-3), GMW-3 (GEI's MW-2), GMW-4 (GEI's MW-1) at concentrations of 35 μg/L, 9.3 μg/L, and 10 μg/L, respectively.

  Toluene was detected in the groundwater samples collected from GMW-2 (GEI's MW-3) and GMW-4 (GEI's MW-1) at concentrations of 23 μg/L and 140 μg/L, respectively.

  Ethylbenzene was detected in the groundwater samples collected from GMW-2 (GEI's MW-3) and GMW-4 (GEI's MW-1) at concentrations of 320 μg/L and 1,500 μg/L, respectively.

Total xylenes were detected in the groundwater samples collected from GMW-2 (GEI's MW-3), GMW-3 (GEI's MW-2), GMW-4 (GEI's MW-1) at concentrations of 220 μg/L, 91 μg/L, and 4,470 μg/L, respectively.

Naphthalene was detected in the groundwater samples collected from GMW-2 (GEI's MW-3) and GMW-4 (GEI's MW-1) at concentrations of 99 μg/L and 290 μg/L, respectively.

Summary of Contamination

The extent of TPH-Gas contamination in the Site soils has been defined to two primary areas of concern (AOCs). These include:

- AOC-1 - immediately east of the location of the former USTs and is estimated to extend 19 feet (southeast to northwest) by 46 feet (southwest to northeast) by a depth interval from 9 feet bgs to 40 feet bgs. However, the majority of the TPH-Gas contamination in soil at AOC-1 is restricted to a depth interval from 9 feet bgs to 20 feet bgs.
- AOC-2 - immediate vicinity of the location of the fuel pump islands and is estimated to extend 46 feet (west to east) by 69 feet (south to north) by a depth interval from 5 feet bgs to 20 feet bgs. However, the majority of the TPH-Gas contamination in soil at AOC-2 is restricted to a depth interval from 5 feet bgs to 10 feet bgs.

The primary extent of TPH-Gas contamination in the Site groundwater and subsurface retention water has been defined to include three primary AOCs. These include:

- AOC-1 and AOC-2. The contamination in groundwater is estimated to extend 65 feet (west to east) by 110 feet (south to north) at an average depth of approximately 16 feet bgs.
- AOC-3 – the area of the former USTs where precipitation has infiltrated the excavation from the surface and has been retained within the UST excavation. The contamination in the retention water is estimated to extend 15 feet wide (north-south) by 100 feet long (east-west) by 12 feet deep.

Planned Response Actions

In preparing this CAP, GEI completed a Conceptual Site Model (CSM) to evaluate potentially complete exposure pathways to potential human and ecological receptors and evaluated five potential remedial action alternatives (RAAs), including:

1. No Action – implement no action to address site contamination;
2. Long-Term Monitoring (LTM) with Land-Use Controls (LUCs) – continue monitoring groundwater and institute LUCs, such as administrative controls to minimize the potential for human exposure;
3. *In-Situ* Treatment – Chemical oxidation and microbial digestion techniques in soil and groundwater where concentrations of COCs exceed their respective Site-specific preliminary CULs;
4. AS/SVE Treatment – Inject air into the zones of COCs and extract vapors from the subsurface; and
5. Removal – Excavation and disposal of the soil where COCs exceed their Site-specific preliminary CULs.

Each RAA was compared to evaluate their capacity to meet the following remedial action objectives (RAOs):

- Protection of human health and the environment - Preventing hypothetical current and future receptors from potential exposure to contaminants in air, soil, and shallow groundwater via inhalation, ingestion, and dermal contact;
- Compliance with applicable, relevant, and cleanup standards and laws;
- Providing short- and long-term effectiveness; and
- Being cost-effective and consistent with the current and planned future use.

After comparing each RAA to the above RAOs and Evaluation Threshold, the third RAA (*in-situ* treatment) was selected as the preferred remedy for the Site.

1.0 INTRODUCTION

Galloway Environmental, Inc. (GEI) has prepared this Cleanup Action Work Plan (CAP) on behalf of the Cascade Built for the Suns Mini Mart & Gas property addressed at 9506 19th Avenue Southeast in Everett, Washington (the "Site"). The Site location is shown in Figure 1 of this CAP.

The Washington State Department of Ecology (Ecology) Facility Identification (ID) number for the Site is 56571915. The Cleanup Site ID number for the Site is 12382.

This CAP has been prepared to outline the scope of work (SOW) and methodologies that will be used to address residual contamination that is present at the Site due to historic release(s) of petroleum hydrocarbons from the former underground storage tank (UST) system. This CAP presents an evaluation of existing Site characteristics, environmental data, and the SOW for implementing the planned Site remediation.

This CAP characterizes the environmental concerns for the Site, assesses the baseline risks to human health and the environment, and evaluates, remedial alternatives to ensure the optimal remedial action alternative is selected for the Site.

Because the remedial action process is dynamic and iterative, this CAP may be modified during the remediation process to incorporate new information and refined project objectives.

1.1 Special Terms and Conditions

This CAP is based upon the application of scientific principles and professional judgment to certain facts with resultant subjective interpretations. Professional judgments expressed herein are based upon the facts currently available within the limits of the existing data, scope of work, budget and schedule and may undergo revision as additional data are obtained. To the extent that more definitive conclusions are desired by the client than are warranted by the currently available facts, it is specifically GEI's intent that the conclusions and recommendations stated in our report is intended as guidance and not necessarily a firm course of action except where explicitly stated as such.

1.2 Involved Parties

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Ecology Project Manager
To Be Determined

1.3 Regulatory Framework

Remediation of petroleum-impacted soil in Washington State is regulated by the Model Toxics Control Act *(MTCA, WAC 173-340, Amended October 12, 2007).* Generally, remediation of such sites is performed following the voluntary independent provisions of MTCA.

GEI's approach to these site cleanup services will follow appropriate local, state, and federal guidance documents, including the following Washington Department of Ecology (Ecology) and US Environmental Protection Agency (USEPA) guidance documents as well as current safety and health regulations, including:

- OSHA CFR 1910.120, Hazardous Waste Operations and Emergency Responses
- WAC 296-24, General Safety & Health Standards
- WAC 296-62, Occupational Health Standards
- WAC 296-800/OSHA 29 CFR 1910, Core Safety & Health Standards
- WAC 296-155/OSHA 29 CFR 1926, Construction Industry Standards
- WAC 173-340, Model Toxics Control Act Cleanup Regulation
- WAC 173-303, Dangerous Waste Regulations
- USEPA CFR 40, Protection of Environment
- NPDES Waste Discharge Regulations
- Stormwater Management Manual for Western WA, Ecology August 2001
- WAC 173-201A, Water Quality Standards for the State of Washington
- RCW 46.25.085, 46.25.080, 46.25.070, 46.48.170, 4.24.314
- Section 311 Clean Water Act, RCW 90.56

2.0 SITE DESCRIPTION

2.1 Location and Legal Description

The physical address of the Site is 9506 19th Avenue Southeast in Everett, Washington. The Site is located on the western side of 19th Avenue SE (also known as Bothell Everett Highway) and lies approximately 440 feet north of the intersection of 19th Avenue SE and 96th Place SE, 250 feet east of Interstate 5 (I5), and 0.6 miles south of State Route 526 (SR526) as shown in Figure 1. Snohomish County lists the Site to be associated with a 0.96 acre parcel of land (Parcel Number 28051800401700). It is situated in the southeast quarter of Section 18, Township 28 North, Range 5 East.

2.2 Site Improvements

The Site ground surface is nearly entirely covered with impervious surfaces (on-site building and asphaltic/concrete pavement) and slopes to the north/northeast.

The Site is currently improved with an irregular-shaped, two story, commercial structure totaling 2,846 square feet (sf) on the first floor and 3,728 sf on the second floor. The structure was constructed in 1971 for use as retail fuel sales, convenience store, and restaurant. The UST system was comprised of three 10,000 gallon capacity gasoline USTs situated immediately south of the Site structure, one 550 gallon waste oil UST situated immediately south of the southwestern corner of the Site structure, and two fuel pump islands situated immediately east of the Site structure. In 1992, the original USTs and associated appurtenances were replaced with new USTs and equipment.

The Site use for retail gasoline sales was terminated in October 2013 at which time the USTs were removed from the Site. The features of the Site and its vicinity are shown in Figure 2.

2.3 Current Use of Adjoining Properties

The current site uses of adjoining properties includes:

- North Adjoining Parcel
  - Name: JR's Sports Bar
  - Address: 9504 19th Avenue SE
  - Owner: Robinson Credit Trust
  - Property Use: Restaurant
  - Construction Date: 1978
  - Property Size: 0.69 acres
  - Property Surface: Nearly entirely impervious with structure and pavement
- Northeast Adjacent Parcel, beyond 19th Avenue SE
  - Name: Terrace East
  - Address: 9505 19th Avenue SE
  - Owner: 9505 19th LLC
  - Property Use: Commercial - medical clinics
  - Construction Date: 1986
  - Property Size: 0.65 acres
  - Property Surface: Nearly entirely impervious with structure and pavement
- Southeast Adjacent Parcel, beyond 19th Avenue SE
  - Name: The Church of Jesus Christ of Latter-Day Saints
  - Address: 9509 19th Avenue SE
  - Owner: LDS Church
  - Property Use: Religious gatherings
  - Construction Date: Unknown

    - Property Size: 4.75 acres
    - Property Surface: Nearly entirely impervious with structure and pavement
- South Adjoining Parcel
    - Name: EconoLodge Motel
    - Address: 9602 19th Avenue SE
    - Owner: Double Star Corporation
    - Property Use: Motel
    - Construction Date: 1981
    - Property Size: 2.62 acres
    - Property Surface: Nearly entirely impervious with structure and pavement
- West Adjoining Parcel
    - Vegetated public land associated with I5

2.4 Proposed Land Use

It is GEI's understanding that the Site will continue to be used for commercial purposes.

3.0 ENVIRONMENTAL SETTING

3.1 Regional Physiographic Conditions

The Site is situated along the eastern side and near the base of a series of northerly-trending ridgelines at an elevation of about 460-feet above sea level (asl). Topography at the Site slopes to the north/northeast.

3.2 Climate

Western Washington is generally characterized as a mild marine climate with average total annual precipitation of approximately 37 inches with the predominant rainfall between October and April.

3.3 Soil/Geologic Conditions

The present day landscape and underlying hydrostratigraphy of Snohomish County are the result of repeated advances and retreats of Pleistocene continental glaciers, which inundated the Puget Lowland during recent geologic time. Over the past 300,000 years, at least six glacial and intervening interglacial episodes have affected the region. During this time, a large volume of glacial and interglacial material was deposited over the basin, resulting in complex accumulation of unconsolidated sediments, which is up to 3,000 feet thick in some places.

The youngest deposits are Quaternary Alluvium, which includes recent stream, lake, floodplain, beach, and peat deposits. These deposits, which occur surficially, are generally thin and discontinuous, and have minor to no regional hydrogeologic importance on the island.

Aerotech Environmental Consulting, Inc. (Aerotech) prepared a Limited and Targeted Phase II Subsurface Investigation (Limited Ph II TSI) report, dated August 13, 2014 in which they described the subsurface soils encountered during their drilling activities as follows:

- Gravelly sand fill from below the pavement to approximately 2-feet below ground surface (bgs);
- "*Very dense fine sandy diamicton, representing the Vashon glacial till deposits*" from approximately 2-feet bgs to at least 15-feet bgs.

G-Logics, Inc. (G-Logics) prepared a summary report, dated September 16, 2016, to a subsurface investigation and remedial effort, in which they described the subsurface soils encountered during their drilling activities as follows:

- "*Very dense, gray, silty sand and sandy silt with gravel (glacial till)*" from below the pavement to the terminal depth of investigation;
- Water bearing zones of silty sand and gravel were noted to be observed between 7-feet bgs and 40-feet bgs.

3.4 Hydrogeologic Conditions

Groundwater gauging by GEI during a previous groundwater monitoring event observed groundwater to be present at approximately 13.8 feet bgs in the southern portion of the Site, 22.2 feet bgs in the eastern portion of the Site, 14.14 feet bgs in the central portion of the Site, and 13.1 feet bgs in the northern portion of the Site.

Groundwater gauging by G-Logics in 2016 observed groundwater to be present at depths between 8.9 feet bgs to 34.8 feet bgs. Based on survey elevation information for the Site groundwater wells, and the groundwater gauging data, G-Logics interprets the predominant groundwater to flow toward the northeast.

4.0 SITE BACKGROUND AND SUMMARY

4.1 Previous Site Environmental Actions

Several environmental actions have been performed at the Site between 1992 and 2020. A background summary of each is provided below. The individual reports for each action should be reviewed for the full context of the work completed during each action. It should be noted that additional actions, reports, and/or data may have been generated for the Site which are not incorporated into this summary.

4.1.1 February 1992; UST Decommissioning by EMCON Corporation

A report prepared by EMCON Corporation (EMCON), dated April 26, 1992, on behalf of Arco Products Company (Arco) documented the removal of four USTs, as described below:

- One 6,000 gallon capacity UST used to store unleaded gasoline;
- One 8,000 gallon capacity UST used to store unleaded gasoline;
- One 8,000 gallon capacity UST used to store leaded gasoline; and
- One 550 gallon capacity UST used to store waste oil.

The three gasoline USTs were noted to be situated immediately south of the Site structure and were removed from one excavation. The final extent of excavation for the three gasoline USTs measured approximately 14 feet wide (north-south) by 56 feet long (east-west) by 14 feet deep. The excavated soils were stockpiled and estimated to total 340 cubic yards (cy).

The waste oil UST was noted to be situated immediately south of the southwest corner of the Site structure. The final extent of excavation for the waste oil UST measured approximately 9 feet wide (north-south) by 9.5 feet long (east-west) by 14 feet deep. The excavated soils were stockpiled and estimated to total 60 cy.

