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Subject: Work Plan for Limited Excavation and In-Situ Remediation – *Revision 1*
Former McGaffick Service – 1020 N Last Chance Gulch, Helena, Montana 59601
DEQ FID 25-01709 *(TID 23433)*; Release 0656; WPID 35083
AWS Project 20025.2

Air Water Soil, LLC (AWS) is pleased to present this work plan for limited remedial excavation and in-situ remediation activities at the *Former McGaffick Service* petroleum release site (hereafter, "the site"). The site is located at 1020 N Last Chance Gulch in Helena, Montana (Figures 1 and 2, Attachment A). The work plan has been prepared on behalf of Stockman Bank of Montana (Stockman Bank), the property owner and "responsible party" of record for the release, in response to the Montana Department of Environmental Quality (DEQ) Petroleum Tank Cleanup Section (PTCS) letter to Stockman Bank titled *Work Plan Requested to Cleanup Petroleum-Contaminated Media*, dated August 13, 2025.

This *Revision 1* version of the work plan has been prepared to incorporate comments and clarifications requested by DEQ PTCS following their preliminary review of the original work plan document, which was dated October 10, 2025.

BACKGROUND

Background information pertinent to this work plan is presented below in a *Release History* subsection and a *Planned Development* subsection.

Release History

AWS's understanding of the history of the petroleum release at the site and remedial activities completed at the site prior to 2021 is based primarily on information aggregated by the previous consultant, CTA Environmental (CTA), and subsequently made available to AWS. Information provided to AWS through CTA included historical reports prepared by other previous consultants (ca. 1991 and 2007) and made available to CTA by DEQ. Additional information has also been provided by Stockman Bank and their architect, Cushing Terrell, including a *Geotechnical*

Investigation Report, dated August 18, 2025, prepared by Tetra Tech for Stockman Bank, in support of their planned site redevelopment.

The petroleum release site is identified as the *Former McGaffick Service (a.k.a. McGaffick's Auto Center); DEQ Facility ID 25-01709; Release 0656*. The site was undeveloped prior to approximately 1950; however, a previous owner had fill material placed at the site from approximately 1930 to 1950 in anticipation of future development. The site was developed as the George McGaffick's Husky service station (including retail petroleum sales) and bulk petroleum distributing plant in 1951. Bulk plant operations ceased in 1975, and retail gasoline operations ceased in 1987. Automobile service operations also resulted in the generation of waste oil and the use of solvents at the site.

In addition to the Former McGaffick Service petroleum release site building (also referred to by Stockman Bank and Cushing Terrell as the "Muffler Shop" building), Stockman Bank also owns the properties adjoining the site to the south (the Former Stockman Insurance building) and to the west (the Stockman Bank building). Stockman Bank has initiated redevelopment of the 3 adjoined properties into a single property with a new bank building, as discussed in more detail below. The former and existing building names used by Stockman Bank and Cushing Terrell are shown on site Figures 2 through 4 (Attachment A) and will be used hereafter, where applicable, for consistency among site redevelopment project stakeholders. Likewise, references to "the site" may also include the overall property (i.e., all 3 adjoined parcels), for simplicity.

In total, 12 underground storage tanks (USTs) have been identified as having been in service at the site from approximately 1951 through 1987; 3 were removed from the ground in 1988, and 9 were "closed in place" in 1986/1991:

- 3 – 10,000-gallon USTs at the SW corner of site; contents not listed but presumed to be gasoline. Understood to be associated with bulk plant operations. Taken out of service in 1975. Closed in place (filled with sand) in 1986. No leaks or problems were reported or known for these USTs.
- 4 – 8,000-gallon USTs at the SW corner of site; contents not listed but presumed to be gasoline. Understood to be associated with bulk plant operations. Taken out of service in 1975. Closed in place (filled with sand) in 1986. No leaks or problems were reported or known for these USTs. *Note – In correspondence with CTA dated April 21, 2020, DEQ's UST Management program indicated that 1 of these tanks had never been registered with DEQ and would need to be registered prior to being removed. This is understood to likely be the result of an historic clerical error/oversight.*
- 1 – 1,000-gallon diesel UST at N/center of site. This tank was converted to storage of unleaded gasoline with alcohol (aka "gasohol") in December 1984. The tank was determined to be leaking based on tank inventories in early 1985, with the last gasohol being added on February 8, 1985. Tank volume measurements from January 13 to March 7, 1985, indicate a loss of approximately 350 gallons (of gasohol) during that period. The amount of diesel lost prior to the conversion is unknown. Closed in place (filled with sand) in 1986.

- 2 – 3,000-gallon USTs near NE corner of site – supplied dispensing islands. Contents were noted to have included leaded and unleaded gasoline as of 1985. Failed tank and line pressure testing in 1988. Removed from the ground in 1988. "Limited" soil contamination observed around tanks and piping during removal. Leaks were inferred to be primarily from pipe joints.
- 1 – 4,000-gallon UST near the NE corner of site – supplied dispensing islands. Contents were noted to have included leaded gasoline with alcohol (aka "regahol") as of 1985. Failed tank and line pressure testing in 1988. Removed from the ground in 1988. "Limited" soil contamination observed around tanks and piping during removal. Leaks were inferred to be primarily from pipe joints.
- 1 – 3,000-gallon waste oil UST at/under SW corner of the muffler shop building. Closed in place (filled with grout) in 1991. Closure soil samples were collected from a test pit (south) and a soil boring (north) adjacent to the tank; results indicated the waste oil tank had not leaked. Waste oil was reportedly burned in an on-site waste oil burner, along with solvents from a recirculating wash bin. Solvents from an on-site parts washer may have been mixed with waste oil in the UST while it was in service.

Based on the information presented above, it is understood tanks associated with the confirmed petroleum release at the site (DEQ *Release 0656*) include the following:

- 1 – 1,000-gallon diesel UST at N/center of site (closed in place in 1986). Unleaded gasoline/alcohol release confirmed; diesel release presumed.
- 2 – 3,000-gallon gasoline USTs at NE corner of site (removed in 1988). Leaded and unleaded gasoline releases confirmed.
- 1 – 4,000-gallon gasoline UST at NE corner of site (removed in 1988). Leaded gasoline/alcohol release confirmed.

Findings from the 1991 investigation indicated petroleum-contaminated soil was present from approximately 6 to 14.5 feet below ground surface (bgs) in the excavation backfill area proximate to the 3 gasoline USTs which were removed in 1988.

Petroleum-contaminated soil, abandoned piping, and miscellaneous debris were present below approximately 4 feet bgs in a test pit advanced proximate to the diesel UST as part of the 1991 investigation. The findings of the report indicated the leak appeared to have been associated with piping, and that the impacts began to decrease below approximately 6 feet bgs, although excavation refusal was met at 9 feet bgs due the presence of granitic boulders. *Notably, debris in the test pit near the former diesel UST was believed to have been associated with the historic Helena landfill, which formerly covered an approximately 25-acre area adjoining (and possibly impinging upon) the site to the north*.

Laboratory analysis of soil samples from borings and a test pit proximate to the 7 large (8,000- and 10,000-gallon) bulk plant USTs and the 3,000-gallon waste oil UST along the W/SW portion of the site did not reveal substantial evidence of petroleum impacts, although field screening results from 1 sample taken at approximately 18.5 feet bgs near the middle of the tank basin were somewhat high: 1,750 parts per million (ppm) total volatile organic compounds (VOCs). The bottoms of the tanks in the test pit along the south end of the tank basin were reported as being approximately 13 to 17 feet bgs. Groundwater was not encountered during the 1991 investigation. A soil vapor extraction (SVE) system was also reportedly installed and operated as part of the 1991 investigation. A 1991 diagram shows 1 extraction well proximate to the 1988 gasoline UST excavation area and 1 extraction well proximate to the diesel UST/dispenser area. Records are not available regarding the operational history of this system, so it is unknown how long it operated, or how effective it was.

Soil boring and test pit logs from the 1991 investigation indicate sandy gravel extends from near the surface to depths of up to 19 feet bgs. However, "granite boulders overlying hard material" were reportedly encountered at depths as shallow as 9 feet bgs, limiting the depth of investigation when encountered. Additionally, debris observed in a test pit along the north side of the site was inferred to be potentially related to the former Helena landfill north of the site.

During the 2007 investigation, 4 soil borings were advanced at the site for the purpose of installing groundwater monitoring wells. Air rotary drilling was used during this investigation, and subsurface soils to depths of up to 60 feet bgs were reported to include a mixture of clay, sand, and gravel – all with boulders. The 2007 report notes that steel casing was driven to depths of approximately 18 feet bgs, followed by drilling and additional placement of casing as discussed below.

Although well logs were not provided by DEQ and were not available from the Montana *Ground-Water Information Center (GWIC)* website, the 2007 report provides a verbal description of well completions. Well MW-1 was drilled to 60 feet bgs, and a depth to water of 39.4 feet was recorded. Subsequent wells were drilled to approximately 50 feet bgs. Steel casing, 6 inches in diameter, was set in each boring, with perforations from approximately 25 to 45 feet bgs (MW-1) and 20 to 40 feet bgs (MW-2, MW-3, and MW-4). All wells were completed as 2-inch monitoring wells, with well screen installed within the perforated steel casing intervals for each. Bentonite seals were placed above and below the screened sections. The approximate locations of the wells were as follows:

- MW-1: S/SE end of site.
- MW-2: N/NE corner of site, proximate to the 1988 UST excavation area.
- MW-3: N/NW corner of site, west of the diesel UST area; and,
- MW-4: W/central portion of site, in the midst of the bulk plant UST basin.

Groundwater monitoring was conducted in March 2007. Groundwater was reported to occur at depths ranging from approximately 37 feet bgs (SE) to 31 feet bgs (NW), with an inferred flow direction across the site from SE to NW. Analysis of samples collected in March 2007 indicated then-current regulatory criteria were exceeded for several petroleum analytes in samples from wells MW-2, MW-3, and MW-4. Petroleum constituents were present in the sample from MW-1, but at concentrations below then-current regulatory criteria. Wells MW-2 and MW-3 were impacted with both gasoline and diesel constituents, while MW-4 appeared to be impacted primarily by gasoline constituents. It was noted that the drilling method (air rotary) typically results in a “halo effect” which is understood to frequently result in groundwater being initially contaminated by petroleum-impacted soil during the drilling process; subsequently, future monitoring events were expected to show lower petroleum constituent concentrations. It should also be noted that the 2007 investigation did not include evaluation of “lead scavengers” in groundwater samples.

In August 2020, DEQ requested a work plan for additional remedial investigation at the site. Following subsequent coordination between CTA and DEQ regarding the scope of work, CTA issued a work plan in September 2020. The scope of the work plan included completion of a limited well assessment and UST inventory, along with groundwater monitoring. DEQ approved the work plan in October 2020, but the work was not completed by CTA. Stockman Bank retained AWS in February 2021 to implement the work plan. The limited well assessment and tank inventory were completed during March 2021. The UST summary presented above reflects the findings of the tank inventory.

Monitoring wells MW-1, MW-2, and MW-3 were located and determined to be serviceable, although the well protectors for MW-2 and MW-3 were damaged. Petroleum odor was noted in wells MW-2 and MW-3, and approximately 0.02 foot of free-phase petroleum product (“free product”) was observed on top of the water table at MW-3. Well MW-4 could not be located or sampled and is believed to be potentially covered or possibly destroyed.

AWS completed a groundwater monitoring event at the site during April 2021. At that time, approximately 0.73 foot of free product was observed in well MW-2, and 0.03 foot of free product was observed in well MW-3. Groundwater monitoring was completed, with water samples being collected from well MW-1 and MW-3; a water sample was not collected from well MW-2. Analytical data indicated no exceedances of DEQ regulatory criteria in MW-1, but the sample from MW-3 exceeded regulatory criteria for benzene and volatile petroleum hydrocarbon (VPH) fractions. Laboratory analysis of a sample of the free product from well MW-2 indicated the product resembled a mixture of diesel fuel (80%) and gasoline (20%).

During late June 2021, AWS completed an additional free product bail down/recovery test for wells MW-2 and MW-3, following approval from DEQ. The free product thicknesses were generally consistent with observed in April 2021. Low transmissivity was calculated for each well, indicating passive or intermittent manual free product recovery would be the most feasible approach to recovering free product from the wells.

In May 2023, Stockman Bank and Cushing Terrell indicated to AWS that site redevelopment plans were moving forward. At the request of Stockman Bank, AWS coordinated with DEQ regarding appropriate next steps for investigation of the petroleum release, with consideration given to planned site redevelopment. DEQ requested a remedial investigation work plan, and AWS prepared and implemented the work plan on behalf of Stockman Bank.

Soil contamination across the site was evaluated through a combination of 30 direct-push and 4 hollow-stem auger (HSA) / overburden drilling excentric (ODEX) soil borings during July and

August 2023. New monitoring wells MW-5 and MW-6 were installed in 2 of the HSA/ODEX borings.

Several other investigation and remediation activities were conducted during late 2023 and early 2024. A site-wide well assessment resulted in the rediscovery of existing monitoring well MW-4 and completion of minor well protector repairs to several existing wells in September 2023. A passive product recovery canister (PRC) was deployed in well MW-2 during September, October, and November 2023, resulting in the recovery of approximately 1.2 gallons of light non-aqueous phase liquid (LNAPL, aka "free product"). Groundwater monitoring was completed at the site during October 2023 and February 2024, including fluid level gauging and collection of samples from all 6 site wells.

Findings from the remedial investigation activities conducted during 2023 and 2024 were presented in AWS's May 28, 2024, *Report of Remedial Investigation*. The investigation included sufficient soil boreholes to generally define the extent of soil and groundwater impacts below the site and indicated that soil had been impacted by both diesel and gasoline.

Planned Redevelopment

Stockman Bank, with the assistance of Cushing Terrell, subsequently undertook additional subsurface investigations at the site for the purpose of redevelopment planning, including completion of sonic drilling in fall 2024. Stockman Bank requested AWS oversee sonic drilling, including advancement of select borings at locations which had encountered previous direct-push drilling refusal. The intent was to evaluate the nature and size of boulders in the subsurface. AWS's observations were summarized in a November 21, 2024, *Report of Fall 2024 Sonic Drilling Observations*. Although the sonic drilling investigation was not requested by DEQ, a copy of AWS's report was provided to DEQ for their review and consideration.

Stockman Bank retained Tetra Tech to perform a geotechnical investigation of the overall redevelopment property (all 3 adjoined parcels) during summer 2025. AWS was not present during the geotechnical investigation but was able to review preliminary geotechnical soil boring logs. Observations and field screening data relating to suspect petroleum contamination were generally consistent with previous subsurface investigation findings at the site, including the reported occurrence of free product in geotechnical boring BH-02, located proximate to and southeast of monitoring well MW-2.

Petroleum impacts to soil were confirmed within approximately 10 feet of the surface near the northwest portion of the site, between the bulk gasoline UST basin and the existing Stockman Bank building, with direct-push boring SB-21. Contaminated soil was also observed variously along the bulk gasoline basin, at depths below 15 feet bgs, in direct-push borings SB-25, SB-26, and SB-27. HSA/ODEX boring SB-B and sonic drilling borings DH-3 and DH-4 also provided evidence of contaminated soil near the northeast corner of the site, proximate to the closed-in-place diesel UST and the former/removed gasoline USTs, at depths below approximately 18 feet bgs. Information provided on the boring logs for geotechnical boring BH-02 and BH-03 indicates petroleum contamination in these areas may extend to depths of at least 40 feet bgs. Soil from the interval of 30 to 35 feet bgs in HSA/ODEX boring SB-A also provided evidence of petroleum contamination north/northeast of the former Muffler Shop building.

Steel tanks within the bulk gasoline UST basin along the west side of the former Muffler Shop were inadvertently punctured by direct-push boring SB-28 and geotechnical boring BH-01. In both cases, sand exhibiting strong petroleum odors was encountered inside the tanks. Based on these observations, it is assumed similar conditions exist within all closed-in-place USTs.

The former Muffler Shop and former Stockman Insurance buildings were demolished in summer 2025 (shortly before the Tetra Tech geotechnical investigation), and the remaining Stockman Bank building is scheduled to be demolished in April 2026. Redevelopment of the overall site (including all 3 current parcels) is expected to commence directly afterward, including excavation of the site to allow for construction of the new bank building. The new building will cover a large footprint, extending across portions of all 3 current parcels, and will include 2 “basement” parking levels.

The lowest level (Basement B2 Level) is expected to be constructed at an elevation of 3,994 feet above mean seal level (ft amsl). For comparison, the current surface elevation of existing well MW-1 (generally the highest point of the *Former McGaffick Service* parcel) is approximately 4,014 ft amsl, while existing well MW-6 (generally the lowest point on the *Former McGaffick Service* parcel) has a surface elevation of 4,005 ft amsl. Accordingly, redevelopment is expected to include excavation of the site to depths of approximately 20 to 25 feet below the current surface along the east side of the site (i.e., along North Last Chance Gulch). Excavation along the west edge of the site (between the current Stockman Bank building and the former Muffler Shop building) is expected to be to depths of approximately 10 to 15 feet below the current surface.

Based on available depth to water data, groundwater at the site has been observed to occur at approximately 3,979 ft amsl (i.e., roughly 15 feet below the planned Basement B2 Level floor elevation), with a general direction of flow toward the northwest. AWS conducted aquifer testing at the site in August 2025 to determine representative parameters of the aquifer. Data analyses have yielded representative values for the aquifer hydraulic conductivity. These values will be used to create design models for future aquifer pumping systems expected to be utilized for in-situ remediation following completion of site redevelopment.

For ease of reference, a brief summary of approximate elevations of key existing and planned site features is presented below, in order of descending elevations:

- Existing ground surface at southeast corner (near MW-1): 4,014 ft amsl
- Existing ground surface at northwest corner (near MW-6): 4,005 ft amsl
- Planned Basement B2 Level Floor Slab: 3,994 ft amsl
- Existing groundwater surface (average): 3,979 ft amsl
- Diorite bedrock surface at center of site (near BH-05): 3,969 ft amsl
- Diorite bedrock surface at northeast corner of site (near BH-02): 3,965 ft amsl

Planned redevelopment will provide some opportunities for remediation, and it will also provide some challenges. Opportunities include removal of potential source materials (i.e., remaining USTs and petroleum impacted soil). Challenges include limitations on future remedial activities following construction of the new site structure. More specifically, since the new building will extend over nearly the entire surface of the overall property, any remediation infrastructure and/or monitoring wells will need to be planned for and installed during construction of the new building. Additionally, Cushing Terrell indicated to AWS that driving lanes of adjacent roadways cannot be closed to facilitate construction, further limiting the option of placing new wells after construction.

Final construction bid documents are currently scheduled for issuance by Cushing Terrel in January 2026, and the plan for and design of these elements will need to be included in the project bid documents at that time.

OBJECTIVES

Following review and discussion of available information with DEQ PTCS, as summarized in the Background section above, AWS submitted an email to DEQ PTCS in August 2025 summarizing remedial activities expected to be required/warranted as part of Stockman Bank's planned site redevelopment. DEQ PTCS subsequently issued an August 13, 2025, *Work Plan Requested to Cleanup Petroleum-Contaminated Media* to Stockman Bank for the release at the site.

