



AJM, Incorporated

1805 Kenyon Dr., Bozeman, MT 59715

Mobile (406) 600-2045

e-mail: dennis@ajminc.net

www.environmentalconsultanatmontana.com

January 24, 2020

Mr. William Bergum
Montana Department of Environmental Quality
PO Box 200901
Helena, MT 59620-0901

RE: Corrective Action Plan RI-01 to Conduct Groundwater /Surface Water Sampling
Community Oil Company, 101 Main St., Reserve, Sheridan County, MT
MT Facility ID #99-95156 (TID 17361) Release 5029, WPID 34011

Dear Mr. Bergum,

Pursuant to your letter of January 8, 2020, AJM Incorporated (AJM) has prepared the following work plan to conduct groundwater sampling, local surface water sampling, and reporting for release 5029 at the Community Oil Company facility in Reserve, Montana. Groundwater and surface water samples will be collected and analyzed for Volatile Petroleum Hydrocarbons (VPH) and Extractable Petroleum Hydrocarbons (EPH). Groundwater samples will also be analyzed for intrinsic biodegradation indicators (IBI) along with lead scavengers Dichloroethane (1,2-DCA) and Ethylene Dibromide (EDB).

Background

AJM was retained by Community Oil Company to conduct a subsurface soil investigation on a property leased from the Burlington Northern Railroad Company. The soil investigation was completed in July 2014. The subject property is currently used as a bulk fuel storage facility and for the storage of fertilizers. During the investigation, soil samples were collected from near and around the current above ground fuel storage system (AST) using both Geoprobe® and hand auger drill rigs. Due to slightly elevated soil impacts observed when results came back from the laboratory, a suspected release was called into the Department of Environmental Quality (DEQ) on July 29, 2014. A 30-day Leak Report was sent shortly thereafter. In 2016, four monitoring wells were installed and sampled over the course of one year. Samples showed elevated hydrocarbon levels in two of the monitoring wells with a hydraulic gradient to the northeast.

Based on the analytical results the DEQ requested additional site evaluation of the groundwater and soils. Following DEQ approval, AJM installed an additional ten wells (MW-5 thru 14) north of the impacted area and toward nearby Muddy Creek in August 2018. Initially, six monitoring wells were anticipated, but the DEQ approved the installation of four more wells based on field observations of strong hydrocarbon odors and discoloration. In six of the wells, moderate to strong hydrocarbon odors were observed in the soil and groundwater. The new wells were developed and the top of casing elevations surveyed by AJM personnel. Given the driving distance to the site from the AJM office in Bozeman, all existing and new wells were sampled during the same site visit in August 2019. RBSL exceedences were observed in MW-1, 2, 4, 6, 8, 10, and 11 for both VPH and EPH constituents. The only new wells showing RBSL exceedence for benzene were MW-6 and 8 in April 2019.

Site Location

The facility is located at 101 Main Street in Reserve, Montana. The geographical location of the subject property can be referenced as 48° 36' 27.21"N latitude, and 104° 27' 41.64"W longitude.

Site Geology/Hydrology

During the previous groundwater monitoring well installation, it was found that the soils consist of silty clay from ground surface to approximately ten feet below ground surface (bgs) at which point tight wet sand was encountered. It was observed that groundwater rose in the wells to approximately four feet bgs, therefore it is believed that the shallow aquifer is semi-confined. Initial assumptions were that groundwater flows in a southeasterly direction based upon a review of the local topographic map which shows Big Muddy Creek approximately 70 yards to the east. This creek flows in a southerly direction into Medicine Lake several miles to the south. However, after the well heads were surveyed into a benchmark, potentiometric maps created for this site have shown a consistent groundwater flow direction to the northeast.

Additionally, a review of Google Earth© satellite imagery shows what appears to be a spring approximately 0.33 mile to the west of the Community Oil site. This feature sites about 80 feet south of our current well placements. AJM believes that this spring is causing groundwater mounding and the northeasterly groundwater flow direction to occur.