The fuel pump dispensers and product lines were removed as part of the UST system decommissioning activities. The pump islands were left intact. The excavations for the eastern and western fuel pump dispensers extended to depths of 5 feet bgs and 4 feet bgs, respectively.

Laboratory analyses of soil samples that were collected from the final extents of excavation resulted in the detection of total petroleum hydrocarbons as gasoline (TPH-Gas) in a soil sample that was collected from below the western pump dispenser at a depth of 6 feet bgs at a concentration of 174 milligrams per kilogram (mg/kg), exceeding the MTCA Method A Cleanup Levels (CULs) of 30 mg/kg with benzene present and 100 mg/kg with benzene absent. Toluene, ethylbenzene, total xylenes, and total lead were also detected in the same soil sample, but at concentrations below their respective MTCA Method A CULs.

Laboratory analyses of the soil samples that were collected from the gasoline UST excavation stockpiled soils resulted in detections of TPH-Gas in three of the five stockpile samples at concentrations ranging from 6 mg/kg to 146 mg/kg. Toluene, ethylbenzene, total xylenes, and total lead were also detected in at least one of the five stockpile soil samples, but at concentrations below their respective MTCA Method A CULs.

Laboratory analyses of the soil sample that was collected from the waste oil UST excavation stockpiled soils resulted in a detection of total petroleum hydrocarbons as oil (TPH-Oil) at a concentration of 1,300 mg/kg, exceeding the 1992 MTCA Method A CUL of 200 mg/kg, but below the current MTCA Method A CUL of 2,000 mg/kg.

In total, 90 cy of TPH-Gas impacted soils and 60 cy of TPH-Oil impacted soils were exported for off-site disposal at the Rabanco Roosevelt Regional Landfill.

4.1.2 February 1992; Exploratory Drilling by EMCON Corporation

EMCON conducted an exploratory drilling and sampling event on behalf of Arco to delineate the extent of contamination beneath the western fuel pump island. EMCON and their drilling subcontractor advanced two borings (B-1 and B-2) to a maximum depth of 8 feet bgs. One soil sample was retained from each boring at a depth of 8 feet bgs for subsequent laboratory analyses.

Laboratory analyses of the soil samples collected from borings B-1 and B-2 resulted in detections of TPH-Gas at concentrations of 15 mg/kg and 155 mg/kg, respectively. Benzene was detected in the soil sample collected from boring B-2 at a concentration of 0.41 mg/kg. Ethylbenzene was detected in the soil samples collected from borings B-1 and B-2 at concentrations of 0.08 mg/kg and 2.01 mg/kg, respectively. Total xylenes were detected in the soil samples collected from borings B-1 and B-2 at a concentration of 0.70 mg/kg and 11.1 mg/kg, respectively. The detections of TPH-Gas, benzene, and total xylenes in the soil sample collected from boring B-2 (one foot east of the western pump island) exceeded their respective MTCA Method A CULs.

EMCON estimated the petroleum hydrocarbon impacts to extend no further than 10 feet bgs and total no more than 10 cy.

With consideration to the work completed by EMCON, Ecology issued a No Further Action (NFA) determination for the Site.

4.1.3 October 2013; UST Decommissioning by Eco Compliance Corporation (ECC)

A report prepared by Eco Compliance Corporation (ECC), dated October 31, 2013, on behalf of Ms. Jennifer Habu documented the removal of three USTs. The three USTs were described to have a capacity of 10,000 gallons and used to store unleaded gasoline.

The three gasoline USTs were noted to be situated immediately south of the Site structure, in the same location as those in 1992. Based on the figure included in the ECC report, it appears that the USTs were removed from one excavation that measured approximately 15 feet wide (north-south) by 100 feet long (east-west) by 12 feet deep.

The fuel pump dispensers and product lines were not removed during the UST system decommissioning activities.

ECC noted that during the removal process, gasoline was released from the product piping into the excavation which made contact with standing water in the excavation and the excavation sidewalls. Recovery of the impacted water was not recorded in the report.

Upon removal of the USTs, ECC collected three excavation sidewall soil samples from the north sidewall, one excavation sidewall soil sample from the east sidewall, three excavation sidewall soil samples from the south sidewall, and one excavation sidewall soil sample from the west sidewall. Each soil sample was submitted to an analytical laboratory for analyses of TPH-Gas and gasoline constituents (benzene, toluene, ethylbenzene, and xylenes [BTEX]).

Laboratory analyses of soil samples that were collected from the final extents of excavation resulted in the detection of TPH-Gas in a soil sample that was collected from the eastern excavation sidewall at a depth of 9 feet bgs at a concentration of 38 mg/kg, exceeding the MTCA Method A CUL of 30 mg/kg with benzene present. Benzene was detected in the soil samples collected from the central and eastern portions of the southern excavation sidewall at a depth of 9 feet bgs at concentrations of 0.055 mg/kg and 0.054 mg/kg, respectively, both exceeding the MTCA Method A CUL of 0.03 mg/kg. Benzene was also detected in the soil sample collected from the eastern excavation sidewall at a depth of 9 feet bgs at a concentration of 0.48 mg/kg, exceeding the MTCA Method A CUL of 0.03 mg/kg. BTEX were also detected in at least one other soil sample collected, but at concentrations below their respective MTCA Method A CULs.

Based on the laboratory analytical results, ECC recommended NFA to delineate or remediate the contaminated media at the Site.

4.1.4 August 2014; Limited and Targeted Phase II Targeted Subsurface Investigation by Aerotech

A report prepared by Aerotech, dated August 13, 2014, on behalf of Coastal Community Bank, documented a Phase II Environmental Site Assessment (Limited Ph II TSI) that was conducted to "*evaluate the condition of the subsurface soils for the Recognized Environmental Conditions associated with the historic use of the property as a gasoline retail station, to determine whether the Site has been impacted by petroleum compounds*".

The Limited Ph II TSI included advancing 4 borings in the general vicinity of the fuel dispenser islands and 8 borings in the general vicinity of the former USTs. Aerotech collected 14 soil samples and one water sample during the investigation. Aerotech directed the laboratory to analyze 8 of the 14 soil samples and the water sample for at least one of the contaminants of potential concern (COPCs).

Laboratory analyses of soil samples that were collected during the investigation resulted in the detections of TPH-Gas in three soil samples at concentration ranging from 5.9 mg/kg to 6,400 mg/kg. The detections in the soil samples collected from the borings identified as B-9 and B-10, both at a depth of 6 feet bgs exceeded the MTCA Method A CUL of 30 mg/kg with benzene present. BTEX were detected in the soil samples collected from the borings identified as B-4 at a depth of 14.5 feet bgs and B-9 at a depth of 6 feet bgs exceeding their respective MTCA Method A CULs. Benzene was also detected in the soil sample collected from the boring identified as B-10 at a depth of 6 feet bgs at a concentration of 0.082 mg/kg, exceeding the MTCA Method A CUL of 0.03 mg/kg. Naphthalene was detected in in the soil sample collected from the boring identified as B-9 at a depth of 6 feet bgs at a concentration of 270 mg/kg, exceeding its MTCA Method A CUL of 5 mg/kg. Laboratory analyses of the water sample collected from the boring identified as B-4 resulted in the detections of TPH-Gas at a concentration of 39,000 micrograms per liter (μg/L), exceeding its MTCA Method A CUL of 800 μg/L, benzene at a concentration of 550 μg/L, exceeding its MTCA Method A CUL of 5 μg/L, toluene at a concentration of 2,600 μg/L, exceeding its MTCA Method A CUL of 1,000 μg/L, ethylbenzene at a concentration of 850 μg/L, exceeding its MTCA Method A CUL of 700 μg/L, xylenes at a concentration of 5,100 μg/L, exceeding its MTCA Method A CUL of 1,000 μg/L, and naphthalene at a concentration of 500 μg/L, exceeding its MTCA Method A CUL of 160 μg/L.

Based on the laboratory analytical results, the COPCs that were detected at concentrations exceeding their respective MTCA Method A CULs included the soil samples collected from borings B-9 and B-10 (near the western fuel pump island) and the soil and water samples collected from boring B-4 (near the eastern extent of the former UST location.

4.1.5 July 2014; Correspondence by Ecology

An Early Notice Letter by Ecology, dated July 9, 2014, was issued for the Site to notify the owner at the time (Ms. Jennifer Habu) that the Site was being listed as a known contaminated site.

4.1.6 February 2015; Subsurface Investigation and Remedial Effort by G-Logics

A report prepared by G-Logics, dated February 2, 2015, on behalf of Jennifer Habu (Habu/Chinn), documented a subsurface investigation and remedial efforts conducted with the objective of removing residual petroleum contaminated soils in the area of the former USTs. Due to "*wet soil conditions and the presence of higher contaminant concentrations in the dispenser-island area*", G-Logics redirected their efforts to assessing the contamination in the vicinity of the dispenser islands.

The subsurface investigation included advancing 6 borings in the vicinity of the dispenser islands and excavating 8 test pits for collection of soil samples and subsequent laboratory analyses for COPCs. G-Logics also conducted product recovery from the existing product lines and removed the product lines from the Site.

Laboratory analyses of the soil samples collected from 4 of the 6 borings resulted in detections of at least one COPC exceeding its MTCA Method A CUL. The exceedances included:

- TPH-Gas at a concentration of 63 mg/kg in the soil sample collected from a depth of 5 feet bgs in the boring identified as GL-B-1;
- TPH-Gas at concentrations of 794 mg/kg and 298 mg/kg in the soil samples collected from depths of 7.5 and 10 feet bgs in the boring identified as GL-B-2;
- TPH-Gas at concentrations of 2,740 mg/kg and 3,960 mg/kg in the soil samples collected from a depth of 10 feet bgs in the boring identified as GL-B-4;

- TPH-Gas at a concentration of 3,240 mg/kg in the soil sample collected from a depth of 10 feet bgs in the boring identified as GL-B-6;
- Benzene at concentrations of 0.088 mg/kg and 0.031 mg/kg in the soil samples collected from depths of 5 and 7.5 feet bgs in the boring identified as GL-B-1;
- Benzene at concentrations of 3.31 mg/kg and 5.55 mg/kg in the soil sample collected from a depth of 10 feet bgs in the boring identified as GL-B-4;
- Toluene at a concentration of 107 mg/kg in the soil sample collected from a depth of 10 feet bgs in the boring identified as GL-B-6;
- Ethylbenzene at a concentration of 10.9 mg/kg in the soil sample collected from a depth of 7.5 feet bgs in the boring identified as GL-B-2;
- Ethylbenzene at concentrations of 20.2 mg/kg and 26.1 mg/kg in the soil sample collected from a depth of 10 feet bgs in the boring identified as GL-B-4;
- Ethylbenzene at a concentration of 60 mg/kg in the soil sample collected from a depth of 10 feet bgs in the boring identified as GL-B-6;
- Xylenes at concentrations of 47.4 mg/kg and 18 mg/kg in the soil samples collected from depths of 7.5 and 10 feet bgs in the boring identified as GL-B-2;
- Xylenes at concentrations of 57.6 mg/kg and 81.1 mg/kg in the soil sample collected from a depth of 10 feet bgs in the boring identified as GL-B-4;
- Xylenes at a concentration of 367 mg/kg in the soil sample collected from a depth of 10 feet bgs in the boring identified as GL-B-6; and
- Benzene at a concentration of 0.0572 mg/kg in the soil sample collected from a depth of 4.5 feet bgs in the test pit identified as GLTP-7.

Based on these data, the confirmed Site contamination generally extends within the areas of eastern portion of the former UST location, the western fuel pump island, and the former product line, just south of the fuel pump islands.

Figure 4 of the G-Logics report indicates that 2-inch diameter air sparge (AS) and soil vapor extraction (SVE) piping was installed in the trenching where the fuel product piping was removed between the fuel pump islands and the location of the former USTs.

4.1.7 September 2016; Subsurface Investigation and Remedial Effort by G-Logics

A report prepared by G-Logics, dated September 6, 2016, on behalf of Jennifer Habu (Habu/Chinn), documented a subsurface investigation and remedial efforts conducted with the objective of removing residual petroleum contaminated soils in the area of the former USTs. The report includes the scope and findings presented in their February 2015 with the addition of advancing nine borings (GLB-7 through GLB-15).

Laboratory analyses of soil samples retained from 5 of the borings resulted in detections of TPH-Gas at concentrations exceeding its MTCA Method A CUL. Benzene was detected at concentrations exceeding its MTCA Method A CUL in soil samples retained from 3 of the borings. Toluene was detected at concentrations exceeding its MTCA Method A CUL in soil samples retained from 2 of the borings. And ethylbenzene was detected at a concentration exceeding its MTCA Method A CUL in a soil sample retained from 1 of the borings.

G-Logics directed the drilling contractor to install permanent groundwater monitoring wells in four of the borings. This included one well in the southern portion of the site, immediately east of the former USTs, one well along the eastern property boundary, south of the fuel pump islands, one immediately north of the western fuel pump island, and one well in the northern portion of the site, north of the fuel pump islands.

Between March 14, 2016 and March 17, 2016, G-Logics collected groundwater samples from each well for laboratory analyses. Laboratory analyses of the groundwater samples collected from the southern, southeastern, and central wells resulted in the detections of TPH-Gas and BTEX at concentrations exceeding their respective MTCA Method A CUL.

G-Logics conducted an elevation survey of the wells to define the groundwater gradient at the Site. Based on the groundwater elevations, the groundwater at the Site was confirmed to flow to the northeast.

G-Logics also conducted a petroleum vapor intrusion (PVI) review for the Site to determine if Site contaminants of concern (COCs) present a potential vapor intrusion risk to the Site structure. G-Logics concluded that PVI may exist for the Site structure due to the presence of light non-aqueous phase liquids (LNAPL) within 30 horizontal feet and 15 vertical feet from the lowest point of the Site structure.