The primary objectives identified in the work plan request letter were generally consistent with AWS's expectations, including: remove remaining USTs at the facility; cleanup of petroleum contamination associated with the release to the extent practicable via soil excavation; evaluate cleanup results with monitoring events for groundwater and soil; design and implement a remediation system; evaluate the status of petroleum-contaminated media associated with the release via groundwater monitoring; and, prepare a release closure plan to identify and propose additional work needed to resolve the release.

With consideration given to available information and DEQ PTCS's requirements as discussed above, AWS presents the following objectives for this corrective action ("cleanup") work plan:

- **Monitoring well abandonment**
  - All 6 existing site monitoring wells are expected to be demolished during the course of planned site redevelopment activities.
- **UST removal**
  - The 9 remaining (closed-in-place) USTs will be physically removed from the ground. All 9 of these tanks are believed to have been closed in place by backfilling with sand. Unfortunately, due to an apparent administrative oversight back in 1986, documentation of closure is only available for 8 of these tanks. As a result, a new UST program tank closure permit will be required for removal of 1 of these tanks. However, the physical process is expected to be the same for all 9 tanks, and it is unlikely to be feasible to identify which of the 9 tanks will be associated with the new closure permit.

- **Opportunistic remedial excavation of petroleum-impacted soil**
  - Petroleum-contaminated soil is expected to be encountered adjacent to and beneath the remaining and removed UST locations (including along the west side of – and potentially beneath portions of – the former Muffler Shop building); along the north edge of the site; and near the northeast corner of the site.
  - Excavation may be completed to depths greater than the planned new building foundation excavation, if feasible. However, AWS anticipates complete remedial excavation of petroleum-impacted soil will be infeasible due to physical limitations (e.g., protection of adjacent roadways and/or other structures, excavation safety, etc.). As a result, residual petroleum-impacted soil is expected to remain along and beneath portions of the new building foundation.
  - In order to protect the structural integrity of adjoining roadways, AWS understands shoring will be placed along the perimeter of the property boundary. Cushing Terrell indicated pile will be placed inside borings, which will result in the generation of petroleum-impacted soil cuttings in some locations.
  - The current construction plan for the new building involves installation of concrete foundation piers. Petroleum-impacted soil cuttings are expected to be generated from the drilling of holes required for the piers (i.e., at depths lower than the planned Basement B2 Level elevation)
  - Waste characterization sampling and analysis is anticipated to be required for disposal of excavation and shoring/piers cuttings soil.
- **Remedial System Design and Installation**
  - AWS anticipates post-construction, in-situ remediation will be required. Development of the design will be part of the upcoming work but is tentatively expected to include the following general elements:
    - Sub-slab vapor barrier and vapor mitigation piping, to be placed beneath the Basement B2 Level of the new structure, under the occupied portions of the new building. The vapor mitigation system will also provide soil vapor extraction for soil remediation in the vadose zone, including after groundwater draw-down from total fluids recovery.
    - New wells within the new building footprint (accessible from the Basement B2 Level of the new structure), and 2 new wells outside the new building footprint (in a planned landscaped area at the northeast corner of the site). The wells will be designed for potential use as extraction, injection, and/or monitoring of groundwater.
    - Total fluids recovery, with some combination of LNAPL separation/disposal, on-site water treatment, and reinjection to the aquifer.
- **Groundwater Monitoring**
  - Numbers and locations of wells to be monitored – and the intervals of monitoring – may be modified based on review of data generated during completion of this work plan. As noted above, new wells will be constructed to facilitate use for extraction, injection, and/or monitoring, depending on the phase of remediation (and in coordination with DEQ PTCS).

- **Corrective Action ("Cleanup") Report Preparation**
  - The cleanup report will be prepared in accordance with DEQ's report format requirements and will document results of remedial activities included in the proposed scope of work.

AWS anticipates providing select information relating to the corrective action scope of work to Cushing Terrell for their inclusion in the overall redevelopment project construction bid documents. The construction bid documents will be used to solicit, select, and retain a redevelopment project contractor. Implementation of select remedial services which may otherwise be subcontracted by AWS will instead be included in the scope of work for the redevelopment construction project contractor. This will likely include drilling and well installation, as well as plumbing and electrical services relating to installation of remedial system components.

As a result of the arrangement described above, AWS's cost estimate included with this work plan includes placeholder estimates for these services, but it does not include bids. Instead, it is anticipated these costs will be included in an *Alternate Bid* package of the overall redevelopment construction project bid documents. Assuming this to be the case, bids for these select remedial services are expected to be available for separate (later) submission to DEQ PTCS and PTRCB, rather than with this work plan.

SCOPE OF WORK

In order to achieve the project objectives identified above, AWS has prepared the scope of work for this work plan to include the tasks discussed below. Note that some tasks included in AWS's overall project scope of work are not under the purview of the DEQ PTCS and are therefore not part of the scope of work directly related to this work plan. In the interest of task-naming continuity regarding the overall project scope of work AWS is completing on behalf of Stockman Bank, all tasks are listed here. Tasks which are not under the purview of DEQ PTCS are clearly identified below (labeled "*Not required by PTCS*"), and the scope of work and costs for such tasks may not be discussed in detail within this work plan.

With consideration given to the above, AWS's overall project scope of work is expected to include the following 18 tasks: 1) Preliminary Coordination; 2) Aquifer Testing; 3) Work Plan Preparation; 4) Project Management; 5) Remediation System Design; 6) Mobilization; 7) Per Diem and Lodging; 8) Monitoring Well Abandonment; 9) UST Removal and Permitted UST Closure; 10) Opportunistic Remedial Excavation; 11) Soil Borings and New Well Installation; 12) New Well Development; 13) Groundwater Monitoring; 14) Remediation System Installation and Operation; 15) Laboratory Analyses; 16) Data Validation Summary Form Preparation; 17) Release Closure Plan Update; and 18) Corrective Action ("Cleanup") Report Preparation.

Select previous, existing, and proposed site structures or features referenced below are illustrated on Figures 3 and 4, which are presented in Attachment A. Implementation of the scope of work will be accomplished following a combination of AWS's Standard Operating Procedures (SOPs) and additional methods discussed below, where applicable. SOPs referenced in this work plan are presented in Attachment B.

AWS's standard task naming for petroleum release projects is intended to generally align with the PTRCB's approach to task naming. Tasks included in this work plan are presented generally in chronological order, starting with tasks which have already been or are currently being completed. Proposed tasks are presented thereafter, generally following the anticipated order of completion.

AWS anticipates Stockman Bank will request initiation of this scope of work as soon as feasible following approval by DEQ, but likely prior to PTRCB's review and issuance of a funding obligation letter. Accordingly, AWS anticipates utilizing the task names as shown in this work plan, even though the PTRCB may reassign some tasks – or portions of tasks – to different task identifiers for their own purposes.

Task 1 – Preliminary Coordination (*Not Required by PTCS*)

Prior to and during preparation of this work plan, AWS has completed a variety of preliminary coordination and planning efforts. These included correspondence with Stockman Bank, Cushing Terrell, DEQ, and PTRCB regarding project status, site logistics, potential work plan elements and preliminary costing approaches, anticipated schedules, and preliminary building design and potential remediation system configurations. Preliminary evaluation of aquifer testing data, necessary to guide preliminary well field design and subsequent selection of proposed new well locations, was also completed as part of this sub-task.

While a necessary component of planning for the overall project and preparation of the work plan, the elements of Task 1 were not directly required by DEQ PTCS. Additionally, a substantial portion of Task 1 had to be completed prior to preparation and subsequent DEQ approval of this work plan. Accordingly, Task 1 costs are understood to be ineligible for PTRCB reimbursement and have therefore been excluded from the work plan and cost estimate.

Task 2 – Aquifer Testing (*Not Required by PTCS*)

As noted in the Background section above, AWS's aquifer testing scope of work was completed prior to preparation of this work plan (in August 2025) to determine representative parameters of the aquifer. Representative values for the aquifer hydraulic conductivity were determined through analysis of aquifer testing data and will be used to create design models for future aquifer pumping systems expected to be utilized for in-situ remediation following completion of site redevelopment.

Costs associated with Task 2 have been excluded from this work plan and cost estimate for the same reasons noted in Task 1 above.

Task 3 – Work Plan Preparation

This work plan has been created to satisfy the requirements stipulated in DEQ's November 2020 *Montana Cleanup Guidance for Petroleum Release* work plan format. Additionally, the general scope of work presented herein is intended to address the objectives stated in DEQ's work plan request letter and subsequent correspondence, as discussed in the Objectives section above. The approach to cost estimating used in preparation of this work plan and associated cost estimate, as discussed in the Objectives section above, was coordinated with DEQ PTCS and PTRCB prior to preparation of the work plan.

DEQ PTCS indicated general agreement with the proposed approach in an email dated September 8, 2025. PTRCB provided comments in email correspondence dated October 6, 2025, including a general summary of activities which PTRCB staff would consider ineligible for reimbursement.

Task 4 – Project Management

Project management activities include correspondence with project stakeholders (e.g., Stockman Bank, Cushing Terrell, construction contractors, DEQ staff, PTRCB staff, etc.) throughout the period of performance; coordination with US Environmental Protection Agency (EPA) Region 8 personnel and subsequent preparation and submission of a Class V Injection Well Notification; scheduling AWS's field personnel and coordinating schedules for on-site activities with stakeholders; preparation of a project-specific health and safety plan (HASP); procuring and coordinating equipment, supplies, and subcontracted and vendor services as necessary to complete the scope of work; and, project budget tracking and invoicing.

Task 5 – Remediation System Design

Although the overall conceptual design of the remediation system expected to be employed at the site was developed as part of the preliminary coordination discussed in Task 1, AWS will not complete the actual system design until this work plan has been approved by both Stockman Bank and DEQ PTCS.

For the purpose of this work plan, the general configuration of the remediation system is expected to consist of the following primary elements:

- A "passive" soil vapor extraction (SVE) system is expected to be installed beneath a portion of the Basement B2 Level floor which underlies the occupied portion of the new building. This is likely to include screened polyvinylchloride (PVC) piping and vapor barrier materials placed generally beneath the shaded area indicated in Figure 4. Although the system will be installed to allow passive release of vapors from the subsurface, it will be configured to facilitate later conversion to an active SVE system, if warranted. Routing of screened piping, manifolds, and exhaust piping, and a potential location for a future SVE blower, are unknown at this time.
- A room along the north edge of the Basement B2 Level is expected to be available for use as a "remediation room." Remediation equipment and control devices are expected to be located in the remediation room. Due to the potential for explosive vapors which may be generated from remediation equipment, intrinsically safe electronic circuits and ventilation are expected to be required in this room.
- As discussed in Task 11 below, select proposed new wells will be connected to the remediation room via laterally placed PVC piping, which will serve as "conduit" lines for later placement of tubing to be used for extraction or injection.

- Submersible low-flow extraction pumps are expected to be deployed in up to 4 of the new wells, likely along the north edge of the site property.
- Free product recovery equipment is expected to be incorporated in up to 4 of the new wells noted above, as appropriate.
- SVE manifold/valve controls, SVE blowers, groundwater pump control equipment, free product recovery receptacles, groundwater treatment equipment (e.g., stripper trays, etc.), day tanks, mixing containers, re-injection pumps, and other remediation system equipment is expected to be located in the remediation room.

Although the remediation system design cannot be completed prior to submission and approval of this work plan, AWS offers the following additional discussion relating to our preliminary expectations for the remediation system:

- The vertical separation between LNAPL observed at the groundwater surface and the anticipated Basement B2 floor is less than the preliminary screening criterion for eliminating petroleum vapor intrusion (PVI) as stated in DEQ's September 2021 Montana Vapor Intrusion Guide. Additionally, soil samples collected at various locations across the site have exhibited Total Purgeable Hydrocarbon (TPH) concentrations exceeding DEQ's PVI screening criterion of 250 mg/kg, which is also established in the 2021 VI Guide.
- Installation of a vapor barrier will help prevent PVI and will continue to be a barrier as long-term recovery of LNAPL is achieved. Additionally, the vapor barrier will help prevent inflow of air from above the Basement B2 Level floor to the sub-slab extraction trenches if the SVE option is implemented.
- At the time of preparation of this work plan, it is unknown whether implementation of SVE will be required. This determination will be made after evaluation of excavation closure soil sample data, initial LNAPL recovery results, and pump and treat efficacy findings. Construction of SVE trenches below the vapor barrier will be convenient – and less costly – if completed during construction of the new building foundation. SVE will be used to address possible residual contaminated soil left behind below the building, as well as to address petroleum impacted soil in the smear zone when the LNAPL recovery and groundwater pumping systems are active. SVE trenches will initially be passive but may be converted to an active vacuum withdrawal system, if needed. Parameters for an active SVE system will be based on future pilot scale testing.
- LNAPL has been observed in existing wells MW-2 and MW-3 and geotechnical borehole BH-02, along the north/northeast portion of the site. Based on these observations, LNAPL is expected to infiltrate planned extraction wells along the north/northwest edge of the new building during groundwater withdrawal due to water table drawdown imparted by pumping. Total fluids recovery (i.e., both LNAPL and groundwater) by dual-phase extraction would not be efficient given the expected low infiltration of LNAPL and groundwater to the new wells. AWS therefore anticipates implementing a combined LNAPL and groundwater recovery strategy using vertically offset, low flow, pnuematic pumps to recover each fluid independently.
- The preliminary expectation is that 2 phases of remedial injections will be needed. The first phase of injections will be utilized to dispose treated groundwater effluent from an air

stripper by upgradient injection of treated water into the aquifer, thereby encouraging flow of contaminated groundwater toward extraction wells. The second phase of injections will entail injecting treated water with supplemental biologicals enhancements. This is expected to be completed in the future, when the groundwater contaminant concentrations no longer degrade by pump and treat methods alone.

As noted in the Objectives section above, AWS anticipates providing select information relating to the remediation design to Cushing Terrell for their inclusion in the overall redevelopment project construction bid documents. The construction bid documents will be used to solicit, select, and retain a redevelopment project contractor. Completion of select portions of the scope of work discussed below (e.g., installation of monitoring wells, placement of SVE components, installation of plumbing and electrical services and components, etc.) which may otherwise be subcontracted by AWS will instead be included in the scope of work for the redevelopment construction project contractor. It may also be important to note that 3-phase electrical service may be required, depending on the selected remediation system configuration.

Decisions regarding implementation of select remediation system elements will be made following review of additional findings during construction, where applicable. For example, the nature and extent of residual petroleum contaminated soil left in place following completion of construction and opportunistic remedial excavation will be considered and may affect the final placement of the vapor barrier and/or SVE extraction piping beneath the foundation, as well as the number, placement, and initial usage of new wells. AWS anticipates discussing such findings, and any applicable recommended changes, with DEQ throughout the construction process.

Task 6 – Mobilization

Mobilization includes labor and vehicle mileage costs for project travel necessary to complete the scope of work. This generally includes AWS personnel's travel to and from the site, as well as preparation time of up to 1 hour per mobilization event, as applicable, per PTRCB's standard reimbursement practice. Mobilization also includes costs for travel between the project site and hotel when overnight stays are required.

Field activities may be combined to reduce mobilization events and costs, where feasible. For the purpose of this work plan, the estimated numbers of mobilization events which may be required to complete the scope of work are summarized below:

- Monitoring Well Abandonment
    - 1 mobilization event (1 preparation; 2 consecutive field day site visits)
    - Staff Engineer/Scientist
- UST Removal (8 previously closed tanks)
    - 1 mobilization event (1 preparation; 3 consecutive field day site visits)
    - Staff Engineer/Scientist
    - Tech II
- Permitted UST Closure (1 permitted tank)
    - 1 mobilization event (1 field day)

  - Project Engineer/Scientist (licensed UST Remover)
  - Tech II
- Opportunistic Remedial Excavation (including waste characterization)
  - 12 mobilization events
  - Staff Engineer/Scientist
- Soil Borings and New Well Installation
  - 4 mobilization events
  - Staff Engineer/Scientist
- New Well Development
  - 2 mobilization events
  - Tech II
- Groundwater Monitoring – Event #1
  - 1 mobilization event (1 preparation; 2 field day site visits)
  - Tech II
- Remedial System Installation
  - 5 mobilization events
  - Principal Engineer/Scientist (3 preparations; 3 field day site visits)
  - Project Engineer/Scientist (2 field day site visits)
  - Staff Engineer/Scientist (2 preparations; 5 field day site visits)
  - Tech II (5 field day site visits)
- Remedial System Operation
  - 15 mobilization events
  - Staff Engineer/Scientist (15 preparations; 15 field day site visits)
  - Tech II (15 field day site visits)
- Groundwater Monitoring – Event #2
  - 1 mobilization event (1 preparation; 2 field day site visits)
  - Tech II
- Groundwater Monitoring – Event #3
  - 1 mobilization event (1 preparation; 2 field day site visits)
  - Tech II

The numbers of mobilization events listed above are estimates. The actual number of mobilizations required to complete the scope of work may be more or less than shown above, based on circumstances and conditions which cannot be predicted at the time of preparation of this work plan.

Task 7 – Per Diem and Lodging

Per diem and lodging costs will be invoiced using PTRCB's daily meal rates and actual hotel costs incurred during completion of the scope of work, per employee. A summary of the per diem and lodging anticipated to be necessary to complete the scope of work is presented below. Per diem and lodging costs account for the mobilization schedule discussed above and are generally based on the same assumptions. The anticipated durations of mobilization events are based on AWS's professional experience and input from subcontractors, where applicable.

- Monitoring Well Abandonment
  - Meals: 1 person, 2 days
  - Lodging: 1 person, 1 night
- UST Removal (8 previously closed tanks)
  - Meals: 2 people, 3 days
  - Lodging: 2 people, 2 nights
- Permitted UST Closure (1 permitted tank)
  - Meals: 2 people, 1 day
  - Lodging: none
- Opportunistic Remedial Excavation (including waste characterization)
  - Meals: 1 person, 10 days
  - Lodging: 1 person, 4 nights
- Soil Borings and New Well Installation
  - Meals: 1 person, 5 days
  - Lodging: 1 person, 3 nights
- New Well Development
  - Meals: 1 person, 2 days
  - Lodging: none
- Groundwater Monitoring – Event #1
  - Meals: 1 person, 2 days
  - Lodging: 1 person, 1 night
- Remedial System Installation
  - Meals: 4 people, 2 days
  - Meals: 3 people, 1 day
  - Meals: 2 people, 2 days
  - Lodging: none
- Remedial System Operation
  - Meals: 2 people, 15 days
  - Lodging: none
- Groundwater Monitoring – Event #2
  - Meals: 1 person, 2 days
  - Lodging: 1 person, 1 night
- Groundwater Monitoring – Event #3
  - Meals: 1 person, 2 days
  - Lodging: 1 person, 1 night

Task 8 – Monitoring Well Abandonment

AWS will coordinate with Cushing Terrell to include guidance in the redevelopment project construction bid documents regarding proper abandonment of the 6 existing wells (MW-1 through MW-6). Abandonment of existing monitoring wells prior to site redevelopment would be impractical, since all existing wells are expected to be demolished during UST Removal and/or Opportunistic Remedial Excavation activities. Instead, AWS anticipates the redevelopment project contractor will be directed to cut off existing well casings proximate to the final excavation depth and properly abandon them at that time.

In practice, the cut-off well casings will likely be temporarily protected at the final excavation depth, followed by in-place abandonment of the remaining well casings via placement of hydrated bentonite or other sealing material. Abandonment will be completed in accordance with the well abandonment requirements set forth in the Administrative Rules of Montana (ARM 36.21.810), by a Montana-licensed monitoring well contractor.

