

MEMORANDUM

Project No. AS230442A

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To: Department of Ecology

cc: Ben Kleban
Stillwater Holdings, LLC

From:



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Re: Interim Action Sampling Plan, Stillwater Holdings Chevron UST and Soil Removal Action

Introduction

This Interim Action Sampling Plan (SAP) has been prepared for the underground storage tank (UST) and soil removal interim action (interim action) at the Stillwater Holdings Chevron Site at 7 East Rose Street in Walla Walla, Washington (Site; Figure 1). The SAP provides the details of sampling to be conducted as part of the interim action, including both pre-construction groundwater monitoring and compliance soil sampling at the excavation limits. The purpose of the SAP is to ensure that field sample collection, handling, and laboratory analysis will generate data to meet project-specific data quality objectives (DQOs) in accordance with the Model Toxics Control Act (MTCA) requirements (WAC 173-340-350). This SAP is comprised of two major components: a Field Sampling Plan (FSP) defining field protocols, and a Quality Assurance Project Plan (QAPP) that defines analytical protocols. The FSP and QAPP are presented below.

The interim action is shown on Figure 2. The interim action approach includes decommissioning and removal of three existing USTs and removal of soil above MTCA Method A cleanup levels (CULs) within the planned excavation extent, which is defined by the limits of the temporary shoring and a practicable excavation depth that is limited by groundwater and access. The USTs and associated piping will be decommissioned in accordance with the Washington State Department of Ecology (Ecology) UST regulations (Washington Administrative Code [WAC] 173-360), and other applicable state or local regulations. A Contractor will be retained by Stillwater Holdings, LLC to perform the UST decommissioning and will provide a Certified UST Decommissioner in accordance with WAC 173-360A-0820(2).

Per WAC 173-360A-0820(3), a site assessment is not required if a release from the UST system has been previously confirmed and reported to Ecology and further remedial action is necessary to

investigate or cleanup the release. However, Aspect will provide a Certified UST Site Assessor to conduct and document the compliance sampling work described herein.

Groundwater monitoring wells located within the footprint of the interim action excavation will be decommissioned, prior to the start of excavation, in accordance with the requirements of Chapter 173-160 WAC. One monitoring well (AMW-2) is currently anticipated to be decommissioned. All other Site monitoring wells will be protected in place during construction.

Field Sampling Plan

Groundwater Sampling

Prior to decommissioning Site wells, a round of Site-wide groundwater sampling will be conducted. Monitoring wells AMW-01 through AMW-04 and MW-1 through MW-9 will be monitored and sampled as described below.

LNAPL and Water Level Gauging

Prior to sampling, the depth to light non-aqueous phase liquid (LNAPL) and depth to water will be measured at all wells. The locking well cap will be removed, and the well will be allowed to equilibrate to atmospheric pressure for at least 30 minutes prior to monitoring. The presence and thickness of LNAPL will be gauged from the surveyed location to the nearest 0.01-foot using an electronic oil/water interface probe. The depth to water will be measured to the nearest 0.01-foot using a water level meter. The oil/water interface probe and water level meter will be decontaminated between wells. At monitoring wells with 0.1-foot or greater of LNAPL, the LNAPL will be removed to the extent that it is technically feasible using a peristaltic pump or a bailer and the estimated volume of LNAPL removed will be recorded in the field notes.¹

Well Development

Monitoring well MW-6 will be developed to remove fine-grained material from inside the well casing and filter pack, and to improve hydraulic communication between the well screen and the surrounding water-bearing formation. Well development will include a combination of surging across the well screen, pumping, and monitoring of turbidity. Surging will be completed by repeatedly raising and dropping a surge block across the length of the submerged screen to dislodge fine-grained material in the well screen and filter pack. A downhole submersible well-development pump will be used to purge groundwater until turbidity is reduced to minimal levels (below 10 nephelometric turbidity units [NTU] if practical), or until a minimum of 10 casing volumes of water have been removed from the well.

Groundwater Sampling Procedures

Groundwater samples will be collected and handled in accordance with the procedures described below:

- Each monitoring well will be purged at a low-flow rate less than 0.5 liter per minute (Puls and Barcelona, 1996; Ecology, 2012) using a peristaltic pump and dedicated tubing (polyethylene tubing with a short length of silicon tubing through the pump head) in order to minimize drawdown. The tubing intake will be placed just below the center of the saturated section of well screen. During purging, field parameters (temperature, pH, specific electrical conductance,

¹ MW-06 has historically had an LNAPL thickness greater than 0.1 feet.

dissolved oxygen, and oxidation-reduction potential [ORP]) will be monitored using a Yellow Springs Instrument (YSI) or an In Situ Inc. AquaTroll (AquaTroll) water quality meter and flow-through cell, or equivalent. These field parameters will be recorded at 3- to 5-minute intervals throughout well purging until they stabilize. Stabilization is defined as three successive readings where the parameter values vary by less than 10 percent (or 0.5 milligrams per liter [mg/L] dissolved oxygen if the readings are below 1 mg/L). However, no more than three well casing volumes will be purged prior to ground water sample collection. Three turbidity measurements will also be made before collecting the sample using a Hach 2100Q turbidimeter, or equivalent.

- Samples with a field-measured specific electrical conductance greater than 1,000 microSiemens per centimeter ($\mu\text{S}/\text{cm}$) or turbidity greater than 25 nephelometric turbidity units (NTU) will be denoted as such on the chain-of-custody form, so that the laboratory can employ appropriate sample preparation techniques to avoid analytical interferences for specific analyses.
- If the monitoring well is completely dewatered during purging, samples will be collected when sufficient recharge has occurred to allow filling of all sample containers.
- Once purging is complete, the groundwater samples will be collected using the same low-flow rate directly into laboratory-supplied sample containers. Samples for dissolved metals analyses will be filtered using an in-line 0.45 micrometer (μm) filter.
- QC groundwater samples (e.g., trip blanks) will be collected at the respective frequencies prescribed in the QAPP.
- Following sampling, the well's cap and monument cap will be secured. Each well's dedicated tubing will be retained in the monitoring well for subsequent sampling events. Any damaged or defective well caps or monuments will be noted and scheduled for replacement, if necessary.

Groundwater sampling forms are included in Attachment A.

Groundwater Sample Laboratory Analysis

Groundwater samples will be submitted to ALS Environmental in Everett, WA and analyzed for the following:

- Gasoline-range petroleum hydrocarbons by Ecology Method NWTPH-Gx
- Volatile organic compounds (VOCs) by EPA Method 8260

Additionally, the on-Property wells (AMW-01 through AMW-04) will be submitted for analysis of the following, per Ecology's *Guidance for Remediation of Petroleum Contaminated Sites* (Ecology, 2016a) and Table 830-1 of MTCA (WAC 173-340-900):

- Dissolved lead (field filtered) by EPA Method 200.8

Soil Sampling

Soil compliance sampling for the interim action will include laboratory analysis of both excavation sidewall and excavation bottom samples. Proposed compliance monitoring locations are shown on Figure 2. The samples will be submitted for laboratory analysis of parameters described in the QAPP.

Once the planned excavation limits are reached, compliance soil samples will be collected for laboratory analysis to evaluate compliance with MTCA Method A cleanup levels and to inform the future site characterization and evaluation of cleanup alternatives.

