



February 21, 2025

Jerome Chvilicek
Hall and Hall, Inc.
PO Box 81490
Billings, MT 59108

Jonathan Love, PG
DEQ Petroleum Tank Cleanup Section
P.O. Box 200901
Helena, MT 59620-0901

RE: Groundwater Monitoring Work Plan (GWM WP) for the petroleum release at the Sheffield Ranch Corp., 1337 Road 158, Miles City, Montana
Facility ID 09-12945, TID 19510, Release 1985, Work Plan 35005

Dear Mr. Love,

On behalf of our client and in accordance with the Montana Department of Environmental Quality (DEQ) request letter dated January 30, 2025, Big Sky Civil & Environmental, Inc. (BSCE) has prepared this Groundwater Monitoring Work Plan for the subject petroleum release. Fieldwork will include completion of soil boreholes, installation of monitoring wells, well abandonment, and groundwater monitoring.

Background/History

The Sheffield Ranch petroleum release site is located approximately 16 miles west of Miles City on Sheffield Road and north of the Yellowstone River. Petroleum contaminated soil and groundwater were discovered at the ranch when two underground storage tanks (UST's), one diesel and one gasoline, were removed from the barnyard in November '93. The excavation was backfilled after removal of the two UST's.

In '94 and '95, two phases of remedial investigation were conducted, including the installation of ten (10) groundwater monitoring wells. In October '96, approximately 200 cubic yards of petroleum-contaminated soil were excavated and removed immediately down-gradient of the former tank basin and treated at a one-time landfarm which was also located on the Sheffield Ranch. This work was performed at the request and under the supervision of Montana DEQ. Following the October '96 corrective action, the one-time landfarm was sampled and analyzed. With DEQ authorization, monitoring of the one-time landfarm was discontinued in '98.

Additional soil boreholes, well installation and groundwater monitoring work were completed in the subsequent years; based on the results of this investigation, it was determined that additional remedial soil excavation should be completed to progress the release toward formal closure. In

July 2006, the soil excavation was completed, and 2100 cubic yards of petroleum contaminated soil were removed from the site. The contaminated soil was hauled to a one-time land farm north of the site for treatment and disposal. Following completion of soil excavation and prior to backfilling, the bottom of the open excavation was treated with a 65% ORC® slurry to stimulate bioremediation in the underlying groundwater.

After the soil excavation, several years of groundwater monitoring have been completed; the most recent sampling event was conducted in 2019. Results from the sampling events indicate that residual levels of petroleum contamination remain in groundwater, and that the concentrations of contaminant are generally decreasing when compared to historical results.

Summary of Facility Conditions

During previous investigations soils were noted as sands (sandy loam, sandy silt, etc.) underlain by gravels beginning at 11'-14.5' bgs. Depth to groundwater at the site was measured at approximately 10' below ground surface (bgs). The Yellowstone River is located approximately 150 feet south of MW-2N.

Objectives of Investigation

The objective of this work plan is to more fully define groundwater contamination to determine if further investigative or remedial work is required and if so, which remedial options should be implemented to clean up the release and progress the release towards formal closure.

Proposed Scope of Services

BSCE proposes to conduct fieldwork activities at the subject release site as defined herein.

- All fieldwork will be scheduled and coordinated with owner representatives and the DEQ PTCS release manager.
- Prior to initiating fieldwork, underground utilities will be located and marked on the ground surface by U-Dig (811).
- As the well is not viable for sampling, well MW-2N will be abandoned in accordance with DNRC regulations.
- Two (2) soil boreholes will be completed at the subject site and will be converted into monitoring wells. The boreholes/wells will generally be located as follows: one well will be a replacement for MW-2N and the other well will be situated between MW-2N and MW-10; the proposed locations are shown on **Fig. 1**. Boreholes will be advanced ~20' beneath the ground surface (bgs) using an 8.25" hollow stem auger drill rig.

