

March 14, 2022

Ms. Jessica Hall
Alaska Department of Environmental Conservation
555 Cordova Street
Anchorage, AK 99501

RE: ADDITIONAL SITE CHARACTERIZATION ACTIVITIES WORK PLAN, 5701
 NORTHWOOD DRIVE, ANCHORAGE, ALASKA; ADEC FILE NO. 2100.38.536

Dear Ms. Hall:

We are pleased to submit herein our revised work plan to conduct additional site characterization activities at 5701 Northwood Drive in Anchorage, Alaska. The site is an Alaska Department of Environmental Conservation (ADEC) contaminated site, and is identified as “MOA – Northwood Maintenance Facility Garage Bay 6”. A vicinity map is included as Figure 1 and a site plan is included as Figure 2.

BACKGROUND

A dry well was removed from Garage Bay 6 of the Northwood Maintenance Facility in 2001. The facility is located within the boundaries of the closed International Airport Landfill (IAL). The on-site structure and former dry well are located on the leading edge of the closed landfill. Imported fill material was placed above the landfill and the structure and other site improvements were constructed. The approximate limit of the landfill is shown on Figure 2.

Based on institutional knowledge of groundwater monitoring conducted at IAL, the regional groundwater flow is towards the west/southwest. Connors Lake is located about 600 feet southwest of the former dry well. According to the Alaska Department of Natural Resources Well Log Tracking System (WELTS) database, the closest downgradient drinking water well is located about 2,700 feet southwest of the site. The database also lists several potential well locations in the vicinity of the site, but it is unlikely that the majority of these wells exist due to the location of the closed landfill and wetlands.

The dry well was connected to the building’s floor drain system. The dry well consisted of a 4-foot diameter concrete pipe with an open bottom. A pipe in the wall of the dry well discharged to a drainage ditch west of the facility. Following removal of the dry well, the pipe no longer discharges to the drainage ditch. Soil samples collected from the dry well

excavation contained concentrations of gasoline range organics (GRO) (maximum of 376 milligrams per kilogram [mg/kg]), diesel range organics (DRO) (maximum of 7,610 mg/kg), ethylbenzene (maximum of 0.315 mg/kg), xylenes (maximum of 5.58 mg/kg), cis-1,2-dichloroethene (maximum of 0.15 mg/kg), 1,2,4-trimethylbenzene (maximum of 30.2 mg/kg), 1,3,5-trimethylbenzene (maximum of 13.7 mg/kg), 1,2-dichlorobenzene (maximum of 48.7 mg/kg), 1,4-dichlorobenzene (maximum of 9.29 mg/kg), and naphthalene (maximum of 8.74 mg/kg) exceeding the current ADEC Method Two cleanup levels.

In December 2018, one soil boring (Boring B1) was advanced and completed as a monitoring well (Monitoring Well B1MW), adjacent to the former dry well. The approximate location of Boring B1/Well B1MW is shown on Figure 2. A soil sample collected from Boring B1 contained concentrations of DRO (12.8 J mg/kg), residual range organics (RRO) (67.6 mg/kg), and 1,2-dichlorobenzene (0.0209 mg/kg) less than the ADEC Method Two cleanup levels of 250 mg/kg, 10,000 mg/kg, and 2.4 mg/kg, respectively. A groundwater sample collected from Well B1MW contained vinyl chloride (0.72 micrograms per liter [$\mu\text{g/L}$]) at a concentration exceeding the ADEC Table C cleanup level of 0.19 $\mu\text{g/L}$. The groundwater sample also contained 1,230 $\mu\text{g/L}$ DRO and 1,090 $\mu\text{g/L}$ RRO which are less than the ADEC Table C cleanup levels of 1,500 $\mu\text{g/L}$ and 1,100 $\mu\text{g/L}$, respectively. Benzene, toluene, xylenes, chloroethane, cis-1,2-dichloroethane, and dichlorodifluoromethane were also detected in the sample at concentrations less than the ADEC Table C cleanup levels.

Monitoring Well B1MW was sampled in July and October 2021. Each sample contained concentrations of vinyl chloride (maximum of 0.481 $\mu\text{g/L}$), exceeding the ADEC Table C cleanup level. The remaining tested analytes were either not detected or were detected at concentrations less than the ADEC Table C cleanup levels.

The purpose of the additional site characterization activities outlined in this work plan is to delineate the extent of groundwater contamination with a goal of progressing towards site closure.