For compliance monitoring, Aspect will collect excavation sidewall and excavation bottom samples for laboratory analysis. Aspect will establish a systematic two-by-two sampling grid on each sidewall (four samples per sidewall). Within each grid area, Aspect will field-screen the soil for evidence of contamination, and one sample per grid area will be collected for laboratory analysis. The vertical distribution of the sidewall samples will consist of the following: one sample will be collected in the vadose zone at approximately five feet below ground surface (bgs) and one sample will be collected just above the water table at approximately 10 feet bgs. Sidewall samples will be collected from behind the shoring wall, and sidewall sample spacing will not exceed 20 feet laterally or 5 feet vertically. Three samples will be collected from the base of the excavation, one from beneath each former tank; the excavation bottom sample spacing will not exceed 20 feet by 20 feet. The soil samples will be collected from within the excavation using the excavator bucket or by hand if safely accessible to a worker in accordance with the soil sample collection methods in the next section.

The following subsections detail the procedures for soil sample collection, handling, identification, and sample quality assurance/quality control (QA/QC).

Soil Sample Collection and Handling Procedures

Aspect field personnel, under the direction of a licensed geologist or engineer, will document the excavation and collect compliance soil samples. The field representative will visually classify the soils in accordance with ASTM International (ASTM) Method D2488 and record soil descriptions, field screening results, and other relevant details (e.g., staining, debris, odors, etc.) in the field notes. If samples are collected for chemical analysis, the sample ID and depth will also be recorded in the field notes.

The compliance monitoring soil samples will be discrete grab samples of soil collected from within the excavation using the excavator bucket, or, if safely accessible to a worker, by hand using a decontaminated stainless-steel spoon or disposable spoon.

Headspace Vapor

Samples will be field screened to obtain a relative estimate of their total VOC concentration. This field screening will be performed by measuring the concentration of VOCs in the headspace above the sample in a closed container using a photoionization detector (PID). The field screening will be performed by placing the soil into a sealed plastic bag (e.g., Ziploc), disaggregating the soil by hand, allowing the sample to equilibrate, and then opening the bag slightly, inserting the instrument probe, and measuring the VOC concentration in the headspace. If the ambient temperature is below 65°F, the sample will be warmed (e.g., in a heated vehicle) before the headspace measurement is made.

The PID will be calibrated daily in the field using the manufacturer's calibration standard (100 parts per million [ppm] isobutylene gas). A calibration test, referred to as a "bump test," will be performed as necessary in the field using the calibration gas to check that the PID remains properly calibrated throughout the day.

Sheen Testing

Sheen testing will be conducted by placing soil in a pan of water and observing the water surface for signs of sheen. Sheens are classified as follows:

- **No Sheen:** No visible sheen on the surface of the water.
- **Slight Sheen:** Light, colorless, dull sheen. The spread is irregular and dissipates rapidly.
- **Moderate Sheen:** Light to heavy sheen, may show color/iridescence. The spread is irregular to flowing. Few remaining areas of no sheen are evident on the water surface.
- **Heavy Sheen:** Heavy sheen with color/iridescence. The spread is rapid and the entire water surface may be covered with sheen.

NAPL Jar Tests

The presence of non-aqueous phase liquid (NAPL) in compliance soil samples will be evaluated using a simple jar test. Soil and water will be mixed in a jar and then visually checked for NAPL on the water surface. A small portion of the soil sample (approximately 1 ounce [oz] to 2 oz) will be placed into a clear, 4- or 8-oz glass jar and gently agitated with 2- to 3-oz of water. After approximately 5 minutes, the fluid surface in the jar will be observed for the presence or absence of NAPL and observations will be recorded in the field notes, including the presence/absence, color, and approximate thickness of NAPL on the water surface, if present.

Sample Collection and Laboratory Analysis

All compliance monitoring soil samples to be submitted for gasoline-range total petroleum hydrocarbons (by Ecology Method NWTPH-Gx) and VOC analyses (by EPA Methods 8021 or 8260C) will be collected in accordance with EPA Method 5035A. The soil aliquot for these analyses will be collected using a laboratory-supplied modified disposable plastic syringe from the bucket as required by the EPA Method 5035A and placed in pre-weighed laboratory-supplied vials.

For all other analyses, the performance monitoring soil samples will be removed from the bucket using a stainless-steel spoon and placed in a stainless-steel bowl for homogenization with the stainless-steel spoon. Gravel-sized material greater than approximately 0.5 inches will be removed from the sample during mixing. A representative aliquot of the homogenized soil will be placed into certified-clean jars supplied by the analytical laboratory.

QC soil samples (e.g., field duplicates and trip blanks) will be collected at the respective frequencies prescribed in the QAPP.

The laboratory analyses are as follows:

- Gasoline-range petroleum hydrocarbons by Ecology Method NWTPH-Gx
- Diesel-range petroleum hydrocarbons by Ecology Method NWTPH-Dx
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8021 or 8260

- Naphthalene² by EPA Method 8260
- 1,2-dibromoethane (EDB)² and 1,2-dichloroethane (EDC)² by EPA Method 8260
- Methyl tertiary-butyl ether (MTBE)² by EPA Method 8260
- Total lead² by EPA Method 200.8

Additional samples will be collected if necessary for disposal facility acceptance requirements.

Soil Sample Identification

Each soil sample collected for chemical analysis will be assigned a unique sample identification number including the location ID and the depth from which the sample was collected. Samples will be named using the following conventions:

- **Bottom samples:** B – number – depth – date (e.g., B-1-14.5-041524)
- **Sidewall samples:** SW – number – depth – date (e.g., SW-1-6-041524)

Sample Custody and Field Documentation

Sample Custody

Upon collection, samples will be placed upright in a cooler. Ice or blue ice will be placed in each cooler to meet sample preservation requirements. Inert cushioning material will be placed in the remaining space of the cooler as needed to limit movement of the sample containers. If the sample coolers are being shipped (not hand carried) to the laboratory, the COC form will be placed in a waterproof bag taped to the inside lid of the cooler for shipment.

After collection, samples will be maintained in the consultant's custody until formally transferred to the analytical laboratory. For purposes of this work, custody of the samples will be defined as follows:

- In plain view of the field representatives
- Inside a cooler that is in plain view of the field representative
- Inside any locked space such as a cooler, locker, car, or truck to which the field representative has the only immediately available key(s)

A COC record provided by the laboratory will be initiated at the time of sampling for all samples collected. The record will be signed by the field representative and others who subsequently take custody of the sample. Couriers or other professional shipping representatives are not required to sign the COC form; however, shipping receipts will be collected and maintained as a part of custody documentation in project files. A copy of the COC form with appropriate signatures will be kept by Aspect.

Upon sample receipt, the laboratory will fill out a cooler receipt form to document sample delivery conditions. A designated sample custodian will accept custody of the shipped samples and verify

² Analysis for naphthalene, EDB, EDC, MTBE, and/or lead will only be conducted if the analyte is detected in groundwater, per Ecology's *Guidance for Remediation of Petroleum Contaminated Sites* (Ecology, 2016a) and Table 830-1 of MTCA (WAC 173-340-900).

that the COC form matches the samples received. The laboratory will notify the project manager, as soon as possible, of any issues noted with the sample shipment or custody.

Field Documentation

While conducting field work, the field representative will document pertinent observations and events, specific to each activity, on field forms (e.g., boring log form, as-built well completion form, well development form, groundwater sampling form, etc.) and/or in a field notebook, and, when warranted, provide photographic documentation of specific sampling efforts. Field notes will include a description of the field activity, sample descriptions, and associated details such as the date, time, and field conditions.