4.1.8 October 2020; Groundwater Monitoring by GEI

On October 12, 2020, GEI collected groundwater samples from each of the four existing groundwater monitoring wells. At the time of the sampling event, GEI was not provided detailed information regarding the well construction details, installation date, previous sampling events, or their identifications. Therefore, GEI arbitrarily identified the southernmost well as MW-1, the southeastern well as MW-2, the central well as MW-3, and the northernmost well as MW-4. During the preparation of this CAP, GEI was provided the additional data gaps regarding the wells. The identifications for each well, relative to those issued by GEI are as follows:

- GEI well identifier MW-1 is G-Logics well GMW-4. This is the southernmost well;
- GEI well identifier MW-2 is G-Logics well GMW-3. This is the southeasternmost well;
- GEI well identifier MW-3 is G-Logics well GMW-2. This is the central well; and
- GEI well identifier MW-4 is G-Logics well GMW-1. This is the northernmost well.

For the purpose of simplicity moving forward, and in consideration of the historic data deliverables, GEI will revert to the well identifiers issued by G-Logics.

Well Gauging and Purging - Prior to sample collection, GEI gauged and purged each monitoring well to determine the depths to groundwater, confirm stabilized groundwater conditions, and attain representative groundwater samples. Groundwater conditions are generally considered stabilized when, for at least three consecutive measurements, the following conditions occur:

- Primary Water Quality Parameters
  - pH remains constant within 0.1 Standard Unit (SU)
  - Specific conductance (conductivity) varies no more than three-percent (3%)
- Secondary Water Quality Parameters
  - Temperature remains constant within 0.1 degrees Celsius (˚C)
  - Dissolved oxygen (DO) remains constant within 0.3 milligrams per liter (mg/L) or 10%, whichever is greater

The depths to water measured at each well included:

- GMW-1 (GEI's MW-4) 13.10 feet from top of casing;
- GMW-2 (GEI's MW-3) 14.14 feet from top of casing;
- GMW-3 (GEI's MW-2) 22.20 feet from top of casing; and
- GMW-4 (GEI's MW-1) 13.80 feet from top of casing.

The purging rates for each well were maintained between 500 and 1,000 milliliters per minute (mL/min) to minimize the potential for significant drawdown (>5% of total water column height).

Well Sample Collection and Retention - Groundwater samples were collected using a low-flow peristaltic pump with dedicated disposable tubing which directed the samples into new 40 milliliter (mL) laboratory supplied glass containers preserved with hydrochloric (HCl) acid. The sample collection rates for each well were maintained below 250 mL/min to minimize the potential for sample alteration, aeration, and/or volatilization. After securing the volatile organic analysis (VOA) vial lid, GEI rotated and tapped each vial to ensure the absence of air bubbles.

Decontamination Procedures - The samples were collected at each sample location using procedures designed to minimize the risk of cross contamination of the samples. All sampling

equipment that could come into direct contact with sample media was decontaminated before starting work and between each sampling location. The following procedure was used for cleaning all sampling equipment:

- Remove gross contamination by brushing/wiping and rinsing with potable water;
- Wash and scrub with laboratory grade detergent (i.e., Alconox®);
- Rinse with distilled water; and
- Air dried.
- GEI rotated and tapped each vial to ensure the absence of air bubbles.

Sample Chemical Analyses - GEI submitted the groundwater samples to a Washington State Certified laboratory (OnSite Environmental, located at 14648 NE 95th Street in Redmond, Washington) to test for TPH-Gas using the Northwest Total Petroleum Hydrocarbons as Gasoline Extended (NWTPH-Gx) method and BTEX/naphthalene using the USEPA method 8021B.

Laboratory analyses resulted in the detections of TPH-Gas in the groundwater samples collected from GMW-2 (GEI's MW-3), GMW-3 (GEI's MW-2), GMW-4 (GEI's MW-1) at concentrations of 6,600 μg/L, 470 μg/L, and 21,000 μg/L, respectively.

Benzene was detected in the groundwater samples collected from GMW-2 (GEI's MW-3), GMW-3 (GEI's MW-2), GMW-4 (GEI's MW-1) at concentrations of 35 μg/L, 9.3 μg/L, and 10 μg/L, respectively.

Toluene was detected in the groundwater samples collected from GMW-2 (GEI's MW-3) and GMW-4 (GEI's MW-1) at concentrations of 23 μg/L and 140 μg/L, respectively.

Ethylbenzene was detected in the groundwater samples collected from GMW-2 (GEI's MW-3) and GMW-4 (GEI's MW-1) at concentrations of 320 μg/L and 1,500 μg/L, respectively.

Total xylenes were detected in the groundwater samples collected from GMW-2 (GEI's MW-3), GMW-3 (GEI's MW-2), GMW-4 (GEI's MW-1) at concentrations of 220 μg/L, 91 μg/L, and 4,470 μg/L, respectively.

Naphthalene was detected in the groundwater samples collected from GMW-2 (GEI's MW-3) and GMW-4 (GEI's MW-1) at concentrations of 99 μg/L and 290 μg/L, respectively.

None of the analytes were detected at concentrations exceeding their laboratory practical quantitation limits (PQLs) in any of the samples analyzed.

5.0 NATURE AND EXTENT OF CONTAMINATION

The Site has undergone numerous environmental investigations between 1992 and 2020. Based on a detailed evaluation of 189 soil samples and 18 groundwater samples, G-Logics has defined the nature of Site contamination to include TPH-Gas and BTEX. The primary COCs have been identified as TPH-Gas and benzene. The extents of contamination are depicted in Figures 3 through 6 (as adopted from G-Logics), in the attached G-Logics reports (Appendix A), and are summarized below:

5.1.1 TPH-Gas and Benzene in Soil

The extent of TPH-Gas contamination in the Site soils has been defined to two primary areas of concern (AOCs). These include:

- AOC-1 - immediately east of the location of the former USTs and is estimated to extend 19 feet (southeast to northwest) by 46 feet (southwest to northeast) by a depth interval from 9 feet bgs to 40 feet bgs. However, the majority of the TPH-Gas contamination in soil at AOC-1 is restricted to a depth interval from 9 feet bgs to 20 feet bgs.
- AOC-2 - immediate vicinity of the location of the fuel pump islands and is estimated to extend 46 feet (west to east) by 69 feet (south to north) by a depth interval from 5 feet bgs to 20 feet bgs. However, the majority of the TPH-Gas contamination in soil at AOC-2 is restricted to a depth interval from 5 feet bgs to 10 feet bgs.

5.1.2 TPH-Gas and Benzene in Groundwater

Based on review of previous environmental reports, it appears that the Site contaminated groundwater is generally restricted to within the property boundaries. However, during a sampling event by GEI in 2020 (discussed below) a slight exceedance of benzene was detected in the well that is situated in the southern portion of the eastern property boundary (G-Logics identifier GMW 3, GEI identifier MW-2), indicating that a minimal expansion of benzene to the east of the Site.

The primary extent of TPH-Gas contamination in the Site groundwater and subsurface retention water has been defined to include three primary AOCs. These include:

- AOC-1 and AOC-2. The contamination in groundwater is estimated to extend 65 feet (west to east) by 110 feet (south to north) at an average depth of approximately 16 feet bgs.
- AOC-3 – the area of the former USTs where precipitation has infiltrated the excavation from the surface and has been retained within the UST excavation. The contamination in the retention water is estimated to extend 15 feet wide (north-south) by 100 feet long (east-west) by 12 feet deep.

On October 12, 2020, GEI collected groundwater samples from each of the four existing groundwater monitoring wells to investigate for the potential presence of contaminants within groundwater and use those data to enhance the approach for *in-situ* remediation, proposed within this proposal. As noted, previous reports indicated that the depth to shallow groundwater was estimated to be approximately 30 feet bgs. However, GEI observed the predominant depth to shallow groundwater to be approximately 13 feet bgs. GEI observed a lens of light non-aqueous phase liquid (LNAPL) on the groundwater from the southwestern groundwater monitoring well. Laboratory analyses resulted in the following detections:

- Total petroleum hydrocarbons as gasoline (TPH-Gas) in the groundwater samples collected from the southwestern, southeastern, and central groundwater monitoring wells at concentrations of 21,000 µg/L, 470 µg/L, and 6,600 µg/L, respectively. All detections exceed the MTCA Cleanup Level of 800 µg/L.
- Benzene in the groundwater samples collected from the southwestern, southeastern, and central groundwater monitoring wells at concentrations of 10 µg/L, 9.3 µg/L, and 35 µg/L, respectively. All detections exceed the MTCA Cleanup Level of 5.0 µg/L.

- Toluene in the groundwater samples collected from the southwestern and central groundwater monitoring wells at concentrations of 140 μg/L and 23 μg/L, respectively. All detections were below the MTCA Cleanup Level of 1,000 μg/L.
- Ethylbenzene in the groundwater samples collected from the southwestern and central groundwater monitoring wells at concentrations of 1,500 μg/L and 320 μg/L, respectively. The detection in the sample collected from the southwestern groundwater monitoring well exceeded the MTCA Cleanup Level of 700 μg/L.
- Total xylenes in the groundwater samples collected from the southwestern, southeastern, and central groundwater monitoring wells at concentrations of 4,470 μg/L, 91 μg/L, and 210 μg/L, respectively. The detection in the sample collected from the southwestern groundwater monitoring well exceeded the MTCA Cleanup Level of 1,000 μg/L.
- Naphthalene in the groundwater samples collected from the southwestern and central groundwater monitoring wells at concentrations of 290 μg/L and 99 μg/L, respectively. The detection in the sample collected from the southwestern groundwater monitoring well exceeded the MTCA Cleanup Level of 160 μg/L.

6.0 CONCEPTUAL SITE MODEL/POTENTIAL EXPOSURE PATHWAYS

Several potential exposure pathways were evaluated during development of this CAP. Each are presented below and included as Figure 7 of this CAP.

6.1 Soil to Groundwater Pathway

Based on the previous environmental investigations, the pathway of contamination from soil to groundwater has been confirmed at the Site.

6.2 Soil Particulate to Air Pathway

The current potential exposure pathway between soil particulate to air is currently considered incomplete because the surface soils with contamination are completely covered with impervious surfaces (site structure and pavement).

The future potential exposure pathway between soil particulate to air with human/ecological receptors may be complete if soils with contamination are exposed through actions such as surface pavement removals and excavation.

6.3 Soil Direct Contact Pathway

The current potential exposure pathway between soils to human and ecological receptors is currently considered incomplete because the surface soils with contamination are completely covered with impervious surfaces (site structure and pavement).

The future potential exposure pathway between direct contact between soil to human/ecological receptors may be complete if soils with contamination are exposed through actions such as surface pavement removals and excavation.

6.4 Groundwater Contact Pathway

The current potential exposure pathway between groundwater to human/ecological receptors is currently considered incomplete because the surface soils with contamination are completely covered with impervious surfaces (site structure and pavement) and the groundwater is not utilized for drinking water purposes.

6.5 Soil and Groundwater to Ecological Receptors and Terrestrial Ecological Evaluation

With consideration to a potential complete exposure pathway between soil and groundwater to ecological receptors, GEI evaluated ecological receptors including plants, soil invertebrates, mammals, and birds. In general accordance with the USEPA *Guidance for Developing Ecological Soil Screening Levels*, OSWER Directive 9285.7-55, dated November 2003 and updated February 2005, chronic exposures (greater than 3 days) were used for mammals and birds.

The current potential exposure pathway between soil and groundwater to terrestrial ecological receptors is currently considered incomplete because the surface soils with contamination are completely covered with impervious surfaces (site structure and pavement) and contaminated the groundwater is not expected to migrate to a surface water feature.

6.6 Conceptual Site Model

As shown in Figure 7 there is a potential complete exposure pathway to several receptors, including:

- Current and future construction workers through direct contact, air transport, and leaching to subsurface soil and groundwater via ingestion, dermal contact, inhalation of vapors and fugitive dust. This considers potential excavation work to be conducted in the area of concern.
- Current and future ecological receptors via bio-uptake and digestion of groundwater and soil.
- Current and future industrial workers (landscapers) through bio-uptake and leaching to groundwater via ingestion, dermal contact, and inhalation of vapors. This considers

potential exposure from leaching to groundwater and exposure to the east as the groundwater surfaces into a stream.

- Future trespassers through direct contact, air transport, and leaching to subsurface soil and groundwater via ingestion, dermal contact, inhalation of vapors and fugitive dust. This is considered potential should future excavation work occur in the area of concern without proper security of excavated contaminated soil.

7.0 SITE-SPECIFIC PRELIMINARY CLEANUP LEVELS

Under MTCA, the point of compliance is the point or location on a site where CULs must be attained to protect humans from direct contact will be throughout the impacted area in accordance with WAC 173-340-760(6)(d) and WAC 173-340-7490(4)(b). Therefore, the standard point of compliance to protect humans from direct contact for the Site will be within the zones of contamination.

The point of compliance will be measured based on the site-specific preliminary cleanup levels as derived from Ecology's Cleanup Levels and Risk Calculation (CLARC) tables. The CLARC table were established for hazardous waste sites to comply with MTCA under 173-340 WAC. The CLARC tables were most recently published in July 2015, updated in August 2015, and include tabulated values for establishing cleanup levels with respect to COCs at various types of site uses.

The site-specific preliminary cleanup levels for the Site were based on MTCA Method A Soil and Groundwater CULs under WAC 173-340-740(2) and Chapter 173-340 WAC Table 745-1 for Unrestricted Land Use and are included in the table below.

