

February 22, 2019

Dean Kinney
Department of Environmental Quality
Petroleum Tank Cleanup Section
655 Timberwolf Way, Suite 3
Kalispell, MT59901

Re: *Abbreviated Soil Boring and Monitoring Well Installation Corrective Action Work Plan (WP) AC-03 for Petroleum Release at the Former Bermel Store (Bigfork Outdoor Rentals), 110 Swan River Road, Bigfork, Flathead County, Montana; Facility ID: 15-07361, Release ID: 2697; Work Plan ID: Not Assigned AWC Project No. 933-17*

Dear Dean:

Applied Water Consulting (AWC) is pleased to present the following Abbreviated Soil Boring and Monitoring Well Installation Corrective Action Work Plan (AC-03) on behalf of Swan Properties, LLC of Bigfork, Montana. The work plan is being submitted pursuant to our discussion of October 16, 2017. The purpose of the work is to further delineate the extent and magnitude of petroleum impacts to soil and groundwater. Investigative work will consist of installing four soil borings that will be completed as monitoring wells. Soil and groundwater samples will be collected and submitted for laboratory analysis pursuant to Montana Tier 1 Risk-Based Corrective Action Guidance for Petroleum Releases. AWC will also conduct a hydraulic conductivity evaluation in the site monitoring wells to assist with remediation design.

Background Information

A 1,000-gallon underground storage tank (UST) was removed from the Bermel Store in August 1995 by Northwest Fuel Systems. Over-excavation of petroleum contaminated soil (PCS) was conducted in the tank basin to a depth of 10 feet below ground surface (bgs). Five monitoring wells (MW-1, MW-2, MW-3, MW-2-1, and MW-2-2) were installed at the site between 1996 and 1997 with groundwater monitoring has been conducted intermittently. Approximately 40 cubic yards of PCS was removed in the area near the distribution pump island in November 2002 during site renovation,. The Bermel Convenience Store building was destroyed in a fire in 2008. Monitoring well MW-1 was destroyed during the razing of the building after the fire. Groundwater monitoring had not occurred at the site since 2011; AWC conducted a groundwater monitoring event in September 2017. Monitoring wells MW-2-1 and MW-2-2 could not be located during the 2017 monitoring event. It is surmised that these wells were either destroyed or paved over. Only two wells (MW-2 and MW-3) remain

intact at the site. A new retail space was constructed on the western portion of the property in 2018. The property is currently operated as Bigfork Outdoor Rentals.

WORK PLAN COMPONENTS

Task 1 - Health and Safety Plan Preparation

In order to comply with Occupation Safety and Health Administration Code of Federal Regulations (CFR) 29 1910.120, AWC will prepare a health and safety plan (HASP) for the project site. The HASP discloses the potential chemical and physical hazards, identifies potential job hazards associated with field activities, describes safe work practices, specifies personal protective equipment and decontamination procedures, identifies project contacts, emergency medical procedures, and the location of the nearest medical facilities to the site.

Task 2 – Utility Clearance

Prior to commencing drilling activities, AWC will prepare and submit a request for U-Dig to locate and mark subsurface utilities within the work area. AWC will mark drilling locations and meet onsite with representatives of the various utility locator services including ELM Locate, Bigfork Water and Sewer District, Charter Communications, Northwest Energy, and Flathead Electric.

Task 3 – Soil Boring and Monitoring Well Installation

AWC personnel will oversee the drilling of four soil borings that will be completed as monitoring wells. Soil samples will be logged continuously from ground surface utilizing two-foot long stainless-steel sampling spoons. All non-disposable downhole equipment will be decontaminated before use. Soil samples will be collected at approximately two-foot intervals and field screened with a PID. Soil boring logs will be completed for each borehole. Soil boring logs will describe lithology, visual and olfactory impacts from petroleum hydrocarbons, and field screening results. Typically, one “worst-case” soil sample will be collected from each boring for laboratory analysis. The sample will be collected from soil-water interface and/or the soil interval that reports the highest PID reading.