Stockpile Sampling and Disposal

Sample Collection and Laboratory Analysis

Soil stockpile samples will be collected using hand tools 6 to 12 inches below the stockpile surface. Samples will be collected using disposable, clean sampling equipment or stainless-steel sampling equipment that is decontaminated. Sample material will be placed in a stainless-steel bowl for homogenization with the stainless-steel spoon. A representative aliquot of the homogenized soil will be placed into certified-clean jars supplied by the analytical laboratory. Soil samples will be named by the following convention: SPS-1-20240604. 'SP' indicates stockpile, 'S' indicates soil, '1' indicates the sample number, and '20240604' indicates the sample collection date. Aspect staff will sketch and record the locations where stockpile samples were collected. An estimated maximum of 100 cubic yards of soil will be generated; therefore, an estimated three soil stockpile samples will be collected, in accordance with Ecology's *Guidance for Remediation of Petroleum Contaminated Sites* (Ecology, 2016a).

Soil samples will be collected and analyzed for gasoline by NWTPH-Gx and BTEX by EPA Method 8260.

Designation and Disposal

The soil will be disposed at the Waste Management Columbia Ridge Landfill in Arlington, Oregon, a Subtitle D Landfill, pending profile results.

Quality Assurance Project Plan

This QAPP identifies QC procedures and criteria required to ensure that data collected are of known quality and acceptable to achieve project objectives. Specific protocols and criteria are also set forth in this QAPP for data quality evaluation, upon the completion of data collection, to determine the level of completeness and usability of the data. It is the responsibility of the project personnel performing or overseeing the sampling and analysis activities to adhere to the requirements of the FSP and this QAPP.

Purpose of the QAPP

As stated in Ecology's *Guidelines for Preparation of Quality Assurance Project Plans for Environmental Studies* (Ecology, 2016b), specific goals of this QAPP are as follows:

- Focus project manager and project team to factors affecting data quality during the planning stage of the project

- Facilitate communication among field, laboratory, and management staff as the project progresses
- Document the planning, implementation, and assessment procedures for QA/QC activities for the investigation
- Ensure that the DQOs are achieved
- Provide a record of the project to facilitate final report preparation

The DQOs for the project include both qualitative and quantitative objectives, which define the appropriate type of data and specify the tolerable levels of potential decision errors that will be used as a basis for establishing the quality and quantity of data needed to support the environmental assessment. To ensure that the DQOs are achieved, this QAPP details aspects of data collection including analytical methods, QA/QC procedures, and data quality reviews, and describes both quantitative and qualitative measures of data. DQOs dictate data collection rationale, sampling and analysis designs that are presented in the main body of the CMP, and sample collection procedures that are presented in the FSP.

Project Organization and Responsibilities

The project consultant team involved with data generation includes representatives from Aspect. Key individuals and their roles on this project are as follows:

Project Manager – Aspect. The project manager is responsible for the successful completion of all aspects of this project, including day-to-day management, production of reports, liaison with party and regulatory agencies, and coordination with project team members. The project manager is also responsible for resolution of non-conformance issues, is the lead author on project plans and reports, and provides regular, up-to-date progress reports and other requested information to project team and Ecology.

Field Manager – Aspect. The field manager is responsible for overseeing the field sampling program outlined in this plan, including collecting representative samples and ensuring that they are handled properly prior to transfer of custody to the project laboratory. The field manager will manage procurement of necessary field supplies, assure that monitoring equipment is operational and calibrated in accordance with the specifications provided herein, and act as the Site Health and Safety Officer.

Data Quality Manager – Aspect. The data quality manager is responsible for developing data quality objectives, selecting analytical methods, coordinating with the analytical laboratory, overseeing laboratory performance, and approving QA/QC procedures. The data quality manager is also responsible for overseeing QA validation of the analytical data reports received from the project laboratory. Data will be validated in-house by Aspect. The validator works independently, with no interference from those who collect and use the Site data.

Laboratory Project Manager – ALS Global. (ALS). Aspect will contract ALS for the analysis described in the SAP. The laboratory project manager is responsible for ensuring that all laboratory analytical work for soil, water, and gas media complies with project requirements, and acts as a liaison with the project manager, field manager, and data quality manager to fulfill project needs on

the analytical laboratory work. This responsibility also applies to analysis the laboratory project manager subcontracts to another laboratory.

Analytical Methods and Reporting Limits

Laboratory analytical methods for groundwater and soil analyses to be performed during this environmental characterization are as follows:

Chemical Group and Analyte	Analytical Method	Matrix
Gasoline-Range Petroleum Hydrocarbons	NWTPH-Gx	Groundwater and soil
Benzene, Toluene, Ethylbenzene, Xylenes	EPA 8260C or 8021B	Groundwater and soil
EDB, EDC, MTBE, Naphthalene	EPA 8260C	Groundwater and soil
Lead	EPA 200.8	Groundwater and soil

The attached Table 1 lists sample containers, preservation, and analytical holding times for each analysis and matrix.

Method Detection Limit and Method Reporting Limit

The method detection limit (MDL) is the minimum concentration of a compound that can be measured and reported with a 99-percent confidence that the analyte concentration is greater than zero. MDLs are established by the laboratory using prepared samples, not samples of environmental media.

The method reporting limit (RL) is defined as the lowest concentration at which a chemical can be accurately and reproducibly quantified, within specified limits of precision and accuracy, for a given environmental sample. The RL can vary from sample to sample depending on sample size, sample dilution, matrix interferences, moisture content, and other sample-specific conditions. As a minimum requirement for organic analyses, the RL should be equivalent to or greater than the concentration of the lowest calibration standard in the initial calibration curve. The expected MDLs and RLs from ALS are summarized in Tables 3 and 4 for samples collected by Aspect.

Data Quality Objectives

DQOs, including the Measurement Quality Indicators (MQIs)—precision, accuracy, representativeness, comparability, completeness, and sensitivity (namely, the PARCCS parameters)—and sample-specific RLs are dictated by the data quality objectives, project requirements, and intended uses of the data. For this project, the analytical data must be of sufficient technical quality to determine whether contaminants are present and, if present, whether their concentrations are greater than or less than applicable screening criteria based on protection of human health and the environment.

The quality of data generated will be assessed against the MQIs set forth in this QAPP. Specific QC parameters associated with each of the MQIs are summarized in Table 2. Specific MQI goals and

evaluation criteria (i.e., MDLs, RLs, percent recovery [%R] for accuracy measurements, relative percent difference [RPD] for precision measurements), are defined in Tables 3 and 4. Definitions of these parameters and the applicable QC procedures are presented below.

Precision

Precision measures the reproducibility of measurements under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements compared with their average values. Analytical precision is measured through matrix spike/matrix spike duplicate (MS/MSD) samples and laboratory control samples/laboratory control sample duplicate (LCS/LCSD) when there is sufficient sample volume. A laboratory duplicate sample or just an LCS/LCSD may be used in place of an MS/MSD if there is insufficient volume.

Analytical precision is quantitatively expressed as the relative percent difference (RPD) between the LCS/LCSD, MS/MSD, or laboratory duplicate pairs and is calculated with the following formula:

$$RPD (\%) = 100 \times \frac{|S - D|}{(S + D)/2}$$

where:

S = analyte concentration in sample

D = analyte concentration in duplicate sample

Analytical precision measurements will be carried out at a minimum frequency of 1 per 20 samples for each matrix sampled, or one per laboratory analysis group. Laboratory precision will be evaluated against laboratory quantitative RPD performance criteria as defined in Tables 3 and 4 for specific analytical methods and sample matrices. If the control criteria are not met, the laboratory will supply a justification of why the limits were exceeded and implement the appropriate corrective actions. The RPD will be evaluated during data review and validation. The data reviewer will note deviations from the specified limits and will comment on the effect of the deviations on reported data.