Groundwater Sampling

Groundwater sampling will be conducted in accordance with the AJM Inc., Quality Assurance Project Plan (QAPjP). Depth to groundwater measurements will be collected, along with pH, salinity, temperature, conductivity, and oxidation/reduction potential (ORP). A peristaltic pump will be used to obtain the samples. 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. All water from development, purging, sampling, and

decontamination procedures will be disposed of in an environmentally responsible manner within the site boundaries.

One round of groundwater samples will be obtained from all monitoring wells during anticipated high conditions in the spring (May/June). The samples will be submitted under chain of custody to an accredited laboratory for VPH and EPH along with 1,2-DCA and EDB analysis.

At the request of the DEQ, up to five groundwater samples will also be collected for IBI analysis to include Biological Oxygen Demand, Chemical Oxygen Demand, Heterotrophic Bacteria Plate Count, and Specific Hydrocarbon Degrading Bacteria Plate Count. The bioremediation/feasibility analysis will be completed by Environmental Bio-Systems (EBS) in Mill Valley, California (see attached EBS proposal). Per recommendation by EBS, three samples should be from the area of greatest impacts and 2 samples should be in up/side gradient where no impacts are seen. Based on this recommendation the bioremediation samples will be collected from impacted wells MW-1, MW-6 and MW-8, while the non impacted wells MW-5 & MW-13.

Surface Water Sampling

It is proposed that **three** surface water samples be collected to evaluate if groundwater impacts from the site are reaching nearby Big Muddy Creek. One sample will be collected from approximately 300 feet upstream (approximate lat 48.6089, long -104.461) to evaluate whether other upstream sources could be negatively affecting the stream. The other samples will be collected on the east side of the facility near the release area, one on the north side of the spring area (48.6078, -104.460) and one on the south side (48.6070, -104.460). These areas are marked on the Google map provided in Attachment . It is believed that these locations would best represent a potential area for groundwater impacts to enter the creek.

Samples will be collected from approximately six inches below the water surface near the west bank. Sampling will be conducted using a peristaltic pump with appropriate HDPE tubing that will be attached to a wooden dowel to reach out from the shore and to six inches below the water line. The pump will be allowed to run at approximately 300 to 500 milliliters per minute while pH, ORP, DO conductivity data are collected. If these parameters appear not to stabilize after two minutes, then the data will be recorded and samples will be collected into sample jars. All appropriate sample gear and preservatives will be used as with groundwater sampling. The samples will be sent to an accredited laboratory analysis of EPH and VPH. It is not proposed that biofeasibility samples be collected from the surface water samples.

Reporting

Following the completion of the remedial investigation work outlined in this work plan (groundwater, surface water and bioremediation/IBI sampling), AJM will complete an AR-07 report format per DEQ requirements. The report will be completed in a MR-01 format to include:

- Results of the laboratory analysis of the groundwater samples for VPH and EPH;
- Results of the biofeasibility study with assessment and recommendations if enhanced bioremediation appears to be a viable clean-up option;
- Results from surface water sampling at Big Muddy Creek;
- Append laboratory analytical results;
- Append the laboratory reports with the DEQ's Data Validation Summary Form.

A cost estimate for this scope of work has been included in Appendix A. Work at this site can begin upon written approval by the DEQ and the PTRCB. Please do not hesitate to call if there are any questions or if we can provide any additional information.

Sincerely,

Dennis Franks

AJM Inc.

By: Dennis Franks, President

ecc; communityoil@ymail.com
PTRCB JoAnne Adydan, Jadydan@mt.gov

APPENDIX A

Well Location Figures
Big Muddy Creek Proposed Sample Locations

Groundwater/Surface Water Unit Cost Estimate,
EBS Biofeasibility Study Proposal/Cost