COC	MTCA Method A CUL	
	Soil (mg/kg)	Groundwater (µg/L)
TPH-Gas	30[1]	800
Benzene	0.03	5.0
Toluene	7.0	1,000
Ethylbenzene	6.0	700
Xylenes	9.0	1,000

Notes:

1 MTCA Method A CUL is 30 mg/kg due to the presence of benzene
MTCA = Model Toxics Control Act
mg/kg = milligrams per kilogram
µg/L = micrograms per liter

8.0 REMEDIAL ACTION ALTERNATIVES

8.1 Remedial Action Objectives

The primary purpose of this Section of this CAP is to qualify the selected remedial action alternative (RAA) for the Site. In selecting the remedial action for this Site, a comparison of response actions was performed to evaluate attainment of the following remedial action objectives (RAOs):

- Protection of human health and the environment - Preventing hypothetical current and future receptors from potential exposure to contaminants in air, soil, and shallow groundwater via inhalation, ingestion, and dermal contact;
- Compliance with applicable, relevant, and cleanup standards and laws;
- Providing short- and long-term effectiveness; and
- Being cost-effective and consistent with the current and planned future use.

8.2 Remedial Alternatives Summary

GEI evaluated five remedial alternatives for the Site, including:

1 No Action – implement no action to address site contamination;

2 Long-Term Monitoring (LTM) with Land-Use Controls (LUCs) – continue monitoring groundwater and institute LUCs, such as administrative controls to minimize the potential for human exposure;

3 *In-Situ* Treatment – Chemical oxidation and microbial digestion techniques in soil and groundwater where concentrations of COCs exceed their respective Site-specific preliminary CULs;

4 AS/SVE Treatment – Inject air into the zones of COCs and extract vapors from the subsurface; and

5 Removal – Excavation and disposal of the soil where COCs exceed their Site-specific preliminary CULs.

8.3 Evaluation of Remedial Alternatives

8.3.1 Evaluation Threshold

The sub-sections below describe how each alternative meets or does not meet the RAOs listed above. Table 1 presents an evaluation of each alternative, relative to the applicable or relevant and appropriate requirements.

- Alternative 1 – No Action does not provide sufficient protection of human health or the environment.
- Alternative 2 – LTM with LUCs may provide protection to human health and the environment provided the LUCs are properly maintained. LTM is typically planned for at least 50 years following adoption of LTM and LUCs as the selected remedy.
- Alternative 3 – *In-Situ* Treatment provides protection of human health and the environment.
- Alternative 4 – AS/SVE Treatment provides protection of human health and the environment.
- Alternative 5 – Removal provides protection of human health and the environment.

8.3.2 Compliance with Cleanup Standards

Per WAC 173-340-700, compliance with cleanup standards is relevant to the cleanup levels (point of compliance) for COCs at a site and the specific areas or pathways of exposure

- Alternative 1 – No Action does not comply with cleanup standards.
- Alternative 2 – LTM with LUCs does not comply with cleanup standards.
- Alternative 3 – *In-Situ* Treatment does comply with cleanup standards.

- Alternative 5 – AS/SVE Treatment does comply with cleanup standards.
- Alternative 4 – Removal does comply with cleanup standards.

8.3.3 Compliance with Applicable State and Federal Laws

Per WAC 173-340-710, the applicability with State and Federal laws refers to 1) laws that are legally applicable and 2) relevant and appropriate requirements that may be determined by regulatory departments. Relevant and appropriate requirements are commonly suited to site-specific conditions and may be more or less stringent than State and Federal laws.

- Alternative 1 – No Action does not comply with applicable State and Federal laws.
- Alternative 2 – LTM with LUCs may comply with applicable State and Federal laws.
- Alternative 3 – *In-Situ* Treatment does comply with applicable State and Federal laws.
- Alternative 4 – AS/SVE Treatment does comply with applicable State and Federal laws.
- Alternative 5 – Removal does comply with applicable State and Federal laws.

8.3.4 Compliance Monitoring

Per WAC 173-340-410, compliance monitoring includes three types: 1) protection monitoring, 2) performance monitoring, and 3) confirmation monitoring.

Protection monitoring is conducted to ensure that human health and the environment are properly protected during construction and the operation and maintenance of an interim action or cleanup action.

Performance monitoring is conducted to ensure that an interim action or cleanup action has satisfactorily attained cleanup standards.

Confirmation monitoring is conducted to confirm that the interim action or cleanup action has satisfactorily attained cleanup standards with long-term effectiveness.

- Alternative 1 – No Action does not comply with compliance monitoring.
- Alternative 2 – LTM with LUCs does not comply with compliance monitoring because cleanup standards will not be attained.
- Alternative 3 – *In-Situ* Treatment may comply with compliance monitoring.
- Alternative 4 – AS/SVE Treatment may comply with compliance monitoring.
- Alternative 5 – Removal does comply with compliance monitoring.

8.3.5 Reasonable Restoration Timeframe

Per WAC 173-340-360(4), reasonable restoration time frame pertains to the determination whether a cleanup action provides a reasonable restoration time frame for several factors including, but not limited to, potential risks to human health and the environment, practicability of achieving a shorter restoration timeframe, current uses of the Site and surrounding areas that may be affected from release(s) from a given site, and potential future uses of the Site and surrounding areas.

- Alternative 1 – No Action does not comply with a reasonable restoration timeframe.
- Alternative 2 – LTM with LUCs may not comply with a reasonable restoration timeframe.
- Alternative 3 – *In-Situ* Treatment may comply with a reasonable restoration time frame. The anticipated cleanup timeframe for *in-situ* treatment is approximately three- to six-months from time of implementation.
- Alternative 4 – AS/SVE Treatment may comply with a reasonable restoration time frame. The anticipated cleanup timeframe for AS/SVE treatment is approximately seven- to ten-years from time of implementation.
- Alternative 5 – Removal does comply with a reasonable restoration time frame. The anticipated cleanup timeframe for removal is approximately one-month from time of implementation.

As shown above, Alternatives 1 and 2 do not meet one or more of the evaluation thresholds. Therefore, in general accordance with Ecology's Feasibility Study (FS) Checklist (Publication No. 16-09-007), they have been eliminated from further consideration in the subsequent sections of this FS.

8.3.6 Disproportionate Cost Analysis

The three remaining alternatives are ranked from most to least permanent based on several factors, including protectiveness, permanence, cost, long-term effectiveness, short-term risks, technical and administrative implementability, and consideration to public concerns.

As shown in Table 2 (Attachment 2), GEI ranked each alternative to the seven evaluation criteria presented below which included protection of human health and the environment, permanence, cost, long-term effectiveness, short-term risks, technical and administrative implementability, and consideration to public concerns. Each evaluation criterion was assigned a weighting factor. The criteria were then ranked from 1 to 10 with 10 being most preferred and 1 being least preferred for each alternative. The ranking was then multiplied by the assigned weighting factor to establish an overall score. For example, the evaluation criterion for *protection of human health and the environment* was assigned a weighting factor of 30%.

For example, the ranking for Alternative 3 (*in-situ* treatment), with consideration to *protection of human health and the environment* was 5. Therefore, the calculated score for the *protection of human health and the environment* criterion for Alternative 3 was 1.5. The scoring for all seven evaluation criteria for each alternative were then summed to establish an overall MTCA Benefit Score.

The overall MTCA Benefit Score for Alternatives 3 (*in*-situ treatment), 4 (AS/SVE), and 5 (Removal) summed to 6.95, 5.70, and 6.85, respectively. Therefore, with consideration to this Disproportionate Cost Analysis (DCA), Alternative 3 is preferred over Alternatives 4 and 5. Details of each are presented in the subsequent subsections.

8.3.6.1 Protection of Human Health and the Environment

Alternative 3 – *In-Situ* Treatment is considered protective of human health and the environment through enhancing microbial digestion of contaminants. The expected timeframe for attaining suitable protectiveness is estimated to be about two years. Based on a weighting factor of 30% and a ranking of 5, the score for Alternative 3, with respect to *protection of human health and the environment* is 1.5.

Alternative 4 – AS/SVE Treatment is considered protective of human health and the environment through enhancing microbial digestion of contaminants. The expected timeframe for attaining suitable protectiveness is estimated to be about seven to ten years. Based on a weighting factor of 30% and a ranking of 5, the score for Alternative 4, with respect to *protection of human health and the environment* is 1.5.

Alternative 5 – Removal is considered protective of human health and the environment through direct removal of contaminants. The expected timeframe for attaining suitable protectiveness is estimated to be about two months. Based on a weighting factor of 30% and a ranking of 9, the score for Alternative 4, with respect to *protection of human health and the environment* is 2.7.

Based on this evaluation, Alternative 5 is preferred over Alternatives 3 and 4.

8.3.6.2 Permanence

Alternative 3 – *In-Situ* Treatment is expected to permanently decrease toxicity and volume of contaminants over an estimated timeframe of 2 years. Based on a weighting factor of 20% and a ranking of 8, the score for Alternative 3, with respect to *permanence* is 1.6.

Alternative 4 – AS/SVE is expected to permanently reduce toxicity and volume of contaminants over an estimated timeframe of seven to ten years. Based on a weighting factor of 20% and a ranking of 10, the score for Alternative 4, with respect to *permanence* is 1.4.

Alternative 5 – Removal is expected to permanently reduce toxicity and volume of contaminants over an estimated timeframe of two months. Based on a weighting factor of 20% and a ranking of 10, the score for Alternative 5, with respect to *permanence* is 2.0.

Based on these data, Alternative 5 is preferred, then Alternative 3, then Alternative 4.

8.3.6.3 Cost

Alternative 3 – *In-Situ* Treatment estimated costs include the following:

- Present capital costs = $159,441.16
- Future capital costs (LTM; 4 quarters) = $28,848.53
- Indirect costs = none
- Operation and maintenance costs = none

Based on a weighting factor of 10% and a ranking of 9, the score for Alternative 3, with respect to *cost* is 0.9.

Alternative 4 – AS/SVE estimated costs include the following:

- Present capital costs = $202,805.38
- Future capital costs (LTM; 4 quarters per year, 10 years) = $181,015.00
- Indirect costs = $127,750.00
- Operation and maintenance costs = $51,250.00

Based on a weighting factor of 10% and a ranking of 4, the score for Alternative 4, with respect to *cost* is 0.4.

Alternative 5 – Removal estimated costs include the following:

- Present capital costs = $750,000.00
- Future capital costs (LTM) = none
- Indirect costs = none
- Operation and maintenance costs = none

Based on a weighting factor of 10% and a ranking of 1, the score for Alternative 5, with respect to *cost* is 0.1.

Based on these data, Alternative 3 is preferred, then Alternative 4, then Alternative 5.

8.3.6.4 Long-Term Effectiveness

Alternative 3 – *In-Situ* Treatment is expected to permanently decrease toxicity and volume of contaminants over the long-term basis. Based on a weighting factor of 20% and a ranking of 8, the score for Alternative 3, with respect to *long-term effectiveness* is 1.6.

Alternative 4 – AS/SVE is expected to permanently decrease toxicity and volume of contaminants over the long-term basis. Based on a weighting factor of 20% and a ranking of 6, the score for Alternative 4, with respect to *long-term effectiveness* is 1.2.

Alternative 5 – Removal is expected to permanently decrease toxicity and volume of contaminants over the long-term basis. Based on a weighting factor of 20% and a ranking of 9, the score for Alternative 5, with respect to *long-term effectiveness* is 1.8.

Based on these data, Alternative 5 is preferred, then Alternative 3, then Alternative 4.

8.3.6.5 Short-Term Risks

Short-term risks associated with the three alternatives are common to construction and implementation of cleanup activities. Risks such as physical injuries due to slips, trips, and falls, striking underground utilities, lifting heavy objects, and injuries to mechanical equipment are equivalent to both alternatives.

Alternative 3 – *In-Situ* Treatment may present short-term application-specific risks to human health and the environment through exposure to the injectant solutions. The injectant is comprised of microorganisms that can cause eye and throat irritation. Proper handling and personal protective equipment must be utilized when handling these materials. In summary, Alternative 3 has low to moderate construction-related risks during implementation. Based on a weighting factor of 10% and a ranking of 6, the score for Alternative 3, with respect to *short-term risks* is 0.6.

Alternative 4 – AS/SVE may present short-term application-specific risks to human health and the environment through exposure to contaminated soil during excavation activities. Alternative 4 has a moderate construction-related risks during implementation. Based on a weighting factor of 10% and a ranking of 5, the score for Alternative 4, with respect to *short-term risks* is 0.5.

Alternative 5 – Removal may present short-term application-specific risks to human health and the environment through exposure to contaminated soil during excavation activities and structural stability. Because there are multiple subsurface utilities throughout the area of contamination, partial excavation would be conducted by air-knife excavation. Air-knife excavation generally entails utilizing vacuum to remove soils that are loosened with either air or water. Because the depth of contamination is estimated to be up to 40-feet bgs, air-knife excavation may only be performed for the top 8 feet of excavation and may present hazards such as workers falling into the excavation, sidewall collapse, inhalation hazards as volatilized contaminants are exhausted from the vacuum truck, and releases to the environment in the event that contaminants are spilled from the vacuum truck prior to proper disposal. In summary, Alternative 5 has high construction-related risks during implementation. Based on a weighting factor of 10% and a ranking of 1, the score for Alternative 5, with respect to *short-term risks* is 0.1.

Based on these data, Alternative 3 is preferred, then Alternative 4, then Alternative 5.

8.3.6.6 Technical and Administrative Implementability

Alternative 3 – *In-Situ* Treatment requires notification to Ecology prior to injecting the microorganisms into the subsurface. The technical implementability of *In-Situ* treatment is relatively easy to implement. However, the microorganisms must be blended with the proper amount of water prior to injections and proper pressure pumps must be used to inject the solution at a low to moderate pressure in order to ensure the necessary radius of influence is achieved. Based on a weighting factor of 5% and a ranking of 7, the score for Alternative 3, with respect to *technical and administrative implementability* is 0.35.