Accuracy

Accuracy measures the closeness of the measured value to the true value. The accuracy of chemical test results is assessed by “spiking” samples with known standards (surrogates, blank spikes, or matrix spikes) and establishing the average recovery. Accuracy is quantified as the %R. The closer the %R is to 100%, the more accurate the data.

Surrogate recovery will be calculated as follows:

$$\text{Recovery (\%)} = \frac{MC}{SC} \times 100$$

where:

SC = spiked concentration

MC = measured concentration

MS percent recovery will be calculated as follows:

$$\text{Recovery (\%)} = \frac{MC - USC}{SC} \times 100$$

where:

SC = spiked concentration

MC = measured concentration

USC = unspiked sample concentration

Accuracy measurements on MS samples will be carried out at a minimum frequency of 1 in 20 samples per matrix analyzed. Blank spikes will also be analyzed at a minimum frequency of 1 in 20 samples (not including QC samples) per matrix analyzed. Surrogate recoveries for organic compounds will be determined for each sample analyzed for respective compounds. Laboratory accuracy will be evaluated against the performance criteria defined in Tables 3 and 4. If the control criteria are not met, the laboratory will supply a justification of why the limits were exceeded and implement the appropriate corrective actions. Percent recoveries will be evaluated during data review and validation, and the data reviewer will comment on the effect of the deviations on the reported data.

Representativeness

Representativeness measures how closely the measured results reflect the actual concentration or distribution of the chemical compounds in the matrix sampled. The FSP sampling techniques and sample handling protocols (e.g., homogenizing, storage, preservation, and use of duplicates and blanks) have been developed to ensure representative samples. Only representative data will be deemed usable. The field sampling procedures are described in the FSP of this SAP.

The representativeness of a data point is determined by assessing the integrity of the sample upon receipt at the laboratory (e.g., consistency of sample ID and collection date/time between container labels versus COC forms, breakage/leakage, cooler temperature, preservation, headspace for VOA containers, etc.); compliance of method required sample preparation and analysis holding times; the conditions of blanks (trip blank, rinsate blank, field blank, method/preparation blank, and calibration blank) associated with the sample; and the overall consistency of the results within a field duplicate pair.

Comparability

Comparability is a qualitative parameter expressing the confidence with which one data set can be compared with another. This goal will be achieved through the use of standard techniques to collect samples, EPA-approved standard methods to analyze samples, and consistent units to report analytical results. Data comparability also depends on data quality. Data of unknown quality cannot be compared.

Completeness

Completeness is defined as the percentage of measurements made that are judged to be valid. Results will be considered valid if the precision, accuracy, and representativeness objectives are met and if RLs are sufficient for the intended uses of the data. Completeness is calculated as follows:

$$\text{Completeness (\%)} = \frac{V}{P} \times 100$$

where:

V = number of valid measurements

P = number of measurements taken

Valid and invalid data (i.e., data qualified with the R flag [rejected]) will be identified during data validation. The target completeness goal for this project is 95 percent.

Sensitivity

Sensitivity depicts the level of ability an analytical system (i.e., sample preparation and instrumental analysis) of detecting a target component in a given sample matrix with a defined level of confidence. Factors affecting the sensitivity of an analytical system include: analytical system background (e.g., laboratory artifact or method blank contamination), sample matrix (e.g., mass spectrometry ion ratio change, co-elution of peaks, or baseline elevation), and instrument instability.

Quality Control Procedures

Field and laboratory QC procedures are outlined below.

Field Quality Control

Beyond use of standard sampling protocols defined in the FSP, field QC procedures include maintaining the field instrumentation used. Field instruments (e.g., PID for evaluating presence of VOCs in soil samples) are maintained and calibrated regularly prior to use, in accordance with manufacturer recommendations.

In addition, field QC samples will be collected and submitted for analyses to monitor the precision and accuracy associated with field procedures. Field QC samples to be collected and analyzed for this cleanup action include field duplicates, trip blanks, and equipment rinsate blanks. The definition and sampling requirements for field QC samples are presented below.

Blind Field Duplicates

Blind field duplicate samples are used to check for sampling and analysis reproducibility; however, the field duplicate sample results include variability introduced during both field sampling and laboratory preparation and analysis, and EPA data validation guidance provides no specific evaluation criteria for field duplicate samples. Advisory evaluation criteria are set forth at 35 percent for RPD (if both results are greater than five times the RL) and two times the RLs for concentration difference (if either of the result is less than five times the RL) between the original and field duplicate results.

Field Duplicates will be submitted “blind” to the laboratory as discrete samples (i.e., given unique sample identifiers to keep the duplicate identity unknown to the laboratory), but will be clearly identified in the field log. **Field duplicate samples will be collected at a frequency of 10 percent (1 per 10) of the field samples for each matrix and analytical method, but not less than one duplicate per sampling event per matrix.** Field duplicate soil samples will be analyzed for gasoline-range petroleum hydrocarbons by NWTPH-Gx, diesel-range petroleum hydrocarbons by NWTPH-Dx, and BTEX by EPA Method 8260.

If a given soil sample depth interval lacks sufficient volume (recovery) to supply material for a planned analysis and its field duplicate analysis, the field duplicate aliquot will be collected for that analysis from another depth interval in that same location if practical.

Trip Blank

Trip blank samples will be used to monitor possible VOC cross-contamination occurring during sample transport. Trip blank samples are prepared and supplied by the laboratory using organic-free, reagent-grade water into a VOC vial prior to the collection of field samples. The trip blank sample vials are placed with and accompany the VOC and TPH-Gx samples through the entire transporting process. **One trip blank will be collected for each soil sampling round where VOC or TPH-Gx analyses are conducted.**

In case a target compound is present in a trip blank, results for all samples shipped with this trip blank will be evaluated and data qualified accordingly if determined that the results are affected.

Equipment Rinsate Blank

Equipment rinsate blanks are collected to determine the potential of cross-contamination introduced by nondedicated equipment (e.g., bladder pump and YSI meter) that is used at multiple sample locations. Deionized water (obtained from the laboratory) is rinsed through the decontaminated sampling equipment and collected into adequate sample containers for analysis. The equipment rinsate blank is then handled in a manner identical to the primary samples collected with that piece of equipment. The blank is then processed, analyzed, and reported as a regular field sample. **The rinsate blank collection frequency will be 1 per 20 samples for each matrix and analytical method, but not less than one equipment rinsate per sampling event per matrix.** When dedicated equipment is used, equipment rinsate blanks will not be collected.

Laboratory Quality Control

The laboratory’s analytical procedures must meet requirements specified in the respective analytical methods or approved laboratory standard operating procedures (SOPs), e.g., instrument performance check, initial calibration, calibration check, blanks, surrogate spikes, internal standards, and/or labeled compound spikes. Specific laboratory QC analyses required for this project will consist, at a minimum, of the following:

- Instrument tuning, instrument initial calibration, and calibration verification analyses as required in the analytical methods and the laboratory SOPs
- Laboratory and/or instrument method blank measurements at a minimum frequency of 5 percent (1 per 20 samples) or in accordance with method requirements, whichever is more frequent

- Accuracy and precision measurements as defined in Table 2, at a minimum frequency of 5 percent (1 per 20 samples) or in accordance with method requirements, whichever is more frequent. In cases where a pair of MS/MSD or MS/laboratory duplicate analyses are not performed on a project sample, a set of LCS/LCSD analyses will be performed to provide sufficient measures for analytical precision and accuracy evaluation.