AWS personnel will be present on site to assist the project contractor with location and identification of the monitoring wells prior to development. This will be completed during other on-site work, if feasible. However, a separate mobilization event is anticipated for the purpose of this work plan.

Task 9 – UST Removal and Permitted UST Closure (*not required by PTCS*)

As discussed in the Background section above, there are 4 closed-in-place 8,000-gallon former gasoline USTs located along the northwest edge of the former McGaffick Service building (Figure 2), 1 of which was apparently never registered with the DEQ UST program. Prior to initiation of UST removal activities, Stockman Bank will be required to register this tank, which will hereafter be referred to as the "target UST" for the purpose of this work plan.

Although it is unknown which of the 4 tanks was previously unregistered, AWS will coordinate with DEQ UST and Stockman Bank to ensure the target UST is properly registered. This is expected to require payment of a tank registration fee by Stockman Bank (the cost of which is excluded from this work plan). Once registered, the target UST will need to be removed under a DEQ UST closure permit. AWS will therefore prepare and submit a closure permit application to DEQ UST on behalf of Stockman Bank for the target UST. Removal of the other 8 closed-in-place USTs will not require an additional permit or coordination with DEQ UST, since they have already been documented as "closed-in-place."

Removal of all 9 of the closed-in-place USTs will be completed by the project excavation contractor and overseen by AWS. This includes the target UST and the other 8 USTs which are documented as having been previously registered and closed-in-place. Permitted UST removal activities (i.e., removal of the target UST) will be completed in accordance with the conditions of the DEQ closure permit. For the purpose of this work plan, AWS assumes this will generally include the following: project oversight from AWS's Montana-licensed UST Remover; uncover each of the 8,000-gallon USTs and attempt to identify them by tank tags in order to determine which is the target UST, if feasible; confirm UST system piping was previously removed; confirm the tanks were previously closed by filling with sand; remove residual fuel from the target UST if necessary (i.e., if not previously filled with sand); inert the target UST if necessary (i.e., if not filled with sand); remove the target UST from the ground; decommission the target UST (i.e., make it unusable); remove UST system piping, if necessary; collect UST closure soil samples from beneath the target UST (and from beneath associated piping, if applicable) for field and laboratory analyses.

For the purpose of this work plan, it is assumed target UST system closure will require collection of the following soil and water samples:

- Tank Soil Samples:
  - 2 natural grab samples (1 from each end of the target UST)
  - 1 duplicate sample
- Piping Soil Samples (if present):
  - None anticipated
- Groundwater Grab Samples (if encountered):
  - None anticipated

Soil samples will be collected following the procedures outlined in *AWS SOP-02 – Soil Sample Collection*, including recording the presence or absence of visual and/or olfactory evidence of petroleum impacts. Field splits will be analyzed following *AWS SOP-03 – Field Measurement of Total Organic Compounds* (VOC). Groundwater samples (if applicable) will be collected in accordance with *AWS SOP-06 – Groundwater Sampling*. Reusable sampling equipment will be decontaminated following *AWS SOP-01 – Field Sampling Equipment Decontamination*. Observations, field screening data, and sample locations will be recorded on field forms and a copy of the existing site diagram, as feasible. Samples will be submitted to the analytical laboratory following *AWS SOP-08 – Sample Packaging and Shipping*, and analyses will be completed as discussed in Task 15 below.

It is understood site redevelopment excavation activities will continue immediately following completion of UST removal activities. Backfill of the UST removal excavation area is therefore excluded from this work plan. Since costs relating to the disposal of the tanks and tank-fill materials are deemed ineligible for reimbursement by PTRCB staff, these materials will be segregated and temporarily stockpiled on site for waste characterization prior to disposal. Costs relating to the excavation and disposal of petroleum contaminated soil and excavation fill materials are expected to be eligible for reimbursement and will be temporarily stockpiled at the site for eventual disposal as discussed in Task 10 below. Waste characterization sampling of excavated soil is therefore not anticipated to be required specifically relating to Task 9.

AWS will prepare and submit a brief summary letter report to Stockman Bank and DEQ UST in electronic (PDF) format, documenting completion of on-site target UST closure activities and target UST soil closure sample results. This brief letter report will only be intended to satisfy the UST closure permit requirements and will not be inclusive of all UST removal activities. The final report discussed in Task 18 will include a full summary of all UST removal activities.

DEQ UST has indicated they will request additional post-excavation soil sample data expected to be acquired as part of Task 10 be forwarded to their program for inclusion in their project file. AWS anticipates sharing post-excavation soil sample data with DEQ UST for this purpose, potentially including the analytical data summary table, analytical laboratory reports, and/or the complete report document discussed in Task 18.

Note that, in the event evidence of a petroleum release is observed or confirmed during completion of UST removal activities, AWS will be required to provide notification of a release to DEQ. In such an event, notification is expected to be a procedural requirement only, with no expected practical impact on the remainder of remedial activities discussed below, since an active release is already documented at the site.

Task 10 – Opportunistic Remedial Excavation

As discussed in the Background section above, redevelopment will include excavation across all 3 parcels of the overall property to facilitate construction of the new building. The approximate outline of the new building is illustrated on Figures 3, along with the approximate locations of the existing and former structures. Total depths of redevelopment excavation will be approximately 20 to 25 feet below the current surface along the east side of the Former McGaffick Service site (i.e., along North Last Chance Gulch) and 10 to 15 feet below the current surface along the west edge of the site (between the current Stockman Bank building and the former Muffler Shop building).

Based on findings from the direct-push, HSA/ODEX, sonic, and geotechnical drilling investigations discussed in the Background section above, AWS anticipates petroleum-contaminated soil may be encountered during redevelopment excavation.

Opportunistic remedial excavation is therefore expected to include (but not necessarily be limited to) soil originating from the areas of the site discussed below and illustrated in Figure 3:

- Subsurface soil in the vicinity of the former bulk gasoline UST basin, located along the west side of the former Muffler Shop building.
    - Contamination has been confirmed at depths below approximately 15 feet bgs in portions of the tank basin. If feasible, opportunistic remedial excavation in this area is expected to extend several feet lower than the excavation depth required for redevelopment.
    - Extents of impacts beneath the north portion of the former Muffler Shop floor slab area are unknown, but lateral extents are generally expected to be limited, based on observations from nearby borings.
    - For the purpose of this work plan, AWS anticipates opportunistic remedial excavation of contaminated soil from depths of approximately 15 to 25 feet bgs. The actual maximum depth of excavation will be determined by on-site factors and limitations.
- Subsurface soil at the northeast corner of the site, in the vicinity of the closed-in-place diesel UST and the former (removed) gasoline UST basin.
    - Contamination has been confirmed at depths below approximately 18 feet bgs at the northeast corner of the site, including adjacent to (and potentially beyond) the property boundary. If feasible, opportunistic remedial excavation in this area is expected to extend several feet lower than the excavation depth required for redevelopment.

  - Lateral extents are expected to be generally limited to the portion of the site extending north and east from the northeast corner of the former Muffler Shop building.
  - For the purpose of this work plan, AWS anticipates opportunistic remedial excavation of contaminated soil from depths of approximately 18 to 25 feet bgs in this area. The actual maximum depth of excavation will be determined by on-site factors and limitations.
- Near surface and shallow subsurface soil in the vicinity of SB-21, west of the northwest corner of the former bulk gasoline UST basin.
  - Contamination has been confirmed from depths near the surface to approximately 10 feet bgs. Contamination was not observed below 10 feet bgs.
  - Lateral extents are likely to be limited, based on observations from nearby borings.

Based on the assumptions listed above, AWS estimates the total volume of petroleum contaminated soil to be removed during opportunistic excavation will be approximately 2,800 cubic yards, measured in-situ (i.e., “bank CY”). The actual volume will be dependent on a variety of factors which cannot be anticipated at the time of preparation of this work plan.

AWS will attempt to collect excavation “closure” soil samples from the base and sidewalls of the excavation, where feasible, to document residual petroleum contamination concentrations at the extents of excavation. The anticipated opportunistic excavation area is expected to be primarily in the “middle” of the site. Additionally, the sidewalls at the extents of the construction project excavation will likely be inaccessible for sampling due to the expected presence of shoring (see below). Based on available guidance from DEQ relating to collection of excavation closure samples in shallow excavations (i.e., excavations without sidewalls), as well as guidance from DEQ regarding acceptable grid sizes for excavation confirmation sampling at State Superfund sites, AWS proposes collection of excavation closure samples as summarized below:

- EPH Screen: 1 5-point composite sample for every 625 SF of excavation base:
  - Bulk gasoline UST basin: 5 composite samples
  - Northeast corner: 4 composite samples
  - Northwest corner: 1 composite sample
- VPH – 2 grab samples for every 625 SF of excavation base:
  - Bulk gasoline UST basin: 10 grab samples
  - Northeast corner: 8 grab samples
  - Northwest corner: 2 grab samples

Excavation closure soil sample field and potential laboratory analytical splits will be collected following *AWS SOP-02* and *AWS SOP-3*, respectively. Decontamination of sampling equipment will be completed in accordance with AWS SOP-01, and selected samples will be submitted for laboratory analyses following *AWS SOP-08*. Laboratory analyses will be performed as discussed in Task 15, below.

In addition to opportunistic remedial excavation in the areas noted above, petroleum-impacted soil is likely to be encountered and removed from the subsurface during installation of borings necessary to facilitate placement of shoring and structural piers. Shoring is expected to be placed along the edges of the property for the purpose of preserving the structural integrity of adjoining roadways. Structural piers will be positioned under the perimeter of the new building foundation and variously throughout the interior of the footprint of the new building. Remedial "excavation" of petroleum-impacted cuttings is anticipated for shoring and pier borings located within the shaded areas indicated on Figure 3.

Borings for structural piers are expected to be 30 inches in diameter and will be installed approximately 5 feet into underlying diorite bedrock (i.e. approximately 25 to 30 feet lower than the base of the excavation). Petroleum contamination is expected to be encountered within approximately 25 pier boring locations, from depths of roughly 18 to 45 feet bgs. Based on the noted assumptions, the total volume of contaminated soil expected to be removed during installation of pier borings is approximately 160 bank CY. Installation of pier borings is expected to occur after completion of excavation activities.

Shoring borings are also expected to be 30 inches in diameter. Information regarding the placement of shoring borings was not available at the time of preparation of this work plan, so AWS has assumed shoring borings will be set contiguously along the perimeter of the property to depths of approximately 5 feet below the base of the planned excavation (i.e., approximately 25 to 30 feet bgs). AWS anticipates petroleum contaminated soil will be encountered during placement of shoring borings along approximately 140 lineal feet of the property boundary, as shown in the shaded portions of Figure 3, at depths of 18 to 30 feet bgs (or depths of 0 to 10 feet bgs near SB-21). Based on the noted assumptions, the total volume of contaminated soil expected to be removed during installation of shoring borings is approximately 200 bank CY. Installation of shoring borings is expected to take place prior to initiation of redevelopment excavation.

As noted above, LNAPL from the release at the site has been confirmed to be approximately 80% diesel and 20% gasoline. Due to the lower volatility of diesel, use of heated headspace methods alone for evaluation of total VOCs may not be sufficient for identification of petroleum contaminated soil at this site. For this reason, field screening will consist of a combination of heated headspace total VOC measurements, observation of visible petroleum contamination (e.g., "sheen" and/or staining in soil), and olfactory observations of petroleum odors. Field screening of petroleum-impacted soil will be completed by AWS personnel when feasible (e.g., during opportunistic excavation completed immediately following UST removal; during excavation closure sampling; etc.). When AWS personnel are not present (e.g., potentially during installation of boring piers and/or shoring borings), screening may instead be completed by the excavation contractor. Soil thus determined to be potentially petroleum contaminated will be segregated and temporarily stockpiled at the site pending further evaluation.

Stockpiles of potentially petroleum-contaminated soil will be sampled by AWS personnel for the purpose of waste characterization. Waste characterization samples will be collected and further field screened following *AWS SOP-02* and *AWS SOP-03*, with decontamination of equipment completed in accordance with *AWS SOP-01*. The waste characterization samples will be submitted to the analytical laboratory following *AWS SOP-08* for analyses as discussed in Task 15, below. The total volume of stockpiled soil thus determined through laboratory analyses to contain petroleum contaminants at concentrations exceeding RBSLs will be considered to have been removed and disposed as part of the opportunistic excavation. Soil thus determined to contain petroleum constituent concentrations *lower* than RBSLs will be *excluded* from the opportunistic remediation volume total and will be handled in the same fashion as the remaining non-petroleum waste soil generated during site redevelopment.

Although a specific waste disposal facility has not yet been selected for this project (and will be selected by the redevelopment contractor), it is assumed waste characterization of the stockpiled soil will be required. AWS anticipates approximately 3,160 bank CY of petroleum-impacted soil generated during excavation and installation of shoring/pier borings will be segregated and temporarily stored at the site by the redevelopment contractor pending characterization for disposal. Based on recent previous experience and industry standards, AWS anticipates at least 1 soil sample will be required for every 200 cubic yards of waste soil (roughly 16 total samples). AWS will assist with collection of waste characterization samples and coordination of waste manifests to facilitate transport and disposal of waste soil by the redevelopment contractor. Due to site limitations, it is anticipated that several smaller stockpiles will need to be characterized over the course of the project, requiring separate mobilization events for each.

Task 11 – Soil Borings and New Well Installation

AWS proposes completion of soil borings at each of up to 11 locations within the footprint of the new building at the site (Figure 4), with each boring to be completed as a new well. The number and locations of proposed new wells is based on available information at the time of preparation of this work plan, and the preliminary remediation system parameters discussed in Task 5 above.

The final selection of the number and locations of borings, decisions regarding which borings are to be completed as wells, and determinations of initial usage of each new well, will be based in part on site conditions and field observations during construction, as discussed in Task 5 above. Once the new building is constructed, placement of new/additional wells will be extremely difficult and costly. The proposed well locations included in this work plan are therefore intended to provide sufficient coverage for potential eventualities which can't be fully known at this time. The well design discussed below is intended to facilitate multiple uses of the wells depending on the project phase. For example, wells initially intended for extraction or re-injection will eventually need to be utilized for monitoring purposes. The anticipated uses for each proposed well are identified on Figure 4 and include extraction, injection, and monitoring (upgradient, source area, or down gradient).

For the purpose of this work plan, it is assumed soil boring and well installation activities will be initiated following completion of excavation, potentially in conjunction with drilling of structural pier borings. Proposed boring/well locations will be included on Cushing Terrell's construction documents, and completion of soil borings and well installation will be a portion of the redevelopment contractor's scope of work. Placement of borings/wells in the field will be coordinated with Cushing Terrell and the construction contractor, and AWS will provide limited oversight of drilling and well installation activities.

Actual boring locations may vary based on interpretation of field data, or for other reasons potentially beyond AWS's control (e.g., changes in building foundation design/construction, etc.). Additional borings may be advanced if deemed appropriate based on field data, although the total drilling depth of 385 feet will not be exceeded without prior coordination with DEQ and PTRCB, as feasible. For planning purposes, drilling provider proposals are expected to include total drilling depths of approximately 35 feet (i.e., extending approximately 5 feet into diorite bedrock, starting from the approximate base of the finished floor elevation) at each of the 11 proposed well locations. Well construction will include extension of well casings to their final, finished elevations (i.e., Basement B2 Level floor for interior wells, or the final ground surface for exterior wells). Assuming bottom-of-hole elevations of 3,960 feet amsl, Basement B2 Level floor elevations of 3,994 feet amsl, and final exterior ground elevations of 4,010 feet amsl, the approximate well completion totals for interior and exterior wells will be 34 feet and 50 feet, respectively. Therefore, the total well completion vertical length will be approximately 410 feet.

Based on previous experience at the site, AWS anticipates air rotary drilling methods will be utilized in order to avoid drilling refusal due to the confirmed presence of granite boulders through the planned drilling depths. AWS estimates each borehole will be drilled to a nominal 9-inches in diameter and temporarily steel cased to maintain borehole integrity. As discussed above, the selection of a driller will be made through the overall redevelopment construction bidding process. AWS will coordinate with Cushing Terrell to ensure the drilling contractor is a Montana-licensed monitoring well constructor.

Collection and analysis of soil samples for accurate quantification of petroleum contaminant concentrations is infeasible when using air rotary drilling due to the use of compressed air for removal of drill cuttings from soil borings. Even so, drill cutting soil samples may be collected for field screening purposes, if feasible, following the procedures outlined in *AWS SOP-02 – Soil Sample Collection*, including recording observations of lithology and the presence or absence of visual and/or olfactory evidence of petroleum impacts. Field splits will be analyzed following *AWS SOP-03*. Reusable sampling equipment will be decontaminated following *AWS SOP-01*.

Despite the limitations noted above, laboratory samples may be containerized from select potential laboratory splits in order to obtain qualitative petroleum contaminant concentration data. Specifically, AWS anticipates potentially collecting 1 drill cutting soil sample at or near the inferred groundwater interface within each boring, if feasible. Samples will be submitted to the analytical laboratory following *AWS SOP-08 – Sample Packaging and Shipping*, and analyses will be completed as discussed in Task 15 below.

Drill cuttings determined to be petroleum contaminated will be segregated, temporarily stored on site, characterized, and disposed along with petroleum contaminated excavation waste, as discussed in Task 10 above.

The project drilling contractor will be directed to install new wells in each of the temporarily-cased 11 borings. New 6-inch diameter, schedule 40 PVC well casing blank and factory-slotted (0.010-inch or 0.020-inch) well screen will be placed inside the temporary steel casing. Casing joints will be flush-threaded; no PVC glue or adhesive will be used. The wells will be screened from approximately 3,960 ft amsl (i.e., 5 feet or more into the diorite bedrock) to 3,985 ft amsl to ensure the upper extents of the well screen are above the average groundwater elevation of 3,979 ft amsl. The annular space between the PVC well screen and casing and the temporary steel casing will be filled by filter pack media and bentonite sealant, respectively, as the temporary steel casing is withdrawn from the borehole.

Well depths may vary slightly across the site, depending on actual bedrock depths observed in the respective borings. The approximate depth for new wells (~ 3,960 ft amsl) was selected to facilitate treatment of the full depth of the aquifer above the diorite bedrock (~ 3,965 ft amsl), based on aquifer testing completed at the site during August 2025. The top of the top of the proposed screen interval was selected to ensure well screens are higher than the historical average groundwater elevation of ~ 3,979 ft amsl.

The upper end of the 6-inch PVC casing will be equipped with a reducer fitting to allow connection of a 2-inch diameter PVC conduit pipe that will laterally extend back to the remediation room. This conduit will provide a means for remediation system tubing and control wiring to be easily installed and operated down each well.

Since the wells will be initially installed near the Basement B2 Level floor elevation, prior to installation of the building foundation and/or Basement B2 Level floor slab, and prior to backfill of the site outside the foundation, it will be necessary to protect the new wells throughout construction. AWS will coordinate with Cushing Terrell to include provisions for protection of the new wells – and extension of the wells to their respective final elevations – throughout construction. Wells located inside the new building foundation are expected to be completed flush with the Basement B2 Level floor, while wells located outside the new building are expected to be finished flush with the final ground surface elevation.

Flush-mounted surface completions for all wells will be large enough to facilitate access for remediation and/or monitoring purposes. Wells located in drive areas will be fitted with traffic-rated surface completions.