- During drilling, soil samples will be collected in ~2' intervals and field screened using heated head-space screening with a Photoionization Detector (PID). Samples from the interval containing the highest PID reading, from the soil-groundwater interface, and/or from the bottom of the borehole will be submitted for analytical testing. For the purposes of the cost estimate, two subsurface soil samples are estimated to be submitted from each borehole.
- Well installation will generally be completed as follows: well casing will consist of two-inch (2") schedule-40 solid and screened polyvinyl chloride (PVC) piping. The screened interval is estimated to span from 5' bgs to 20' bgs with solid casing from the surface to 5' bgs. The annular space surrounding the well casing will be backfilled with bentonite chips (solid casing) and 10/20 silica sand (screened interval). Finally, at the surface a bolt-down traffic-rated manway will be set in a concrete collar.
- For each test hole, a soil log and well construction diagram will be completed which will include PID readings, any signs of soil contamination, zones of saturation, and soil types using a standard classification system (e.g., USCS).
- Soil samples described above will be sent to Energy Laboratories, Inc. in Helena, MT and analyzed for volatile petroleum hydrocarbons (VPH), extractable petroleum hydrocarbons (EPH) screen (with fractionation if the screen exceeds 200 mg/kg), and lead scavengers (EDB and EDC via methods 8011 and 8260, respectively). Additionally, for classification of waste and disposal of soil cuttings at the landfill, one composite soil sample will be collected and analyzed for: TCLP metals and TCLP VOCs. Soil disposal will be completed by Muggli Construction Co. after approval from the landfill is received; disposal tickets will be attached to the AR-03 report.
- After installation, the new monitoring wells will be developed using a disposable two-inch (2") plastic bailer until visibly non-turbid water is achieved. Additionally, redevelopment of the existing wells MW-4, MW-5N, and MW-10N will be completed as sampling has not been conducted at the site in approximately six years. If purge water remains turbid, development will be completed for up to one hour (1 hr), or as conditions allow. Initial clarity/turbidity and final clarity/turbidity will be recorded. To allow for equilibration, groundwater sampling will be completed a minimum of one month after development.
- After monitoring well installation, a limited topographic survey will be completed. The survey will include the casings of the newly installed wells, and any existing wells for updates to the site map and for estimating the hydraulic gradient and groundwater flow direction.
- Semiannual groundwater monitoring will be completed at the site for one year (a total of two events) using low-flow techniques recommended by DEQ. Samples will be collected from the two newly installed wells and the existing MW-10N.

- Monitoring/sampling will generally be completed as follows:
 - First, a water level measurement will be taken using a Solinst oil/water interface probe. Next, the well will be purged using a peristaltic pump, and field parameters (dissolved oxygen, pH, temperature, conductivity, oxidation-reduction potential and turbidity) will be measured and recorded. After stabilization of field parameters, samples will be collected and sent to Energy Laboratories, Inc. in Helena, MT. Groundwater samples will be analyzed for VPH, EPH screen (with fractionation if the screen exceeds 1,000 ug/L) and lead scavengers (EDB and EDC via methods 8011 and 8260, respectively).
- Purge water from groundwater monitoring will be disposed of in accordance with the purge water disposal flowchart.

Reporting

- After completion of the soil boreholes and wells, an Abbreviated Soil Boring and Well Installation (AR-03) report will be completed and submitted to DEQ.
- After completion of the first groundwater monitoring event, a groundwater interim data submittal will be submitted.
- After the final groundwater monitoring event, a Groundwater Monitoring Report will be prepared and submitted to DEQ. At a minimum the report will include the following: exhibits depicting the location of site features, utilities, soil borehole and monitoring well locations, well logs, all pertinent data tables including analytical data in tabular format, lab reports, data validation summary forms, Release Closure Plan, receptor survey, data interpretations, conclusions, and recommendations.
- Standardized DEQ report formats will be used for all documents. Reports and supporting documentation will be submitted following DEQ submittal requirements.

Quality Assurance / Quality Control (QA/QC)

All soil sampling and groundwater monitoring will be completed in strict accordance with BSCE's standard QA/QC procedures, which are on file and are available upon request. Additionally, the following procedures will be used during sample collection to provide quality assurance and quality control (QA/QC), to minimize loss of volatiles, and to maintain the suitability of samples for analysis. Sample collection and analytical procedures were consistent with SW-846: *Test Methods for Evaluating Solid Waste*, November 1986, and updates published by the U.S. EPA. QA/QC methods used are defined below:

- All sample containers/preservatives will be supplied by a state-certified laboratory. Analyses will be performed by a state-certified laboratory.
- All samples will be handled in a manner which minimizes the loss of organic compounds to volatilization and biodegradation.

- All samples for analyses will be placed in a cooler on ice (at a temperature of 4° C) immediately following collection.
- Chain-of-custody procedures will be utilized during sampling and delivery.
- Documentation of the sampling and QA/QC procedures including notes will be available for DEQ inspection. These notes will document the procedures for sampling and all other routine activities, along with field notes describing the sequence of activities that took place during the corrective action cleanup and the following monitoring well construction and sampling.

Cost Estimate and Bids

For soil boreholes and monitoring well installation, BSCE sent bid invitations to: Haztech Drilling, Boland Drilling, and O'Keefe Drilling. Haztech provided pricing; Boland and O'Keefe did not respond. Therefore, Haztech's bid is included in the attached cost estimate, and their bid is attached.

Schedule


Fieldwork is estimated to begin summer 2025 and be completed in fall 2026. As such, BSCE requests a due date of December 31, 2026.

Signature


Please feel free to contact us with any questions or concerns you may have.

Respectfully,

Big Sky Civil & Environmental, Inc.



Joseph N. Murphy, P.E.



