

November 8, 2017

Alaska Department of Environmental Conservation
555 Cordova Street
Anchorage, Alaska 99501

Attn: Mr. Bill O'Connell

**RE: GROUNDWATER MONITORING WELL INSTALLATION AND SAMPLING
WORK PLAN, FORMER WILLIAMS EXPRESS SITE NO. 5021, 6010 OLD
SEWARD HIGHWAY, ANCHORAGE, ALASKA**

On behalf of Williams, we are pleased to provide this work plan to install groundwater monitoring wells and conduct biennial groundwater monitoring at the former Williams Express Site No. 5021 (WES 5021) located at 6010 Old Seward Highway in Anchorage, Alaska.

BACKGROUND

At least 19 underground storage tanks (USTs) have been in use at or near WES No. 5021 since the late 1950s. The earliest formal records of on-site tank installations are four USTs that were installed in 1975. A vapor extraction system (VES) and groundwater pump-and-treat (P&T) system were installed at the site in December 1990 and October 1991, respectively. The P&T system function was limited due to low water table conditions, and was shut down in January 2004. The VES system was last operated in 2007 and decommissioned in 2013.

As part of ongoing site characterization activities, 40 groundwater monitoring wells have been installed at the site and neighboring properties. Many of these wells were decommissioned prior to 2016. In addition, during road construction activities conducted by the Municipality of Anchorage in 2016, Monitoring Wells MW-9, MW-35, MW-36, MW-41, MW-43, and MW-44 were paved over and assumed destroyed. Currently eight groundwater monitoring wells, including Wells MW-1R, MW-30, MW-31, MW-32, MW-39, MW-40, MW-42, and B5MW, remain at the site. The approximate locations of former and existing wells are shown on Figure 1.

On July 26, 2017, representatives of Williams (Mr. Lee Andrews), ADEC (Mr. Bill O'Connell), and Shannon & Wilson (Mr. Dan McMahon) met to discuss the current regulatory status of WES 5021. During the meeting, it was agreed that replacement groundwater monitoring wells would be placed downgradient of WES 5021 and biennial groundwater monitoring would be conducted at the site.

SCOPE OF SERVICE

The project activities will consist of advancing four borings, installing four groundwater monitoring wells, collecting soil samples, and preparing a summary report. The project will also include conducting biennial groundwater sampling events. Discovery Drilling, Inc. (Discovery) of Anchorage, Alaska will provide the equipment and personnel to advance the borings and install the groundwater monitoring wells. SGS North America, Inc. (SGS) of Anchorage, Alaska will conduct the analytical testing of the soil and groundwater samples.

Four soil borings (Borings B-45 through B-48) which will be completed as monitoring wells (Monitoring Wells MW-45 through MW-48) will be advanced/installed in the approximate locations shown on Figure 1. Well MW-45 will be advanced in the approximate location of former Well MW-41 to monitor the eastern extent of the impacted groundwater plume. Well MW-46 will be advanced in the approximate location of former Well MW-9 to monitor contaminant concentrations within the central portion of the downgradient impacted groundwater plume. Well MW-47 and MW-48 will be installed downgradient of the documented groundwater plume and will act as sentinel wells.

Task 1 – Soil Borings and Sampling

At least three days prior to advancing the borings, the utility locate center 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.

The borings will be advanced by Discovery utilizing a truck-mounted drill rig with 4.25-inch inside diameter hollow-stem augers. Based on previous work conducted in the area, a perched and/or seasonal water layer has been observed in several wells at depths less than 10 feet bgs. The borings will be advanced until the deeper aquifer is encountered, which is estimated to be present between 25 and 35 feet bgs. Based on previous investigations, the deeper aquifer is located within more permeable material (sand and gravel) beneath less permeable material (silt and silty sand). If these conditions are not observed, as expected, the Shannon & Wilson field representative will contact the Shannon & Wilson project manager, prior to completing the boring and installing a groundwater monitoring well.

Field screening samples will be collected at 2.5-foot intervals until the deeper aquifer is encountered. The borings will be advanced approximately 5 feet below the observed soil/groundwater interface to facilitate installation of groundwater monitoring wells. Each soil sample will be visually described and "screened" for volatile organic compounds using a photoionization detector (PID) and ADEC-approved headspace screening techniques. The PID

will be calibrated before screening activities with 100 parts per million (ppm) isobutylene standard gas. The field screening samples will be collected in re-sealable plastic bags, warmed to a common temperature, and tested within 60 minutes of collection.