Alternative 4 – AS/SVE Treatment requires notification to the Puget Sound Clean Air Agency (PSCAA) prior to implementing the system due to possible exhaust of VOCs. The technical implementability of AS/SVE treatment is relatively easy to implement. However, the exhaust VOCs must be filtered through activated carbon and tested for VOCs prior to releasing to the environment. Based on a weighting factor of 5% and a ranking of 6, the score for Alternative 4, with respect to *technical and administrative implementability* is 0.30.

Alternative 5 – Removal requires planning, profiling, and receiving approval(s) by a pre-determined permitted disposal facility prior to excavation, transportation, and disposal of contaminated soil. The technical implementability of removal is moderately complex because, as the excavation is advanced to greater depths, excavation sidewalls and the surrounding physical environment must be protected from collapse. During vacuum excavation, air or water is sprayed into the excavation to loosen soils. If water is used, the volume and weight of soils being transported and disposed may substantially increase. Also, Alternative 5 would require extensive site restoration including, but not limited to, complete excavation backfill and compaction. Based on a weighting factor of 5% and a ranking of 1, the score for Alternative 5, with respect to *technical and administrative implementability* is 0.05.

Based on these data, Alternative 3 is preferred, then Alternative 4, then Alternative 5.

8.3.6.7 Consideration to Public Concerns

Alternative 3 – *In-Situ* Treatment is expected to result in low to moderate concerns as the work would be completed from within the property boundaries and requires minimal disturbances to public right-of-ways. Based on a weighting factor of 5% and a ranking of 8, the score for Alternative 3, with respect to *public concerns* is 0.4.

Alternative 4 – AS/SVE Treatment is expected to result in low to moderate concerns as the work would be completed from within the property boundaries and requires minimal disturbances to public right-of-ways. However, extra precautions would be necessary to

reduce ambient noise being generated from the AS/SVE system. Based on a weighting factor of 5% and a ranking of 8, the score for Alternative 4, with respect to *public concerns* is 0.4.

Alternative 5 – Removal expected to result in moderate to high public concerns as work would result in disruptions to the public right-of-way(s) and potentially lead to damaged site utilities. Based on a weighting factor of 5% and a ranking of 2, the score for Alternative 5, with respect to *public concerns* is 0.1.

Based on these data, Alternative 3 is preferred over Alternative 4.

9.0 REMEDY SELECTION

Per WAC 173-340-370, the selected cleanup action shall meet several expectations including:

1. The treatment technology shall be suitable for addressing site contaminant(s);
2. For sites with small volumes of contaminants, the contaminated media shall be destroyed, detoxified, and/or removed to concentrations below their respective CULs;
3. Engineering controls may be suitable for sites with large volumes of contaminants with relatively low levels of hazardous substances;
4. Migration of contaminants shall be prevented and/or contained and treated;
5. Residual contamination that exceeds CULs shall be consolidated where reasonably possible in order to minimize the potential for direct contact and migration;
6. Protection to nearby surface water bodies must be implemented to prevent/minimize releases to the surface water; and
7. Under certain situations, natural attenuation may be a viable response action.

The three alternatives meet all of the above expectations, where applicable.

With consideration to the Evaluation Threshold (Section 8.3.1) and the DCA Rankings (Section 8.3.6), Alternative 3 – *In-Situ* treatment has been selected as the proper remedy for the Site. Alternatives 3 and 4 provide similar results to criteria such as protectiveness, permanence, effectiveness, administrative implementability, and compliance with applicable State and Federal laws. However, Alternative 3 is expected to be able to be completed at a significantly lower overall cost and timeframe. Furthermore, Alternatives 3 and 4 have a considerably a lesser degree of overall risk to human health and the environment than Alternative 5.

10.0 REMEDIAL ACTION SCOPE OF WORK

The primary objective of the planned scope of work to implement the selected remedy, described herein, is to remediate residual gasoline and gasoline constituents in subsurface soils and excavation-retained water in the former UST location, and shallow groundwater to concentrations below their respective MTCA Cleanup Levels so the property can be managed without environmental covenants and land use restrictions, with respect to environmental contamination.

The scope of work is separated into five distinct tasks (i.e., Task 1 – Planning and Preparation, Task 2 – Remediation Implementation, Task 3 – Report Preparation, Task 4 – Groundwater Monitoring, and Task 5 – No Further Action [NFA] Application). Details of each task are included below.

10.1 Task 1 Planning and Preparation

The Planning and Preparation portion of this project will include the following scope of work.:

1. Prepare an internal Site-Specific Health and Safety Plan (HASP) as required by the WAC 296-843-12005 for GEI and GEI subcontractors during implementation of the field activities;
2. Prepare this CAP ARARs – see Table 1;
3. Mark out planned drilling locations and order a public utility locate through the Washington Utility Notification Center (WUNC) prior to fieldwork, as required by the Revised Code of Washington (RCW) 19.122.030;
4. Conduct a subsurface geophysical survey using electromagnetic (EM) and ground-penetrating radar (GPR) to clear boring locations of underground utilities and other subsurface anomalies that may interfere with invasive activities;
5. Notify Ecology of the planned injections through the Underground Injection Control (UIC) Well Registration process prior to implementation of the remedial action.

10.2 Task 2 Remediation Implementation

1. Drill one eight inch diameter boring to a maximum depth of 15 feet bgs in the area of the former USTs;
2. Install a six inch diameter extraction well within the boring noted above to remove LNAPL from the area;
3. Extract up to 18,000 gallons of water and LNAPL for off-site treatment and recycling;
4. Drill up to 32, two inch diameter borings utilizing direct-push drilling techniques throughout the planned remediation area. This will generally include 22 deep borings a maximum depth of 23 feet bgs and 10 shallow borings to a maximum depth of 10 feet bgs. The anticipated locations are depicted in Figure 8 of this CAP;
5. Retain continuous soil samples throughout the drilling process using a hydraulically driven hollow-core sampler fitted with a dedicated acetate liner. The sampling device and soil samples will be collected and field screened for indications of contamination (discoloration, obvious odors, sheening, etc.);
6. Collect one soil sample from each boring for laboratory analysis;
7. Submit each soil sample boring for laboratory analysis of the following:
    a. TPH-Gas
    b. BTEX
8. Install temporary well screens into 29 of the 32 boreholes and permanent well screens into 3 of the 32 boreholes. The well screens are anticipated to be constructed of 1-inch diameter, schedule 40 PVC or stainless steel well screens, machine-cut with a screen interval of approximately 0.2-inches per cut (20 Slot);
    a. For the deep injection wells, the well screens will be positioned from approximately 13 feet bgs to 23 feet bgs. Solid PVC or stainless steel well

risers will be positions from ground surface to approximately 13 feet bgs. This will result in an injection depth interval from 13 feet bgs to 23 feet bgs;

b. For the shallow injection wells, the well screens will be positioned from approximately 2 feet bgs to 10 feet bgs. Solid PVC or stainless steel well risers will be positions from ground surface to approximately 2 feet bgs. This will result in an injection depth interval from 2 feet bgs to 10 feet bgs.

9 Pressure-inject 16 units of Petrox® microorganism solution into the injection wells per the manufacturer recommendations;

10 Decommission the temporary injection wells and backfill their borings with hydrated bentonite and concrete and/or asphalt. The remaining 3 permanent injection wells will be left in place for subsequent injections of additional Petrox® microorganism solution, if deemed necessary;

11 To evaluate the effectiveness of the remedial action, GEI will collect representative soil samples and groundwater samples in the area of treatment approximately 45 days after treatment. This will generally include:

a. Drilling and sampling soil from up to 7 locations using direct-push drilling techniques to a maximum depth of 15 feet throughout the remediation area;
b. Collect two soil samples from each boring for laboratory analysis; and
c. Submit each soil sample boring for laboratory analysis of TPH-Gas and BTEX.

12 Collect one groundwater sample from each of the existing groundwater monitoring wells for laboratory analysis of TPH-Gas, BTEX, and naphthalene.

10.3 Task 3 Report Preparation

GEI will prepare a letter report which will generally include a background of the site, observations made during the fieldwork, interpretation of analytical data, conclusions and recommendations, photographic documentation, and laboratory report(s).

10.4 Task 4 Groundwater Monitoring

Because shallow groundwater has been confirmed to be contaminated, further evaluation will be needed to demonstrate that the remedial action has reduced concentrations of contaminants in shallow groundwater to levels below their respective MTCA cleanup levels. GEI will collect groundwater samples from each of the existing groundwater monitoring wells for laboratory analysis of TPH-Gas, BTEX, and naphthalene for up to four quarters.

GEI will prepare a letter report for each monitoring event which will generally include a background of the site, observations made during the fieldwork, interpretation of analytical data, conclusions and recommendations, photographic documentation, and laboratory report(s).

10.5 Task 5 NFA Application

Upon confirmation that the remedial efforts have attained the remedial action goals, GEI will apply for a NFA determination with the Washington State Department of Ecology.

11.0 LIMITATIONS

This CAP is based upon the application of scientific principles and professional judgment to certain facts with resultant subjective interpretations. Professional judgments expressed herein are based upon the facts currently available within the limits of the existing data, scope of work, budget and schedule and may undergo revision as additional data are obtained. To the extent that more definitive conclusions are desired by the client than are warranted by the currently available facts, it is specifically GEI's intent that the conclusions and recommendations stated in our report is intended as guidance and not necessarily a firm course of action except where explicitly stated as such. WE MAKE NO WARRANTIES, EXPRESS OR IMPLIED INCLUDING WITHOUT LIMITATION, WARRANTIES AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This CAP was prepared for the use of the Cascade Built (“Client”) and the findings presented in this CAP are based upon the agreed scope of work outlined in the CAP and the Contract for Professional Services between Client and Galloway Environmental, Inc. ("Consultant"). Use or misuse of this report, or the reliance upon the findings hereof by any parties other than the Client, is at their own risk. Neither Client nor Consultant make any representations or warranty to such other parties as to the accuracy or completeness of this report or to the suitability of its use by such other parties for any purpose whatever, known or unknown to Client or Consultant. Neither Client nor Consultant shall have any liability to or indemnifies or holds harmless third parties for any losses incurred by the actual or purported use or misuse of this report.

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ATTACHMENTS

Attachment 1

Figures

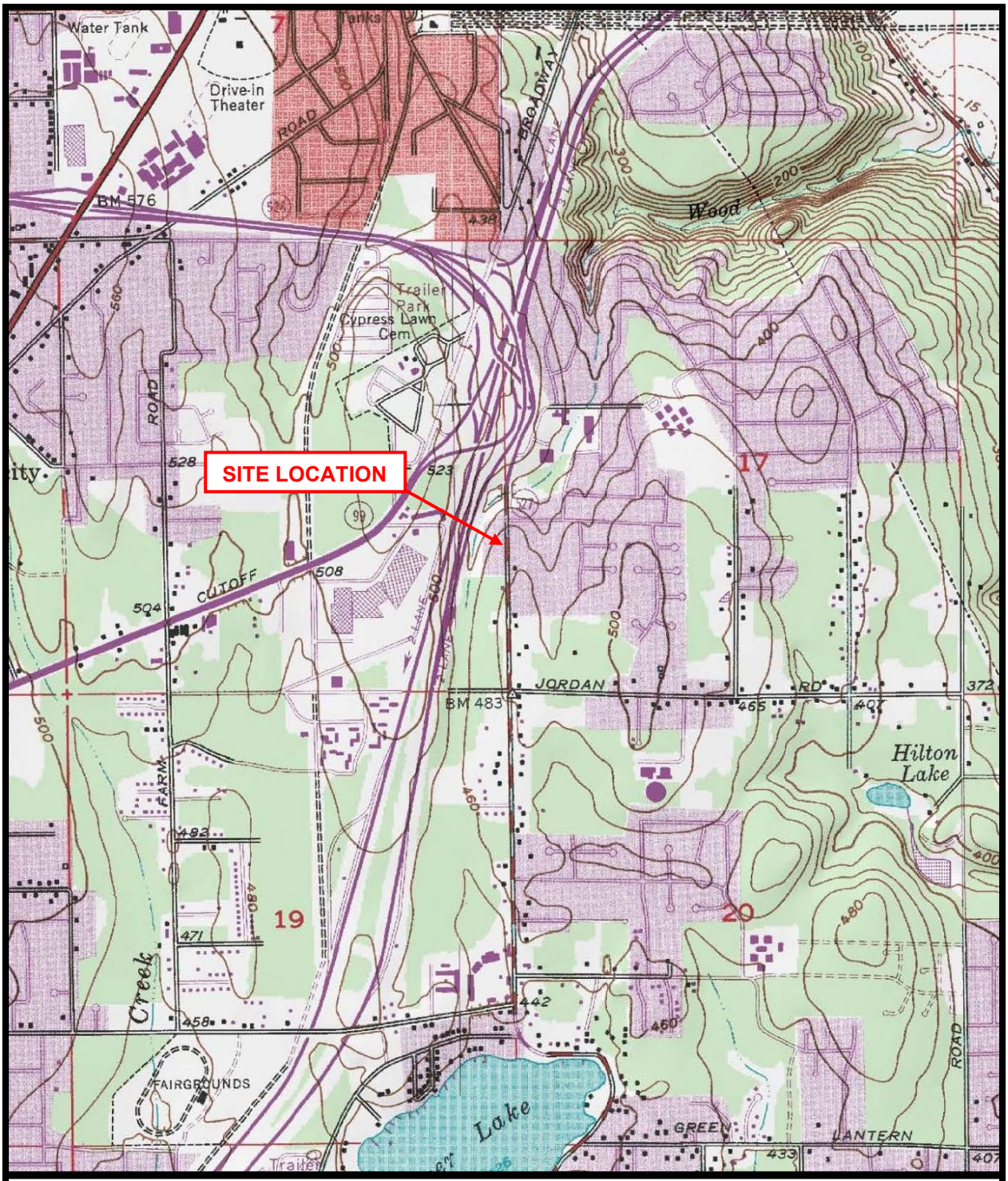

FIGURE 1 — SITE LOCATION MAP

Former Sun's Mini Mart and Gas

9506 19th Avenue SE, Everett, Washington
Source: WSDOT, April 2021; GEI Project #40026

