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November 3, 2016

Mr. Dale Myers
Site Manager
Toxics Cleanup Program
Washington State Department of Ecology – Northwest Regional Office
3190 160th Avenue SE
Bellevue, Washington 98008-5452

SUBJECT **Confirmational Groundwater Monitoring Plan**
Yarrow Bay Yacht Basin and Marina
5207 Lake Washington Boulevard NE
Kirkland, Washington 98033
ATC Project No. 076.40540.0003
Washington Department of Ecology VCP No. NW1791

Dear Mr. Myers:

Pursuant to a request from the Washington State Department of Ecology (Ecology), ATC Group Services LLC (ATC) has prepared this Confirmational Groundwater Monitoring Plan (CGMP) presenting a scope of work to confirm the long-term effectiveness of the cleanup action completed at the Yarrow Bay Yacht Basin and Marina (Site). The Site is identified as Tax Parcel No. 172505-9130, which is an irregular shaped lot that consists of approximately 44,797 square feet of commercial property, a portion of which extends into Lake Washington. Site features include a marina with boat repair and fueling facilities. The Site address is 5207 Lake Washington Boulevard Northeast in Kirkland, Washington.

The Site location is shown relative to surrounding physical features in **Figure 1**. The layout of the Site is shown on **Figure 2**.

BACKGROUND

A release of gasoline and diesel associated with the former fueling system was discovered during investigative activities in 2006. The resulting groundwater contaminant plume extended from the locations of the previous USTs toward Lake Washington and near the former fuel dispensers (adjacent to the shoreline bulkhead). Previous investigative activities indicate that the residual impacts to soil and groundwater comprise an area approximately 250 square feet just south of the covered dock area, in the vicinity of the fuel dispensers (**Figure 2**). The remaining mass of impacted soil is confined and delineated, and based on the most recent groundwater monitoring and sampling data, is not impacting groundwater conditions that would present unacceptable risk to human health and the environment. The remaining contaminant mass is not expected in increase in contaminant concentration.

Natural Attenuation (NA) with institutional controls and restrictive covenant has been selected as the preferred remedial technology based on a completed comparative evaluation of various technologies, ability to attain the remedial action objectives, analysis of screening criteria, and a disproportionate cost analysis. In order to ensure that NA and institutional controls remain effective and continue to protect groundwater conditions, a scope of work describing future monitoring and sampling has been prepared (presented below) and will be implemented on a periodic basis.

SCOPE OF WORK

The scope of work presented below consists of collecting groundwater samples for chemical analysis (to evaluate groundwater conditions) and observing the integrity of the existing cap (currently consisting of approximately 6- to 8-inches of paved concrete) that prevents exposure, minimizes leaching of contaminants from soil to groundwater, prevents stormwater from contacting impacted soil and minimizes airborne contaminants.

The scope of work is summarized in the following tasks:

- Develop a project-specific Health and Safety Plan (HASP);
- Collect groundwater samples from groundwater monitoring well, MW-1, on an annual basis for three consecutive years.
- Submit the groundwater samples for chemical analysis by an Ecology certified laboratory.
- Place any sampling-derived waste (purge water) generated during the sampling activities into labeled 55-gallon drums pending characterization and disposal at a state approved facility.
- Observe the condition of the existing cap concurrently with each groundwater sampling event. Document the condition of the cap with photographs and note any issues pertaining to its integrity.
- Prepare and submit written reports to Ecology and Mr. and Mrs. Bortko (property owners) describing the field activities for each event, including the groundwater sampling activities, laboratory analytical results, conditions of the cap (including photographs) and any conclusions and recommendations based on those results.

A sampling and analysis plan, fulfilling the requirements of Washington Administrative Code (WAC) 173-340-820, is presented below.

SAMPLING AND ANALYSIS PLAN

The purpose of this Sampling and Analysis Plan (SAP) is to provide guidance for field sampling activities and to identify Quality Assurance (QA) procedures that will be implemented during the field activities and laboratory analyses. The SAP has been organized into the following sections:

1. Groundwater Sampling Procedures including purging, sample handling, sample designation and labeling, and sample custody;
2. Decontamination procedures;
3. Documentation of field activities;
4. Chemical Analysis;
5. IDW; and
6. Reporting

Each Section is described below:

Groundwater Sampling Procedures

Purging:

Prior to collection of the groundwater samples, monitoring well MW-8 will be purged using low-flow sampling techniques. During low-flow groundwater purging, high density polyethylene (HDPE) tubing is lowered into the well to the approximate center of the screened interval. Groundwater is then purged by means of a peristaltic pump set at a steady flow rate while maintaining a drawdown of less than 0.33 feet. During the low flow purge, ATC will monitor and document water quality parameters including pH, temperature, conductivity, turbidity, dissolved oxygen, and oxidation reduction potential (ORP). Purging will continue until these parameters stabilize for three consecutive readings as indicated:

- pH +/-0.1 standard units
- temperature +/- 0.1 degree Celcius
- specific conductance +/- 10.0 ohm-cm
- dissolved oxygen +/- 0.2 mg/L
- ORP +/-10 millivolts

Stabilization is considered to have occurred when the above criteria are met for three successive readings, although due to geologic heterogeneities within the screened interval and site-specific conditions, adjustments on flow rate and stabilization criteria may be required.

After purging, groundwater samples from the well will be transferred directly from the sampling apparatus to clean, laboratory-supplied containers and preserved during transport to the analytical laboratory. Sample handling and chain-of-custody procedures are described below. All purged groundwater will be temporarily stored on site in labeled, 55-gallon drums until a permanent off-site disposal method is selected.

Sample Handling:
New disposable nitrile gloves will be worn when collecting groundwater samples. All samples collected for chemical analysis will be transferred into clean sample containers supplied by the analytical laboratory. Sufficient sample volume will be obtained for the laboratory to complete the method-specific QC analyses on a laboratory-batch basis.

Immediately after the samples are collected, they will be stored in a cooler with ice at approximately 4 degrees Celcius until they are delivered to the analytical laboratory. A laboratory temperature QA vial will accompany each cooler to verify that proper holding temperatures were maintained during transport.
Standard chain-of-custody procedures, as described below, will be followed for all samples collected. All samples will be submitted to the laboratory within 48 hours after their collection. Shipment procedures will include the following:

- Individual sample containers will be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant/container. If the cooler contains a drainage hole, it will be sealed and secured in case of sample container leakage.
- Each cooler will be delivered directly to the analytical laboratory.
- Glass bottles will be separated in the shipping container by cushioning material (for example, Styrofoam or absorbent material) to help prevent breakage.
- The chain-of-custody form and sample request form will be taped inside the lid of the cooler/container and delivered to the laboratory. Chain-of-custody tape will be used to seal the sample-shipping container in conformance with EPA protocol.
- Signed and dated chain-of-custody seals will be applied to each cooler/container prior to transport of samples from the project site.

Sample Designation and Labeling:
Each groundwater sample collected during the field activities will be identified by a sample designation that will be included on the sample label. For this project, the samples collected from monitoring well MW-1 will be designated and labeled as "MW-1." Sample labels will be completed in indelible ink. Sample labels will also include the following information:

- ATC's project number
- Date of sample collection (month/day/year)
- Time of sample collection (hours:minutes)
- Chemical analyses to be conducted
- Sample preservation, if appropriate

Sample Custody:
All samples collected for analysis will be recorded in the field report or data sheets. A chain-of-custody form will be completed at the end of each sampling day prior to transfer of samples off site and will accompany the samples during shipment to the laboratory. A signed and dated custody seal will be affixed to the inside lid of the shipping container. The samples will be delivered to the laboratory by ATC personnel, by laboratory courier, or by common carrier, such as Federal Express. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody form will be signed as received by the laboratory, and the condition of the samples will be recorded on the form. The original chain-of-custody form will remain with the laboratory, and copies will be returned to the relinquishing party.

Decontamination Procedures

The objective of the decontamination procedure is to help minimize the potential for cross-contamination prior to collecting the groundwater samples. Sampling and measurement equipment, including well pumping equipment and water level measurement instruments, will be decontaminated in accordance with the following procedures before each sampling attempt or measurement:

- Brush equipment with a wire brush, if necessary, to remove large particulate matter.
- Rinse with potable tap water.
- Wash with nonphosphate detergent solution (liquinox and potable tap water).
- Rinse with potable tap water.
- Rinse with distilled water.

Disposable nitrile gloves will be worn during decontamination activities, and gloves will be rinsed with potable tap water between decontamination procedures. All decontamination solutions will be collected and stored temporarily on site in labeled, 55-gallon drums pending chemical analysis for disposal.

