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Latysha Pankratz
Environmental Specialist
Petroleum Tank Cleanup Section
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RE: Remedial Investigation Work Plan and Budget for the Petroleum Release at Cardwell Store, LLC, 770 Montana Highway 2 East, Cardwell, Jefferson County, Montana;
Facility ID 22-13424 (TID 22656), Release 6243, Work Plan 34321

Dear Mr. Perry,

In response to the Montana Department of Environmental Quality (DEQ) Work Plan Request letter dated April 4, 2022, AJM Inc. has prepared the following work plan outlining the construction of 4 geo-probe monitoring wells to identify petroleum hydrocarbon impacts in the groundwater and provide possible remediation strategies based on concentrations found and determine geologic/hydrologic conditions.

BACKGROUND
The Cardwell Store facility is a combined fuel station and convenience store. On August 26, 2020, a release was discovered through a tightness test. A failed flex hose to the dispenser was found to be the source. Based on soil samples collected at the time which showed hydrocarbon

levels above established Risk Based Screening Levels (RBSLs), which indicate that hydrocarbon could leach into the shallow groundwater, the DEQ has requested further site evaluation.

OBJECTIVES OF INVESTIGATION

The purpose of this investigation is to determine the extent and magnitude of impacts in the groundwater and further evaluate if any additional remedial action would be necessary to either remediate groundwater impacts or sample groundwater wells to determine if the impacts are moving or stable and at low enough concentrations to limit more investigation.

Site Location

The facility is located in Cardwell, MT after exiting Interstate 90 and heading east on Highway 2 for a quarter mile. This can be further described by GPS coordinates as 45.8691, -111.9488 or T1N/R3W/S2
See Figure 1, Appendix A for Site Location Map.

Site Geology/Hydrology

The Boulder River is located approximately 1/4 mile east of the facility and flows in an southerly direction toward the Jefferson River confluence. Based on current site information, the depth to groundwater is estimated at 5 to 10 feet below ground surface (bgs). The groundwater flow at the facility has been estimated to be south/southeasterly with a shallow gradient. Based on the local topography along with GWIC site information, it is believed that the local geology consists of silty sand and small gravels. A geo-probe type rig should be able to set the proposed well to the desired depth of between 15 and 20 feet below ground surface.

TASK 1

Private Locate

AJM will retain Geo-Search to find and locate on-site underground utilities that are not typically located by “One-Call Locate”. These include electric lines from the building to the fueling systems, underground fuel lines, vent lines and underground power from overhead lines into the building. If possible, underground septic lines near the main store will be evaluated. This type of locate must be done prior to the drill crew showing on site to complete the well installations. The location of these lines will also be included on survey map of the facility.

Small Diameter Well Installation

As per the DEQ’s correspondence, up to 4 geo-probe type wells (MW-1 to MW-4) will be advanced to 20 feet below ground surface (bgs) to help evaluate lateral and downgradient hydrocarbon impacts in the groundwater to the south, southeast and southwest of the pump island where the initial soil impacts were found. Using a Geo-Probe type well, each borehole will be advanced to the total depth of approximately 20 feet bgs. Split spoon sampling will be

conducted over the entire course of each borehole, with continuous soil samples being collected heated headspace using a calibrated Photoionization Detector (PID) field analysis conducted along with visual and olfactory. A laboratory sample will be collected from the highest PID reading and at the soil water interface in each borehole. If no impacts are observed, then a soil sample will only be collected from the soil/water interface.

Two-inch boreholes will be advanced to 20 feet bgs (or 10 feet beyond first water contact as applicable) in the approximate locations shown on Figure 1 and the monitoring wells will be constructed as follows:

- Slotted 1-inch flush-threaded sch 40 casing with 0.01 slot from 20 to 5 feet bgs;
- Solid flush-threaded casing from 5 to 1 foot bgs;
- 10/20 Colorado silica sand from bottom of borehole to 4 feet bgs;
- Bentonite from 4 to 2 feet bgs, sand to 1 foot bgs;
- 5" steel well box cemented in place;
- Locks and locking caps will be placed on each well;
- Wellhead elevation survey for these new wells will be completed during the well development stage of this work, with wellhead elevations tied into current site benchmarks.

The estimated 2 cubic feet of drill cuttings may be taken to local landfill for disposal if necessary.

Well construction shall be conducted according industry standards and the drilling company will provide well logs to AJM along with sending well logs to the Department of Natural Resources and Conservation.