The two soil borings will be completed as monitoring wells by inserting a two-inch diameter PVC, 10-foot length of 20-slot well screen with 4-feet of blank well casing into the borehole. The borehole will be filled to one foot above the well screen with 10-20 Colorado silica sand. The three monitoring wells will be completed with flush-mount wellhead protectors as they are located in a parking lot. A map showing the proposed locations is presented as **Figure 1**. **Table 1** provides a rationale for the placement each of the proposed monitoring wells. AWC does not recommend replacement of monitoring wells MW-2-1 and MW-2-2 as the groundwater samples collected from these historic wells have not reported detections of petroleum contaminants above risk-based screening levels (RBSLs) since 1997.

Table 1	
Monitoring Well Location Rationale	
MW No.	Comments
MW-1R	Replace historic monitoring well MW-1, evaluate downgradient plume conditions
MW-4	Evaluate downgradient plume conditions
MW-5	Evaluate former tank basin
MW-6	Evaluate up gradient groundwater conditions, allow for further triangulation of water table elevations

Installation of the above monitoring wells will allow for adequate site characterization.

Task 4 – Soil Sample Analyses

The soil samples will be analyzed for a suite of laboratory methods including volatile petroleum hydrocarbons (VPH) and extractable petroleum hydrocarbon (EPH) screen. Soil samples that exceed a total extractable hydrocarbon (TEH) concentrations of 200 mg/kg will be submitted for fractionation analysis. The samples will be packaged in laboratory provided containers and shipped via overnight courier in a cooler on ice with appropriate chain-of-custody documentation to Energy Laboratories in Billings, Montana.

Task 5 – Monitoring Well Development

Well drilling and installation procedures create a skin or filter cake on the borehole wall. Therefore, the monitoring wells will be developed to establish a hydraulic connection with the shallow aquifer by removing fine particulate from the well, sandpack, and the saturated formation near the screen. A secondary function of development is to settle and stabilize the sandpack in the borehole. Well development will be accomplished utilizing a combination of surging, bailing, and over-pumping if possible, to remove the fines. Development will be conducted for a minimum of one hour per well and will continue until an improvement in turbidity and production can be observed.

Task 6 – Groundwater Sample Collection and Analyses

Groundwater samples will be collected from the monitoring well network including MW-1R, MW-2, MW-3, MW-4, and MW-5. Each well will be purged of a minimum of three well-bore volumes to obtain a representative sample of the surrounding aquifer formation. When three bore volumes have been evacuated, the well will be considered adequately purged. Purging of the wells will be conducted using a decontaminated low-flow pump with new tubing.

Field water-quality parameters including dissolved oxygen, pH, temperature, specific conductivity, and oxidation/reduction potential will be measured in the purge water of all monitoring wells during groundwater sampling. Purge water will be handled in accordance with *Disposal of Untreated Purge Water from Monitoring Wells* (DEQ, July 27, 2015).

Laboratory provided sample containers will be labeled with a unique identifier consisting of project number and monitoring well number. The date, time, and location will also be listed on the sample label. This approach provides a unique identification for database management as necessary. The sample will be transferred directly from the pump outlet into the appropriate container that was previously labeled. The appropriate preservative (i.e., HCL, H₂SO₄, HNO₃, etc.) will be added to the container when it is half full. Samples will be packed in coolers with ice and maintained at a temperature less than 6° C. The groundwater samples will be shipped in the coolers overnight to Energy Laboratories, Inc. in Billings, Montana.

The samples will be submitted for analysis of VPH, EPH Screen, 1,2-dibromoethane (EDB) by EPA 524.2, by EPH Method 8260B – low level and lead scavengers by EPA Method 8011 in accordance with the Montana Tier 1 Risk-Based Corrective Action Guidance for Petroleum Releases (May 2018). Groundwater samples will also be analyzed for biodegradation parameters including sulfate, nitrate, ferrous iron, manganese, and methane. Samples that exceed a TEH concentration of 1,000 µg/L will be submitted for fractionation analysis.