Documentation of Field Activities

Daily field activities, including observations and field procedures, will be recorded on appropriate forms. The original field forms will be maintained in ATC's office files. Copies of the completed forms will be maintained in a sequentially numbered field file for reference during field activities. Indelible ink will be used, unless prohibited by weather. Photographic documentation of field activities will be performed, as appropriate. The daily record of field activities will include the following:

- Date
- Time of arrival and departure
- Weather conditions (including temperature)
- Field investigation team members
- Daily activities and times conducted
- Observations
- Record of samples collected with sample designations and locations specified
- Photographic log
- Field monitoring data, including health and safety monitoring
- Equipment used and calibration records, if appropriate
- Site visitors
- List of additional data sheets and maps completed
- Signature of personnel completing field record

Chemical Analysis

Groundwater samples submitted for chemical analysis will be delivered to a Washington State certified laboratory and analyzed within standard holding times. Groundwater samples will be analyzed for the following contaminants of concern (COC) using the following methods:

- Benzene, Toluene, Ethylbenzene, and total Xylenes (BTEX), by United State Environmental Protection Agency (EPA) Method 8260B;
- Total petroleum hydrocarbons as gasoline (TPHG) by Northwest Method NWTPH-Gx; and
- Total petroleum hydrocarbons as diesel (TPHD) by Northwest Method NWTPH-Dx.

Additional analysis may be necessary depending on the results of the above analysis. Additional analysis will be analyzed according to Table 830-1 of WAC 173-340-900.

The analytical laboratory will have an established internal QA program. The laboratory will use a combination of blanks, surrogates, duplicates, Matrix Spike (MS)/MS Duplicates, and laboratory control samples Blank Spikes (BS)/BS Duplicates to demonstrate analytical QA/Quality Control (QC). The laboratory will have established control limits for individual chemicals or groups of chemicals based on the long-term performance of the test methods.

The laboratory's equipment calibration procedures, calibration frequency, and calibration standards will be in accordance with EPA- or Ecology-specified test methodology requirements. All instruments and equipment used by the laboratory will be operated, calibrated, and maintained according to manufacturers' guidelines and recommendations. Personnel who have been properly trained in these procedures will perform operation, calibration, and maintenance.

Investigation-Derived Waste

Investigation-derived wastes (IDW) in the form of purge and decon wastewater are expected to be generated during field activities. Wastewater generated during field activities will be placed in Department of Transportation (DOT)-approved 55-gallon drums. The drums will be sealed, labeled, and temporarily stored on site. Arrangements for proper disposal and/or recycling of IDW will be made upon receipt of final analytical results for groundwater.

Report Generation

ATC will compile the field data into a Confirmation Groundwater Monitoring Report upon receipt of laboratory analytical data. This report will be submitted to Mr. and Mrs. Bortko for review prior to submittal to Ecology. The report will present a description of field activities and analytical laboratory results. This report will also include laboratory reports, well purge logs, photographs, and chain-of-custody documentation as attachments. This report will also include a description of the methods and procedures used, any assumptions made, findings, and recommendations (if appropriate).

If groundwater monitoring results indicate further attenuation, or stability and compliance with MTCA Method A cleanup levels for three consecutive annual events, the property owners will contact Ecology to discuss the necessity of additional monitoring and sampling events.

Should you have any questions or require additional information regarding this CGMP, please contact the undersigned.

Respectfully submitted,
ATC Group Services LLC

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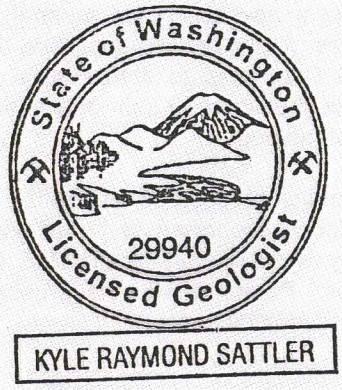

Enclosures
cc: Mr. and Mrs. Bortko – Property Owners (electronic copy only)

FIGURES

SOURCE: USGS TOPO MAP, BELLEVUE NORTH W, WA QUAD, 1982

SITE VICINITY MAP

YARROW BAY MARINA WESTERN PARCEL
5207 LAKE WASHINGTON BOULEVARD NE
KIRKLAND, WA

PROJECT NUMBER: Z076000030		DATE: 9/28/16	FIGURE 1
APPROVED BY: KS		DRAWN BY: BK	

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SOURCE: USGS TOPO MAP, BELLEVUE NORTH W, WA QUAD, 1982

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FIGURES