0 1/4 mi 1/2 mi
(approx. scale)

N

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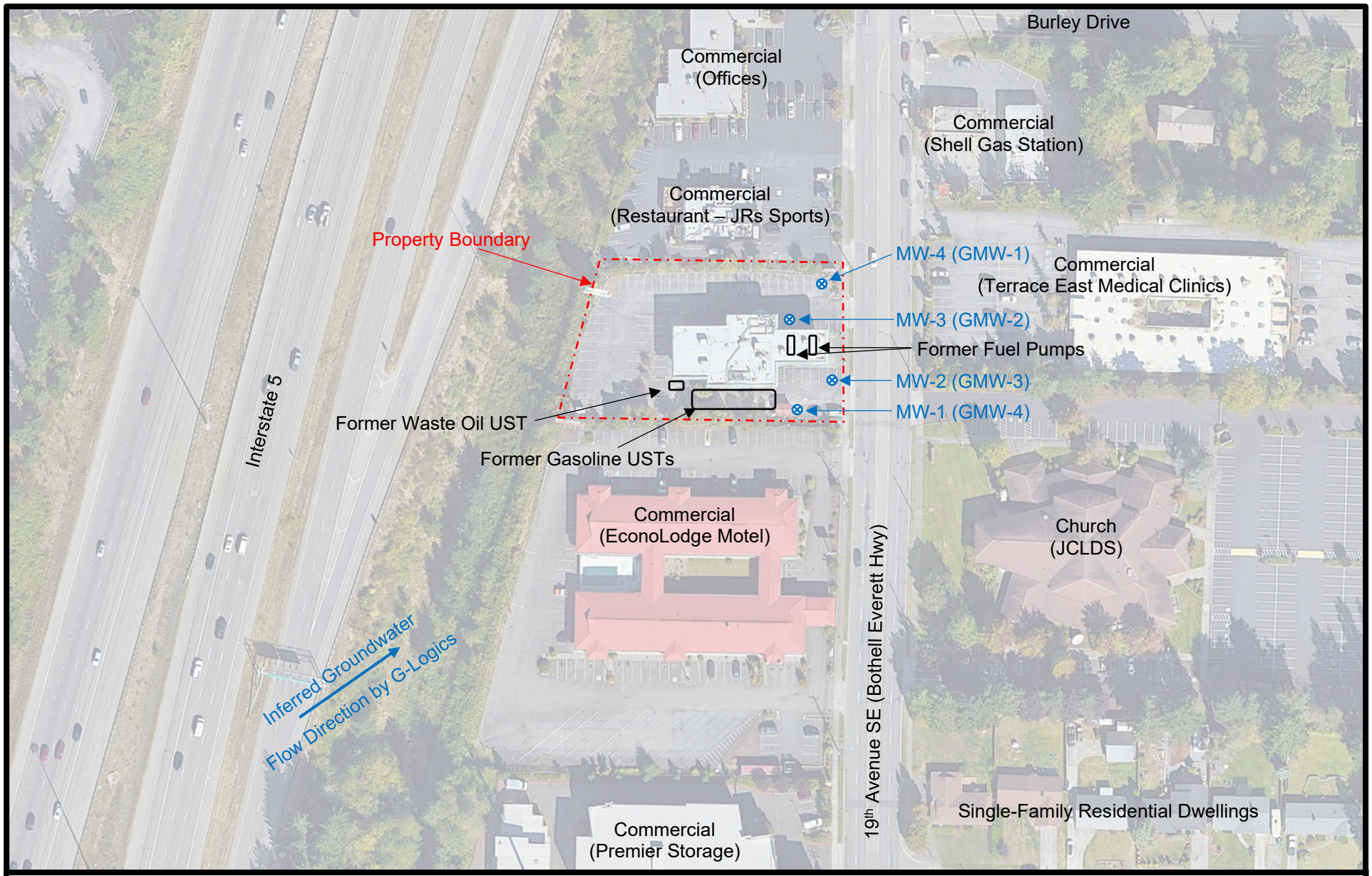

FIGURE 2 — SITE LAYOUT AND VICINITY MAP

Former Sun's Mini Mart and Gas

9506 19th Avenue SE, Everett, Washington

Source: G-Logics - 2016; GEI Project #40026

0 10 ft 200 ft

Approximate Scale

Note: Locations of all site features are approximate

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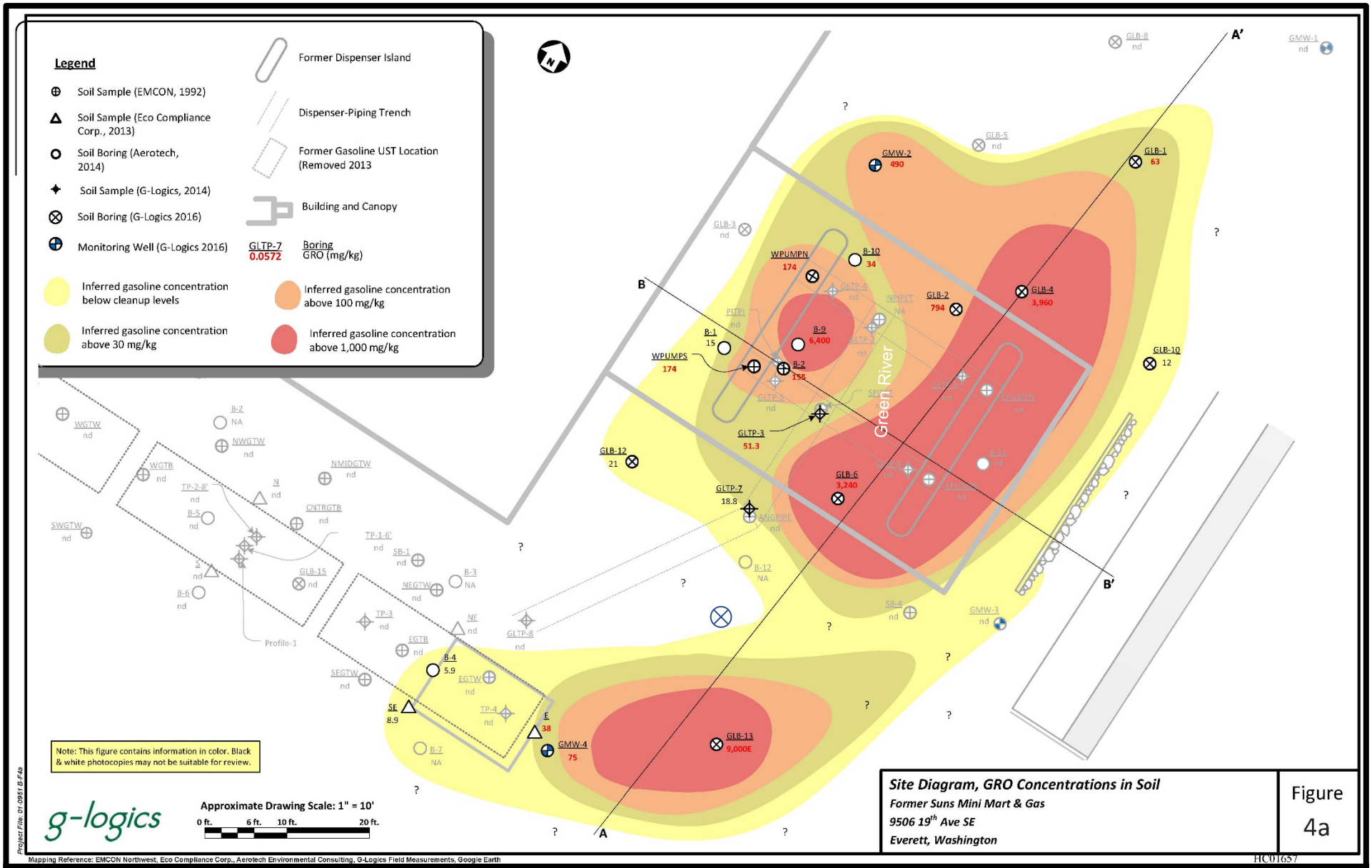

FIGURE 3 — EXTENT OF GASOLINE CONTAMINATION IN SOIL

Former Sun's Mini Mart and Gas

9506 19th Avenue SE, Everett, Washington
Source: G-Logics - 2016; GEI Project #40026

0 10 ft 20 ft
Approximate Scale

Galloway Environmental, Inc.

N

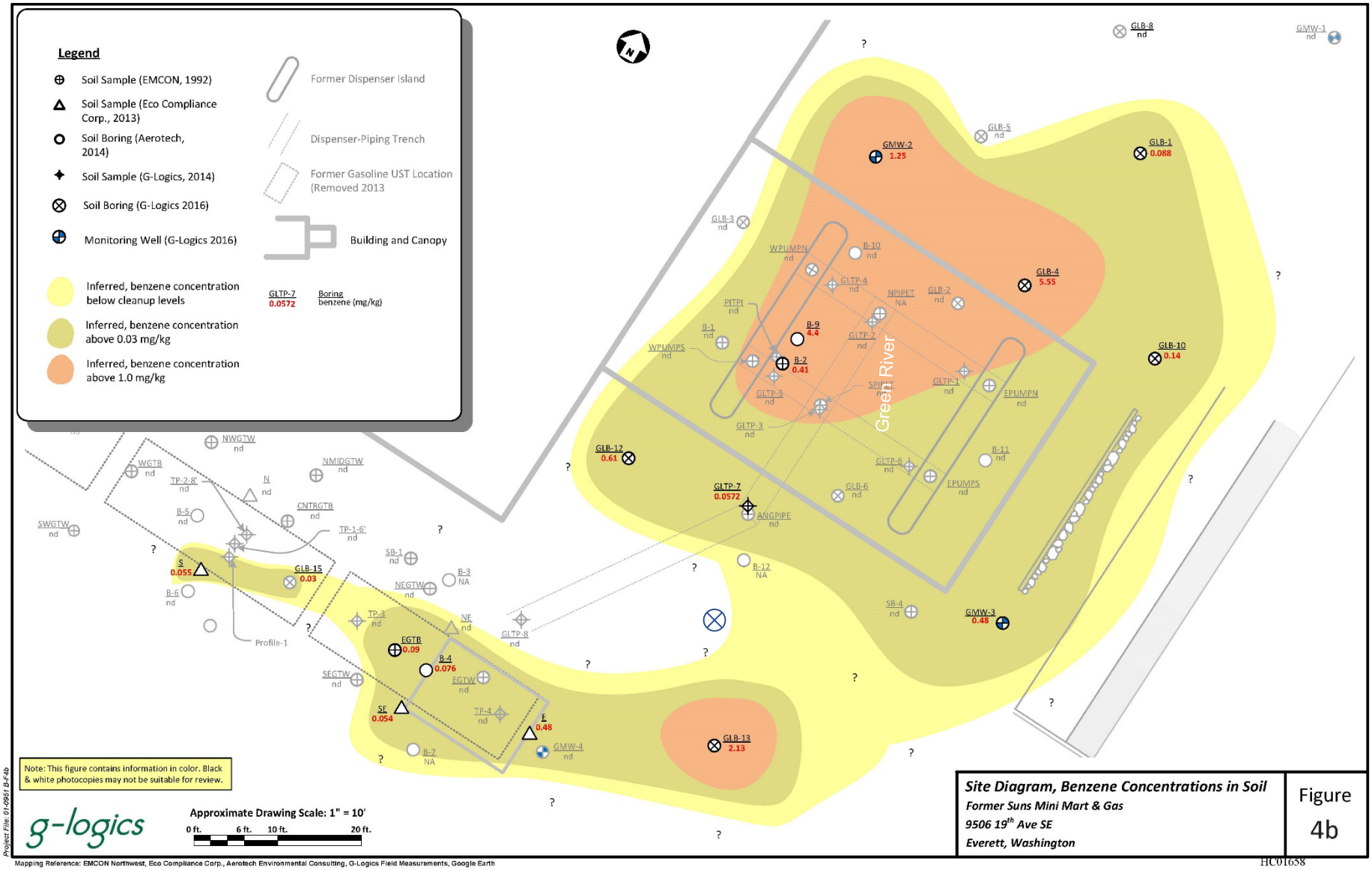

FIGURE 4 — EXTENT OF BENZENE CONTAMINATION IN SOIL

Former Sun's Mini Mart and Gas

9506 19th Avenue SE, Everett, Washington
Source: G-Logics - 2016; GEI Project #40026

0 10 ft 20 ft
Approximate Scale

Galloway Environmental, Inc.