Task 7 – Aquifer Hydraulic Conductivity Assessment

Based on available site data, the former Bernel Store release appears to be a candidate for injection of an in-situ remediation agent. AWC recommends completing an evaluation of the hydraulic conductivity of the shallow aquifer at the site to assist in designing a remedial injection program. Hydraulic conductivity assessments will be conducted in the five source area monitoring wells (MW-1R, MW-2, MW-3, MW-4, and MW-5). The hydraulic conductivity assessment will consist of performing a minimum of three slug tests on each monitoring well, analyzing the slug test data utilizing both the Bower-Rice and Hvorslev methods, and calculating hydraulic conductivity and groundwater seepage rates.

Based on the construction of the existing monitoring wells and depth to water measurements it is anticipated that only slug-out tests will be conducted. A pressure transducer data logger will be utilized to monitor water-level changes in the well during slug testing. Once the monitoring equipment has been put in place, a new disposable bailer will be lowered into the well. The water level will be allowed to equilibrate; and the bailer will be removed, lowering the water level, causing a “slug-out” of water. After the water level recovers to equilibrium the process will be repeated until a total of three tests per well have been performed (a minimum of 15 slug tests for the site). If additional time is available, additional slug tests will be performed.

Each slug test will be analyzed utilizing Aqtesolv^{Pro}. Data from each test will be entered into Aqtesolv^{Pro} and the Bower-Rice and Hvorslev methods will be utilized to determine hydraulic conductivity for each test. Average conductivity will be calculated for each well and for the site as a whole. Calculated conductivities will be utilized to estimate groundwater seepage velocity. In the future the hydraulic conductivity data will be utilized to design spacing and injection rates for injection of an in-situ remediation agent.

Task 8 – Monitoring Well Survey

The existing monitoring well network was surveyed to an arbitrary benchmark elevation. AWC will subcontract with Breckenridge Surveying to perform a survey of all monitoring well locations and establish measuring point elevations relative to the North American Vertical Datum (NAVD) and the Montana State Plane coordinate system. The elevation and spatial data will be utilized to update the site map and create a potentiometric map.

Task 9 – Project Management

Project management tasks include the preparation and review of subcontractor agreements, attending meetings with DEQ PTCS staff and the owner, communications with Breckenridge Surveying, Energy Laboratories, Boland Drilling, communications and coordination of field work the property owner and property manager, and other communications and management activities as needed.

Task 10 – Prepare Abbreviated Soil Boring & Monitoring Well Installation Report (AR-03)

AWC will prepare an Abbreviated Soil Boring and Monitoring Well Installation Report (AR-03) upon receipt of the soil and groundwater analytical results. The report will contain the results of the soil and groundwater investigation, tabulated soil and groundwater laboratory data, soil boring logs, monitoring well completion diagrams, soil disposal receipts and appropriate figures and tables.

The report will also contain an additional section on the results of the hydraulic conductivity assessment with tabulated aquifer hydraulic conductivity data, calculated groundwater seepage rates, average hydraulic conductivity, and plots of the Bower-Rice and Hvorslev slug test analyses.

PROJECT BUDGET

Cost estimates were solicited from three drilling contractors that utilize hollow-stem auger rigs. A summary of the bids from each contractor is presented as **Table 2**. As shown, Boland Drilling of Great Falls submitted the low bid. Bids for the soil boring and well installation work were competitive; all submissions were within ten percent of one another.

Table 2	
Soil Boring and Monitoring Well Installation Bids	
Contractor	Bid Amount
O'Keefe Environmental Drilling	\$5,863.00
Boland Drilling*	\$5,767.00
Enviro Probe Services	\$6,341.00
*Apparent Low Bidder	

A detailed budget for the actions described in this work plan is presented as **Attachment A** and subcontractor bids are provided in **Attachment B**. The total costs associated with project implementation are \$39,197.33.