One analytical soil sample will be collected from each boring and submitted for analysis. Each submitted sample will be collected from the interval just above the soil/water interface or the sample interval with the highest PID measurement. Five soil samples, including one duplicate sample, will be submitted to SGS for analysis using chain-of-custody procedures. Each sample will be analyzed for gasoline range organics (GRO) by Alaska Method (AK) 101; diesel range organics (DRO) by AK 102; and benzene, toluene, ethylbenzene, and xylenes (BTEX) by Environmental Protection Agency (EPA) Method 8021B. The sample with the highest PID reading will also be analyzed for volatile organic compounds (VOCs) by EPA Method 8260C, in lieu of BTEX, and polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270D. A trip blank will be analyzed for GRO/BTEX by AK 101/EPA Method 8021B.

Task 2 – Monitoring Well Installation and Development

The monitoring wells will be constructed of 2-inch nominal inside diameter schedule 40 polyvinyl chloride (PVC) pipe with threaded connections. The lower portion of the wells will consist of a 10-foot section of 0.010-inch slotted well screen. The screen will extend from approximately 5 feet above and below the observed level of the deeper aquifer. The Shannon & Wilson project manager will be consulted prior to installation of the wells, to discuss the observed subsurface conditions and placement of the well screens. A sand pack of #10/20 silica sand will be used to backfill around the well screen above the screened section to at least 1 to 2 feet above the screened section. Approximately 5 feet of hydrated bentonite chips will be used to backfill the boreholes from the top of the sand packs to create a seal. Soil cuttings removed from the top of the borings will be placed above the bentonite chips to approximately 2 feet bgs. Pea gravel and/or silica sand will be placed above the drill cuttings and a flush mount protective casing will be installed and embedded in asphalt around the monitoring well.

The monitoring wells will be developed at least 24 hours following installation, using a surge block and submersible pump (3 to 5 minute cycles of each). Water quality parameters, including pH, temperature, turbidity, and conductivity will be collected to evaluate the effectiveness of the development process. 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.

Task 3 – Biennial Groundwater Sampling

Wells MW-1R, MW-31, MW-32, MW-39, MW-40, MW-42, and MW-45 through MW-48 will be sampled biennially starting in 2018. In addition, Wells MW-30, and B5MW will be screened for the presence of measurable product.

Consistent with previous sampling events, the groundwater samples will be collected following purging, which will consist of removing approximately three well volumes from each well with disposable bailers. Field parameters including temperature, specific conductivity, pH, dissolved oxygen, and turbidity will be measured following removal of the three well volumes. Analytical samples will be collected by transferring water directly from the bailers into the laboratory supplied containers. The sample jars will be filled in decreasing order of volatility.

The samples will be analyzed for GRO by AK 101, DRO by AK 102, RRO by AK 103, and BTEX by EPA Method 8021B. A trip blank accompanying the sample cooler will be analyzed for GRO/BTEX by AK 101/EPA Method 8021B.

Task 4 - Investigation-Derived Waste Management

Investigation-derived waste (IDW) will consist of drill cuttings, development water, and purge water which will be placed in labeled 55-gallon drums, and stored on-site pending analytical results. The ADEC will be contacted under separate cover prior to transport and treatment of the IDW. Shannon & Wilson will complete the ADEC's *Transport, Treatment & Disposal Approval Form for Contaminated Media* and provide analytical soil and groundwater data under separate cover for ADEC review and approval prior to coordinating IDW disposal. IDW disposal receipts will be included in the summary report.

Task 5 - Reporting

The well installation activities will be summarized in a report that will include tabulated field and analytical results, a site plan showing the locations of the borings/wells, boring logs, well completion logs, copies of laboratory reports, and completed ADEC laboratory data review checklists.

Following receipt of the groundwater analytical results, a separate summary report will be prepared. The report will include a description of field sampling procedures, a scaled site plan, tabulated water quality results, and a summary of historical analytical results. The report will

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also include copies of the laboratory reports and completed ADEC laboratory data review checklists.

SCHEDULE

We anticipate installing the groundwater monitoring wells during May 2018. The biennial groundwater sampling event will be conducted in August 2018. Our final reports will be submitted to Williams approximately three weeks following receipt of analytical results.

If you have any questions or comments regarding this work plan, please call the undersigned at (907) 561-2120.