N

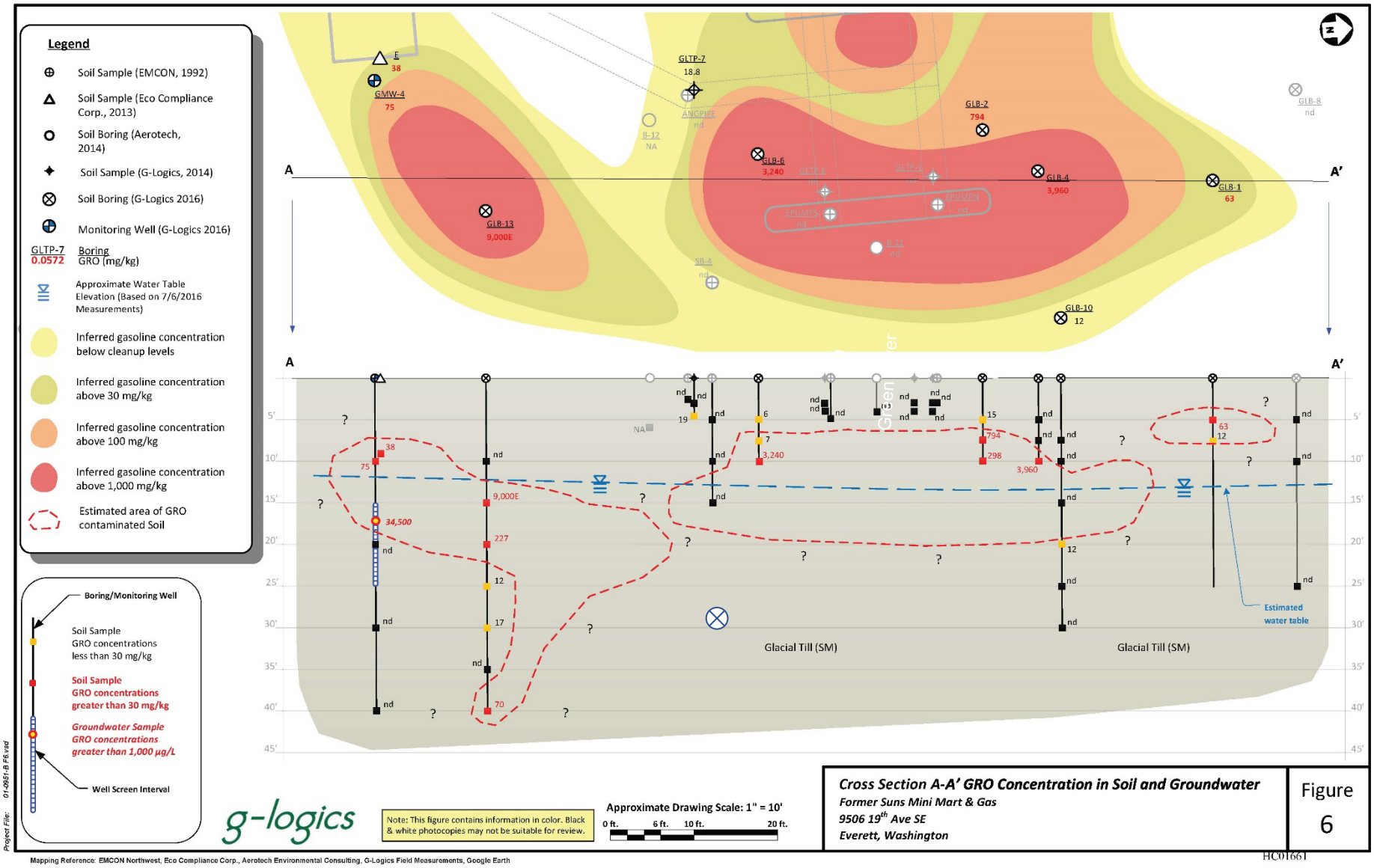

FIGURE 5 — EXTENT OF GASOLINE AND BENZENE CONTAMINATION IN SOIL AND GROUNDWATER (A-A')

Former Sun's Mini Mart and Gas

9506 19th Avenue SE, Everett, Washington

Source: G-Logics - 2016; GEI Project #40026

0 10 ft 20 ft

Approximate Scale

N

Galloway Environmental, Inc.

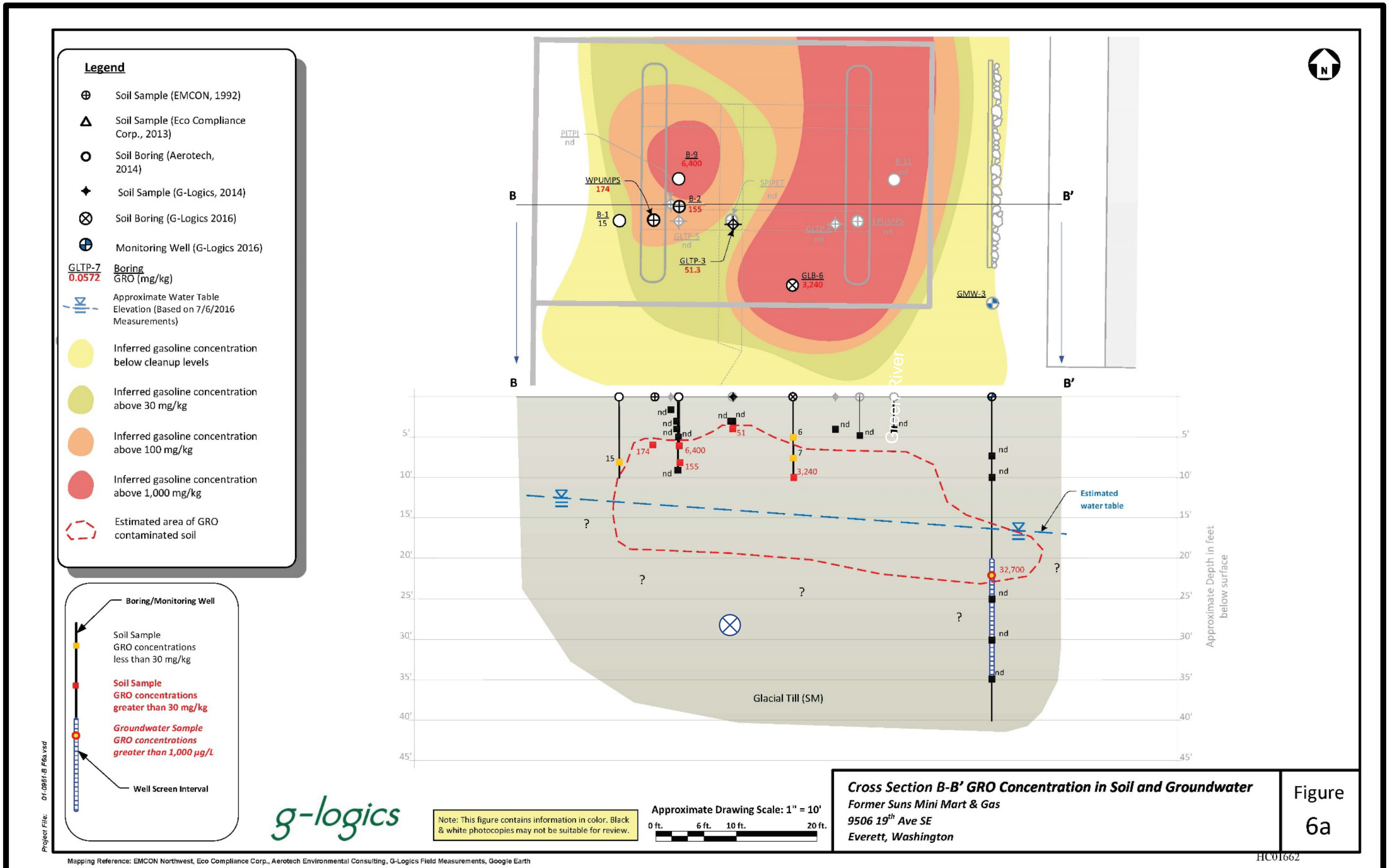

FIGURE 6 — EXTENT OF GASOLINE AND BENZENE CONTAMINATION IN SOIL AND GROUNDWATER (B-B')

Former Sun's Mini Mart and Gas

9506 19th Avenue SE, Everett, Washington
Source: G-Logics - 2016; GEI Project #40026

0 10 ft 20 ft
Approximate Scale

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Exposure Pathway			Receptors										Rationale
			Current Land Use					Future Land Use					
Contributing Source	Transport Mechanism	Exposure Route	Industrial Worker	Construction Worker	Trespasser (Adult/Child)	Site Resident (Adult/Child)	Offsite Resident (Adult/Child)	Industrial Worker	Construction Worker	Trespasser (Adult/Child)	Site Resident (Adult/Child)	Offsite Resident (Adult/Child)	
Subsurface Soil	Direct Contact	Incidental Ingestion	Incomplete	**Potentially Complete**	Incomplete	Incomplete	Incomplete	Incomplete	**Potentially Complete**	**Potentially Complete**	Incomplete	Incomplete	Potentially complete for Current and Future Construction Workers. Also potentially complete for Future Treaspassers during construction activities in the unlikely event soil is left exposed during and after construction activities are completed. There are currently no known or planned construction activities at the Site. There are no Site Residents or Offsite Residents in close proximity to the impacted soils.
		Dermal Contact	Incomplete	**Potentially Complete**	Incomplete	Incomplete	Incomplete	Incomplete	**Potentially Complete**	**Potentially Complete**	Incomplete	Incomplete	Same as above.
	Air Transport	Inhalation of VOCs	Incomplete	**Potentially Complete**	Incomplete	Incomplete	Incomplete	Incomplete	**Potentially Complete**	**Potentially Complete**	Incomplete	Incomplete	Same as above.
		Inhalation of Fugitive Dust	Incomplete	**Potentially Complete**	Incomplete	Incomplete	Incomplete	Incomplete	**Potentially Complete**	**Potentially Complete**	Incomplete	Incomplete	Same as above.
	Bio-uptake	Ingestion by Plants/Animals	Incomplete	**Potentially Complete**	Incomplete	Incomplete	Incomplete	Incomplete	**Potentially Complete**	Incomplete	Incomplete	Incomplete	Potentially complete for Current and Fugure Landscaping contractors through exposure via bio-uptake. There are no subsistence activities at the Site.
	Leaching to Subsurface Soil	Ingestion	Incomplete	**Potentially Complete**	Incomplete	Incomplete	Incomplete	Incomplete	**Potentially Complete**	**Potentially Complete**	Incomplete	Incomplete	Potentially complete for Current and Future Construction Workers. Also potentially complete for Future Treaspassers during construction activities in the unlikely event soil is left exposed during and after construction activities are completed. There are no current or planned construction activities at the Site. There are no Site Residents or Offsite Residents in close proximity to the impacted soils.
		Dermal Contact	Incomplete	**Potentially Complete**	Incomplete	Incomplete	Incomplete	Incomplete	**Potentially Complete**	**Potentially Complete**	Incomplete	Incomplete	Same as above.
		Inhalation of VOCs	Incomplete	**Potentially Complete**	Incomplete	Incomplete	Incomplete	Incomplete	**Potentially Complete**	**Potentially Complete**	Incomplete	Incomplete	Potentially complete for Current and Future Construction Workers. Also potentially complete for Current and Future Treaspassers during construction activities in the unlikely event soil is left exposed during and after construction activities are completed. There are no current or planned construction activities at the Site. There are no Site Residents or Offsite Residents in close proximity to the impacted soils.
	Leaching to Groundwater	Ingestion	Incomplete	**Potentially Complete**	Incomplete	Incomplete	Incomplete	Incomplete	**Potentially Complete**	**Potentially Complete**	Incomplete	Incomplete	Groundwater is not used and is not a source of drinking water. Groundwater may be exposed during construction activities. Therefore, potentially complete for Current and Future Construction Workers and Current and Future Treaspassers during construction activities in the unlikely event groundwater is left exposed during and after construction activities are completed. There are no current or planned construction activities at the Site. There are no Site Residents or Offsite Residents in close proximity to the impacted groundwater.
		Dermal Contact	Incomplete	**Potentially Complete**	Incomplete	Incomplete	Incomplete	Incomplete	**Potentially Complete**	**Potentially Complete**	Incomplete	Incomplete	Same as above.
		Inhalation of VOCs	Incomplete	**Potentially Complete**	Incomplete	Incomplete	Incomplete	Incomplete	**Potentially Complete**	**Potentially Complete**	Incomplete	Incomplete	Same as above.

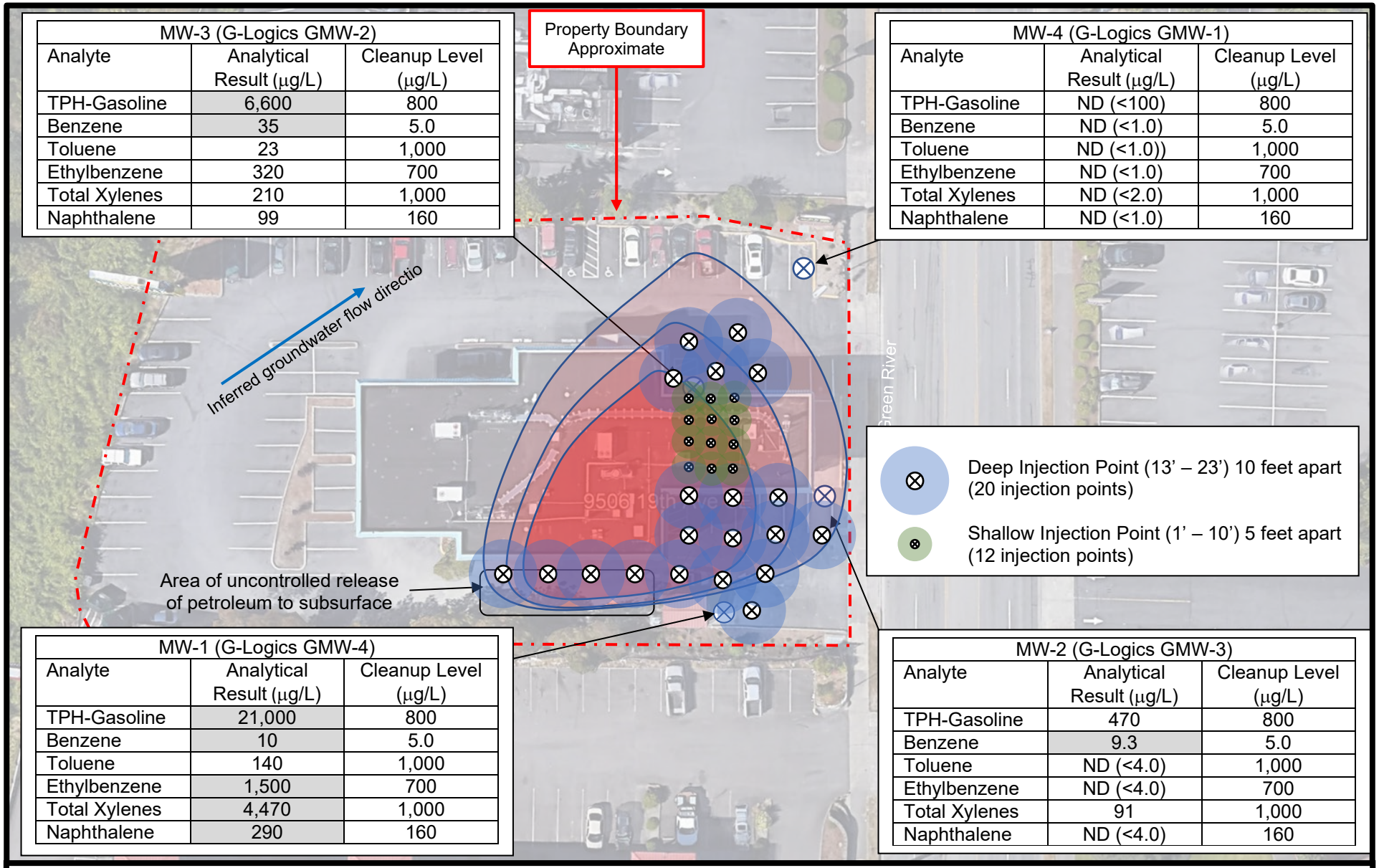
FIGURE 7 — CONCEPTUAL SITE MODEL

Former Sun's Mini Mart and Gas

9506 19th Avenue SE, Everett, Washington

GEI Project Number 40026

Galloway Environmental, Inc.