Well Development
Once the wells have been installed, a peristaltic pump will be used to develop the wells to remove silts and sands. This will include surging the tubing and removing both water and silts from the small diameter wells until water flow has cleared to less than 10 Nephelometric Turbidity Units (NTU),

TASK 2

SURVEY
A Professional Land Survey (PLS) company will be contracted to conduct a survey of the area and tie-in well head elevations into a local USGS bench mark. Street curbs along with both underground and overhead utilities, fuel system lines and buildings will also be incorporated into the PLS work. This will provide AJM with A-CAD figures so that groundwater flow direction and gradient can be calculated along with potential future work at the facility and prevent damage to underground utilities.

GROUNDWATER SAMPLING

Groundwater and soil samples will be collected from all monitoring wells and boreholes and analyzed for Extractable Petroleum Hydrocarbons (EPH) screen and Volatile Petroleum Hydrocarbons (VPH).

Groundwater sampling will occur no sooner than 72 hours after well development and will be sampled quarterly for the first year. The four sample occurrences will provide baseline data for hydrologic activity and contamination concentrations. Following the first year's data collection, semiannual groundwater samples may be required depending on discussions with both the DEQ and site owner and based on any impacts found.

Standard Sample Protocols

- During sample events, static water levels and field parameter data will be obtained from all wells listed. During well purging, the data collection will include temperature, pH, dissolved oxygen, conductivity, turbidity and ORP. Once the above parameters are within 10% of previous readings, a sample will be collected. All sampling will be conducted per AJM's Quality Assurance Project Plan along with the established MDEQ Quality Assurance Plan (QAP). Sampling will be conducted in the 1 inch wells with a peristaltic pump with low flow controller. When using the peristaltic pump, new 1/4-inch HDPE tubing will be used. Appropriate labeling, cooling, and chain of custody protocols will be followed. Samples will be delivered under chain of custody to an accredited laboratory for analysis of Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH) using appropriate EPA methodology. EPH fractionation will be conducted as necessary based on total extractable concentrations.

- All water produced from this sampling process will be allowed to evaporate on the asphalt and no on-site storage is currently planned. Should significant sheen or free phase product be observed, the DEQ and PTRCB will be contacted to determine course of action.

All non-dedicated equipment used for purging, sampling, or depth measurements will be decontaminated with an Alconox wash solution, followed by a distilled water triple rinse prior to each use.

REPORT WRITING

Per the April 4, 2022 DEQ request letter, a Remedial Investigation Report will be written, detailing corrective action work after the first GW sampling occurs and all Survey Data and Well logs have been provided by the subcontractors. An Interim Report will be completed along with a Release Closure Plan once the final sampling and lab work data has been received.

Reporting

Prepare and submit a Remedial Investigation Report detailing the method and results for the initial well installation, soil and initial groundwater sampling events and field activities completed under this work plan. The Report will include at a minimum the following:

- Use the report format found under the Guidance dropdown at the PTCS webpage to prepare the Remedial Investigation Report detailing the results of the investigation in accordance format sections in the RI Guidance document.
- Discussion of the monitoring method results, deviations from the approved work plan, recommendations, and conclusions
- Cumulative groundwater data tables
- Site features and potentiometric surface maps.
- Prepare a Release Closure Plan (RCP) based on the site data collected
- Validate all laboratory data using the DEQs Data Validation Summary form
- Submit WP and reports electronically following the Petroleum Tank Cleanup Section submittal requirements found under the Guidance dropdown at the PTCS webpage[2]

One Interim report may be provided at the request of the DEQ should impacts be found during the initial and subsequent groundwater sampling round.

A cost estimate for the well installations and a unit cost work sheet for sampling and report writing have been completed for the above-described work and can be found in Appendix B. Work at this site can begin upon written approval by the DEQ. Please do not hesitate to call if there are any questions or if we can provide any additional information.

Sincerely,

Dennis Franks

AJM Incorporated
By: Dennis Franks, President

ecc: PTRCB Staff, PO Box 200902, Helena, MT 59620-0902 (PDF Only)

APPENDIX A

Figure

Cardwell General Store & Campground, Cardwell MY Facility 22-13424, Release 6243

Proposed Approximate Small Diameter Monitoring Well Locations

Approximate Scale 1-inch = 40 feet

Figure 1
AJM Inc.
Work Plan ID 34321