The laboratory's QA officers are responsible for ensuring that the laboratory implements the internal QC and QA procedures detailed in the laboratory's Quality Assurance Manual.

Corrective Actions

If routine QC audits by the laboratory result in detection of unacceptable conditions or data, actions specified in the laboratory SOPs will be taken. Specific corrective actions are outlined in each SOP used and can include the following:

- Identifying the source of the violation;
- Reanalyzing samples if holding time criteria permit;
- Resampling and analyzing;
- Evaluating and amending sampling and analytical procedures; and/or
- Accepting but qualifying data to indicate the level of uncertainty.

If unacceptable conditions occur, the laboratory will contact the project manager to discuss the issues and determine the appropriate corrective action. Corrective actions taken by the laboratory during analysis of samples for this project will be documented by the laboratory in the case narrative associated with the affected samples.

In addition, the project data quality manager will review the laboratory data generated for this investigation to ensure that project DQOs are met. If the review indicates that non-conformances in the data have resulted from field sampling or documentation procedures or laboratory analytical or documentation procedures, the impact of those non-conformances on the overall project data usability will be assessed. Appropriate actions, including re-sampling and/or re-analysis of samples may be recommended to the project manager to achieve project objectives.

Data Reduction, Quality Review, and Reporting

All data will undergo a QA/QC evaluation at the laboratory which will then be reviewed by the Aspect data quality manager. Initial data reduction, evaluation, and reporting at the laboratory will be carried out in full compliance with the method requirement and laboratory SOPs. The laboratory internal review will include verification (for correctness and completeness) of electronic data deliverable (EDD) accompanied with each laboratory report. The responsible database manager will verify the completeness and correctness of all laboratory deliverables (i.e., laboratory report and EDDs) before releasing the deliverables for data validation.

Minimum Data Reporting Requirements

The following sections specify general and specific requirements for analytical data reporting to provide sufficient deliverables for project documentation and data quality assessment.

General Requirements

The following requirements apply to laboratory reports for all types of analyses:

- A laboratory report will include a cover page signed by the laboratory director, the laboratory QA officer, or his/her designee to certify the eligibility of the reported contents and the conformance with applicable analytical methodology.
- Reanalyzing samples if holding time criteria permit;
- Resampling and analyzing;
- Evaluating and amending sampling and analytical procedures; and/or
- Accepting but qualifying data to indicate the level of uncertainty.
- Definitions of abbreviations, data flags, and data qualifiers used in the report.
- Cross reference of field sample names and laboratory sample identity for all samples in the sample delivery group (SDG).
- Completed chain-of-custody document signed and dated by parties of acquiring and receiving.
- Completed sample receipt document with record of cooler temperature and sample conditions upon receipt at the laboratory. Anomalies such as inadequate sample preservation, inconsistent bottle counts, and sample container breakage, and communication record and corrective actions in response to the anomalies will be documented and incorporated in the sample receipt document. The document will be initialed and dated by personnel that complete the document.
- Case narrative that addresses any anomalies or QC outliers in relation to sample receiving, sample preparation, and sample analysis on samples in the SDG. The narrative will be presented separately for each analytical method and each sample matrix.
- All pages in the report are to be paginated. Any insertion of pages after the laboratory report is issued will be paginated with starting page number suffixed with letters (e.g., pages inserted between pages 134 and 135 should be paginated as 134A, 134B, etc.)
- Any resubmitted or revised report pages will be submitted to project manager with a cover page stating the reason(s) and scope of resubmission or revision, and signed by laboratory director, QA officer, or the designee.

Specific Requirements

The following presents specific requirements for laboratory reports:

- Sample results: All soil sample results will be reported on a dry-weight basis. The report pages for sample results (namely Form 1s) will, at minimum, include sample results, RLs, unit, proper data flags, preparation, and analysis, dilution factor, and percent moisture (for solid samples).
- Method blank results.
- LCS and LCSD (if matrix spike duplicate analysis is not performed) results with laboratory acceptance criteria for %R and RPD.
- Surrogate spike results with laboratory acceptance criteria for %R.

- MS and MSD results with laboratory acceptance criteria for %R and RPD. In cases where MS/MSD analyses were not performed on a project sample, LCS/LCSD analyses should be performed and reported instead.

Data Quality Verification and Validation

Reported analytical results will be qualified by the laboratory to identify QC concerns in accordance with the specifications of the analytical methods. Additional laboratory data qualifiers may be defined and reported by the laboratory to more completely explain QC concerns regarding a particular sample result. All data qualifiers will be defined in the laboratory's narrative reports associated with each case. Data validation shall be performed at Quality Assurance Level 2 (EPA2) by Aspect.

In cases where a systematic QC problem is suspected, such as unusual detections of an analyte or consistent outlying results of a QC parameter, a more detailed review will be performed on laboratory records pertinent to the concerned analysis to further evaluate the extent of the QC issue and the final data quality and usability. The actual level of validation for each data point will be entered in the electronic database submitted to the Ecology Environmental Information Management system (EIMs). Data validation will be conducted following the guidance below.

- EPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Methods Data Review (EPA, 2017a)
- EPA Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review (EPA, 2017b)

The data validation will examine and verify the following parameters against the method requirements and laboratory control limits specified in Tables 3 and 4:

- Sample management and holding times
- Instrument performance check, calibration, and calibration verification
- Laboratory and field blank results
- Detection and reporting limits
- Laboratory replicate results
- MS/MSD results
- LCS and/or standard reference material results
- Field duplicate results
- Surrogate spike recovery (organic analyses only)
- Internal standard recovery (internal calibration methods only)
- Inter-element interference check (inductively coupled plasma analyses only)
- Serial dilution (metals only)
- Labeled compound recovery (isotope dilution methods only)

- Ion ratios for detected compounds (high resolution gas chromatography–mass spectrometry methods only)

Data qualifiers will be assigned based on outcome of the data validation. Data qualifiers are limited to and defined as follows:

- U – The analyte was analyzed for but was determined to be non-detect above the reported sample quantitation limit, or the quantitation limit was raised to the concentration found in the sample due to blank contamination.
- J – The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- UJ – The analyte was not detected above the reported quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R – The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet QC criteria. The presence or absence of the analyte cannot be verified.
- DNR – Do not report from this analysis; the result for this analyte is to be reported from an alternative analysis.

In cases of multiple analyses (such as an undiluted and a diluted analysis) performed on one sample, the optimal result will be determined and only the determined result will be reported for the sample.

Preventative Maintenance Procedures and Schedules

Preventative maintenance in the laboratory will be the responsibility of the laboratory personnel and analysts and ensured by the laboratory project manager. This maintenance includes routine care and cleaning of instruments and inspection and monitoring of carrier gases, solvents, and glassware used in analyses. Details of the maintenance procedures are addressed in the respective laboratory SOPs.

Precision and accuracy data are examined for trends and excursions beyond control limits to determine evidence of instrument malfunction. Maintenance will be performed when an instrument begins to change as indicated by the degradation of peak resolution, shift in calibration curves, decrease in sensitivity, or failure to meet one or another of the method-specific QC criteria.

Maintenance and calibration of instruments used in the field for sampling (e.g., PID for evaluating presence of VOCs in soil samples, and the AquaTroll meter for measuring field parameters during groundwater sampling) will be conducted regularly in accordance with manufacturer recommendations prior to use.