PROJECT ACTIVITIES

The project activities will consist of advancing two soil borings, installing two groundwater monitoring wells, collecting soil and groundwater samples, conducting a level-loop survey of the monitoring wells, managing investigation-derived waste (IDW), and preparing a summary report. Discovery Drilling, Inc. (Discovery) will provide the equipment and personnel to advance the soil borings and install the monitoring wells. SGS North America

Inc. (SGS) will analyze the soil and groundwater samples. If necessary, IDW will be disposed and/or treated by US Ecology.

Task 1- Soil Boring and Sampling

At least three days prior to advancing the borings, the local utilities will be contacted to mark buried utilities within the project area and identify potential conflicts such that the proposed boring locations can be adjusted, if necessary. Based on previous assessment activities conducted at the site, groundwater is assumed to be approximately 20 feet below ground surface (bgs) and groundwater flow direction is assumed to be to the west/southwest. If landfill debris is encountered the boring will be terminated.

Two soil borings, designated Borings B2 and B3, will be advanced by Discovery using a GeoProbe® direct-push drill rig in the approximate locations shown on Figure 2. Borings B2 and B3 will be advanced west and southwest, respectively, of Monitoring Well B1MW.

Starting at approximately 2.5 feet bgs, soil samples will be recovered on a continuous basis using 5-foot sampling sleeves until groundwater is encountered. At least two field screening samples will be collected from each sample interval assuming at least 80 percent recovery within the sampling sleeves. The borings will be advanced approximately 5 feet below the soil/groundwater interface to facilitate installation of groundwater monitoring wells. One analytical soil sample will be collected from each boring and submitted for analysis. The sample will be collected from the interval just above the soil/water interface or from the sample interval with the highest photoionization detector (PID) measurement. The non-disposable sampling equipment will be decontaminated prior to use with a non-phosphate detergent wash, a tap water rinse, and a distilled-water rinse.

Immediately following retrieval and opening of the sampling sleeves, the analytical samples and field screening samples will be collected. The analytical sample jars for volatile analyses will be collected first, followed by the non-volatile analytical sample jars, and finally the field screening sample. Each soil sample will be visually described and “screened” for volatile organic compounds (VOCs) using a PID and ADEC-approved headspace screening techniques. The field screening samples will be collected in re-sealable plastic bags, warmed to at least 40 degrees Fahrenheit, and tested within 60 minutes of collection. To screen, the sample will be agitated for about 15 seconds, the seal of the bag will be opened slightly, the instrument probe will be inserted into the air space above the soil, and the bag held closed around the probe. The maximum ionization response as the

PID draws vapor from the sample bag will be recorded. The PID will be calibrated with 100 parts per million (ppm) isobutylene in air standard gas.

The soil samples tested for volatile constituents will be collected using methanol preservation. In accordance with the method, at least 25 grams of soil will be quickly placed into a laboratory supplied 4-ounce jar that had been pre-weighed. Afterward, 25 milliliters of reagent grade methanol will be added to submerge the soil. The methanol extracts the hydrocarbons from the soil at the time of sampling, thereby reducing the possible loss of volatile constituents prior to sample analysis. The sample jars for non-volatile analyses will be collected after the volatile analysis jars. All samples will be transferred to the appropriate laboratory supplied jars using decontaminated stainless-steel spoons, and transferred to the laboratory in coolers with ice packs using chain-of-custody procedures.

Each sample will be analyzed for DRO by Alaska Method (AK) 102, RRO by AK 103, polynuclear aromatic hydrocarbons (PAHs) by Environmental Protection Agency (EPA) by EPA Method 8270D SIM, and VOCs by EPA Method 8260D. For quality control purposes, one duplicate sample and one trip blank will be submitted for analysis. The duplicate will be submitted blind to the laboratory.

Task 2 – Monitoring Well Installation, Development, and Sampling

Borings B2 and B3 will be completed as Monitoring Wells B2MW and B3MW, respectively. If landfill debris is encountered in a boring, a monitoring well will not be installed at that location. The wells will be constructed of 2-inch nominal inside diameter 40 polyvinyl chloride (PVC) pipe with threaded connections. The lower portion of the wells will consist of an approximately 10-foot section of 0.010-inch slotted well screen. The screen will extend approximately 5-feet below the soil/groundwater interface. A continuous sand pack will be used to backfill around the well screen to 1 to 2 feet above the screened section. Hydrated bentonite chips will be used to backfill the boreholes from the top of the sand pack to approximately 2 feet bgs to create a seal. Flush-mount protective casings will be used around the monitoring wells and finished with asphalt to match the surrounding surface.