If you have any questions regarding this work plan, please do not hesitate to contact me at (406) 756-2550.

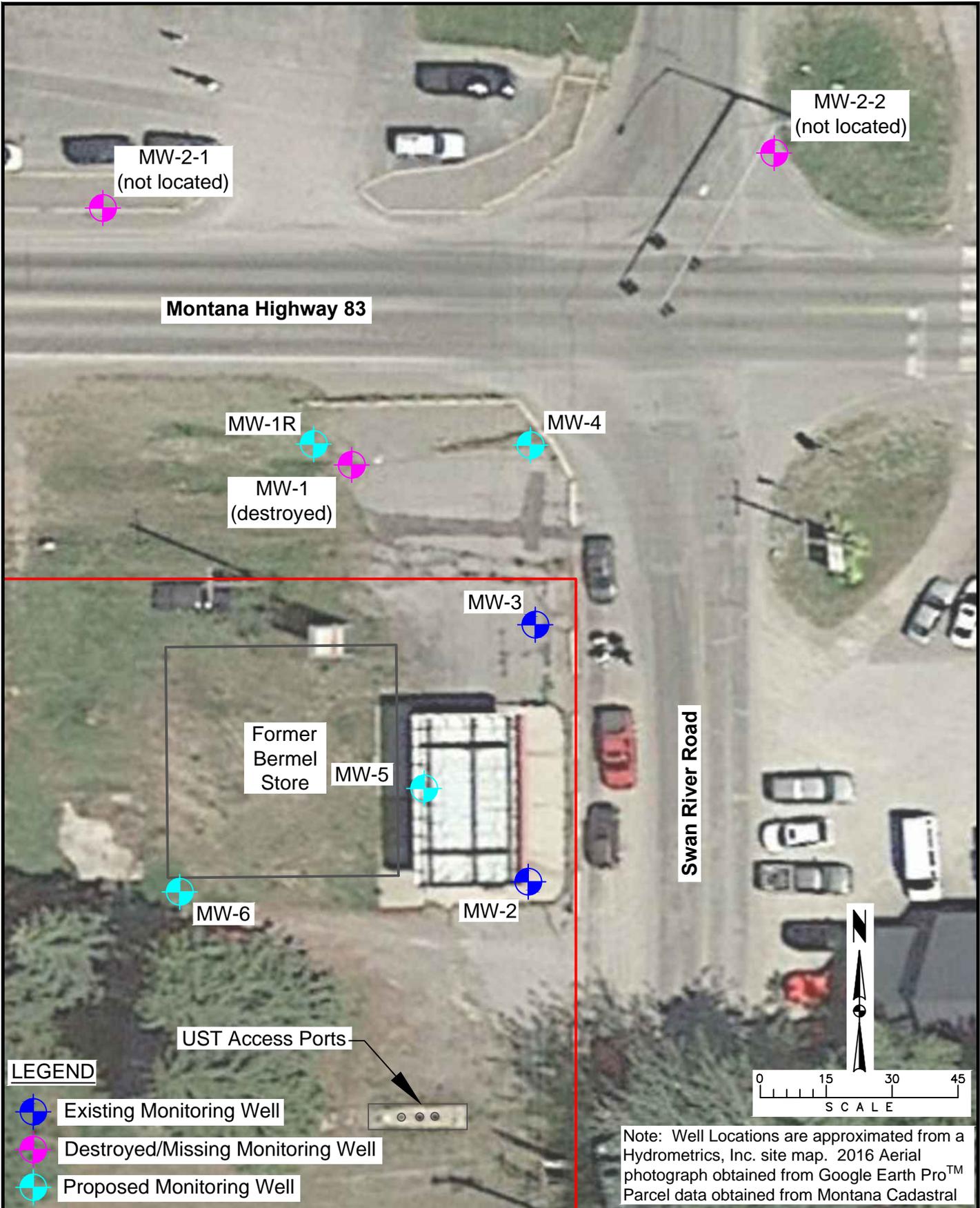
Sincerely,



Jamie Graham
Staff Hydrogeologist

c: Dale Whalen

FIGURES



MW-2-1
(not located)