Community Oil

Big Muddy Creek Proposed Sample Collection Points

Legend

Proposed Creek Sample Locations

GW Flow

Big Muddy Creek Flow Direction

Community Oil Fuel Tank Farm

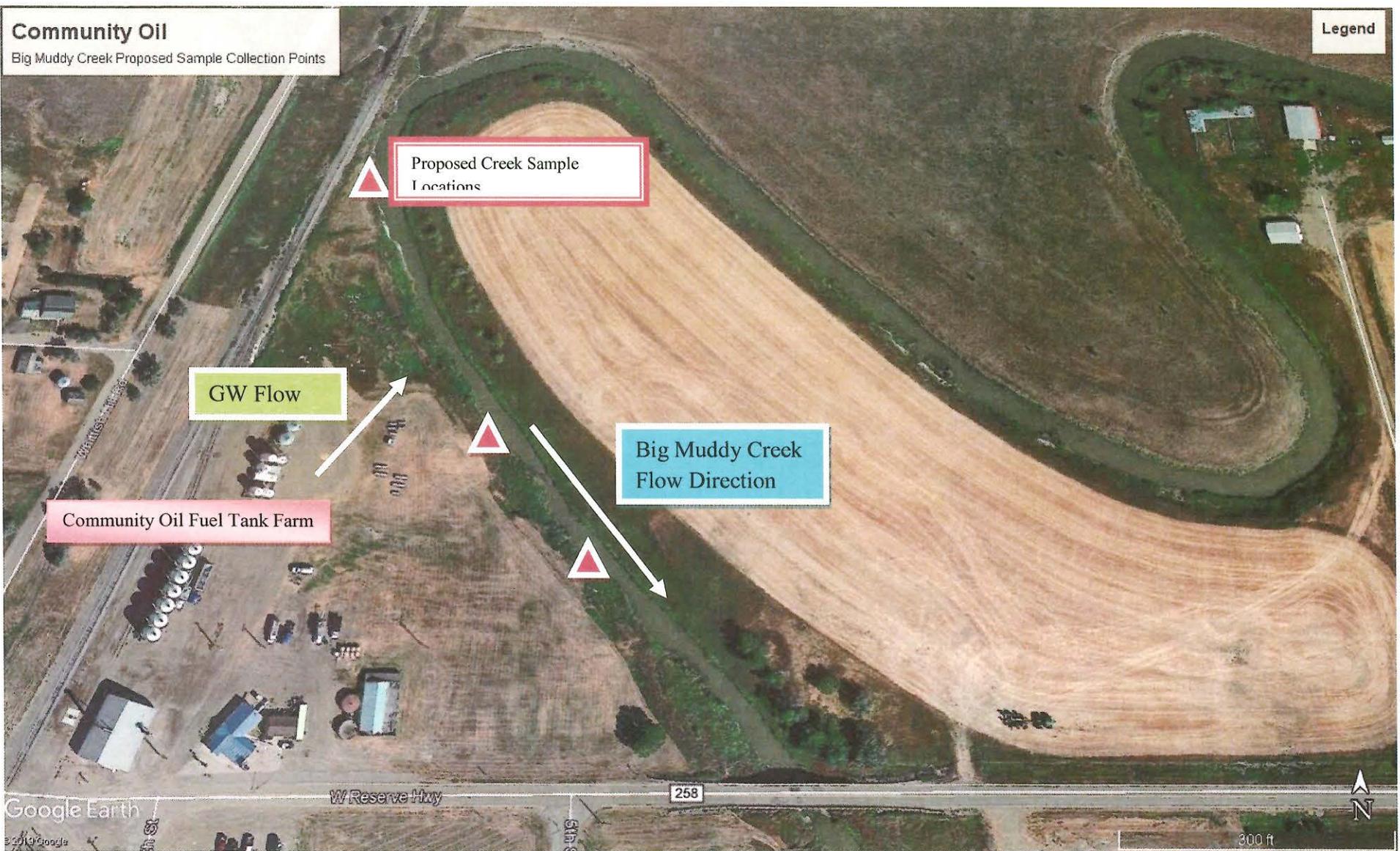
Google Earth

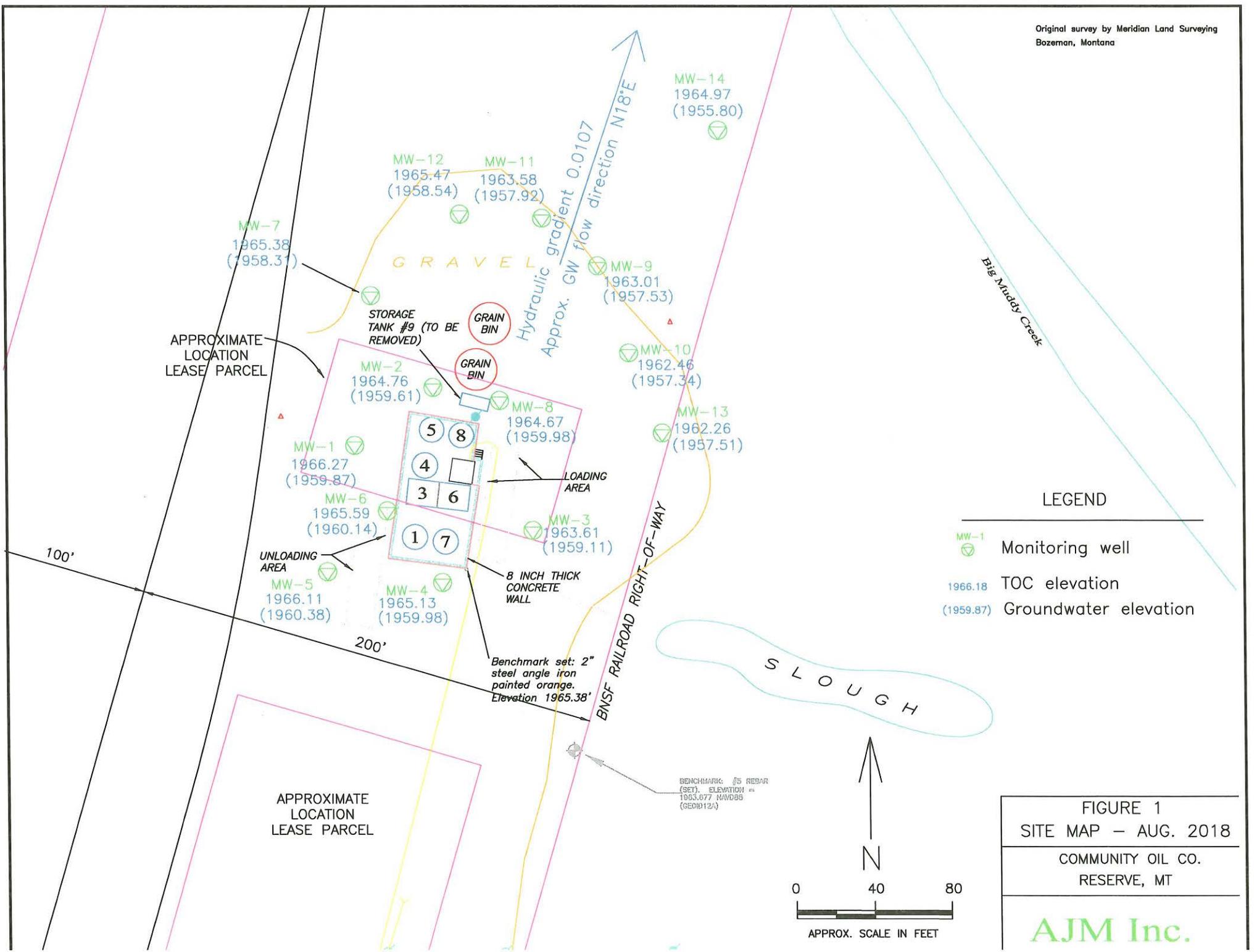
W Reserve Hwy

258



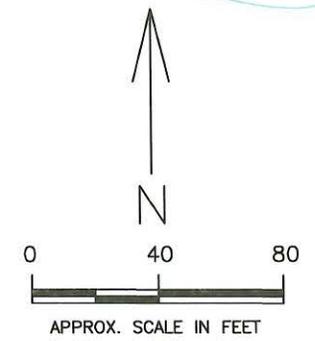
300 ft





- LEGEND
- ▽ MW-1 Monitoring well
 - 1966.18 TOC elevation
 - (1959.87) Groundwater elevation

FIGURE 1
SITE MAP – AUG. 2018
COMMUNITY OIL CO.
RESERVE, MT



AJM Inc.