AWS will coordinate with Cushing Terrell to ensure the top north quadrant of each new well casing is surveyed as part of the overall construction project as-built survey, including horizontal and vertical coordinates (XYZ). It is understood Cushing Terrell will provide AWS with elevation data and an electronic (PDF) copy of the final as-built diagram, including the locations of all new wells, for our use in calculating groundwater elevations and preparing future report diagrams.

Task 12 – New Well Development

Newly installed groundwater monitoring wells will be developed following the procedures outlined in *AWS SOP-04 – Field Measurement of Depth of Groundwater* and *AWS SOP-05 – Monitoring*

Well Development. Purge water generated during development will be handled in accordance with *AWS SOP-56*. Reusable down-hole equipment will be decontaminated prior to initiating development of each well following *AWS SOP-01*.

Task 13 – Groundwater Monitoring (3 events)

Groundwater monitoring will be conducted during 3 separate events as part of this work plan. The schedules for each event will be determined based on the actual dates of construction and subsequent installation and operation of the remediation system, as follows:

- Event #1 – Pre-remediation baseline, as soon as feasible following development.
- Event #2 – Approximately 2 months after initiation of remediation.
- Event #3 – Approximately 6 months after initiation of remediation.

As discussed in the Objectives section above, all new wells will be designed to facilitate use as either extraction, injection, or monitoring wells, depending on the phase of remediation and the corresponding configuration of the remediation system. It is understood that collection of groundwater samples from a well being used for active remediation may result in analytical data which are not fully representative of conditions within the aquifer. However, for the purpose of evaluating efficacy of remediation during the early phases of operation of the system, data from these wells are expected to be useful for qualitative screening purposes. During later phases of remediation, especially as contaminant concentrations approach regulatory closure criteria, and accurate quantification becomes more important, samples would not be collected from wells which are being (or have recently been) used for remedial injection.

Event #1 will include fluid gauging and sample collection of all new wells, in order to establish a post-construction baseline for the well network. Water samples will not be collected from wells which contain LNAPL, if any.

Events #2 and #3 will also include gauging fluids in all new wells. AWS anticipates collecting water samples from all new wells during Events #2 and #3, although some adjustments may be made based on review of available data from the baseline event (and from Event #2, when planning for Event #3). In order to increase the reliability of “screening” data from wells being used for remedial injection, the extraction and re-injection system will be deactivated for approximately 1 week prior to completion of Event #2. Samples will not be collected from wells which contain LNAPL, if any.

The wells to be gauged and monitored under this work plan, and the analytical parameters to be evaluated for each are summarized by event in the groundwater monitoring analytical plan presented in Attachment C.

Depth to water (DTW) and depth to product (DTP) will be measured following the procedures outlined in *AWS SOP-04* and groundwater monitoring will be completed in accordance with *AWS SOP-06*. AWS anticipates utilizing both peristaltic and bladder pump systems to obtain samples for this project. Peristaltic pumps are expected to be used for sampling wells located within the building footprint. Wells located outside the building footprint are expected to be completed at the ground surface, so the sampling depths of these wells (from the surface) will require a bladder pump system. Depending on the feasibility of removing extraction equipment from the wells, qualitative sampling may also be completed using submersible extraction pumps in wells, where applicable. Unused water evacuated from each well will be handled in accordance with *AWS SOP-56*. Reusable monitoring and sampling equipment will be decontaminated following *AWS SOP-01* prior to use in each monitoring well.

Laboratory samples will be containerized, preserved, and transported to the analytical laboratory (Energy) following the procedures outlined in *AWS SOP-08*, and in accordance with the referenced analytical methods, using vessels and preservatives provided by the analytical laboratory. Laboratory analyses to be requested are discussed in Task 15, below.

Reusable monitoring and sampling equipment will be decontaminated following *AWS SOP-01* prior to use in each monitoring well. Unused water evacuated from each well will be handled in accordance with *AWS SOP-56*.

Task 14 – Remediation System Installation and Operation

Select infrastructure elements necessary for the remediation system are expected to be installed by the redevelopment project contractor during construction of the new building. In addition to protection, extension (where applicable), and placement of surface completions for the new wells, as discussed in Task 11 above, elements expected to be installed by the redevelopment project contractor generally include the following:

- Sub-slab SVE piping, vapor barrier, exhaust piping, and the SVE blower (if applicable).
- Electrical, mechanical, and plumbing services to the remediation room. Special provisions will be required, relating to the potential presence of petroleum vapors.
- Lateral PVC “conduit” piping between new wells and the remediation room.

Based on the remediation system design to be developed as part of Task 5, AWS will coordinate with Cushing Terrell regarding inclusion of the elements discussed above into the redevelopment project construction documents, as appropriate. Although installation of remediation system elements included in the construction documents is expected to be overseen by Cushing Terrell, as part of their contract/construction administration (CA) process, AWS anticipates providing limited CA assistance to Cushing Terrell relating to remediation system elements.

Near the end of the construction process – possibly after Cushing Terrell confirms “substantial completion” has been achieved by the redevelopment contractor – AWS will begin installation of remediation system elements which are excluded from the redevelopment contractor’s scope of work. Remediation equipment to be installed by AWS will be based on the system design to be developed as part of Task 5 and are generally expected to include the following:

- Free product extraction equipment in select wells, with tubing placed in conduit to recovery receptacles in the remediation room.

- Submersible low-flow pumps in select wells, with tubing placed in PVC conduit connected to day tanks and/or treatment equipment (e.g., mixing tanks, stripper trays, etc.) in the remediation room.
- Re-injection pumps in the remediation room, with tubing placed in PVC conduit to select re-injection wells.
- Compressed air and/or vacuum equipment and control panels for extraction and injection pumps in the remediation room.

Remediation equipment is expected to be sourced from a reputable provider, such as Geotech Environmental Equipment. The configuration of equipment will be determined during remediation system design and will also be contingent on availability of equipment from the selected provider.

Prior to initiating AWS's portion of the remediation system installation and operation, AWS will review available soil and groundwater field and laboratory analytical data collected during completion of the preceding tasks, including Groundwater Monitoring Event #1. In the event modifications to the remediation plan are warranted, AWS will coordinate the changes with DEQ prior to implementation.

For the purpose of this work plan, AWS anticipates completing our portion of the remediation system installation over the course of approximately 5 field days. Operation of the system through the initial treatment phase (i.e., up to the point of Groundwater Monitoring Event #3, approximately 6 months after initiation of the system) is expected to include approximately 16 site visits:

- Months 1 and 2 – 3 times the first week, then weekly: 10 events
- Months 3 and 4 – every other week: 4 events
- Months 5 and 6 – once per month: 2 events

During the first week of operation, AWS anticipates collecting pre- and post-treatment water samples for the purpose of evaluating efficacy of the treatment system. This is expected to be a requirement of EPA relating to re-injection of treated water under the Class V Injection Well Notification discussed in Task 4 above. Collection, handling, and delivery of these water samples to the laboratory will be completed in accordance with relevant portions of *AWS SOP-01*, *AWS SOP-06*, *AWS SOP-08*, and *AWS SOP-56*. Laboratory analyses of the samples will be completed as discussed in Task 15 below.

Reusable remediation equipment will be decontaminated and necessary following the procedures outlined in *AWS SOP-01*. Evacuated free product and associated disposable recovery equipment will be handled in accordance with *AWS SOP-56*. AWS anticipates utilizing Custom Recyclers to transport and dispose the recovered free product at their facility north of Helena.

Observations of free product recovery and groundwater treatment will be recorded on field forms, as appropriate, throughout the duration of remediation system operation.

Task 15 – Laboratory Analyses

AWS anticipates submitting soil and groundwater samples collected during completion of this work plan to Energy Laboratories, Inc. (Energy) in Helena, Montana. Except in specific instances noted below, standard analytical turnaround time will be requested for all analyses. Laboratory analyses for soil and water samples collected under this scope of work will be requested for the respective tasks, as discussed below. Requested analyses have been selected based on historic soil and groundwater data for the site and requirements stipulated for gasoline and diesel releases in the February 2024 *Montana Risk Based Corrective Action Guidance for Petroleum Releases (RBCA)*.

The analytical hold time prior to laboratory extraction of soil samples being analyzed for volatile petroleum hydrocarbons (VPH) is 48 hours. In order to avoid concerns relating to VPH hold time exceedances, and given the proximity of the laboratory to the project site, AWS anticipates submitting soil and water samples directly to the laboratory.

It should be noted that analysis of lead scavenger ethylene dibromide (EDB) has been completed for soil and groundwater samples collected from the site, and historic and recent data from existing monitoring well locations indicate EDB is not present at detectable concentrations. Therefore, analysis of EDB analytes has been excluded from this scope of work. Analysis of lead scavenger 1,2-Dichloroethane (DCA) has also been completed for soil and groundwater samples collected from the site. Since historic and recent data indicate the presence of DCA at the site, this work plan has been prepared to initially include DCA analyses, although analysis of DCA may be reduced pending results from the first groundwater monitoring event.

<u>Soil and Water Samples from Target UST Closure (Task 9)</u>

Soil samples collected during direct-push drilling activities will be analyzed for the following parameters:

- *VPH*, by the Montana VPH Method:
  - 3 soil samples (2 natural + 1 duplicate)
  - 0 water samples (1 natural sample, if groundwater encountered)
- *Extractable Petroleum Hydrocarbons (EPH) Screen*, by the Montana EPH Method:
  - *2 soil samples (2 natural + 0 duplicate)*
  - 0 water samples (1 natural sample, if groundwater encountered)
- *EPH Fractions*: all natural samples exhibiting Total Extractable Hydrocarbon (TEH) concentrations exceeding DEQ's EPH Screen criterion of 200 milligrams per kilogram (mg/kg):
  - *2 soil samples (2 natural + 0 duplicate)*
  - *0 water samples (1 natural sample, if groundwater encountered)*
- *DCA*, by EPA Method 8260B:
  - *2 soil samples (2 natural + 0 duplicate)*
  - *0 water samples (1 natural sample, if groundwater encountered)*

Groundwater is not expected to be encountered during UST removal activities. Potential groundwater sample analyses are listed here because the UST closure permit requires grab sampling, if encountered.

<u>Soil Samples from Opportunistic Remedial Excavation (Task 10)</u>

Post-excavation soil samples collected to document petroleum constituent concentrations in soil at the lateral and vertical extents of the redevelopment excavation (and select soil samples collected from excavation pile borings and/or foundation pier borings, if feasible) will be analyzed for the following parameters:

- *VPH*, by the Montana VPH Method:
  - 21 samples (20 natural + 1 duplicate)
- *EPH Screen*, by the Montana EPH Method:
  - *10 samples (10 natural + 0 duplicate)*
- *EPH Fractions*: all natural samples exhibiting TEH concentrations exceeding DEQ's EPH Screen criterion of 200 mg/kg:
  - *10 samples (10 natural + 0 duplicate)*
- *DCA*, by EPA Method 8260B:
  - *20 samples (20 natural + 0 duplicate)*

<u>Soil Waste Characterization Samples from Opportunistic Remedial Excavation (Task 10)</u>

Although the specific waste disposal facility has not yet been selected (and will be selected by the redevelopment contractor), AWS anticipates soil samples collected to characterize waste from remedial excavation and cuttings from borings advanced for shoring/pile and/or foundation piers will be analyzed for the parameters listed below. Based on recent previous experience and industry standards, AWS anticipates 1 sample will be required for every 200 cubic yards of waste soil. The actual waste characterization analytical requirements and sampling frequency will be modified as necessary to meet the requirements of the disposal facility. *AWS anticipates RUSH analytical turnaround will be required for waste characterization analyses*.

- *VPH*, by the Montana VPH Method:
  - 16 samples (16 natural + 0 duplicate)
- *EPH Screen*, by the Montana EPH Method:
  - *16 samples (16 natural + 0 duplicate)*
- *EPH Fractions*: all natural samples exhibiting TEH concentrations exceeding DEQ's EPH Screen criterion of 200 mg/kg:
  - *16 samples (16 natural + 0 duplicate)*
- *RCRA Metals* (EPA Method 6010/20) plus *Zinc* (EPA Method 7470):
  - 16 samples (16 natural + 0 duplicate)

Groundwater is not expected to be encountered during excavation. Even if encountered, ground water grab samples will not be collected or analyzed as part of excavation activities.

<u>Soil Samples from Soil Borings and New Well Installation (Task 11)</u>

As discussed in Task 11 above, collection of soil samples for accurate quantification of petroleum contaminant concentrations is expected to be generally infeasible due to the inherent limitations of the air rotary drilling method. However, for planning purposes, AWS assumes drill cutting soil samples may be collected and analyzed for the following, for the purpose of obtaining qualitative data from soil borings:

- *VPH*, by the Montana VPH Method:
  - 12 samples (11 natural + 1 duplicate)
- *EPH Screen*, by the Montana EPH Method:
  - *11 samples (11 natural + 0 duplicate)*
- *EPH Fractions*: all natural samples exhibiting TEH concentrations exceeding DEQ's EPH Screen criterion of 200 mg/kg:
  - *11 samples (11 natural + 0 duplicate)*
- *DCA*, by EPA Method 8260B:
  - *11 samples (11 natural + 0 duplicate)*

<u>Water Samples from Groundwater Monitoring (Task 13)</u>

Laboratory analysis of select IBIs will be requested, along with laboratory analyses of petroleum analytes stipulated in the February 2024 RBCA for groundwater suspected of being contaminated by gasoline and diesel. The table in Attachment C summarizes the analyses which will be requested for natural and duplicate samples to be collected during each monitoring event.

Pending review of results from Groundwater Monitoring Event #1 and discussion with DEQ, a reduced number of wells may be monitored in later events. Likewise, the specific wells to be monitored and the analyses to be performed will also be evaluated and potentially changed based on review and discussion of results from Groundwater Monitoring Event #1.

<u>Treatment Water Samples (Task 14)</u>

For the purpose of this work plan, it assumed 3 sets of pre- and post-treatment samples will be required to evaluate the efficacy of the treatment system. Pre- and post-treatment water samples will be analyzed for the following parameters:

- *VPH*, by the Montana VPH Method:
  - 6 samples (6 natural + 0 duplicate)
- *EPH Screen*, by the Montana EPH Method:
  - *6 samples (6 natural + 0 duplicate)*
- *EPH Fractions*: all natural samples exhibiting TEH concentrations exceeding DEQ's EPH Screen criterion of 200 mg/kg:
  - *0 samples (0 natural + 0 duplicate)*
- *DCA*, by EPA Method 8260B:
  - *6 samples (6 natural + 0 duplicate)*

AWS anticipates RUSH analytical turnaround will be required for analysis of water samples collected during the first week of operation of the remediation system.

<u>Task 16 – Data Validation Form Preparation</u>

Upon receipt of final laboratory analytical data for each soil and water sampling event, AWS will complete data validation in accordance with DEQ's *Data Validation Summary Form*. Data will be validated to assess the precision, accuracy, repetitiveness, comparability, and completeness of the reported parameters. A separate *Data Validation Summary Form* will be required for each separate laboratory analytical report.

Note that PTRCB reimburses preparation of DEQ's *Data Validation Summary Form* separately from the actual validation of data, which is reimbursed as a portion of the Report Preparation task. The analytical laboratory will issue a separate report for each set of samples delivered to the laboratory; combined reports are not issued for samples delivered on different days, even if they are collected as part of a single sampling event.

The actual number of separate analytical reports required for completion of the scope of work cannot be known at the time of preparation of this work plan. For planning purposes, however, AWS assumes a total of 18 *Data Validation Summary Forms* will be required, as follows:

- 15 Soil Sample Analytical Reports:
    - 1 Target UST Closure Soil Sample Analytical Report.
    - 10 Opportunistic Remedial Excavation Soil Sample Analytical Reports.
    - 4 Waste Characterization Soil Sample Analytical Reports.
- 3 Groundwater Sample Analytical Reports.
- 0 Treatment Water Sample Analytical Reports.

<u>Task 17 – Release Closure Plan Update</u>

Following completion of all Tasks 4 through 16, including receipt and review of all final analytical data, AWS will update the previous RCP. This will include assessing available historical data for the release, as well as data collected during the investigation to be completed under this work plan. The results will be evaluated to help determine an appropriate remediation plan to address residual contamination from the petroleum release at the site in light of planned site redevelopment. The updated RCP will also list identified data gaps which should be addressed during future work.

<u>Task 18 – Corrective Action ("Cleanup") Report Preparation</u>

Following completion of Tasks 4 through 17, including receipt and review of all final analytical data, AWS will prepare a summary report which will comply with DEQ's *Corrective Action "Cleanup" Report* format. As noted above, PTRCB reimburses data validation as a portion of the Report Preparation task, so data validation will be completed under Task 18, even though completion of the *Data Validation Summary Forms* will technically be completed under Task 16.

In any case, the report will include a discussion of methods and findings from the corrective actions completed as part of this scope of work; discussion of data validation; and discussion of the updated RCP. Data will be presented in tabular form, and select information will be presented on a site diagram(s). The report will be submitted to Stockman Bank and DEQ electronically, in Portable Document Format (PDF). A hard copy of the report will not be prepared or provided.

SCHEDULE

As discussed above, Tasks 1 and 2 have already been completed, and submission of this work plan completes Task 3. AWS will initiate implementation of Tasks 4 through 18 following our receipt of DEQ PTCS's work plan approval, but only after also receiving Stockman Bank's authorization to proceed. Note that DEQ typically requires initiation of a work plan once approved, without regard to the timing of PTRCB's obligation of funding. Any delay of implementation after issuance of DEQ's work plan approval letter will need to be coordinated with DEQ.

The overall redevelopment project schedule is expected to be complex and dynamic. The schedule for services provided by AWS will be contingent on various conditions which are indeterminable at the time of preparation of this work plan, including but not limited to approval from all listed parties, weather, and availability of AWS personnel and subcontractors. AWS will coordinate with Stockman Bank, the selected project remediation contractor, Cushing Terrell, DEQ, and other project stakeholders as appropriate and will make reasonable efforts to adhere to the desired schedule.

For the purpose of this work plan, a rough outline of the anticipated schedule is as follows:

- Remediation System Design: October through December 2025
- Monitoring Well Abandonment: Prior to April 2026
- UST Removal and Permitted UST Closure: April 2026
- Opportunistic Remedial Excavation: April 2026 - TBD
- Soil Borings, New Well Installation, Well Development: TBD, after excavation
- Groundwater Monitoring Event #1: TBD, prior to remediation
- Remediation System Installation and Operation: TBD
- Groundwater Monitoring Events #2 and #3: TBD
    - Event #2 - approximately 2 months after initiation of remediation
    - Event #3 – approximately 6 months after initiation of remediation
- RCP Update and Report Preparation: TBD

FEE

AWS's fee for completing the scope of work described in this work plan will be assessed in general accordance with the cost estimate presented in Attachment D, which is based on the assumptions noted above. The cost estimate includes costs expected to be invoiced directly by AWS (i.e., AWS labor, equipment, mileage, per diem, lodging, vendors, and subcontractors). Services provided by AWS will be invoiced using AWS's PTRCB labor and equipment rates for the period of performance. Costs shown in the cost estimate reflect AWS's 2025 PTRCB rates and include applicable portions of the DEQ/PTRCB groundwater monitoring unit cost tool.