MW-2-2
(not located)

Montana Highway 83

MW-1R

MW-4

MW-1
(destroyed)

MW-3

Former
Bermel
Store

MW-5

Swan River Road

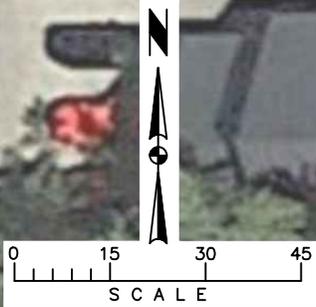
MW-6

MW-2

UST Access Ports

LEGEND

-  Existing Monitoring Well
-  Destroyed/Missing Monitoring Well
-  Proposed Monitoring Well



Note: Well Locations are approximated from a Hydrometrics, Inc. site map. 2016 Aerial photograph obtained from Google Earth Pro™ Parcel data obtained from Montana Cadastral

	PROJ NO: 933-17	DRAWN: JEG	FORMER BERMEL STORE	FIGURE 1
	LOCATION: BIGFORK, MT	PROJ MGR: R.NOBLE		
	SCALE: 1"=30'	CHECKED: APPVD:	WELL LOCATION MAP	REV -
	FILE NAME: Site Map.dwg	DATE: Feb/22/2019		

ATTACHMENT A

AWC PROJECT BUDGET ESTIMATE

*Soil Boring and Monitoring Well Installation Work Plan for the Petroleum Release at the Former Bermel Store (Bigfork Outdoor Rentals)
Bigfork, Montana*

Applied Water Consulting Project Budget Sheet					(2019 PTRCB Approved Rates)		
Project Name:	Former Bermel Store (Bigfork Outdoor Rentals)			Facility ID #	15-07361		
Location:	Bigfork, Montana			Release #	2697		
Type of Project:	Soil Boring and Monitoring Well Installation with Hydraulic Conductivity Assessment			Work Plan #	Not Yet Assigned		
				AWC #	933-17		
		Description	Rate	Units	# Units	Totals	
Abbreviated Soil Boring and Monitoring Well Installation Corrective Action Work Plan (AC-03)							
Labor	Project Scientist	work plan prep & coordination	\$ 134.75	hrs.	1	\$ 134.75	
	Staff Scientist	Work plan development, solicit bids	\$ 106.00	hrs.	7	\$ 742.00	
	Word Processor	Work plan assembly	\$73.50	hrs.	1	\$ 73.50	
Misc.	Office	phone, fax, copies, etc.	\$ 14.75		1	\$ 14.75	
Subtotal						\$ 965.00	
Prepare Work Plan Sections & Budget for Hydraulic Conductivity Assessment							
Labor	Staff Scientist		\$ 106.00	hrs.	1	\$ 106.00	
Subtotal						\$ 106.00	
Project Management							
	Project Scientist	Meetings with property owner and DEQ, phone communications, coordination with subcontractors;	\$ 134.75	hrs.	9	\$ 1,212.75	
	Staff Scientist	U-dig submission & onsite meetings w/ U-dig representative, communications with laboratory	\$ 106.00	hrs.	6	\$ 636.00	
	Mileage	mark boring locations, meet U-Dig reps onsite	\$ 0.63	miles	80	\$ 50.40	
Subtotal						\$ 1,899.15	
Prepare Site Health and Safety Plan							
	Staff Scientist	prepare site specific health and safety plan	\$ 106.00	hrs.	6	\$ 636.00	
Subtotal						\$ 636.00	
Soil Boring and Monitoring Well Installation - Field Work & Subcontractor Costs							
	Staff Engineer/Scientist	Load & unload equipment, travel time	\$ 106.00	hrs.	3	\$ 318.00	
	Staff Engineer/Scientist	Log boreholes, oversee well installation, drilling oversight, & collect soil samples	\$ 106.00	hrs.	16	\$ 1,696.00	
Equipment	PID		\$ 15.00	hrs.	16	\$ 240.00	
	Disposable gloves		\$ 1.00	pair	21	\$ 21.00	
	Cones	12 cones for 2 days	\$ 1.00	per cone per day	24	\$ 24.00	
	De-ionized water		\$ 1.50	gallon	10	\$ 15.00	
Mileage	Light Duty		\$ 0.63	miles	80	\$ 50.40	
Subcontractor	Boland Drilling	Soil boring and monitoring well installation	\$ 5,767.00	bid	cost + 7%	\$ 6,170.69	
Subtotal						\$ 8,535.09	
Soil Sample Analysis							
	Soil VPH		\$ 120.00	sample	4	\$ 480.00	
	Soil EPH Screen		\$ 75.00	sample	5	\$ 375.00	
	EPH Fractionation		\$ 150.00	sample	4	\$ 600.00	
	PTRCB sample fee		\$ 10.00	sample	4	\$ 40.00	
Subtotal						\$ 1,495.00	
Soil Disposal							
Labor	Tech III	load and haul and unload soil at landfill	\$ 101.00	hrs.	7	\$ 707.00	
Mileage	Light Duty		\$ 0.63	miles	60	\$ 37.80	
	Trailer Rental		\$ 120.00	day	1	\$ 120.00	
	Landfill Disposal fee		\$ 31.05	ton	2	\$ 62.10	
Subtotal						\$ 926.90	
Monitoring Well Survey							
	Breckenridge Surveying	survey monitoring wells	\$ 1,200.00	cost estimate	cost + 7%	\$ 1,284.00	
	Tech III	locate wells and survey support	\$ 101.00	hrs.	2	\$ 202.00	
	Tech III	drive to and from site	\$ 101.00	hrs.	2	\$ 202.00	
Mileage	Light Duty		\$ 0.63	miles	40	\$ 25.20	
Subtotal						\$ 1,713.20	