Petroleum Tank Release Compensation Board Groundwater Monitoring and Sampling Unit Cost Worksheet

Contractor Information

Company Name:
Address:
City, State, Zip:
Cost Estimator:

Phone:

Signature: Digitally signed by Dennis Franks
DN: CN=Dennis Franks, O=AJM Inc., OU=President, E=dennis@ajminc.net, C=US
Reason: I am the author of this document
Location:
Date: 2020-01-20 15:33:41
Full Name: Dennis Franks

Date:

Project Information

Site Name:
Address:
City:

Facility ID#
Release #
WP ID#

Monitoring Well Details

Total Number of Wells at Site
Number of Water Level Measurements Only ⁽²⁾
Number of Wells to be Monitored/Sampled ⁽³⁾
Well Casing Diameter (inches)
Average Depth to Groundwater (ft)
Average Depth of Wells (ft)

Well Purging Method

- Hand Bailing
- Peristaltic Pump
- Submersible Pump
- Micropurge
- No Purge
- Other (please specify)

Monitoring/Sampling Interval

Estimated Start Date:
 Quarterly # of events
 Semi-annual # of events
 Annual # of events
 Other # of events (specify)

Other Services

- Free Product Recovery
- Groundwater Well survey
- Wellhead retrofit/reconstruction
- Other (please specify)

Cost Estimate Explanation:

- ⁽¹⁾ **Mobilization/Demobilization:** Includes all costs and mileage to transport equipment, materials, and personnel to and from the site location. More than one mobilization event will require justification and pre-approval by the DEQ-PTCS and Board staffs. This item should be on a per mile unit rate.
- ⁽²⁾ **Water Level Measurements:** Includes all costs (labor, equipment, materials, and well consumables) to measure groundwater depth, collect other groundwater information from well, and decontaminate equipment. The well monitoring costs should be on a per well basis and does not include purging and sampling of the well.
- ⁽³⁾ **Well Monitoring/Purging/Sampling:** Includes all costs (labor, equipment, materials, and well consumables) to monitor (see above), purge, sample groundwater, decontaminate equipment, take water level measurements and handle disposal of contaminated purge water. The cost should be on a per well basis.
- ⁽⁴⁾ **Laboratory Analysis:** Includes all laboratory costs for all wells, for duration of project. It is realized that some laboratory analyses will not be conducted for every event and that the well sampling frequency may change.
- ⁽⁵⁾ **PTRCB Sampling Fee:** Includes all costs related to management of the sample including: sample container, cooler, packing, shipping, handling, sample preservation, and office related handling charges. The Sample is defined as the laboratory ID number on the laboratory invoice.
- ⁽⁶⁾ **Report Preparation and Project Management:** Includes all costs (labor and materials) project management, report preparation, and report submittal, including all office related costs, per groundwater sampling event.