The cost estimate also includes costs to be invoiced by the redevelopment contractor which are expected to be eligible for PTRCB reimbursement (e.g., abandonment of existing wells, excavation and disposal of contaminated soil, disposal of contaminated soil generated from structural pier and shoring borings, drilling and constructing new wells, as-built survey of new wells, and installation of select remediation system infrastructure). As discussed above, solicitation of bids for select "subcontracted" services was not feasible due to the logistics of the overall redevelopment project. As a result, placeholder costs have been included in the cost estimate for these costs. Competitive bidding is expected to be achieved through the redevelopment construction bidding process, and these costs are expected to be available once construction bids are received.

Costs which are not expected to be eligible for reimbursement (e.g., removal and disposal of USTs) are excluded from the attached cost estimate.

Actual costs will be dependent on a variety of factors, including but not limited to unforeseen delays or other necessary but unexpected changes to the scope of work. Given the overall complexity of the redevelopment project, and the inherent need to coordinate the scope of work discussed in this work plan into the overall construction process, changes and unexpected conditions are likely to occur. AWS will coordinate changes to the scope of work, if necessary, with Stockman Bank, DEQ, and PTRCB staff prior to implementing the changes, as appropriate.

Petroleum release 0656 at the Former McGaffick Service site is eligible for PTRCB reimbursement of eligible costs, with no known penalties or reductions in eligibility. AWS understands Stockman Bank of Montana is recognized by the PTRCB as an eligible party for reimbursement of costs associated with the investigation and remediation of the release. Information obtained from the PTRCB in June 2025, which is understood to be current at the time of preparation of this work plan, indicates PTRCB has issued $104,739.24 in reimbursements to date for the release at the site. Since more than 50% of the first $35,000 in eligible costs (commonly referred to as the "$17,500 co-pay") have been paid by Stockman Bank, 100% of eligible future costs are expected to be reimbursed by the PTRCB, up to the $982,500 release maximum.

It is important to note that some costs for common tasks are considered ineligible by the PTRCB staff, including costs incurred performing tasks required by DEQ, in some cases. Examples of costs which are typically ineligible for reimbursement include, but are not limited to, the following:

- Preliminary coordination efforts and other costs incurred prior to work plan preparation.
- Investigation and remediation activities completed without prior DEQ approval.
- Costs exceeding PTRCB staff's established maximum allowable rates or task totals for project administration, groundwater sampling, work plan and report preparation, etc.
- All costs associated with closure/removal of USTs.

- Some costs associated with hazardous materials (e.g., asbestos, lead paint, etc.) assessment and abatement and subsequent building demolition.
- Some costs associated with maintenance and repair of monitoring wells and monitoring well protectors.
- Preparation of applications for PTRCB reimbursement of eligible costs.

AWS will submit invoices relating to this scope of work directly to Stockman Bank for payment. We anticipate preparing and submitting an application for reimbursement to the PTRCB following completion of the final report for this work plan. The reimbursement application prepared and submitted by AWS will include additional documentation required by the PTRCB, including *Acknowledgement of Payment Form 6* documents confirming AWS's receipt of payment from Stockman Bank for AWS invoices included with the application. Completed *Form 6* documents will also be included confirming AWS's payment to our subcontractors, as applicable.

AWS anticipates the PTRCB will subsequently issue a reimbursement payment directly to Stockman Bank. As discussed above, and in our previous correspondence, AWS anticipates a portion of the anticipated costs shown in the Cost Estimate will be deemed ineligible by the PTRCB. Stockman Bank will remain financially responsible for payment of AWS's invoices in the event costs are deemed ineligible for reimbursement by the PTRCB.

LIMITATIONS

The scope of work included in this work plan has been prepared for Stockman Bank of Montana and includes only those services described above. This work plan does not include remedial or disposal services, or costs for such services, beyond those listed specifically in the scope of work.

The proposed remediation scope of work is based on available information from previous remedial investigations completed at the site, as discussed in the Background section of this work plan, industry standards of practice, and AWS's professional judgement. Specifically relating to petroleum contamination, efficacy of remediation is dependent on a variety of factors, some of which cannot be fully known in advance and which may not be controllable during remediation. Implementation or proposed remediation based on available information and industry standards or practice does not guarantee a favorable outcome.

AWS cannot and does not warrant that the scope of services described in this work plan will be adequate to address all environmental conditions or latent conditions at the site. Our scope of work will be performed with a standard of care meeting or exceeding that of other environmental consultants performing similar work in the area.

ACCEPTANCE

Stockman Bank authorized AWS to prepare this work plan by signing our Work Order 20025.2 on July 23, 2025. Please indicate Stockman Bank's acceptance of this work plan, and authorization for initiation of the scope of work present herein under the terms of AWS's Work Order 20025.2, by signing below and returning a signed copy to AWS.

Work Plan Acceptance: ____

Signature / Printed Name   Date

A copy of this work plan will be submitted to the Montana DEQ on behalf of Stockman Bank. It is understood DEQ's review of the work plan will relate only to the technical aspects of the proposed scope of work.

Assuming DEQ approves the work plan from a technical standpoint, it is presumed they will forward the work plan and cost estimate to the PTRCB staff for their review. PTRCB staff's review of the work plan is presumed to relate only to the proposed costs to implement the scope of work approved by DEQ. Note that Stockman Bank and/or DEQ may require implementation of the work plan prior to PTRCB's obligation of funding. Any delay of implementation after issuance of DEQ's work plan approval letter will need to be coordinated with DEQ.

If you have any questions or concerns relating to this work plan, please call me at your earliest convenience to discuss (406.315.2201).

Respectfully Submitted:

J. Scott Vosen
Project Manager
scott@airwatersoil.com

Alan Frohberg, P.E.
Principal Engineer
alan@airwatersoil.com

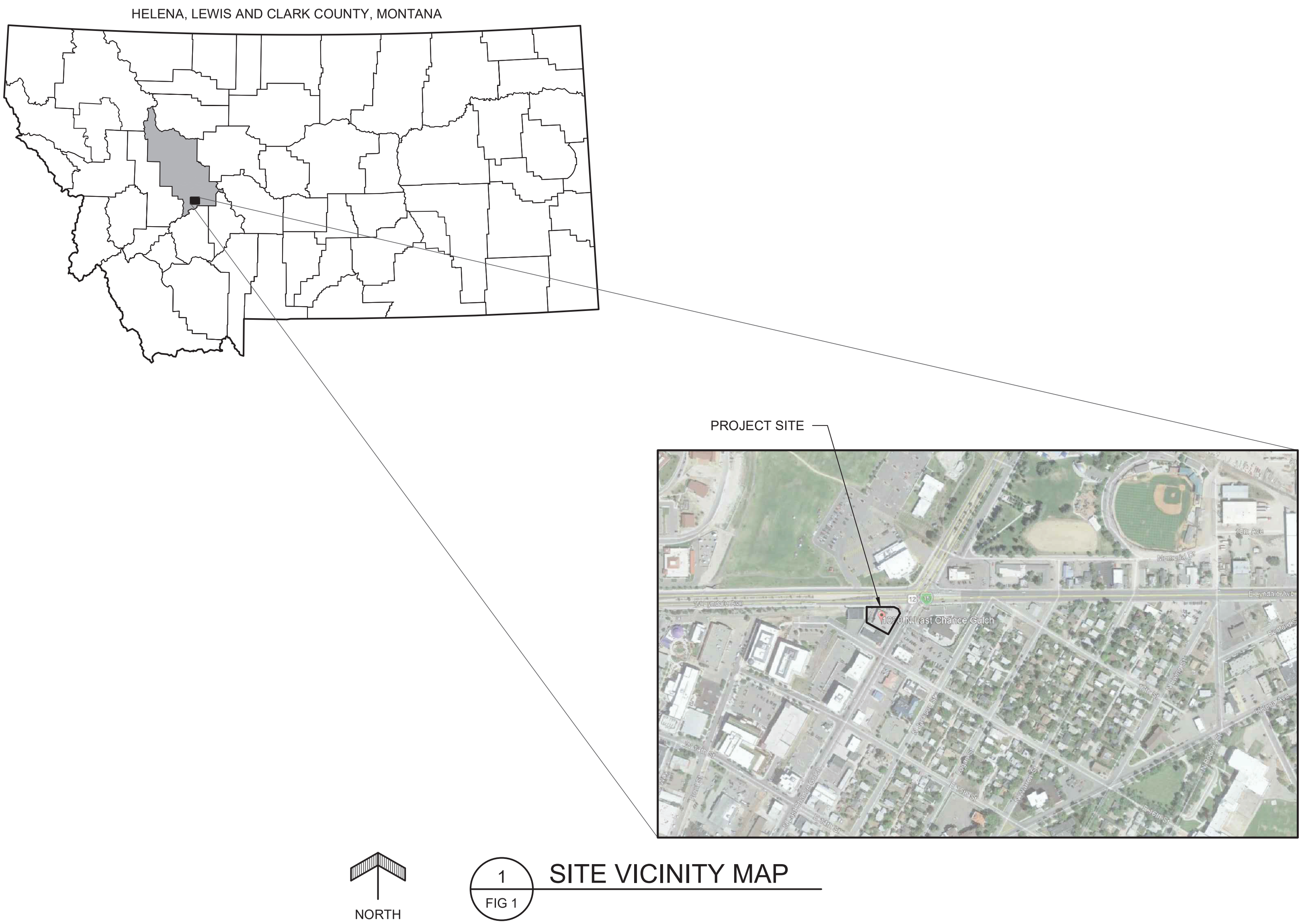
Attachments: A – Figures (*Revision 1*)
B – AWS Standard Operating Procedures (*unchanged from original work plan*)
C – Groundwater Monitoring Analytical Plan (*Revision 1*)
D – Cost Estimate (*unchanged from original work plan*)

cc: Rachel Mindt, Montana DEQ PTCS, P.O. Box 200901, Helena, MT 59620. Transmitted via email to rachel.mindt@mt.gov.

ATTACHMENT A

Figures

(Revision 1)



1
FIG 1
SITE VICINITY MAP

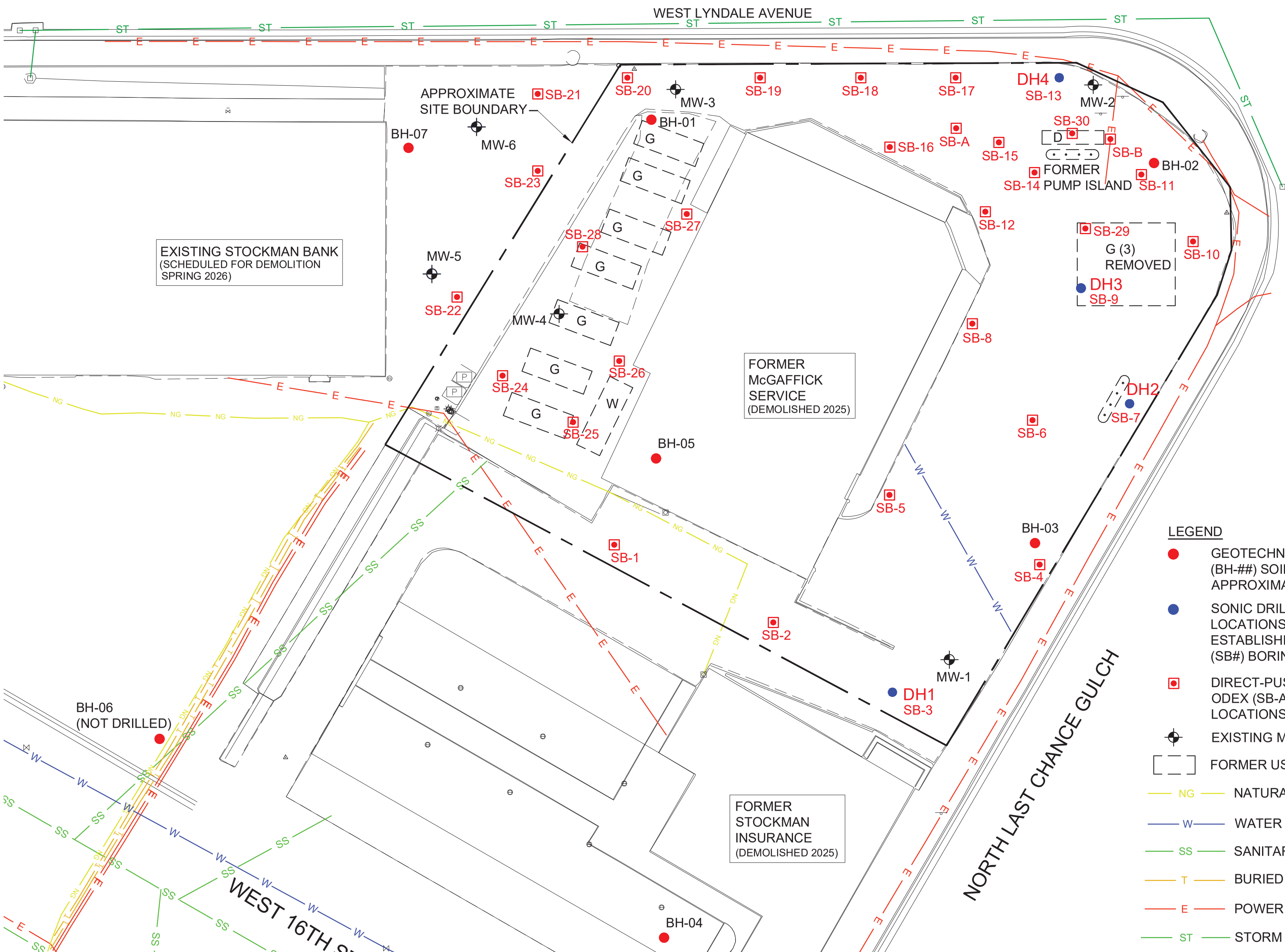
AIR WATER SOIL
GREAT FALLS, MT
p 406.315.2201

STOCKMAN BANK OF MONTANA
WORK PLAN FOR LIMITED EXCAVATION AND IN-SITU REMEDIATION
FORMER MCGAFFICK SERVICE
1020 NORTH LAST CHANCE GULCH, HELENA, MONTANA 59601
DEQ FID 25-01709 (TID 23433); RELEASE 0656; WPID 35083

12.9.2025
20025.2
DRAWN BY
DRESCH
CHECKED BY
JSV

SITE VICINITY MAP

FIGURE
1



NORTH

1
FIG 2

SITE DIAGRAM

0 10 20 40
SCALE: 1:20

LEGEND

- GEOTECHNICAL INVESTIGATION ODEX (BH-##) SOIL BORING LOCATIONS, APPROXIMATE (JUNE 2025).
- SONIC DRILLING (DH#) SOIL BORING LOCATIONS (OCTOBER 2024) ESTABLISHED AT SELECT DIRECT-PUSH (SB#) BORING LOCATIONS.
- DIRECT-PUSH (SB-1 TO SB-30) AND ODEX (SB-A, SB-B) SOIL BORING LOCATIONS (AUGUST 2023).
- EXISTING MONITORING WELL LOCATION
- FORMER UST SYSTEM COMPONENTS
- NG — NATURAL GAS LINE
- W — WATER LINE
- SS — SANITARY SEWER LINE
- T — BURIED TELECOM LINE
- E — POWER LINE
- ST — STORM SEWER

AWS
AIR WATER SOIL
GREAT FALLS, MT
p 406.315.2201

STOCKMAN BANK OF MONTANA

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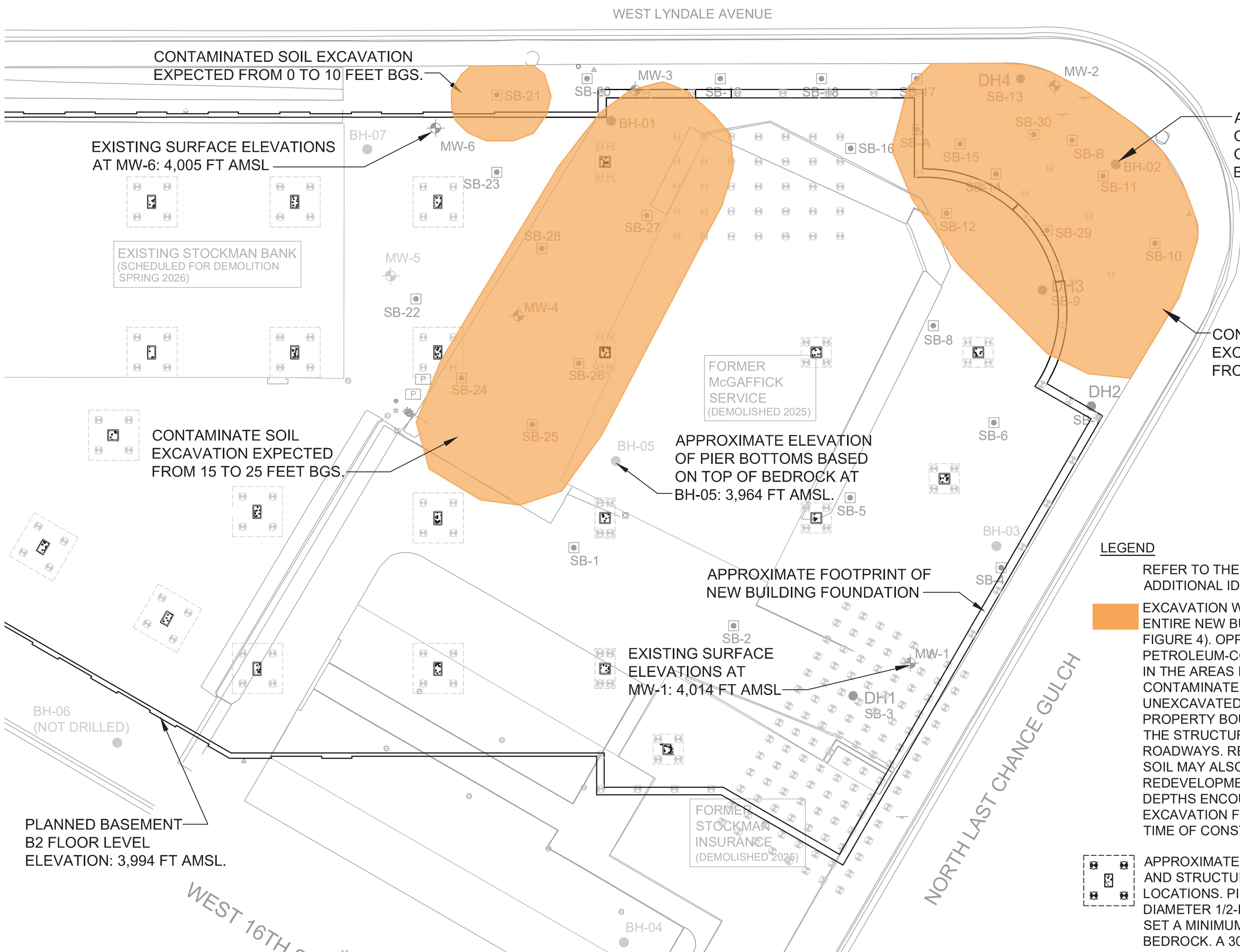
DEQ FID 25-01709 (TID 23433); RELEASE 0656; WPID 35083

12.9.2025
20025.2
DRAWN BY
DRESCH
CHECKED BY
JSV

SITE
DIAGRAM

FIGURE
2



NORTH

1
FIG 3

REMEDIAL EXCAVATION

ANTICIPATED OPPORTUNISTIC EXCAVATION AREAS

0 10 20 40

SCALE: 1:20

SELECT ELEMENTS OF THIS DIAGRAM ARE BASED ON PRELIMINARY CONSTRUCTION DOCUMENTS PROVIDED BY CUSHING TERRELL FOR PRELIMINARY PLANNING PURPOSES. THE FINAL QUANTITIES, LOCATIONS, AND/OR CONFIGURATIONS MAY CHANGE IN THE FINAL PROJECT CONSTRUCTION DOCUMENTS.