Monitoring Well Development							
Labor		Tech III	load and unload equipment, drive to site and from site	\$ 101.00	hrs.	2	\$ 202.00
		Tech III	develop 3 new monitoring wells	\$ 101.00	hrs.	3	\$ 303.00
Equipment		12-volt pump		\$ 8.00	hrs.	2	\$ 16.00
		Disposable Bailers		\$ 15.25		3	\$ 45.75
mileage		Light Duty		\$ 0.63	mile	40	\$ 25.20
Subtotal							\$ 591.95
Monitoring Well Groundwater Sampling							
		Tech III	load & unload equipment, mobilize to site, drive to ship samples	\$ 101.00	hrs.	2	\$ 202.00
Mileage		Light Duty		\$ 0.63	miles	45	\$ 28.35
		Tech III	monitoring well sampling	\$ 186.00	well	5	\$ 930.00
Equipment		Filters	for metals analysis sample collection	\$ 20.00	sample	4	\$ 80.00
Subtotal							\$ 1,240.35
Groundwater Laboratory Analyses and Fees							
		GW VPH		\$ 120.00	sample	4	\$ 480.00
		EPH Screen		\$ 75.00	sample	4	\$ 300.00
		EPH Fractionation		\$ 150.00	sample	4	\$ 600.00
		Ferrous Iron and Manganese		\$ 20.00	sample	4	\$ 80.00
		Sulfate		\$ 10.00	sample	4	\$ 40.00
		Nitrate		\$ 25.00	sample	4	\$ 100.00
		Methane		\$ 50.00	sample	4	\$ 200.00
		Lead scavenge by EPA 8260B		\$ 75.00	sample	4	\$ 300.00
		Lead scavenger by EPA 8011		\$ 75.00	sample	4	\$ 300.00
		PTRCB sample fee		\$ 10.00	sample	4	\$ 40.00
Subtotal							\$ 2,440.00
Monitoring Well Hydraulic Conductivity Assessment							
Labor		Staff Scientist	Conduct hydraulic conductivity assessments in site wells	\$ 106.00	hrs.	15	\$ 1,590.00
		Staff Scientist	load and unload equipment, travel time	\$ 106.00	hrs.	4	\$ 424.00
Mileage		Light Duty		\$ 0.63	miles	80	\$ 50.40
Equipment		Field Laptop Computer		\$ 7.00	hrs.	15	\$ 105.00
		Oil-water interface probe		\$ 12.50	hrs.	15	\$ 187.50
		Pressure transducer-data logger		\$ 12.75	hrs.	15	\$ 191.25
		Disposable Bailers (2-inch)		\$ 15.75	bailer	5	\$ 78.75
		Disposable Gloves		\$ 1.00	pair	15	\$ 15.00
		Cones	2 days 6 cones	\$ 1.00	per cone per day	12	\$ 12.00
Subtotal							\$ 2,653.90
Soil Boring and Monitoring Well Installation Report (AR-03)							
Labor		Project Scientist	review/edit report	\$ 134.75	hrs.	2	\$ 269.50
		Staff Scientist	draft report	\$ 106.00	hrs.	14	\$ 1,484.00
		CAD/GIS Specialist	prepare site maps and figures	\$ 97.00	hrs.	6.5	\$ 630.50
		Word Processor	report prep	\$ 73.50	hrs.	2	\$ 147.00
Misc.		Office	phone, fax, copies, etc.	\$ 42.50	hrs.	1	\$ 42.50
Subtotal							\$ 2,573.50
Additional Report Section on Hydraulic Conductivity Assessment							
Labor		Staff Scientist	Slug test analysis - prepare AQTESOLV plots for each hydraulic conductivity test, analyze each slug test using Bower-Rice and Hvorslev methods	\$ 106.00	hrs.	10	\$ 1,060.00
		Staff Scientist	prepare report section on hydraulic conductivity assessment	\$ 106.00	hrs.	4	\$ 424.00
Subtotal							\$ 1,484.00
Update Release Closure Plan							
Labor		Staff Scientist	update release closure plan	106.00	hrs.	4	\$ 424.00
Subtotal							\$ 424.00
Project Total							\$ 39,427.33