Groundwater Monitoring and Sampling Unit Cost Worksheet

Task	Unit Cost	Number of Units	Total Cost
Work Plan Preparation	\$1,800.00	1	\$1,800.00
Project Management	\$120.00 /hr	16	\$1,920.00
Mobilization/Demobilization ⁽¹⁾	\$4.31 /mile	1,200	\$5,172.00
Field Work			
Water Level Measurements ⁽²⁾	/well		\$0.00
Well Monitoring/Purging/Sampling ⁽³⁾	\$190.00 /well	14	\$2,660.00
Other Service (please specify) <u>Creek Samples for EPH/VPH</u>	\$200.00	3	\$600.00
Other Service (please specify) <u>Bioremediation EBS sampling</u>	\$250.00	5	\$1,250.00
Lodging & Per Diem (Lodging – actual only)			
Lodging: # of people <u>2</u>	\$150.00 /person per day	6	\$1,800.00
Food: # of people <u>2</u> (\$30.50 max a day allowed) (Breakfast \$7.50, Lunch \$8.50, Dinner \$14.50)	\$30.50 /person per day	6	\$366.00
Laboratory Analysis ⁽⁴⁾			
Volatile Petroleum Hydrocarbons (VPH)	\$150.00 /sample	17	\$2,550.00
Extractable Petroleum Hydrocarbons (EPH)			
EPH “screen”	\$80.00 /sample	17	\$1,360.00
EPH “fractions”	\$180.00 /sample	5	\$900.00
BTEX/MTBE/Naphthalene only-method:	/sample		\$0.00
Polyaromatic Hydrocarbons (PAHs)	/sample		\$0.00
PTRCB sampling fee (\$10.00 allowed) ⁽⁵⁾	\$10.00 /sample	50	\$500.00
Other (please specify) <u>bioremediation samples/report from EBS</u>	\$2,750.00 /sample	5	\$13,750.00
Other (please specify) <u>Lead Scavengers EDB & 1,2 DCA</u>	\$125.00 /sample	14	\$1,750.00
Report Preparation ⁽⁶⁾			
Quarterly	/report		\$0.00
Semi-annual	/report		\$0.00
Annual	/report		\$0.00
Other (Please specify) <u>AC-07 (MR-01 format+DVSF+ RCP)</u>	\$5,000.00	1	\$5,000.00
Monitoring & Sampling Total:			\$41,378.00

Additional Conditions/Comments/Costs:

The volume of sampling and critical timing for processing samples to EBS along with safety to sample creek will take a 2 man crew. For this reason an additional \$2000 may be needed to account for the extra crew time needed to prepare for and implement appropriate field activities. Also, overnight shipment of samples to EBS in California is estimated at \$200.

If you require assistance, call 406-444-9710
 Submit completed form to:
 Petroleum Tank Release Compensation Board
 PO Box 200902, Helena MT 59620-0902



www.ebsinfo.com Since 1989
707 View Point Road
Mill Valley, CA 94941
Tel: 415-381-5195 Fax: 415-381-5816

January 18, 2020

Mr. Dennis Franks
AJM Incorporated
1805 Kenyon Drive
Bozeman, MT 59715

RE: Bioremediation Feasibility Study Cost Estimate
1130-Community Oil
Proposal # B-011820 AJM Biofeasibility Study

Dear Dennis:

Environmental Bio-Systems, Inc. (EBS) is pleased to respond to your request for proposal for a bioremediation feasibility study at the 1130-Community Oil site. EBS recommends using samples from 5 monitoring wells: three within the groundwater plume and two upgradient (or one cross gradient and one upgradient (background conditions).

WELL SELECTION

Ideally, five wells provide a good amount of information for a biofeasibility project.

- 3 wells within the plume, preferably at least 2 with the highest concentrations and 1 with lower concentrations;
- 2 wells upgradient and not in the plume, or 1 cross-gradient and 1 upgradient

LABORATORY ANALYSIS

EBS will analyze a variety of compounds to evaluate aquifer conditions as to dissolved chemicals, alternate terminal electron acceptors, macronutrients, and general minerals to develop a picture of bioremediation potential at the site. Laboratory methods are suggested for each analysis, but equivalent laboratory methods may be substituted.

Chemical Analyses

- Total Dissolved Solids;
- Total Inorganic Carbon;
- Total Organic Carbon;
- Speciated Alkalinity; including:
- Carbonate;
- Bicarbonate; and
- Carbon dioxide.



www.ebsinfo.com Since 1989
707 View Point Road
Mill Valley, CA 94941
Tel: 415-381-5195 Fax: 415-381-5816

Alternate Terminal Electron Acceptors:

- Nitrate (NO₃); (see below)
- Sulfate (SO₄); (see below)
- Manganese (Mn); and
- Iron (in the field): Fe(total) and Fe(II); subtract to get Fe(III).