LEGEND

REFER TO THE LEGEND IN FIGURE 2 FOR ADDITIONAL IDENTIFICATION OF FEATURES.

EXCAVATION WILL BE COMPLETED ACROSS THE ENTIRE NEW BUILDING FOOTPRINT (REFER TO FIGURE 4). OPPORTUNISTIC EXCAVATION OF PETROLEUM-CONTAMINATED SOIL IS ANTICIPATED IN THE AREAS INDICATED HERE. RESIDUAL CONTAMINATED SOIL IS EXPECTED TO BE LEFT UNEXCAVATED ALONG PORTIONS OF THE SITE PROPERTY BOUNDARY IN ORDER TO PRESERVE THE STRUCTURAL INTEGRITY OF ADJOINING ROADWAYS. RESIDUAL PETROLEUM-IMPACTED SOIL MAY ALSO BE LEFT AT THE BASE OF THE REDEVELOPMENT EXCAVATION, DEPENDING ON DEPTHS ENCOUNTERED AND DETERMINATIONS OF EXCAVATION FEASIBILITY AND SAFETY AT THE TIME OF CONSTRUCTION.

APPROXIMATE NEW BUILDING FOUNDATION PIER AND STRUCTURAL CONCRETE COLUMN LOCATIONS. PIERS ARE EXPECTED TO BE 20-INCH DIAMETER 1/2-INCH THICK OPEN END STEEL PIPE, SET A MINIMUM OF 5 FEET INTO DIORITE BEDROCK. A 30-INCH DIAMETER BORING IS EXPECTED AT EACH PIER LOCATION. PIERS LOCATED WITHIN THE OPPORTUNISTIC EXCAVATION SHADED AREA ARE ANTICIPATED TO GENERATE PETROLEUM-CONTAMINATED CUTTINGS.

DEQ FID 25-01709 (TID 23433); RELEASE 0656; WPID 35083

1020 NORTH LAST CHANCE GULCH, HELENA, MONTANA 59601

FORMER MCGAFFICK SERVICE

WORK PLAN FOR LIMITED EXCAVATION AND IN-SITU REMEDIATION

STOCKMAN BANK OF MONTANA

AIR WATER SOIL
GREAT FALLS, MT
p 406.315.2201

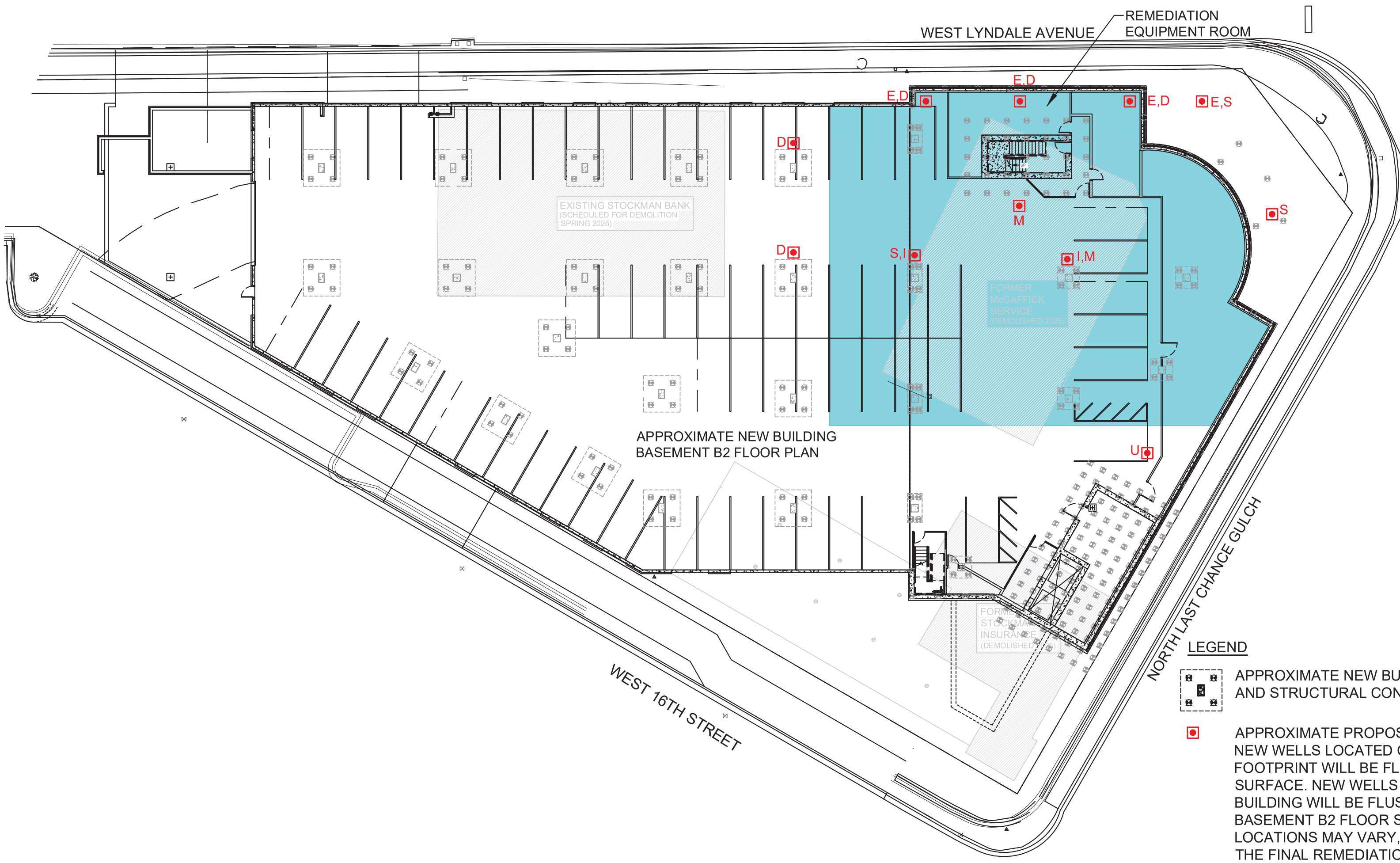
12.9.2025
20025.2

DRAWN BY
DRESCH

CHECKED BY
JSV

REMEDIAL EXCAVATION

FIGURE
3



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NORTH

1
FIG 4

WELLS AND IN-SITU REMEDIATION

POTENTIAL NEW WELLS AND IN-SITU REMEDIATION INFRASTRUCTURE

0 15 30 60

SCALE: 1:30

LEGEND

APPROXIMATE NEW BUILDING FOUNDATION PIER AND STRUCTURAL CONCRETE COLUMN LOCATIONS.

APPROXIMATE PROPOSED NEW WELL LOCATIONS. NEW WELLS LOCATED OUTSIDE THE BUILDING FOOTPRINT WILL BE FLUSH MOUNTED AT GROUND SURFACE. NEW WELLS LOCATED INSIDE THE BUILDING WILL BE FLUSH MOUNTED AT THE BASEMENT B2 FLOOR SURFACE. ACTUAL LOCATIONS MAY VARY, PENDING DEVELOPMENT OF THE FINAL REMEDIATION DESIGN. NEW WELLS WILL BE ACCESSIBLE AT THE TOPS OF CASINGS AND WILL ALSO BE CONNECTED TO THE REMEDIATION ROOM VIA SUB-SLAB PIPING/CONDUIT. THE ANTICIPATED USE(S) OF PROPOSED NEW WELLS IS INDICATED BY THE FOLLOWING LABELS: **E** = EXTRACTION; **I** = INJECTION, **M** = MONITORING; **D** = DOWN GRADIENT MONITORING; **S** = SOURCE AREA MONITORING; AND **U** = UP GRADIENT MONITORING.

PROPOSED SOIL VAPOR EXTRACTION (SVE) PIPING AND VAPOR BARRIER TO BE INSTALLED ALONG THE FOUNDATION AND BENEATH THE FLOOR SLAB OF THE BASEMENT B2 LEVEL BENEATH THE PORTION OF THE STRUCTURE WHICH WILL BE OCCUPIED ON UPPER LEVELS.

AIR WATER SOIL
GREAT FALLS, MT
p 406.315.2201

STOCKMAN BANK OF MONTANA

WORK PLAN FOR LIMITED EXCAVATION AND IN-SITU REMEDIATION
FORMER MCGAFFICK SERVICE
1020 NORTH LAST CHANCE GULCH, HELENA, MONTANA 59601
DEQ FID 25-01709 (TID 23433); RELEASE 0656; WPID 35083

12.9.2025
20025.2

DRAWN BY
DRESCH

CHECKED BY
JSV

WELLS AND IN-SITU REMEDIATION

FIGURE
4

AIR WATER SOIL

ATTACHMENT B

AWS Standard Operating Procedures

(unchanged from original work plan)

STANDARD OPERATING PROCEDURE

Field Sampling Equipment Decontamination

AWS SOP-01

EQUIPMENT:

- Disposable gloves (e.g., latex, nitrile)
- Eye protection
- Phosphorus-free detergent concentrate (e.g., Alconox®, Liquinox®)
- Concentrated alcohol (e.g., isopropyl, methanol) to make 10% solution
- Concentrated nitric acid to make 10% solution
- Deionized (DI), distilled, or potable tap water
- Spray bottles, collapsible dispensers, buckets, basins
- Scrub brushes
- Disposable wet-wipes
- Paper towels
- HEPA-filtered vacuum
- Garbage bags

PROCEDURE:

Decontamination of asbestos sampling tools and equipment is generally accomplished using HEPA-filtered vacuums, disposable wet-wipes, or water and paper towels. Cleaning is continued until visible contaminants are removed to prevent cross contamination between samples, and to prevent potential fiber exposure.

Decontamination of petroleum investigation sampling equipment generally includes a 3-step process: 1) detergent scrub; 2) alcohol/acid rinse; and 3) water rinse.

Prepare detergent solution by mixing detergent concentrate with potable water in a large cooler or basin. Keep this mixture free from contaminants; draw small portions out into smaller basins/buckets as needed. Prepare 10% alcohol-in-water and 10% nitric acid-in-water solutions in collapsible containers and/or spray bottles. Methanol and nitric acid solutions should be prepared using DI or distilled water.

Decontamination should be performed in an area upwind of the contamination zone or otherwise reasonably free from contaminants of concern. Gross contaminants/debris should be removed from equipment and left in the sampling area(s) if practicable. Remove remaining gross contamination by scrubbing equipment with detergent solution in a small basin. Empty basin and refill with fresh detergent solution as necessary. Rinse with alcohol solution, nitric acid solution (when sampling for metals), and DI/distilled water.

Dry decontaminated equipment using paper towels or place in an area as free from contaminants of concern as practicable an allow to air dry.

Caution should be used to avoid direct contact with contaminated materials; gloves and eye protection should be worn during preparation of decontamination fluids and during decontamination of sampling equipment. Decontamination fluids should be prepared in a location as free from contamination as practicable.

DISPOSAL:

All disposable items (soiled wipes, used paper towels, vacuum filters, etc.) should be deposited into a garbage bag and properly disposed. Decontamination waste from asbestos decontamination may require disposal as asbestos waste.

Decontamination fluids for petroleum investigations do not need to be collected under most circumstances. Spread decontamination fluids over a paved surface, if practicable.

EQUIPMENT:

- Shovels, spades, hoes, trowels, etc.
- Stainless steel mixing bowl
- Stainless steel hand auger
- Excavation equipment (e.g., backhoe, trackhoe)
- Drill rig sample equipment (e.g., steel split spoons, MacroCore® tubes)
- Field forms
- Disposable gloves and decontamination fluids (per AWS SOP-01)
- Leak-tight cooler with ice

GENERAL:

Soil samples should be described according to the procedures outlined in the Unified Soil Classification System (USCS – method ASTM D2487) or the Soil Conservation Service (SCS) classification system. Soil texture should be classified by either the USCS or USDA classification.

Pertinent soil sample information should be recorded on sampling forms or on specific documents identified in the SAP. Information should be recorded in a way to facilitate preparation of an overall soil sample summary. Information to be recorded for individual soil samples typically includes the following:

- Sample name/I.D.
- Collection date and time
- Sample type (grab/composite; natural/duplicate)
- Sample location, including diagram reference, if applicable
- Sample preservation, if applicable
- Analysis(es) to be performed
- Notation of deviations from SOP, if applicable

Decisions regarding sample collection and analyses will be guided by project-specific parameters and conditions. Collection and analysis of soil samples for evaluation of suspected or confirmed petroleum releases will generally be completed in accordance with the Montana Department of Environmental Quality (DEQ) *Final February 2024 Montana Risk-Based Corrective Action Guidance for Petroleum Releases (RBCA)*. Sampling requirements stipulated in the RBCA are shown in *Table B – Testing Procedures for Soils and Water* from the RBCA, which is presented on the following page of this SOP.

Decontamination will be completed following procedures outlined in AWS SOP-01.

Petroleum Product	VPH	EPH Screen	EPH Fractionation	EPH for PAHs	RCRA Metals + Zinc	EPA Method 8260B – Oxygenates /VOCs	Lead Scavengers
Gasoline/Aviation Gasoline	R						SS
Diesel (#1 & #2)	R	R	X	SS			
#1 - #2 Heating Oils	R	R	X	SS			
#3 - #6 Fuel Oils		R	X	X			
Used/Waste Oil	R	R	X	X	SS	R	SS
Kerosene, Jet Fuel (Jet-A, JP-4, JP-5, JP-8, etc.)	R	R	X	SS			
Mineral/Dielectric Oils		R	X				
Heavier Wastes		R	X	X			
Crude Oil	R	R	X	X			
Unknown Oils/Sources	R	R	X	X	SS	R	SS

Table B - Testing Procedures for Soils and Water
R - required analysis
X - analysis to be run if the EPH screen concentration in is >200 mg/kg TEH or >1,000 µg/L TEH in soil and water, respectively.
SS - Site-specific determination.

SURFACE SAMPLING:

Surface soil samples are collected from the surface to depths of approximately 6 inches below ground surface (bgs), unless otherwise specified in the project specific SAP. Sufficient sample will be collected for the analysis that will be performed, but generally, this will be less than 1 quart. Soil samples will be collected in either wide mouth glass jars or re-sealable polyethylene bags (Ziploc® or equivalent).

Samples should be collected from an area of approximately 1 square foot or less using shovels, trowels, etc., as appropriate. Where composite samples are desired for petroleum samples, care should be taken to minimize volatilization while mixing. Field mixing may be accomplished in the mixing bowl or in a sealed Ziploc bag for EPH and metals samples. Field compositing should not be completed for VPH or VOC samples. Aliquots may be containerized individually and submitted for laboratory compositing, if necessary.

If a sod or duff layer is present, this layer should be peeled back to the top of the mineral soil. Likewise, larger aggregate (e.g. > ¾" diameter) should generally be removed from the sample.

The sample must be well mixed, with a representative portion placed in the sample container. Quarter the sample in the bowl/bag and place an equal volume of soil from each quarter in the sample container(s) provided by the laboratory. Label sample containers (location, depths, etc.) and place on ice as quickly as practicable and keep cool until receipt by laboratory. Transfer to laboratory using chain-of-custody (COC) protocol and overnight shipping or direct delivery, if applicable.

SUBSURFACE SAMPLING:

Ensure subsurface utilities, including any private utilities (e.g., electrical for signs, water & controls for irrigation, etc.) have been surface-marked prior to initiation of subsurface sampling activities. Consider utilizing “daylighting” techniques where utility locations are unknown.

Arrange for disposal of cuttings/waste material prior to initiation of sampling (e.g., return to boring/excavation; transport/dispose at a landfill; etc.), including waste manifesting, if appropriate. Where waste materials must be temporarily left on site, arrange for storage in drums, lined berms, etc., as appropriate.

Ensure equipment (drill rigs, backhoes, trackhoes, etc.) can safely access the areas to be sampled. Minimize damage to the surface (landscaping, pavement, etc.) as feasible, or arrange for repair prior to on-site activities.

Subsurface sampling will generally be completed using a hand auger, excavator, or drill rig. Sampling procedures for each type of equipment are described below. Sample collection, homogenization, compositing, transfer to sampling containers, and transmittal to the laboratory should follow the same procedures as outlined for collection of surface samples.

Hand auger: Auger holes can be drilled at a consistent diameter or in a telescoping manner, if contamination between sample intervals is a concern. The telescoping method includes advancing the largest auger to an approximate depth of 3 feet bgs, collecting specified depth increment samples as the auger is advanced. Install temporary casing (e.g., new or decontaminated PVC) with a diameter slightly smaller than the borehole to keep the hole open and reduce possible cross-contamination between depth intervals. Using the next size smaller bucket auger, repeat the process. Record lithology from recovered cuttings throughout. Select sample intervals for field screening and packaging for laboratory analysis in accordance with procedures described in the SAP. Return cuttings to the boring as feasible, or abandon the boring with hydrated bentonite chips. Restore the site in accordance with the project plan.

Drill Rig: Retrieve sampler from driller. Split spoon samplers are generally utilized by advancing alternating larger samplers (~3-inch diameter) and small samplers (~1.5-inch diameter), both being approximately 2.5-feet long, using hollow-stem auger drilling methods. MacroCore® samples are generally obtained by advancing 4-foot-long sample tubes of approximately 1.5-inch diameter using a direct-push drilling method. In either case, record lithology and percent recovery from cores retrieved. Collect at least 1 sample interval from each recovered interval for field screening, and select sample intervals for packaging for laboratory analysis in accordance with procedures described in the SAP. Return cuttings to the boring as feasible, or abandon the boring with hydrated bentonite chips. Restore the site in accordance with the project plan.

Excavations: Excavate to the prescribed depth. If the excavation depth exceeds 5 feet, OSHA construction standards for shoring or sloping must be followed to prevent accidental injury. Sampling personnel should enter the excavation only as necessary, and always with care, during and after excavation. Soil profile descriptions shall be made from a freshly scraped surface along the excavation wall or base, as feasible. Soil samples shall be collected from depth intervals specified in the SAP.

After sampling is completed, the excavation should be backfilled with excavation material in the reverse order that it was excavated so topsoil material is returned to the surface. Alternatively, if excavated material is being disposed, backfill with imported fill material. Backfill material should be mechanically compacted to extents feasible, or in accordance with project-specific requirements in the SAP. Restore the site in accordance with the project plan.

PREPARATION AND PRESERVATION:

All soil samples will be packaged and preserved in accordance with the respective analytical method(s), using containers and preservatives provided by the analytical laboratory, where applicable. Samples will be placed in coolers with ice (or refrigerators) as soon as practicable following collection and will be kept cool until received by the laboratory, as required for the respective method(s).

Samples will be containerized and shipped using chain-of-custody protocol, as outlined in AWS SOP-08. This includes placement of custody seals on coolers (or on individual sample containers).

Standard analytical methods, sample container and preservation requirements, and analytical hold times are presented in *Table A – Soil Sampling and Preservation Protocol* on the following page of this SOP. The provided *Table A* has been taken from DEQ's *Final February 2024 RBCA*.