Performance and System Audits

The Aspect project manager has responsibility for reviewing the performance of the laboratory QA program; this review will be achieved through regular contact with the analytical laboratory's project manager. To ensure comparable data, all samples of a given matrix to be analyzed by each specified analytical method will be processed consistently by the same analytical laboratory.

Data and Records Management

Records will be maintained documenting all activities and data related to field sampling and chemical analyses.

Field Documentation

The project manager will ensure that the field team receives the final approved version of this QAPP, the site health and safety plan, and the Standard Field Procedures prior to the initiation of field activities. Field records will include:

- Field data and sample collection information forms
- Electronic field data collection using a GPS unit to record sample locations and other pertinent sample collection information
- Sample tracking/chain of custody forms.
- Photo documentation (as needed)

Field documents will be maintained in the project file.

Analytical Data Management

Raw data received from the analytical laboratory will be reviewed, entered into a computerized database, and verified for consistency and correctness. The database will be updated based on data review and independent validation if necessary.

The following field data will be included in the database:

- Sample location coordinates
- Sample type (i.e., soil or water)
- Soil sampling depth interval

Information regarding whether concentrations represent total phase (unfiltered samples) or dissolved phase (filtered samples) will be compiled and stored in the database. Data will be submitted to Ecology's EIM database once data have been reviewed and validated.

References

Puls, R.W. and M.J. Barcelona, 1996, Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures, EPA Groundwater Issue, EPA/540/S-95/504.

U.S. Environmental Protection Agency (EPA), 2017a, Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Methods Data Review, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, January 2017, OLEM 9355.0-135, EPA-540-R-2017-001.

U.S. Environmental Protection Agency (EPA), 2017b, Contract Laboratory Program National Functional Guidelines for Organic Superfund Methods Data Review, Office of Superfund Remediation and Technical Innovation, U.S. Environmental Protection Agency, January 2017, OLEM 9355.0-135, EPA-540-R-2017-001.

Washington State Department of Ecology (Ecology), 2012, Guidance for Groundwater Monitoring at Landfills and Other Facilities Regulated Under Chapters 173-304, 173-306, 173-350, and 173-351 WAC, Publication No. 12-07-072.

Washington State Department of Ecology (Ecology), 2016a, Guidance for Remediation of Petroleum Contaminated Sites, Publication No. 10-09-057, June 2016.

Washington State Department of Ecology (Ecology), 2016b, Guidelines for Preparing Quality Assurance Project Plans for Environmental Studies, Publication No. 04-03-030, December 2016.

Limitations

Work for this project was performed for the Stillwater Holdings, LLC (Client), and this memorandum was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This memorandum does not represent a legal opinion. No other warranty, expressed or implied, is made.

All reports prepared by Aspect Consulting for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect Consulting. Aspect Consulting's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Attachments: Table 1 – Analytical Methods, Sample Containers, Preservation, and Holding Times
Table 2 – QC Parameters Associated with PARCCS
Table 3 – Measurement Quality Objectives for Water Samples – ALS
Table 4 – Measurement Quality Objectives for Soil Samples - ALS
Figure 1 – Site Location Map
Figure 2 – Site Map Showing Proposed Compliance Monitoring Locations
Attachment A – Field Forms

V:\230442 Singers Chevron\Deliverables\SAP\Final\IA Sampling Plan_Final.docx

TABLES

Table 1. Analytical Methods, Sample Containers, Preservation, and Holding Times

Project No. AS230442A, Stillwater Holdings Chevron, Walla Walla, WA

Sample Matrix	Analytical Parameter	Analytical Method	Sample Container	No. Containers	Preservation Requirements	Holding Time
Groundwater	Gasoline Range Petroleum Hydrocarbons	Ecology Method NWTPH-Gx	Method 5035A, 40-mL vials	4	4°C ±2°C, Methanol	14 days
	Benzene, Toluene, Ethylbenzene, Total Xylenes, Naphthalene, EDB, EDC, and MTBE	EPA Method 8260	Method 5035A, 40-mL vials	4	4°C ±2°C, Methanol	14 days
	Dissolved lead	EPA Method 200.8	Poly, 250-mL bottle	1	4°C ±2°C, HNO ₃	180 days
Soil	Gasoline Range Petroleum Hydrocarbons	Ecology Method NWTPH-Gx	Method 5035A, 40-mL vials	4	4°C ±2°C, Methanol	14 days
	Diesel Range Petroleum Hydrocarbons	Ecology Method NWTPH-Dx	Glass, 4-oz jar	1	4°C ±2°C	14 days
	Benzene, Toluene, Ethylbenzene, Total Xylenes, Naphthalene, EDB, EDC, and MTBE	EPA Method 8260	Method 5035A, 40-mL vials	4	4°C ±2°C, Methanol	14 days
	Lead	EPA Method 200.8	Glass, 8-oz jar	1	4°C ±2°C	180 days

Notes:

Ecology = Washington State Department of Ecology

EDB = 1,2-Dibromoethane

EDC = 1,2-Dichloroethane

EPA = United States Environmental Protection Agency

MTBE = tert-Butyl Methyl Ether

TPH = total petroleum hydrocarbons

VOA = volatile organic analysis

Table 2. QC Parameters Associated with PARCCS

Project No. AS230442A, Stillwater Holdings Chevron, Walla Walla, WA

Data Quality Indicators	QC Parameters
Precision	RPD values of:
	(1) LCS/LCS Duplicate
	(2) MS/MSD
	(3) Field Duplicates
Accuracy/Bias	Percent Recovery (%R) or Percent Difference (%D) values of:
	(1) Initial Calibration and Calibration Verification
	(2) LCS
	(3) MS
	(4) Surrogate Spikes
	Results of:
	(1) Instrument and Calibration Blank
	(2) Method (Preparation) Blank
	(3) Trip Blank
	(4) Equipment Rinsate Blank (if appropriate)
Representativeness	Results of All Blanks
	Sample Integrity (Chain-of-Custody and Sample Receipt Forms)
	Holding Times
Comparability	Sample-specific Reporting Limits
	Sample Collection Methods
	Laboratory Analytical Methods
Completeness	Data Qualifiers
	Laboratory Deliverables
	Requested/Reported Valid Results
Sensitivity	MDLs and MRLs

Notes:

LCS = laboratory control sample

MDL = method detection limit

MRL = method reporting limit

MS/MSD = matrix spike/matrix spike duplicate

QC = Quality Control

PARCCS = Precision, Accuracy, Representativeness, Comparability, Completeness, Sensitivity

Table 2

SAP/QAPP

Page 1 of 1

Table 3. Measurement Quality Objectives for Water Samples - ALS

Project No. AS230442A, Stillwater Holdings Chevron, Walla Walla, WA

Analyte Name	MDL ^(A)	MRL	LCS/LCSD %R ^(A)	RPD (%)	Surrogate %R ^(A)
Volatile Organic Compounds (VOCs) by SW8260D (µg/L)					
1,2-Dibromoethane	0.003	0.01	50-150	≤25	n/a
1,2-Dichloroethane	0.001	0.1	50-150	≤25	n/a
Benzene	0.004	0.02	74.7-143	≤20.5	n/a
Ethyl Benzene	0.096	0.5	50-150	≤25	n/a
m,p-Xylene	0.189	1	50-150	≤25	n/a
Naphthalene	0.121	0.5	50-150	≤25	n/a
o-Xylene	0.086	0.5	50-150	≤25	n/a
tert-Butyl Methyl Ether	0.112	0.5	50-150	≤25	n/a
Toluene	0.081	0.5	71.7-139	≤20.5	n/a
4-Bromofluorobenzene (surr)	n/a	n/a	n/a	n/a	78-120
Dibromofluoromethane (surr)	n/a	n/a	n/a	n/a	71-130
Toluene-d8 (surr)	n/a	n/a	n/a	n/a	80-120
Gasoline Range Hydrocarbons by NWTPH-Gx (µg/L)					
Gasoline Range Hydrocarbons	9.8	50	50-150	≤20	n/a
Toluene-d8 (surr)	n/a	n/a	n/a	n/a	60-140
Dissolved Lead by EPA 200.8					
Lead	0.0363	0.109	87.5-107	10	n/a

Notes:

(A) = Based on current laboratory control criteria. Some values may vary slightly between instruments and can be subject to change as the laboratory updates the charted values periodically.