The monitoring wells will be developed at least 24 hours following installation, using alternating 3 to 5-minute cycles of surging and purging using a surge block and submersible pump. During the development of the wells, water quality parameters (temperature, specific conductivity, pH, and turbidity), and purge volume will be collected to evaluate the effectiveness of the development process. The water quality instruments will be calibrated prior to use, using the manufacturer's instructions. The non-disposable equipment that

comes into contact with groundwater will be decontaminated prior to use with a non-phosphate detergent wash, a tap water rinse, and a distilled-water rinse. Development will be considered complete when the following stabilization criteria are met over three successive readings: pH is within 0.1 unit, temperature is within 3 percent (minimum 0.2 degree Celsius), conductivity is within three percent, and turbidity is within 10 percent or three consecutive readings of less than 10 Nephelometric Turbidity Units (NTU). If the stabilization criteria are not met once 55-gallons of water are removed or 3 hours of effort per well is expended, development will be considered complete. The monitoring wells will not be sampled if free product is encountered.

The wells will be allowed to recharge to 80 percent of the original water volume before sample collection. Sampling will be initiated as soon as the groundwater has re-equilibrated, is free of visible sediment, and water quality parameters stabilize. If more than 24 hours passes to allow for recharge, the wells will be purged before sampling. One analytical sample will be obtained from the screened portion of each well using a submersible pump with dedicated disposable tubing. Following development/purging, groundwater samples will be collected from the two newly installed wells and the one existing well. The pump intake will be placed within the top one foot of the water column. The existing well (B1MW) will be purged and sampled once stabilization criteria are met over three successive readings following the same criteria stated above. Analytical samples will be collected by transferring water directly from the pump tubing into the laboratory supplied containers, using the correct volumes and the proper preservatives, for analysis.

The samples will be analyzed for DRO by AK 102, RRO by AK 103, PAHs by EPA Method 8270D SIM, and VOCs by EPA Method 8260D. For quality control purposes, one duplicate sample and one trip blank will be submitted for analysis. The duplicate will be submitted blind to the laboratory.

Task 3 – Level Loop Survey

Following installation of the groundwater monitoring wells, a level-loop survey will be conducted to establish the groundwater elevations with respect to an assumed benchmark. The level-loop survey of the monitoring wells will be closed within an accuracy of 0.01 foot. The elevations will be used to determine the groundwater flow direction and gradient at the time of sampling. In addition, swing tie measurements will be collected from the borings/monitoring wells to fixed locations to verify the horizontal locations.

Task 4 – Investigation-Derived Waste

IDW will consist of development/purge water and soil cuttings. Water generated during monitoring well development and sampling will be containerized in 55-gallon drums, labeled, and stored onsite pending analytical results. The drill cuttings from the boreholes will be containerized in labeled 55-gallon drums and stored on site pending analytical results. If the groundwater and/or soil samples contain concentrations greater than the applicable ADEC cleanup levels, prior approval will be obtained from ADEC to transport and treat the water and/or drill cuttings. If contaminant concentrations do not exceed the applicable ADEC cleanup levels, the water and/or soil will be discharged and/or landspread on an unpaved portion of the property, following ADEC approval.

Task 5 – Reporting

A summary report will be prepared following receipt of analytical results. The report will include a description of field procedures; a scaled site plan showing the boring/well locations; photographs taken during field activities; boring and well construction logs; tabulated field screening and laboratory analytical results; copies of field notes, ADEC Laboratory Data Review Checklists; and a summary of analytical data.

SCHEDULE

It is estimated that the field work can be conducted over three days and begin as soon as practicable following ADEC work plan approval. Analytical laboratory results are typically available approximately 7 to 10 business days following submittal. A summary report following the release investigation activities will be submitted to Municipality of Anchorage within four weeks following receipt of the analytical results.