Parameter	Analytical Method	Sample Container/ Preservation	Holding Time
Soil Samples			
VPH	Montana Method VPH	60 mL or 40 mL VOA vials or 4 oz wide mouth jar. Collect at least 10 g of soil, cool to 4 ±2° C. Must be preserved at the lab in methanol within 48 hours of collection. or Methanol preservation in the field.1 mL methanol for every g soil, +/- 25%; lab can provide appropriate vials with methanol for easy collection; cool to 4 ±2° C. If preserving with methanol in the field, a sample containing no methanol must also be submitted for determining moisture percentage.	28 Days to analysis from collection. If collecting in the field without methanol, lab preservation in methanol w/in 48 hours and 28 days to analysis from collection.
EPH Screen	Montana Method EPH	4-oz wide-mouth amber glass jar, cool to 4±2° C	Extracted within 14 days of collection. Analyzed within 40 days of extraction.
EPH Fractionation with or without PAH's	Montana Method EPH (PAHs: 8270))	One 4-oz glass jar, cool to (4 ± 2) ºC	Following EPH Screen 14-day to extraction, 40 days to analysis.
VOCs/Oxygenates/ 1,2 DCA/lead scavengers EDB	EPA Method 8260 /SW-846-5035A	One 4-oz. glass jar, cool to (4 ± 2) ºC Preserve in methanol in field or at lab within 48 hours of collection.	48 hours to lab extraction. 14-day hold time from collection MeOH preservation: 14 days to extraction and analysis from collection.
RCRA Metals plus zinc (Except Hg) Mercury (Hg)	EPA Method 6010 or 6020 EPA Method 7471 B	One 4-oz. plastic or glass jar, no preservation One 4-oz. plastic or glass jar, no preservation	6 months 28 days
% Moisture-required for all soil samples	USDA Handbook 60 method 26 (or equivalent)		

Table A - Soil Sampling and Preservation Protocol

Alternate approved versions of the methods are allowed.

EQUIPMENT:

AWS measures total volatile organic compounds (VOC) using a photoionization detector (PID) with a 10.6 electron volt (eV) lamp, following a “heated headspace” method. The PID should be fully charged the day prior to field usage, and extra batteries or field chargers should be available, as feasible. Calibration equipment and supplies should be included in the field kit based on the recommendations of the manufacturer. These generally include a cylinder of compressed calibration gas, a pressure/flow regulator, and an activated carbon “zero” filter.

Field screening sample containers may consist of either heavy zip-top plastic bags (e.g., Ziploc® Freezer bags or equivalent) or glass canning jars fitted with aluminum foil under the metal lid rings. Plastic bags and aluminum foil should never be reused. When using canning jars, the jars and rings should be decontaminated between sample analyses (see AWS SOP-01). Whether plastic bags or glass jars are used, sample vessels and sample amounts should be consistent in composition and volume for all field total VOC samples collected for a given project. This will facilitate consistent sample headspace for all field screening samples, increasing data reliability.

Use of personal protective equipment (e.g., disposable latex or nitrile gloves, eye protection, etc.) and decontamination fluids and equipment should be consistent with AWS SOP-01 and AWS SOP-02.

CALIBRATION:

The PID should be field calibrated prior to use at least once per day, at a minimum. Bump testing and/or recalibration should be completed if the accuracy of field data are questioned by the operator, or if the duration of field activities following initial calibration exceeds 8 hours.

In an upwind or otherwise vapor-free atmosphere, turn the instrument on and initiate the calibration procedure per the manufacturer’s instructions. Ensure the calibration span setting in the instrument matches that of the calibration gas. The calibration span gas utilized for field screening of total VOCs at petroleum release investigation projects is 100 parts per million (ppm) isobutylene in air.

PROCEDURE:

Collect soil samples following AWS SOP-02, including labeling of field screening sample containers with the appropriate sample name/identification (ID). Field screening samples are often collected from the same locations as laboratory samples. In such instances, the portions to be containerized for field screening are referred to as field “split” samples.

Ensure field split samples are kept out of direct sunlight, allowing them to warm to approximately 70-80 degrees Fahrenheit (°F) as determined by feel (approximately room temperature). This may be accomplished by placing the sample vessel on the floor board of a running vehicle with the heater turned on. In this scenario, caution should be used to avoid exposing vehicle occupants to VOCs (roll-down windows to provide cross-ventilation). To ensure data precision, warm all samples for a given project to approximately the same temperature over approximately the same amount of time, if practicable.

Attach the sample probe to the PID and allow the instrument to complete its warm-up cycle, if necessary. Opening the sample vessel as little as possible, insert the probe into the “headspace” of the sample vessel. This can be accomplished by opening the zip-top plastic bag enclosure approximately ¼-inch or by poking the probe through the foil jar cover. In either instance, avoid inserting the sample probe directly into the soil. Samples should be analyzed in order of assumed impacts, beginning with the samples inferred to be least impacted and finishing with the samples inferred to be most-impacted.

Continually observe the instrument readout and record the highest concentration (or use the instruments “Max” function, if available, taking care to reset the instrument’s “Max” value after each sample reading). Sample name/ID and observed total VOC concentrations should be recorded in a way to facilitate preparation of an overall soil sample and field screening data summary for the project.

Heated and analyzed soil samples must never be containerized for laboratory analysis. Laboratory samples must be split from the original sample and containerized and preserved separately, immediately following collection. Alternatively, laboratory samples may be collected and containerized separately following completion of field analyses.

MAINTENANCE:

The instrument should always be stored in the case provided by the manufacturer when not in use. Maintenance and storage of the instrument and batteries should be conducted in accordance with the manufacturer’s recommendations.

Periodic instrument maintenance should be completed as recommended by the manufacturer, including occasional partial disassembly and removal, cleaning, or replacement of in-line filters and or lamps. Other failed components should be replaced as necessary as well. Some maintenance may need to be completed by the manufacturer or authorized service center.

EQUIPMENT:

- Electric Water Level Indicator (well probe)
- Electronic Oil-Water Interface Probe (interface probe)
- Extra batteries
- Field sampling forms
- Decontamination equipment

CALIBRATION:

The well probe and interface probe should be checked annually at a minimum, or more frequently as needed, for proper operation prior to completing field activities. The well probe should be checked by lowering the probe into a cup of clean water and confirming the probe's proper response. The interface probe should be checked by lowering the probe into a cup containing both vegetable oil and clean water, and where the oil and water have had time to separate into two distinct layers, and confirming the probe's proper response to each layer.

GENERAL:

Measure the depth to water in all wells , using the well probe, from the north quadrant of the top of the well casing or from a designated measuring point, as appropriate. Measure and record vertical distance from measuring point to ground level (unless measuring point has been surveyed for elevation). Make sure the measuring point is labeled or marked on the well casing so future measurements can be made from the same location. Obtain a depth to water from the established measuring point to the nearest hundredth of a foot. Record data on appropriate field forms.

Decontaminate the well probe between each well in accordance with AWS SOP-01 and/or the project-specific SAP.

If free-product petroleum is known or suspected to be present in a well, an interface probe should be used to measure the depth to water and thickness of free product in the well.

Using the interface probe, measure the depth to the top of free-product below the designated measuring point. Continue to lower the probe until the bottom of the product/top of groundwater interface is reached. Record both measurements on field forms. Product thickness can be calculated by subtracting the depth to the top of free-product measurement from the depth to groundwater/free-product interface measurement.

Decontaminate the interface probe between each well in accordance with the AWS SOP-01 and/or the project-specific SAP.

EQUIPMENT:

- 5-gallon bucket graduated in quarter gallons
- Electric Oil-Water Interface Probe (interface probe)
- Bailer(s)
- Disposable bailer rope or reusable Teflon cable on a reel
- Field forms
- Decontamination equipment

GENERAL:

Groundwater will be allowed to equilibrate in the new monitoring well for several days before development. Immediately prior to initiation of development activities, depth to water (DTW) will be measured relative to the previously established measuring point using an interface probe, in accordance with AWS SOP-04 and/or the project-specific SAP. DTW data will be recorded on field forms and will be used to calculate the casing water volume for well development purposes.

A new, disposable, polyethylene bailer will be used to develop the new well. A surge and bail technique will be used to remove sediment from the filter pack. Bailed water and sediment will be contained in a graduated 5-gallon bucket and DTW measurements will be intermittently collected after bailing events to monitor infiltration of groundwater into the well. If sufficient groundwater infiltration to the well occurs, development will continue until purge water turbidity is visibly decreased, or until 10 casing volumes of water have been evacuated. Following development of the well, the post-development DTW will be measured. DTW measurements, purge volumes, and visual observations (qualitative turbidity descriptions) will be recorded on a field form.

If free product petroleum is present in the new well, it will not be developed. In this instance, the thickness of the free product layer would be measured with the interface probe and the measurement recorded on a field form. If the interface probe measurement is inconsistent or if the interface probe is unavailable, an approximate measurement of visible product thickness will be determined using a bailer and tape measure. Recovery, sampling, and analysis of free product petroleum will <u>not</u> be performed under this scope of work.

If specified in the SAP to be completed during the evacuation process, collect water samples for field determinations of temperature, specific conductivity, and pH. Continue developing the well until field parameters stabilize to within ±5% on 3 consecutive measurements. Report field observations and volume of water removed on the field forms.

Dispose purge water in accordance with AWS SOP-56.

EQUIPMENT:

- 5-gallon bucket graduated in gallons
- Low-flow cell or 12-ounce glass jar
- Hydrogen potential (pH) and temperature meter
- Specific conductance (SC) meter
- Dissolved oxygen (DO) meter
- Oxidation/reduction potential (ORP) meter
- Turbidity meter
- Coolers and ice
- Sample bottles
- Sampling pump – Peristaltic or Bladder-type with controller and compressor
- Disposable bladders (if using bladder pump)
- Disposable tubing
- Bailer(s)
- Bailer rope or Teflon cable reel
- Preservatives
- Disposable in-line filters or filter apparatus with filter media
- Field sampling forms
- Decontamination equipment and indelible marker
- Fluids
- Stopwatch
- Electronic Oil-Water Interface Probe (interface probe)
- Graduated vessel

MAINTENANCE:

All equipment should be inspected for damage and proper functionality (including battery charge) prior to use in the field. Unstable or “drifting” measurement readouts may be indicative of damaged probes/sensors, especially if the problem persists following recalibration. Damaged or improperly functioning equipment should be repaired or replaced as appropriate.

All meters, probes, pumps, sampling equipment, and sample vessels should be decontaminated in accordance with AWS SOP- 01 and following completion of sampling.

CALIBRATION:

Instruction manuals should always be kept with meters, especially sections pertaining to calibration and trouble shooting. Keep spare batteries with each meter. Calibration fluids appropriate for the anticipated sample ranges (pH 4.01 buffer solutions for acidic samples) should be kept with meters and should not be used if marked expiration dates have been exceeded. Several small sample vessels should be kept with meters for calibration and sample analyses.

Calibration of individual meters will vary; calibration should always be performed in accordance with the manufacturer’s recommendations. In general, most meters should be calibrated at the beginning of each field day, at a minimum. Additional calibrations may be necessary if meter readings become questionable. Performance of “bump testing” to determine whether meters are within acceptable calibration ranges is advisable for sampling events longer than approximately 6 hours.

DO meters calibrate with barometric pressure. ORP and SC meters may only require periodic calibration using calibration solutions appropriate for the anticipated sample ranges. Two or three-point calibration is advisable for most pH meters; for two-point calibrations, consideration should be given to the anticipated sample range. Turbidity meters use four standards for calibration (800 NTU, 100 NTU, 20 NTU, and 0.02 NTU), if 20, 100, or 800 NTU drifts more than 10% the solution needs to be replaced. Temperature sensors for most meters do not require calibration.

PROCEDURE:

AWS will complete groundwater sampling in accordance with the procedures presented below. Where applicable, groundwater sampling procedures will also be completed in accordance with the current version of DEQ's *Groundwater Sampling Guidance.*

Initial Measurements - Begin by determining the depth-to-water (DTW) in accordance with the AWS SOP-04, and/or the project-specific SAP. If DO is a desired field analysis, gently lower the DO meter's probe, calibrated per manufacturer's guidelines, to just beyond the DTW observed in the previous step. Once submerged, readings will begin trending in a consistent increasing or decreasing manor, until a transitional point is reached and the initial trend is reversed. This transitional point should be recorded on the appropriate sampling form as the pre-purge DO.

Well Purging - Purging must be performed on all wells prior to sample collection. Well purging will be accomplished using a peristaltic pump, bladder pump, or with a disposable polyethylene bailer. The specific purging method shall be chosen based on the following: DTW; diameter of well; existing well configuration; contaminant(s) of concern; and/or, the project-specific SAP. Sampling is generally not conducted when free product (e.g., light non-aqueous phase liquid, or LNAPL) is present.

Where pumping methods are used, field water quality indicators (WQIs) will be observed and recorded in approximate five-minute intervals. Evacuation of fluids will continue until DO, pH, SC, ORP, and turbidity readings stabilize. Stabilized readings will include changes of no more than 0.1 standard unit (su) for pH and no more than 3 percent (%) for SC, no more than 10 percent (%) for DO and turbidity, and 10 millivolts (mV) for ORP.

Where bailer methods are used, purging should remove at least three (3) casing volumes of fluid from the well and until stabilized WQIs are achieved. The following equation is used to calculate well casing volume in gallons:

$$V = 3.14 \times (r^2) \times h \times 7.48$$

Where: V = volume (gallons)
r = well radius (feet)
h = height of water column in well (feet)

The radius of the well pack will be used for the well radius (r) for calculating volumes. For example, a 2-inch diameter PVC monitoring well installed in a 6-inch diameter borehole with sand filter pack would use a well radius of 3 inches or 0.25 feet.

The height of the water column (h) is calculated as the total well depth minus the DTW measurement for the well.

WQIs will be observed during bailing of each well, if feasible. Stabilized readings will include changes of no more than 0.1 su for pH, no more than 3% for SC, no more than 10% for DO or turbidity, and no more than 10 mV for ORP. If WQIs have not stabilized after five (5) casing volumes have been evacuated, it is at the discretion of the AWS field technician whether to collect a sample or to continue purging.

The actual pumping duration and/or volume of water purged from the well, along with the WQI readings, must be recorded on appropriate sampling forms for all methods of purging.

Wells with documented or expected low yield/slow recovery may require sample collection without prior purging due to limited available water volume.

If the recovery of a low-yield well exceeds 2 hours after purging, a sample shall be extracted as soon as sufficient volume is available in the well. At no time will a monitoring well be pumped dry if the recharge rate causes formation water to cascade down interior portions of the well casing, causing an accelerated loss of volatile organics and change in pH.

General Well Sampling - Wells must be sampled from the least contaminated to the most contaminated, if known. Open well and measure DTW in accordance with the AWS SOP-04. Decontaminate all sampling/down-well equipment in accordance with the AWS SOP-01. Use disposable nitrile gloves throughout decontamination and sampling procedures and use new gloves for each sampling point.

The actual pumping duration and/or volume of water removed from the well, along with all WQI readings, must be recorded on appropriate sampling forms for all methods of sampling.

Low-Flow Method - The goal of low flow purging and sampling is to collect water samples that reflect the total mobile organic and inorganic loads transported through the subsurface under ambient flow conditions, with minimal physical and chemical alterations from sampling operations. During this procedure, emphasis is placed on minimizing hydraulic stress at the well-aquifer interface by maintaining low water-level drawdowns, and by using low pumping rates during purging and sampling operations.

WQIs are monitored during purging to identify stabilized conditions to determine when sample collection may begin. Stabilized readings will include changes of no more than 0.1 su for pH, no more than 3% for SC, no more than 10% for DO or turbidity, and no more than 10 mV for ORP.

The low-flow method should be implemented with a positive-lift pump (e.g., peristaltic or bladder pump). The pump intake should be located within the well-screen interval and at a depth that will remain under water at all times. It is recommended that the intake depth and pumping rate remain the same for all sampling events. The following equation is used to calculate the pump intake depth or sampling depth:

$$SD = DTW + [(TD - DTW) \div 3]$$

Where: SD = Sampling depth (feet)
DTW = Depth to water (feet)
TD = Total well depth (feet)

Note this equation places the pump intake in the upper one-third of the water column and should be modified to sample from deeper depths, accordingly (e.g., if wanting to sample from the middle of the water column, replace the value of 3 with 2 in the equation).

The low-flow cell should be set up over the 5-gallon bucket so that the pump tubing discharge flows into the cell and overflows into the bucket. The pH, temperature, SC, and ORP (if used) meters should be set up to monitor water quality in the low-flow cell during purging and sampling.

Disposable tubing should be cut to a length that extends from the down-well bladder pump, or sampling depth for peristaltic pump, to the low-flow cell discharge point.

DTW should be measured before installing the pump and continuously recorded during purging at consistent intervals (e.g., 5 or 10 minutes). Pumping rates should, as needed, be reduced to the minimum capabilities of the pump to ensure drawdown of less than 0.3 foot or stabilization of the water level. If the minimal drawdown that can be achieved exceeds 0.3 foot, but remains stable, continue purging until the three (3) casing volumes are removed and/or water quality parameters stabilize.

The final purge volume must be greater than the stabilized drawdown volume plus the pump's tubing volume. If the drawdown has exceeded 0.3 foot and WQIs have stabilized, calculate the volume of water between the initial water level and the stabilized water level. Add the volume of the water which occupies the pump's tubing to this calculation. This combined volume of water needs to be purged from the well after the water level has stabilized before samples are collected.

Bailer Method – Removal of water from the well by bailing will be accomplished using a new, disposable, polypropylene (or other material specified in the SAP), bailer and a spool of polypropylene rope or equivalent bailer cord (e.g., Teflon-coated stainless-steel cable). The length of the bailer and cord should be sufficient for the bailer intake to reach the middle of the well-screen section, and to allow evacuation of water from the lower one-third of the well casing, if needed.

Bailing should be a semi-continuous procedure of removing water from the upper one-half of the water column. Care should be taken not to disturb sediment in the bottom of the well.

Bailed water should be gently poured into a decontaminated, 12-ounce glass jar equipped with pH, temperature, SC, and ORP (if used) meters to monitor water quality. Bailing will continue until the purging requirements stated previously are achieved.

Domestic Well Sampling – If an active domestic or irrigation well needs to be sampled, then the water needs to be initially purged. First, the total volume of water in the well casing is calculated using equation provided on Page 2 of this SOP. Thereafter, a minimum of three (3) casing volumes of water should be evacuated from the well prior to sampling.

Well purging should be accomplished by opening a faucet connected to the well pump. A faucet location should be selected as close to the well pump as possible. The faucet shall not be located after water treatment systems such as softeners or filtration units.

Flow from the faucet should be measured using a graduated vessel and stopwatch. Several measurements should be taken to monitor possible changing flows during the purging procedure.

If desired, WQIs may be monitored in the discharged fluid during the well purging.

Collecting Water Samples - Label each sample container with project number, sample location, well owner, date, time, sampler’s initials, preservative, and analysis required. Wear new disposable nitrile gloves immediately prior to obtaining the sample.

For low-flow samples, several inches should be cut from the end of the sample effluent tubing (i.e., removing the portion in contact with the flow-through monitoring cell) before collecting water samples. A disposable in-line filter should be attached to the cut end of the tubing, as needed, prior to collection of filtered samples.

For domestic well sampling, pump flow should be reduced so that a constant minimal flow is achieved from the faucet. Samples should be collected directly from the faucet and not through rubber hoses. Filtered samples may be obtained by using a filter apparatus fitted with new filter media.

When using a bailer, take care to minimize degassing or contamination of the sample by submerging and withdrawing the bailer slowly to avoid splashing. Do not place the bailer on the ground. Filtered samples may be obtained by using a filter apparatus fitted with new filter media.