MW-3 (G-Logics GMW-2)		
Analyte	Analytical Result (µg/L)	Cleanup Level (µg/L)
TPH-Gasoline	6,600	800
Benzene	35	5.0
Toluene	23	1,000
Ethylbenzene	320	700
Total Xylenes	210	1,000
Naphthalene	99	160

MW-4 (G-Logics GMW-1)		
Analyte	Analytical Result (µg/L)	Cleanup Level (µg/L)
TPH-Gasoline	ND (<100)	800
Benzene	ND (<1.0)	5.0
Toluene	ND (<1.0))	1,000
Ethylbenzene	ND (<1.0)	700
Total Xylenes	ND (<2.0)	1,000
Naphthalene	ND (<1.0)	160

MW-1 (G-Logics GMW-4)		
Analyte	Analytical Result (µg/L)	Cleanup Level (µg/L)
TPH-Gasoline	21,000	800
Benzene	10	5.0
Toluene	140	1,000
Ethylbenzene	1,500	700
Total Xylenes	4,470	1,000
Naphthalene	290	160

MW-2 (G-Logics GMW-3)		
Analyte	Analytical Result (µg/L)	Cleanup Level (µg/L)
TPH-Gasoline	470	800
Benzene	9.3	5.0
Toluene	ND (<4.0)	1,000
Ethylbenzene	ND (<4.0)	700
Total Xylenes	91	1,000
Naphthalene	ND (<4.0)	160

FIGURE 8 — PLANNED INJECTION LOCATIONS

Former Sun's Mini Mart and Gas

9506 19th Avenue SE, Everett, Washington

Source: GoogleEarth; September 2020; GEI Project #40026

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Attachment 2

Tables

Table 1
Applicable Requirements and
Relevant and Appropriate Requirements
Former Suns Mini Mart Gas
9506 19th Avenue SE
Everett, WA

Regulated Chemical, Location, or Action	Standard, Requirement Criterion, or Limitation	Regulatory Status	Description	Potential Application to the Site
Fuel constituents released into soil or water from USTs	Washington UST Regulations and Statute, WAC 173-340, WAC 176-360-399, & RCW 90.76	Applicable	The State UST rules govern site investigations, release reporting, and response actions for UST sites that store petroleum constituents. Environmental media affected by releases from regulated tanks and tank systems must be remediated to residual contaminant concentrations that comply with site cleanup criteria requirements.	MTCA action levels for contaminants in soil and groundwater were compared with the maximum detected concentrations at the Site. Media in which petroleum constituents could pose an unacceptable human health risk or hazard.
Hazardous substances that discharge into surface water	Federal Clean Water Act (33 USC 1344)	Relevant and Appropriate	Implements the CWA and governs point-source discharges to waters of the State via National Pollution Discharge Elimination System (NPDES) permitting program. Establishes allowable effluent discharge limits in accordance with the Clean Water Act and Washington	Currently there are no point source discharges at the Site. There are nearby surface water features. Therefore, best management practices would be required to control potential overland transport of contaminants to surface water should excavation occur.
Wetlands	Executive Order 11990, Protection of Wetlands, 40 CFR 6.302(a) and Appendix A	Potentially Applicable	Actions must be taken to avoid adverse effects, minimize potential harm, and preserve and enhance wetlands, to the extent possible. If no practicable alternative exists, design or modify selected alternatives to minimize harm to or mitigate adverse impacts on wetlands.	There are no known wetlands situated in the immediate vicinity of the site. The site is situated appproximately 0.65 miles south of Wood Creek which is a tributary to Snohomish River. Any material from the site that may discharge into surface water must meet the criteria established under the CWA.
Aquatic Ecosystems	Clean Water Act 33 UST Section (§)1344, §404(b)(1; 40 CFR 230.10; 33 CFR 323.3(b)	Applicable	Except as provided under §404(b)(2) of the CWA, no discharge of dredged or fill material into an aquatic ecosystem is permitted if there is a practicable alternative that would have less adverse impact	There are no known wetlands situated in the immediate vicinity of the site. The site is situated appproximately 0.65 miles south of Wood Creek which is a tributary to Snohomish River. Any material from the Site that may unintentionally discharge into surface water must meet the criteria established under the CWA.
Waterways	CWA 33 USC §§1251-1387: 33 CFR 320-330, 335-338; 40 CFR 104-140, 230-233, 401-471	Potentially Applicable	Regulates construction activities that directly affect waterways. Except as provided under §404(b)(2) of the CWA, no discharge of dredged or fill material into an aquatic ecosystem is permitted if there is a practicable alternative that would have less adverse impact. Actions must be taken to avoid adverse impacts during dredge or fill activities in surface waters.	There are no known wetlands situated in the immediate vicinity of the site. The site is situated appproximately 0.65 miles south of Wood Creek which is a tributary to Snohomish River. Any material from the site that may unintentionally discharge into surface water must meet the criteria established under the CWA.
Critical habitat of endangered or threatened species	Endangered Species Act 16 USC §1531, 50 CFR 402	Potentially Applicable	Activities affecting species listed as endangered or threatened in areas listed as their critical habitat. Action must not threaten continued existence or listed species or destroy critical habitat. Prohibits the taking, harassment, harming, or killing of endangered or threatened species of flora or fauna. Consultation with the U.S. Fish and Wildlife Service is required.	No threatened or endangered species have been identified at the site. If observed, efforts will be taken to conduct response activities in a manner protecting all listed species. Taking of any endangered species is not associated with the operation of the evaluated remedial alternatives.
Migratory and wild bird species	Migratory Bird Treaty Act (16 USC §§703-712)	Potentially Applicable	The Federal Species Act protects migratory bird species and habitat in flyways. The taking of any species of wild bird, including native, introduced, and pest species is prohibited.	Intentional and unintentional taking of any bird is not associated with operation of the evaluated remedial alternatives.

Galloway Environmental, Inc.

Table 1
Applicable Requirements and
Relevant and Appropriate Requirements
Former Suns Mini Mart Gas
9506 19th Avenue SE
Everett, WA

Regulated Chemical, Location, or Action	Standard, Requirement Criterion, or Limitation	Regulatory Status	Description	Potential Application to the Site
Within an area impacting a stream or other body of water and presence of other wildlife resources (e.g., fish)	Fish and Wildlife Coordination Act 16 USC 661 *et seq.*	Potentially Applicable	The effects of water-related projects on fish and wildlife resources and their habitat should be considered with a view to the conservation of fish and wildlife resources by preventing loss of and damage to such resources.	There are no known wetlands situated in the immediate vicinity of the site. The site is situated appproximately 0.65 miles south of Wood Creek which is a tributary to Snohomish River. Any material from the Site that may unintentionally discharge into surface water must be in accordance with the Fish and Wildlife Coordination Act.
Activities causing fugitive dust emissions	Puget Sound Clean Air Agency	Applicable	Taking reasonable precautions to prevent visible fugutive dust from becoming airborne. Reasonable precauseions include, but are not limited to, use of water or suitable chemical suppressant for control of fugitive dust in the demolition of buildings or structures, construction operations, road grading, land clearing, or ingress/egress of construction vehicles; Covering transported materials that could emit fugitive dust; and prompt removal of soil from paved surfaces. Discharge of visible fugitive dust beyond the property lot lines where fugitive dust originates is not allowed.	Construction activities undertaken during implementation of remedial actions at the site shall comply with State construction regulations, including those pertaining to dust control.
Federal Occupattional Safety and Health Act (OSHA) 29 CFR 1960	OSHA and L&I	Applicable	Defines occupational safety and health practices that must be implemented at construction sites.	Worker safety and health is subject to OSHA and L&I instructions governing health and safety concerns.
Waste Characterization	RCRA Hazardous Waste Determination (40 CFR 262.11)	Applicable	Requires generators of solid waste to determine if their waste is regulated as hazardous waste according to 40 CFR 261	Remediation waste (e.g., soil, debris) generated at the site has been compared to applicable standards and determined not to be classified as hazardous.

Table 2
Disproportionate Cost Analysis
Former Suns Mini Mart Gas
9506 19th Avenue SE
Everett, WA

Evaluation Criteria	Cleanup Action Alternative and Scoring					
	Alternative 3; *In-Situ* Treatment	**Score**	**Alternative 4; AS/SVE Treatment**	**Score**	**Alternative 5; Removal and Disposal**	**Score**
Protection of Human Health and the Environment (30% weighting factor)	Alternative 3 is considered protective through enhancing micribrobial digestion of contaminants; minimizes potential risks to human health during implementation. The expected timeframe for attaining protectiveness is estimated to be two years. (Rank 5)	1.5	Alternative 4 is considered protective through enhancing micribrobial digestion of contaminants; minimizes potential risks to human health during implementation. The expected timeframe for attaining protectiveness is estimated to be two years. (Rank 5)	1.5	Alternative 5 is considered protective through direct removal of contaminants; inreased potential risks to human health during implementation. The expected timeframe for attaining protectiveness is estimated to be two months. (Rank 9)	2.7
Permanence (20% weighting factor)	Alternative 3 will decrease toxicity and volume of contaminants over an estimated timeframe of 2 years, which is less than natural attenuation. (Rank 8)	1.6	Alternative 4 will decrease toxicity and volume of contaminants over an estimated timeframe of 7 to 10 years, which is less than natural attenuation. (Rank 7)	1.4	Alternative 5 would permanently and relatively quickly reduce the tocixity and volume of contaminants. (Rank 10)	2
Cost (10% weighting factor)	Alternative 3 is estimated to cost approximately $188,289. (Rank 9)	0.9	Alternative 4 is estimated to cost approximately $562,820. (Rank 4)	0.4	Alternative 5 is estimated to cost approximately $750,000. Due to unstable soil conditions at the former UST pit, the need to shore or remove parts of the Site structure, and the presence of utilities in the excavation area, costs for conducting removal are substantial. (Rank 1)	0.1
Long-Term Effectiveness (20% weighting factor)	Alternative 3 is anticipated to be effective over the long-term. (Rank 8)	1.6	Alternative 4 is anticipated to be effective over the long-term (7-10 years). (Rank 6)	1.2	Alternative 5 is anticipated to be effective over the long-term. (Rank 9)	1.8
Short-Term Risks (10% weighting factor)	Alternative 3 has low to moderate construction related risks during implementation. (Rank 6)	0.6	Alternative 4 has moderate construction related risks during implementation. (Rank 5)	0.5	Alternative 5 has high construction related risks during implementation due to soil stability, the presence of underground and aboveground utilities in the area of excavation, and to the public. (Rank 1)	0.1
Technical and Administrative Implementability (5% weighting factor)	Alternative 3 is relatively easy to implement as the area is easily accessible complications. (Rank 7)	0.35	Alternative 4 is relatively easy to implement as the area is easily accessible. (Rank 6)	0.3	Alternative 5 is relatively difficult to implement as multiple protection factors must be included to ensure protection of workers, the public, and utilities. (Rank 1)	0.05
Consideration to Public Concerns (5% weighting factor)	Alternative 3 is expected to result in low to moderate public concerns as the majority of the work would be implemented from outside the public right-of-way. Also, similar in-situ injections have been conducted at the site with no known public concerns. (Rank 8)	0.4	Alternative 4 is expected to result in low to moderate public concerns as the majority of the work would be implemented from outside the public right-of-way. (Rank 8)	0.4	Alternative 5 is expected to result in moderate to high public concerns as work may result in disruptions to the public right-of-ways and potentailly damage site utilities. (Rank 2)	0.1
	MTCA Benefit Score	**6.95**		**5.7**	**MTCA Benefit Score**	**6.85**

Notes:
Ranking = Evaluation criteria are ranked from 1 to 10 with 10 being most preferred and 1 least preferred.
MTCA Benefit Scoring is calculated by multiplying the "Rank" of each criteria to the weighting factor.

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APPENDICES

Appendix A

Previous Reports