Sincerely,

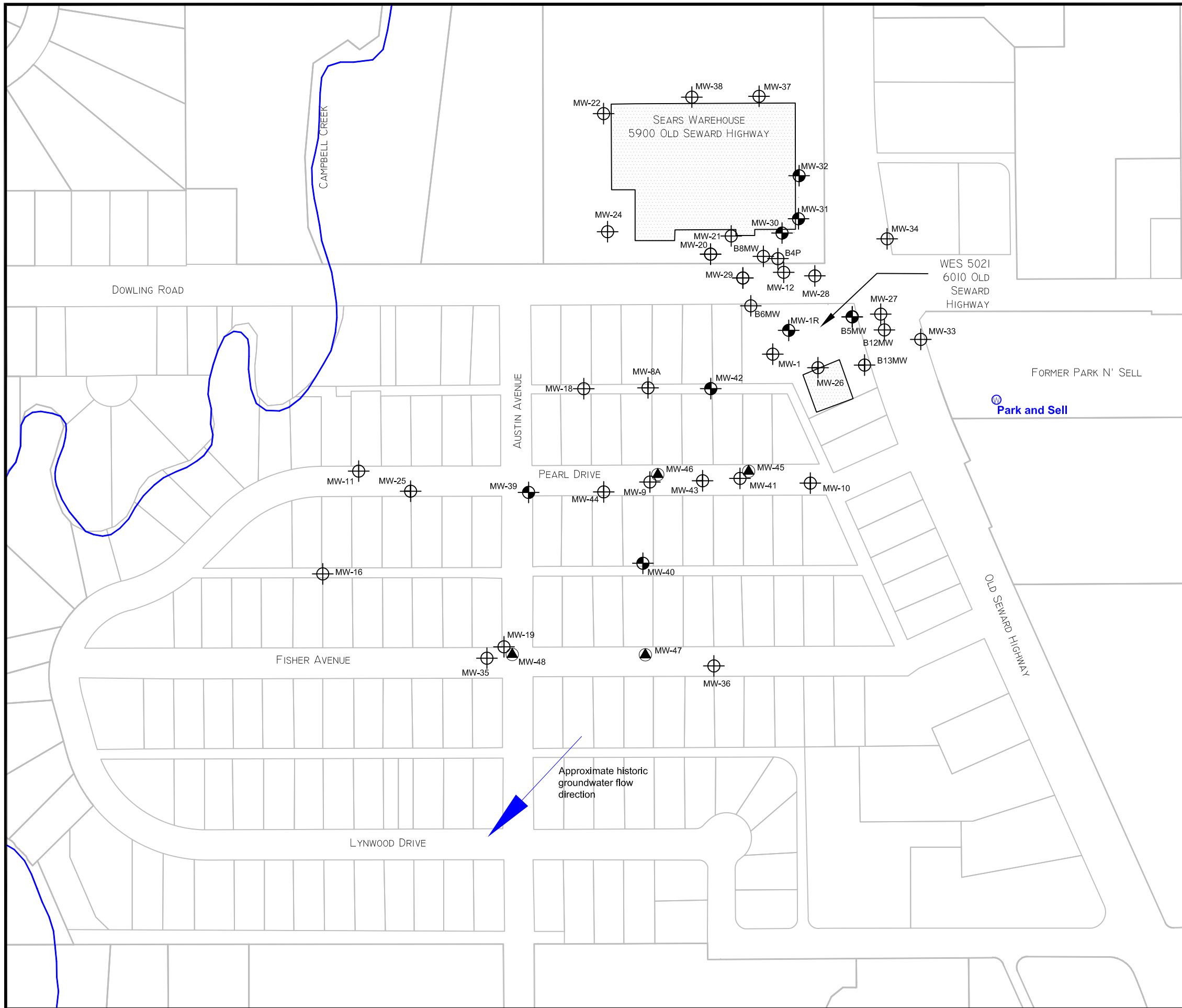
SHANNON & WILSON, INC.

Dan P. McMahon
Associate





Encl: Figure 1

cc: Mr. Lee Andrews, Williams

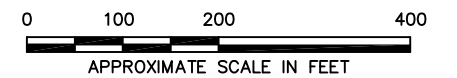
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LEGEND

-  Approximate location of Monitoring Well MW-32
-  Approximate location of former Monitoring Well MW-12 (well was decommissioned, destroyed, or could not be located during the most recent sampling event)
-  Approximate Location of Drinking Water Well
-  MW-45 Approximate location of proposed Monitoring Well MW-45

Notes:
Existing and select former wells are presented on this figure.



6010 OLD SEWARD HIGHWAY
ANCHORAGE, ALASKA

SITE PLAN

NOVEMBER 2017

32-1-2004.0



FIG. 1