Nutrients:

- Orthophosphate; and
- Ammonia as Nitrogen.

The General Mineral by Inductively Coupled Plasma Mass Spectrometry (ICP-MS) consists of:

- Sulfate as SO₄ by EPA 300.0;
- Total Dissolved Solids (TDS) by SM 2540C;
- pH by SM4500H;
- Nitrite as NO₂ by EPA 300.0;
- Nitrate as NO₃ by EPA 300.0;
- Sodium (Na) Total by ICP-MS200.8;
- Magnesium (Mg) Total by ICP-MS200.8;
- Methylene blue active substances assay (MBAS) EPA 425.1;
- Potassium (K) total by ICP-MS200.8;
- Fluoride (F) by EPA 300.0;
- Conductivity by SM2510B;
- Chloride (Cl) by EPA 300.0;
- Calcium (Ca) Total by ICP-MS200.8; and
- Total Alkalinity by SM 2320.

Sewer and septic leaks are common and can significantly impact subsurface redox conditions. These analyses are worthwhile since a sewer or septic leak could minimize aerobic potential. The MBAS (listed above) is used to detect the presence of anionic surfactants (such as a detergent or foaming agent) in a sample of water. MBAS can indicate a broken sewer line or septic line.

Oxygen Demand:

- Biological Oxygen Demand; and
- Chemical Oxygen Demand;



www.ebsinfo.com Since 1989
707 View Point Road
Mill Valley, CA 94941
Tel: 415-381-5195 Fax: 415-381-5816

Biological Analyses:

- Heterotrophic Bacteria Plate Count; and
- Specific Hydrocarbon Degrading Bacteria Plate Count.

FIELD MEASUREMENTS

AJM Incorporated will collect on-site data including and EBS will provide the rental of the YSI meter which includes DO/ORP/pH/conductivity and temperature parameters as well as the iron kits (total and Fe(II) plus the labeled bottles and coolers, all prepaid with EBS's Fedex account.

- Dissolved Oxygen;
- Oxidation Reduction Potential;
- pH;
- Conductivity;
- Total Iron;
- Iron II; and
- Iron III is obtained by subtracting Total Iron from Iron II

DETAILED BIOFEASIBILITY REPORT

After receiving the above-mentioned samples and field data, EBS will compile a detailed biofeasibility study report outlining the requirements for bioremediation and specific recommendations for this site, including the potential for adding terminal electron acceptors, nutrients, or other amendments. EBS will also provide an evaluation and recommendations on the limiting factors to natural attenuation on the site: oxygen, nutrients, and microbial populations.

Please contact me if you have any questions regarding this cost estimate. To authorize this project, please sign below and fax back to EBS at 510-232-2823.

SCHEDULE

Once EBS receives the samples, it will take about 14 days for the samples to be analyzed, and 14 to 28 days for the final EBS biofeasibility report to be produced.



www.ebsinfo.com Since 1989
707 View Point Road
Mill Valley, CA 94941
Tel: 415-381-5195 Fax: 415-381-5816

AUTHORIZATION TO PROCEED

This proposal includes EBS to pay for all chemical and biological laboratory costs listed above, FedEx charges, rental of YSI meter and iron kits with FedEx to AJM and return FedEx (with samples) to EBS.

EBS recommends using 5 wells in the feasibility study. For budgeting purposes, EBS also is providing the price for 3 well samples. Please check the requested number of samples.

5 (# of wells) X \$2,750/each = \$13,750; or

3 (# wells) X \$3,450/each = \$10,350

Representative Date
AJM Incorporated

Proposal prepared by: James A. Jacobs, P.G.C.H.G.; Date: January 18, 2020
Principal Hydrogeologist

Please call me at EBS at 510-590-1098 if you have any questions.

Sincerely,

James A. Jacobs, C.P.G. #7760
Principal Hydrogeologist