Paxton Ellis, P.E.

encl. Fig. 1 – Site Map
Cost Estimate
Bids from Subcontractors

cc: Jerome Chvilicek

Mr. Jonathan Love
February 21, 2025



SITE MAP

PROFESSIONAL SEAL

BY: JPE

DATE: 2/21/25

OWNER:

HALL & HALL, INC.

PROJECT NAME:

SHEFFIELD RANCH
SHEFFIELD, MT
FACILITY ID #09-12945
RELEASE #1985

SHEET TITLE:

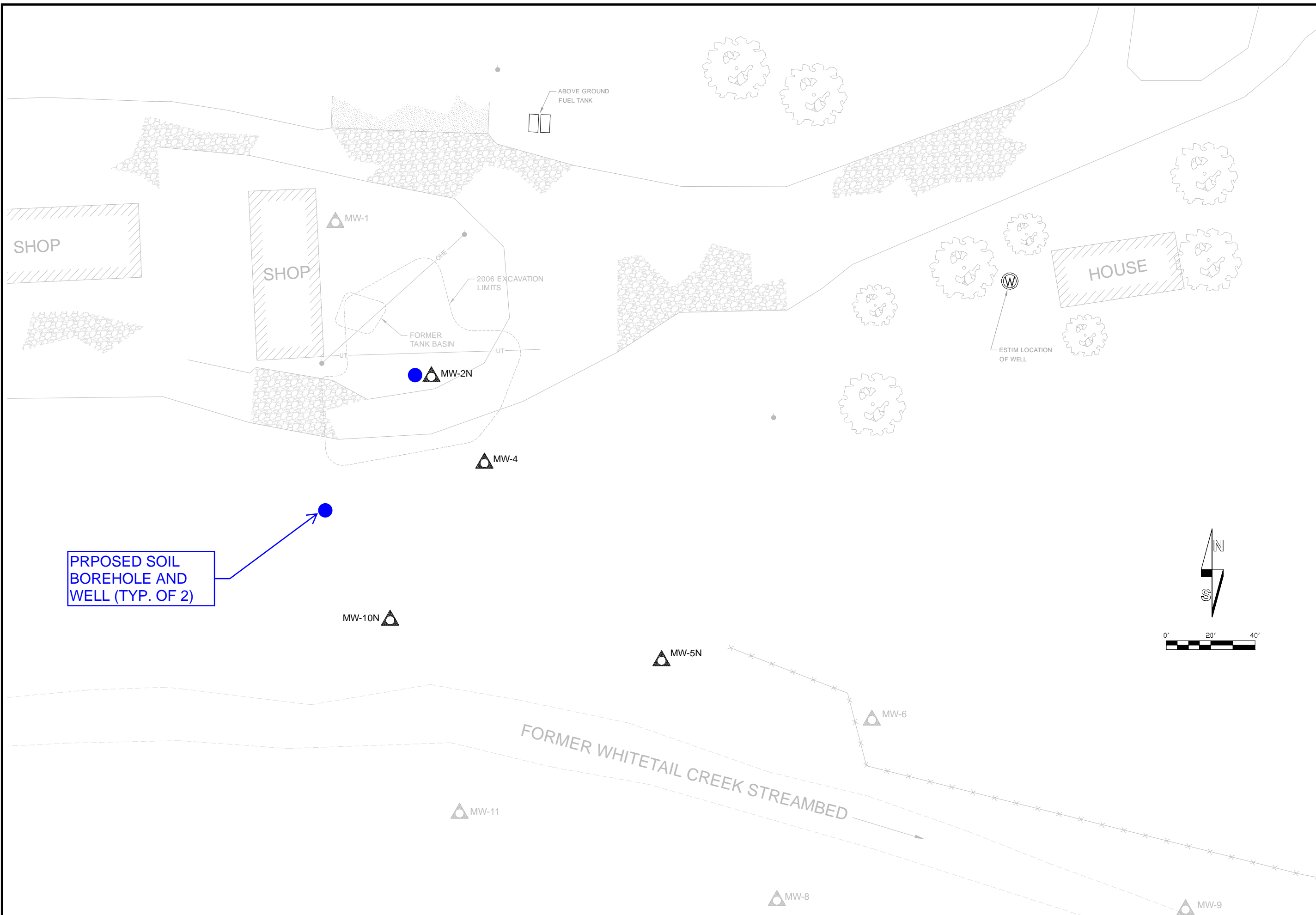
SITE
MAP

DRAWING INFORMATION:

OFFICE PROJECT NUMBER: 1008
OWNER FILE NUMBER:
CADD FILE NAME: 1008-FIG1-SITEMAP
ASSOCIATED PROJECTS:

FIGURE:

FIGURE 1



PROPOSED SOIL
BOREHOLE AND
WELL (TYP. OF 2)