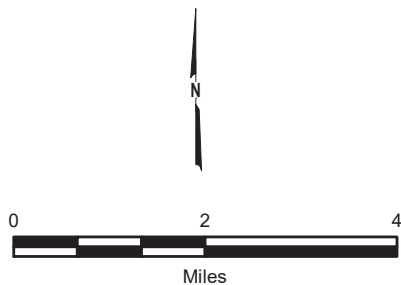
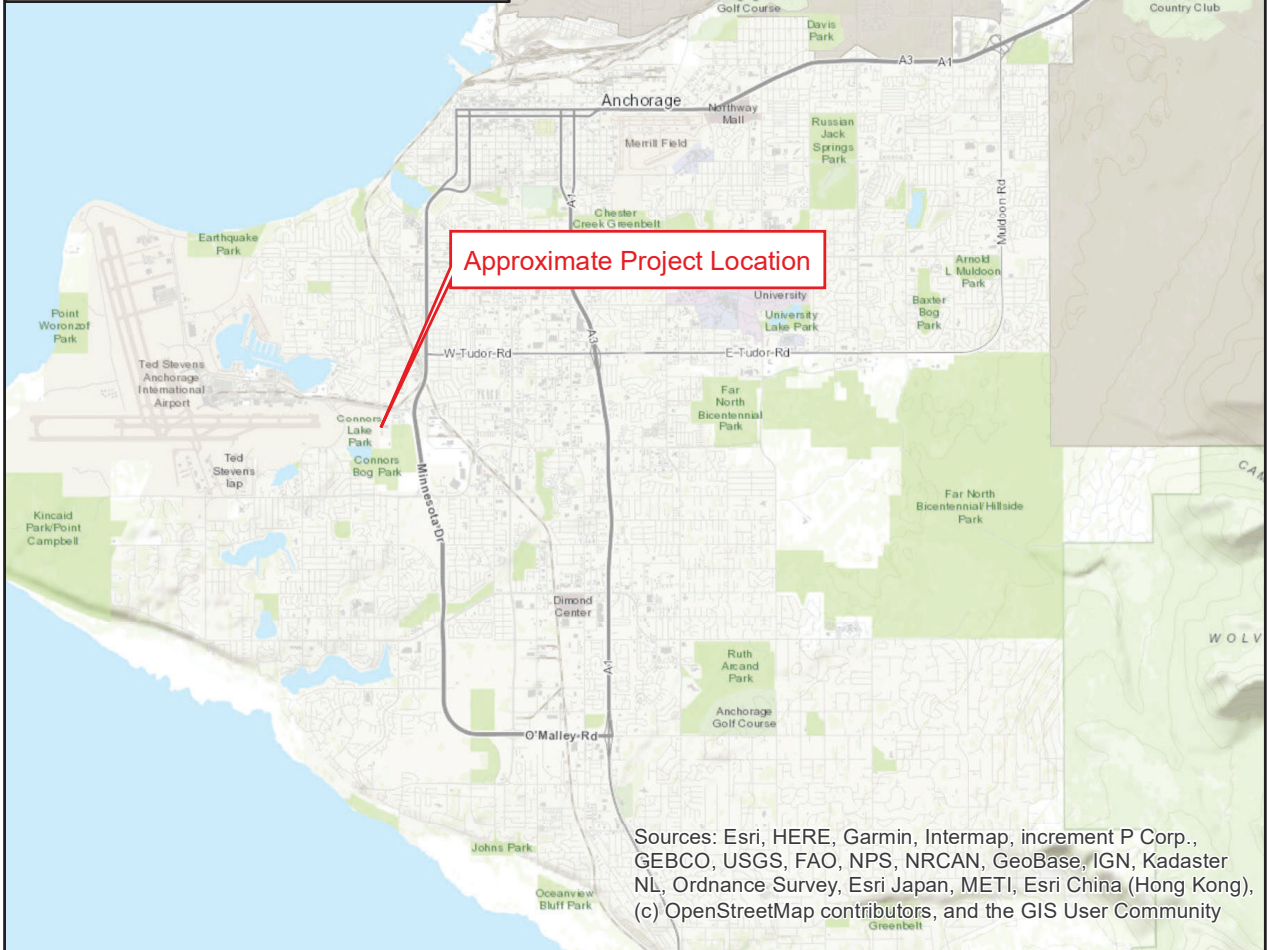
If you have any questions or comments, please contact the undersigned at (907) 561-2120.