LCS/LCSD = laboratory control samples and laboratory control sample duplicate

%R = percent recovery

MDL = method detection limit

MRL = method reporting limit

n/a = not applicable

RPD = relative percent difference

µg/L = microgram per liter

(--) = Not identified by the lab

Table 4. Measurement Quality Objectives for Soil Samples - ALS

Project No. AS230442A, Stillwater Holdings Chevron, Walla Walla, WA

Analyte Name	MDL ^(A)	MRL	LCS/LCS %R ^(A)	RPD (%)	Surrogate %R ^(A)
Volatile Organic Compounds (VOCs) by SW8260C (ug/kg)					
1,2-Dibromoethane	0.086	0.25	76.8 - 120	≤20	n/a
1,2-Dichloroethane	0.083	1	78.4 - 118	≤20	n/a
Benzene	0.075	5	75-138	≤25	n/a
Ethyl Benzene	0.063	10	50-150	≤25	n/a
m,p-Xylene	0.125	20	50-150	≤25	n/a
Naphthalene	0.205	1	54.7 - 151	≤20	n/a
o-Xylene	0.078	10	50-150	≤25	n/a
tert-Butyl Methyl Ether	0.057	1	55.4 - 146	≤20	n/a
Toluene	0.045	10	71-122	≤25	n/a
Gasoline Range Hydrocarbons by NWTPH-Gx (mg/kg)					
Gasoline Range Hydrocarbons	0.487	3	50-150	≤25	n/a
Diesel Range Hydrocarbons by NWTPH-Dx (mg/kg)					
Diesel Range Hydrocarbons	3.93	25	75.5-122	≤12	n/a
Lead by EPA 200.8					
Lead	0.0252	0.5	80-120	11	n/a

Notes:

(A) = Based on current laboratory control criteria. Some values may vary slightly between instruments and can be subject to change as the laboratory updates the charted values periodically.