Add preservatives to the sample container prior to sample collection. Remove water from the well and transfer sample water directly into sample bottles (using an in-line filter or filter apparatus, as necessary), maintaining a slow linear flow with as little agitation as possible.

For volatile analyses, fill vials at the rate of about 100 milliliters per minute (24 seconds for 40 mL vial) or less. Fill each sample vial completely so the water forms a convex meniscus at the top to ensure no air space exists in the vial after it has been capped. After filling, immediately cap, invert, and gently tap the vial to check for trapped air. If air bubbles are present, un-cap vial, add more sample water and repeat procedure. If air bubbles continue to be present after repeated filling attempts, cap the vial, keep for laboratory analyses, and note the condition on the field form.

For inorganics samples not requiring preservatives, rinse sample containers three (3) times with sample water before final collection. Do not rinse containers for organics analysis.

Water samples should be preserved as described in the following table, or in accordance with instructions from the analytical laboratory, if different:

PARAMETER	NUMBER	CONTAINER	PRESERVATION	MAXIMUM HOLDING TIME UNTIL EXTRACTION / ANALYSIS
VOCs	3	40 mL glass VOA	6°C and HCL	14 days
VPH	2	40 mL glass VOA	6°C and HCL	14 days for extraction/ 28 days for analysis
EPH	2	1000 mL glass bottle	6°C	14 days for extraction/ 28 days for analysis
SVOCs	2	1000 mL glass bottle	6°C	7 days for extraction/ 40 days for analysis
Metals	1-2*	250 mL plastic bottle	6°C and HNO_3	6 months 28 days for mercury
Inorganics	1	Varies	varies	Varies – contact laboratory

Notes: VOCs – Volatile Organic Compounds; VPH – Volatile Petroleum Hydrocarbons; EPH – Extractable Petroleum Hydrocarbons; SVOCs – Synthetic Volatile Organic Compounds; mL – milliliter; °C – degrees Celsius; HCL – hydrochloric acid; HNO_3 – nitric acid. *Filtered and/or unfiltered.

Dispose purge water in accordance with AWS SOP-56.

Replace well cap and lock (if present) when sampling is complete, and replace all appurtenances on domestic wells (if present prior to work), when sampling is complete.

Prepare all necessary chain-of-custody forms, sampling forms, and other documentation. Package and ship samples in accordance with AWS SOP-08.

CHAIN-OF-CUSTODY PROCEDURES:

A chain-of-custody (COC) form must be prepared for all samples collected in the field for laboratory analysis. Multiple samples from the same sampling event, relating to a specific single project, may be included on a COC form. Samples from more than one project should not be included on the same COC form. The sampler should use a COC form provided by the laboratory performing sample analyses.

Completed COC forms must be maintained from the time of sample collection until the time of sample delivery to the analytical laboratory. The completed COC form should accompany the samples through analysis and final disposition. A copy(ies) of the COC form(s) should be maintained in the project file.

Information to be included on the COC form will include, but is not limited to:

- Project number / name
- Sampler's name and signature
- Date and time of sample collection, per sample
- Unique sample name/identification (ID)
- Number of containers per sample
- Sample media (e.g., soil, water, vapor)
- Sample preservative (if applicable)
- Requested analysis(es)
- Comments or special instructions to the laboratory

All samples must be assigned unique sample names/IDs. The information on the COC form, including the ID for a specific sample, must correspond to the information recorded by the sampler on the field forms, and the sample ID label on the sample container, for the respective sample.

A sample is considered under a person's control when it is in their possession. When custody of a sample is relinquished by the sampler, the sampler will sign and date the COC form and note the time that custody was relinquished. The person receiving custody of the sample will also sign and date the form and note the time that the sample was accepted into custody. The goal is to provide a complete record of control of the samples. Should the chain be broken (signed by the relinquisher, but not receiver, or vice versa), the integrity of the sample is lost and the reliability of the resulting analytical data may be degraded.

Samples must be packaged and shipped (or directly transported) to the laboratory following the procedures described below. If an overnight shipping service is used to transport the samples to the laboratory, custody of the samples must be relinquished to the shipping service. If possible, have the shipping service sign the COC form prior to placing the COC form in the sample cooler. If this is not possible (i.e., form placed in sealed cooler), a note should be included on the COC that the shipping company will receive the samples with the COC form inside the sample container.

PACKAGING:

All environmental samples should be packaged and shipped using the following procedures:

- Label all sample containers with indelible ink (on the side of the container, not on the cap or lid).
- Place labeled sample containers in a sturdy outer shipping box or cooler. When samples must remain refrigerated, use a well-insulated cooler containing an adequate amount of ice, making sure the cooler drain plug is taped shut (if applicable). Water ice should be used whenever feasible. Use of dry ice is more likely to result in freezing of samples, and use of reusable (e.g., “blue”) ice packs is likely to result in samples exceeding the allowable temperature range.
- Place soil and water sample containers in an upright position and wrap the containers with cushioning material for stability during transport. Samples should not be loose; the cooler and packed samples should be able to withstand rough handling during shipment without sample container breakage. If feasible, all sample containers and ice bags should be placed inside at least 1 heavy plastic bag, inside the cooler. The top of the outer bag should be twisted and taped in a “goose neck” fashion to help prevent leaks. It is advisable to place absorbent materials in the outer bag when liquids (including water ice) will be shipped.
- Fill out the appropriate shipping forms and place the paperwork in a Ziploc® bag (or equivalent) and tape it to the inside lid of the shipping container. Shipping forms usually include: 1) a COC form, documenting the samples included in the shipment; 2) an analysis request form, specifying the laboratory analyses for each sample (these are usually on the same form but may be separate).
- If more than one cooler is used per COC, put a photocopy in each of the additional coolers and mark them as a copy. Clearly identify on the COC (and copies) the total number of coolers included in the sample group.
- Complete and apply a custody seal to the exterior of each cooler where the lid meets the cooler container. Close and seal the cooler using clear packing tape. Secure the shipment label with address, phone number and return address clearly visible.

SHIPPING HAZARDOUS MATERIALS / WASTE:

Hazardous materials need to be shipped using procedures specified under Federal Law.

Transportation regulations for shipping of hazardous substances and dangerous goods are defined by the U.S. DOT in 49 CFR, Subchapter C, Part 171 (October 1, 1988); IATA and ICAO. These regulations are accepted by Federal Express and other ground and air carriers.

According to U.S. DOT regulations, environmental samples are classified as Other Regulated Substances (ORS). ORS are articles, samples, or materials that are suspected or known to contain contaminants and/or are capable of posing a risk to health, safety, or property when transported by ground or air. Samples, substances, or materials from sources other than material drums, leachate streams, and sludges should be considered as ORS or environmental samples. Materials shipped under the classification of ORS must not meet any of the following definitions:

- Class 1: explosives
- Class 2: gases (compressed, liquefied, dissolved under pressure, or refrigerated)
- Class 3: flammable liquids
- Class 4: substances susceptible to spontaneous combustion

- Class 5: oxidizing substances
- Class 6: poisonous (toxic and infectious)
- Class 7: radioactive materials
- Class 8: corrosives.

Coordinate special shipping or direct-delivery arrangements with the Project Manager for samples meeting any of the definitions above.

AIR WATER SOIL

STANDARD OPERATING PROCEDURE

Disposal of Investigation-Derived Waste

AWS SOP-56

EQUIPMENT:

- Disposal drums (typically steel)
- Adjustable wrench, end wrench, or ratchet/socket for drum lids
- Buckets
- Funnels
- Plastic sheeting (typically 6-mil or heavier)
- Utility knife or scissors
- Shovels (flat, spade, etc.)
- Plastic garbage bags

SOLID WASTE:

Solid investigation-derived waste (IDW) generally includes small quantities of soil generated from drilling or test pit excavations. Larger quantities of waste generated from remedial actions are excluded from this SOP.

Soil cuttings are typically placed back in the holes from which they originated, thereby negating the need for disposal. Similarly, if drill or test pit cuttings do not demonstrate evidence of contamination, as determined through visual or olfactory observations, or through field analysis of total volatile organic compounds (VOC; see AWS SOP-03), the cuttings may instead be spread on unpaved areas of the site. In such instances, coordinate with project stakeholders (e.g., the client, site owner, regulatory personnel, etc.) to determine acceptable areas for placement.

Cuttings which demonstrate evidence of contamination must be transported to an appropriate solid waste disposal facility, such as a licensed landfill or permitted land farm. Characterization of cuttings waste should be completed in accordance with the requirements of the disposal facility selected for the project, as requirements often vary by facility.

Contaminated cuttings may be temporarily stored at the site in steel drums, or stockpiled on paved surfaces or plastic sheeting, when characterization has been completed in advance. Care should be taken to limit the potential for runoff of contaminant from uncovered stockpiles in the event of a precipitation event. For example, berms under plastic sheeting around the perimeter of the stockpile will help prevent runoff. In any case, stockpiled cuttings should be loaded and transported for disposal as quickly as feasible.

Alternatively, when advanced characterization is not feasible, the cuttings may be placed in steel drums and temporarily stored at the site. In some cases, temporary storage of stockpiled soil may be required, in which case stockpiles should be placed on and covered by plastic sheeting, with covered berms utilized as appropriate to limit the potential for runoff of contaminant. Coordinate the temporary storage approach and locations with project stakeholders, and complete waste characterization, transport, and disposal as promptly as feasible.

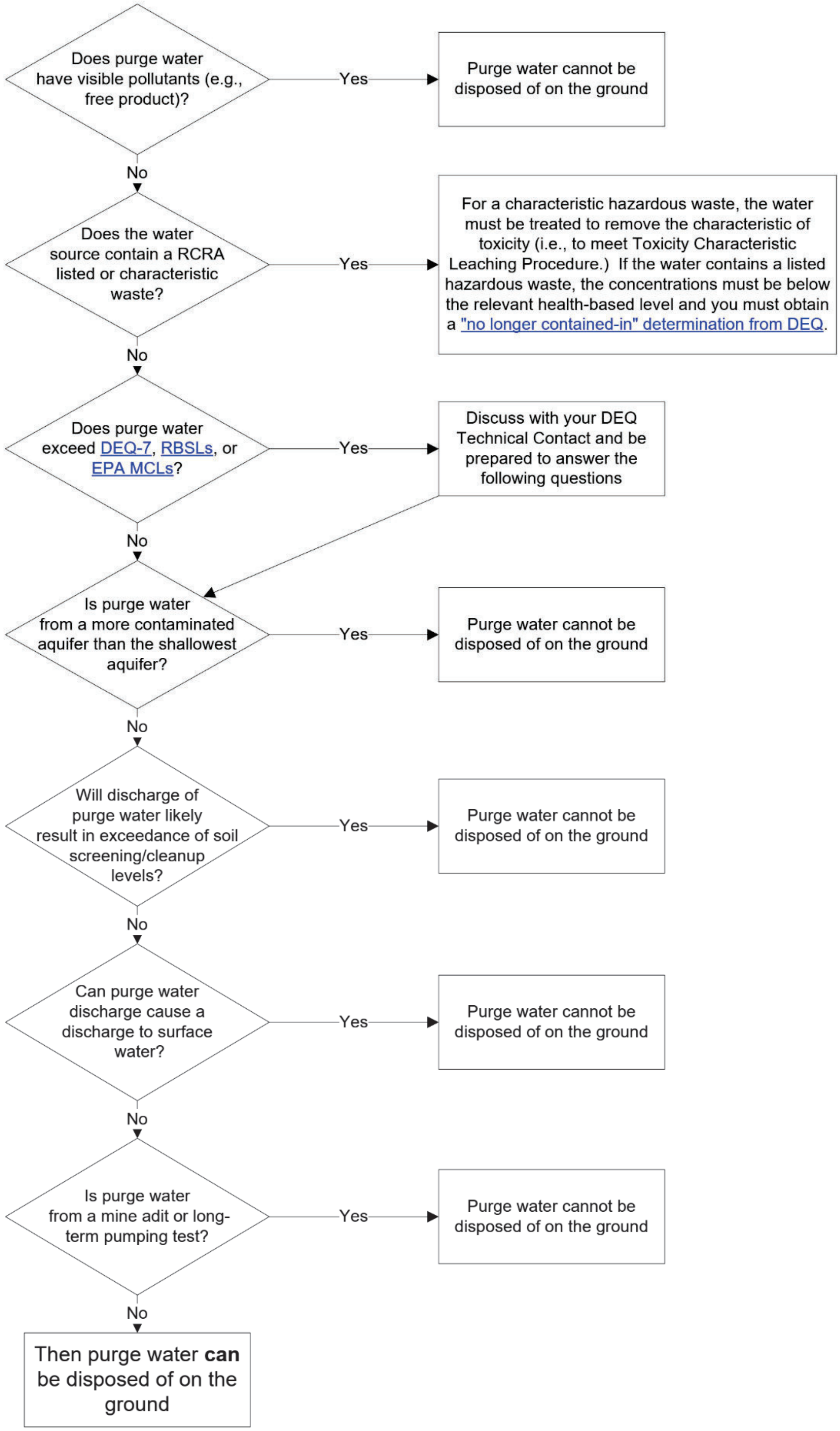
General trash and personal protective equipment waste shall be cleansed of any gross contaminated soil accumulation and shall be placed in plastic garbage bags and properly disposed at a licensed solid waste disposal facility.

LIQUIDS:

Liquid IDW includes purge water generated during well development and groundwater monitoring activities. Purge water shall be assessed in accordance with the Montana Department of Environmental Quality (DEQ) flow chart provided below.

Purge water assessed via the DEQ flow chart and determined not to contain known contaminants may be spread on the ground surface near the source well or boring. Where feasible, such purge water will be surface applied on paved surfaces. Purge water shall not be poured into storm water inlets, sewer manholes, natural drainages, or surface water bodies.

Purge water which is assessed via the DEQ flow chart and is determined to be contaminated shall be contained in drums and disposed at a licensed liquid waste disposal facility in accordance with that facility's disposal requirements. Alternatively, options for disposal of contaminated purge water may be discussed with DEQ in accordance with the flow chart on the following page. Temporary on-site storage of liquid waste in drums should be coordinated with project stakeholders. Characterization of liquid waste should be completed in accordance with the requirements of the disposal facility selected for the project, as requirements often vary by facility. Waste characterization and disposal should be completed as quickly as feasible.


Does purge water have visible pollutants (e.g., free product)?
Yes
Purge water cannot be disposed of on the ground
No
Does the water source contain a RCRA listed or characteristic waste?
Yes
For a characteristic hazardous waste, the water must be treated to remove the characteristic of toxicity (i.e., to meet Toxicity Characteristic Leaching Procedure.) If the water contains a listed hazardous waste, the concentrations must be below the relevant health-based level and you must obtain a "no longer contained-in" determination from DEQ.
No
Does purge water exceed DEQ-7, RBSLs, or EPA MCLs?
Yes
Discuss with your DEQ Technical Contact and be prepared to answer the following questions
No
Is purge water from a more contaminated aquifer than the shallowest aquifer?
Yes
Purge water cannot be disposed of on the ground
No
Will discharge of purge water likely result in exceedance of soil screening/cleanup levels?
Yes
Purge water cannot be disposed of on the ground
No
Can purge water discharge cause a discharge to surface water?
Yes
Purge water cannot be disposed of on the ground
No
Is purge water from a mine adit or long-term pumping test?
Yes
Purge water cannot be disposed of on the ground
No
Then purge water can be disposed of on the ground

AIR WATER SOIL

ATTACHMENT C

Groundwater Monitoring Analytical Plan

(Revision 1)

AIR WATER SOIL

GROUNDWATER MONITORING ANALYTICAL PLAN

Work Plan for Limited Excavation and In-Situ Remediation
Former McGaffick Service
DEQ FID 25-01709 (TID 23433); Release 0656; WPID 35083

Wells	Depth to Water (DTW)	Volatile Petroleum Hydrocarbons (VPH) *(MT VPH Method)*	Extractable Petroleum Hydrocarbons (EPH) Screen *(MT EPH Method)*	EPH Fractions *(MT EPH Method)*	1,2-dichloroethane (DCA) *(Method 8260B)*	Alkalinity *(Method A2320B)*	Dissolved Methane *(Method SW8015M)*	Sulfates *(Method E300.0)*	Sulfides *(Method A4500-SF)*	Nitrogen, Nitrate + Nitrite *(Method E353.2)*	Dissolved + Total Iron and Manganese *(Methods E200.7/E200.8)*
Event #1:	**Pre-remediation baseline**										
W-01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-05	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-06	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-07	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-08	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-09	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Duplicate	--	✓	--	--	--	--	--	--	--	--	--

Notes:

W-## All existing monitoring wells (MW-1 through MW-6) will be abandoned and replaced with new wells W-01 through W-11. This table therefore refers only to planned new wells.

Work Plan for Limited Excavation and In-Situ Remediation
Former McGaffick Service
DEQ FID 25-01709 (TID 23433); Release 0656; WPID 35083

Wells	Depth to Water (DTW)	Volatile Petroleum Hydrocarbons (VPH) *(MT VPH Method)*	Extractable Petroleum Hydrocarbons (EPH) Screen *(MT EPH Method)*	EPH Fractions *(MT EPH Method)*	1,2-dichloroethane (DCA) *(Method 8260B)*	Alkalinity *(Method A2320B)*	Dissolved Methane *(Method SW8015M)*	Sulfates *(Method E300.0)*	Sulfides *(Method A4500-SF)*	Nitrogen, Nitrate + Nitrite *(Method E353.2)*	Dissolved + Total Iron and Manganese *(Methods E200.7/E200.8)*
Event #2:	**Approximately 2 months after initiation of remediation**										
W-01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-05	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-06	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-07	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-08	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-09	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Duplicate	--	✓	--	--	--	--	--	--	--	--	--

Notes:

W-## All existing monitoring wells (MW-1 through MW-6) will be abandoned and replaced with new wells W-01 through W-11. This table therefore refers only to planned new wells.

Pending review of results from Event #1 and discussion with DEQ, a reduced number of wells may be monitored in Events #2 and #3. Likewise, the specific wells to be monitored and the analyses to be performed will also be evaluated and potentially changed based on review and discussion of results from Event #1.

Work Plan for Limited Excavation and In-Situ Remediation
Former McGaffick Service
DEQ FID 25-01709 (TID 23433); Release 0656; WPID 35083

Wells	Depth to Water (DTW)	Volatile Petroleum Hydrocarbons (VPH) *(MT VPH Method)*	Extractable Petroleum Hydrocarbons (EPH) Screen *(MT EPH Method)*	EPH Fractions *(MT EPH Method)*	1,2-dichloroethane (DCA) *(Method 8260B)*	Alkalinity *(Method A2320B)*	Dissolved Methane *(Method SW8015M)*	Sulfates *(Method E300.0)*	Sulfides *(Method A4500-SF)*	Nitrogen, Nitrate + Nitrite *(Method E353.2)*	Dissolved + Total Iron and Manganese *(Methods E200.7/E200.8)*
Event #3:	**Approximately 6 months after initiation of remediation**										
W-01	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-02	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-03	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-04	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-05	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-06	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-07	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-08	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-09	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
W-11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Duplicate	--	✓	--	--	--	--	--	--	--	--	--

Notes:

W-## All existing monitoring wells (MW-1 through MW-6) will be abandoned and replaced with new wells W-01 through W-11. This table therefore refers only to planned new wells.

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