Sincerely,

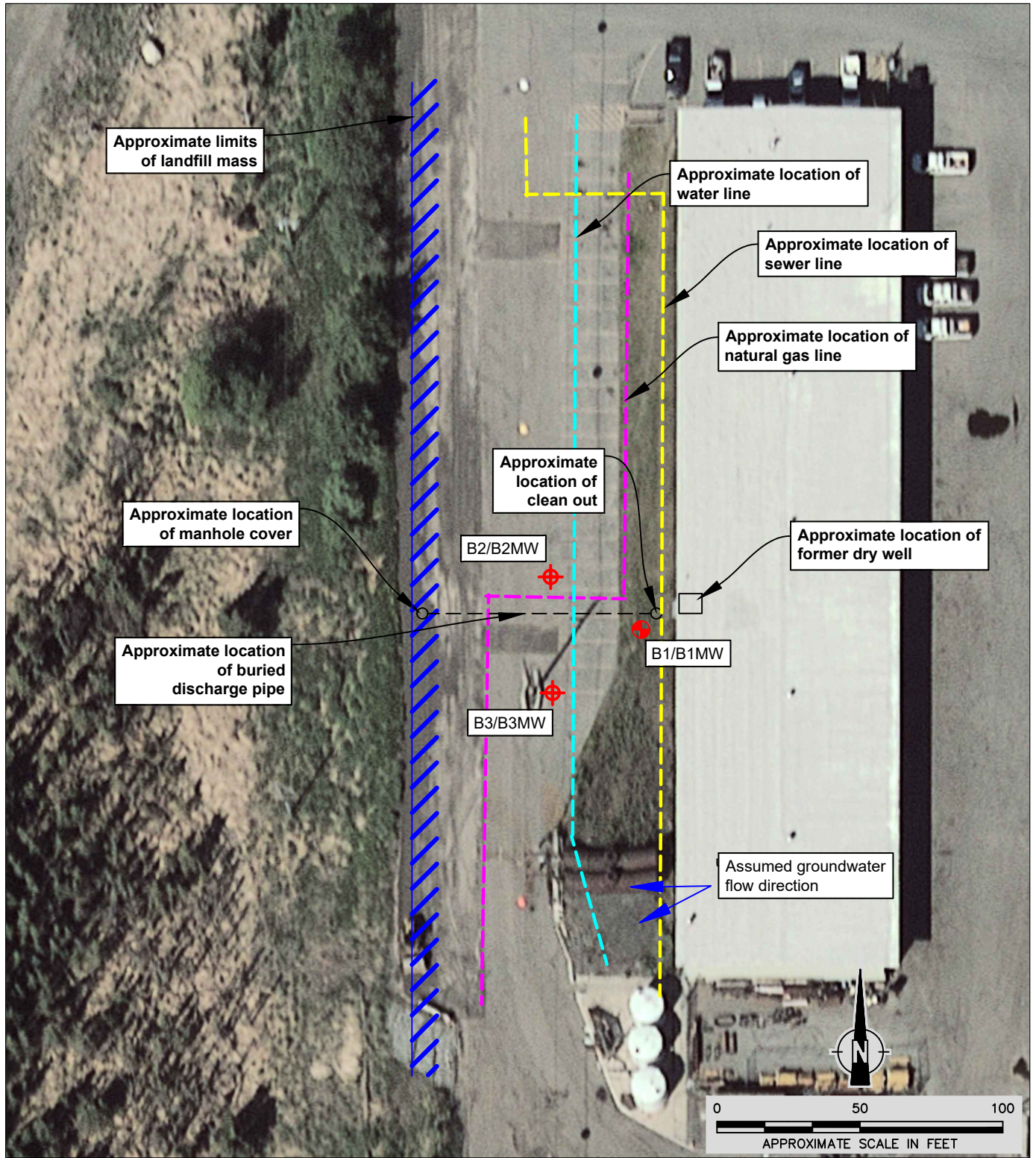
SHANNON & WILSON

Dan P. McMahon, PMP
Vice President

Enc. Figures 1 and 2



5701 Northwood Drive Anchorage, Alaska	
VICINITY MAP	
March 2022	108557-001
SHANNON & WILSON, INC. GEOTECHNICAL AND ENVIRONMENTAL CONSULTANTS	FIG. 1



Map adapted from aerial imagery provided by the Municipality of Anchorage.
Image date: May 2015

LEGEND

- B1/B1MW

 Approximate location of Boring B1/Monitoring Well B1MW
- B2/B2MW

 Approximate proposed location of Boring B2/Monitoring Well B2MW

5701 Northwood Drive Anchorage, Alaska	
SITE PLAN	
March 2022	108557-001
SHANNON & WILSON, INC. <small>Geotechnical and Environmental Consultants</small>	FIG. 2