%R = Percent recovery

LCS/LCSD = Laboratory control samples and laboratory control sample duplicate

MDL = Method detection limit

mg/kg = milligram per kilogram

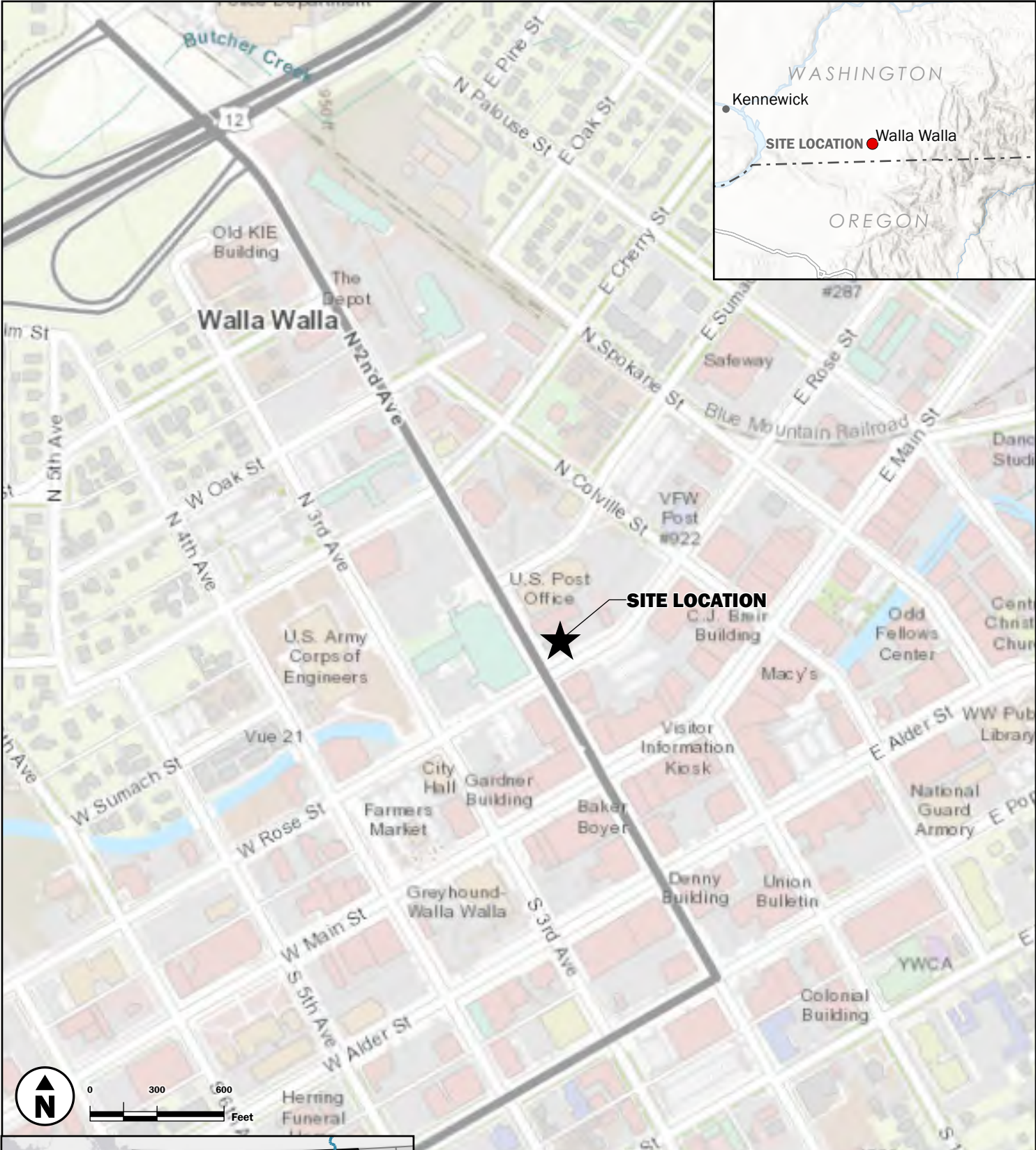
MRL = Method reporting limit

n/a = not applicable


RPD = Relative percent difference

ug/kg = microgram per kilogram

FIGURES

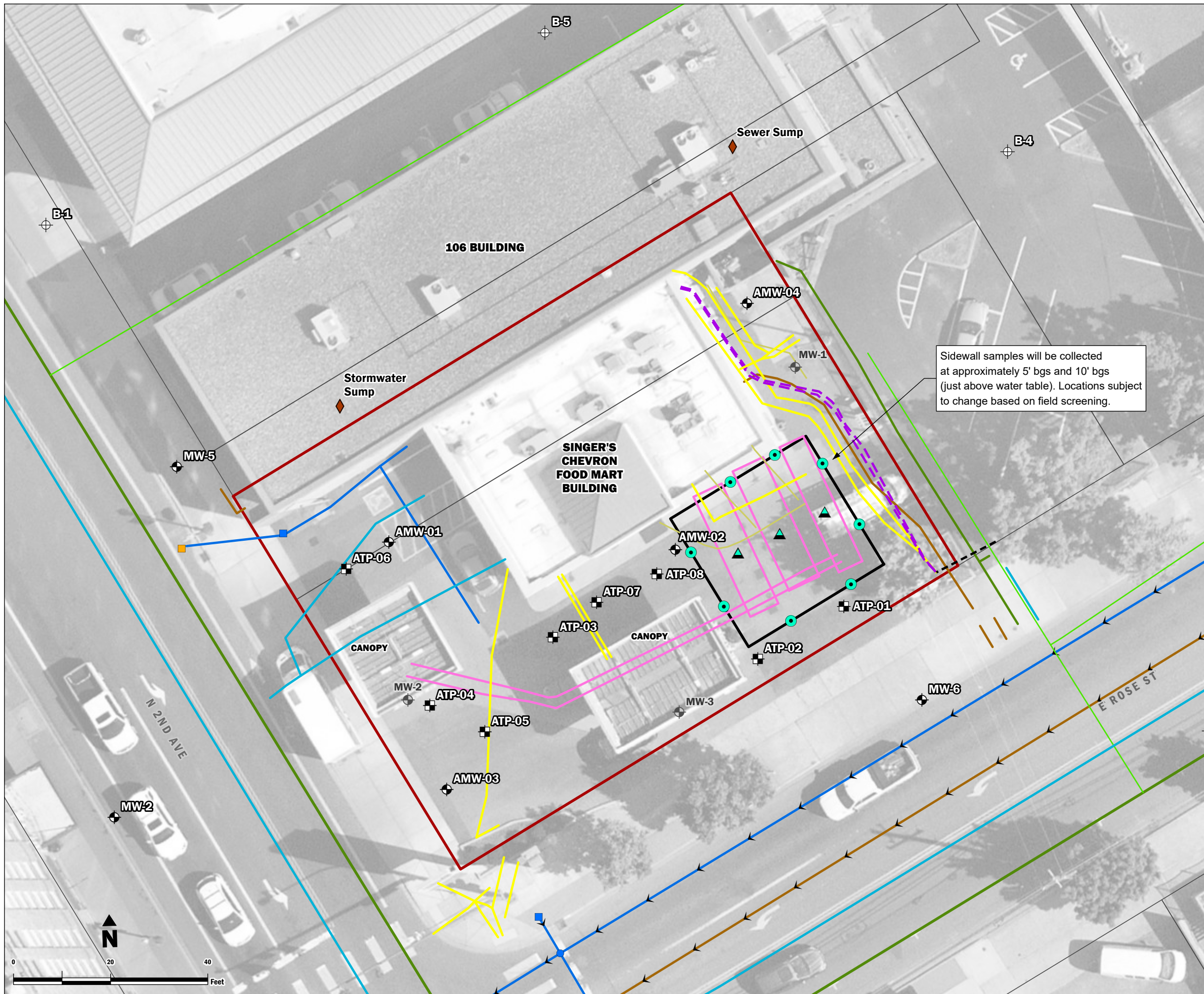


Site Location Map
Stillwater Holdings Chevron
Walla Walla, Washington

	FEB-2024	BY: STM / HMD	FIGURE NO. 1
	PROJECT NO. 230442	REVISED BY: --- / ---	

Data source credits: None | Basemap Service Layer Credits: City of Walla Walla, Bureau of Land Management, State of Oregon, State of Oregon DOT, State of Oregon GEO, Esri Canada, Esri, HERE, Garmin, INCREMENT P, USGS, EPA, USDA, City of Walla Walla, Oregon State Parks, WA State Parks GIS, Esri, TomTom, Garmin, FAO, NOAA, USGS, Bureau of Land Management, EPA, NPS, USFWS, Esri, USGS, Esri, HERE, Garmin, USGS, EPA, NPS

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- Proposed Excavation Side Sample
- ▲ Proposed Excavation Bottom Sample
- Test Pit
- ⊕ Boring
- ◆ Monitoring Well
- ◆ Decommissioned Monitoring Well
- ◆ Sump
- Storm Manhole
- Catch Basin
- Bubble Up Catch Basin
- Sewer Line
- Storm Line
- Water Line
- Gas Line
- Petroleum Line
- Electrical Line
- Telephone Line
- - - Overhead Power Line
- Unknown Buried Utility
- - - Limits of Temporary Shoring
- ▭ Approximate Property Boundary
- ⊕ Walla Walla Tax Parcel

- Notes:
- On-property utility locations from 1/22/2024 survey provided by PBS Engineering and Environmental.
 - Off-property utility locations approximate from map provided by the City of Walla Walla.
 - Monitoring Well locations from survey provided by PBS Engineering and Environmental.
 - Decommissioned monitoring well locations approximate from Plateau Geoscience Group Quarterly Monitoring Report, Sept 2012.
 - Sump locations approximate from map provided by Clean Harbors.
 - Parcel boundaries from County of Walla Walla GIS.
 - Mill Creek boundary from WADNR GIS.

Site Map Showing Proposed Compliance Monitoring Locations
Stillwater Holdings Chevron
Walla Walla, Washington

Aspect CONSULTING	APR-2024	BY: DIM / NLK	FIGURE NO. 2
	PROJECT NO. 230442	REVISED BY: ---	

ATTACHMENT A

Field Forms



Sample ID: _____

GROUNDWATER SAMPLING RECORD

WELL NUMBER: _____

Page: ___ of ___

Project Name: _____

Project Number: _____

Date: _____

Sampled by: _____

Measuring Point of Well: NTOC

Screened Interval (ft. bgs) _____

Filter Pack Interval (ft. bgs) _____

Casing Volume _____ (ft Water) x _____ (L/ft) = _____ (L)

Casing volumes: 3/4" = 0.09 L/ft 2" = 0.62 L/ft 4" = 2.46 L/ft 6" = 5.56 L/ft

Starting Water Level (ft TOC): _____
Sample Intake Depth (ft TOC): _____
Total Depth After Sampling (ft TOC): _____
Casing Diameter (inches): _____

WELL CONDITION

Vault Condition: _____ Well Sealed? _____ Lock Present? _____

Standing Water in Vault? _____ Ecology Well Tag Present (and Number if yes)? _____

PURGING MEASUREMENTS

Stabilization Criteria (for 3 consecutive readings):		Typical 0.1-0.5 Lpm	Stable (<0.3 ft target)	na	± 3%	± 10% (or ± 0.5 mg/L if < 1 mg/L)	± 0.1	± 10 mV	± 10% (or 3 successive < 10 NTU)	
Time	Cumul. Volume (L)	Purge Rate (mL/min)	Water Level (ft)	Temp. (°C)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	pH	ORP (mv)	Turbidity (NTU)	Comments

Total Liters Purged: _____ Total Casing Volumes Removed: _____ Ending Water Level (ft TOC): _____

SAMPLE INVENTORY

Time	Volume	Bottle Type	Quantity	Filtration	Preservation	Appearance		Remarks
						Color	Turbidity & Sediment	

METHODS

Parameters measured with (instrument model & serial number): _____

Purging Equipment: _____ Decon Equipment: _____

Disposal of Discharged Water: _____

Observations/Comments: _____