ATTACHMENT B

SUBCONTRACTOR BIDS

*Soil Boring and Monitoring Well Installation Work Plan for the Petroleum
Release at the Former Bermel Store (Bigfork Outdoor Rentals)
Bigfork, Montana*

Petroleum Tank Release Compensation Board

Soil Boring/Monitoring Well Installation Unit Cost Worksheet

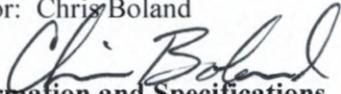
Contractor Information

Company Name: Boland Drilling

Address: 4701 N Star Blvd

City, State, Zip: Great Falls, MT 59405

Cost Estimator: Chris Boland

Signature: 

Phone: 406-761-1063

2/20/2019

Project Information and Specifications

Former ~~B~~ermel Store

110 Swan River Rd

Big Fork

Facility ID #

Release #

WP ID #

Type of Drilling Equipment

Hollow-Stem Augers

Air Rotary

Direct Push

Other (please specify)

x

Monitoring Well Specifications

Number of Wells

Surface: Concrete Asphalt Barren

Depth (per well)

Estimated Depth to Groundwater (ft)

Boring Diameter (inches)

Casing Diameter and type (inches)

Surface Completion: Flush Mount Aboveground

4
15
8
2" pvc

Soil Boring

Number of Borings

Boring Diameter (inches)

Depth (per boring - ft)

Surface: Concrete Asphalt Barren

Soil Disposal: Onsite Stockpile Drums

Abandonment: Bentonite Soil Cuttings

4
8
15

Soil Sampling

Continuous Soil Sampling

Interval Soil Sampling (specify interval)

No Sampling

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 of either the drilling rig or support vehicle will require justification and pre-approval by the DEQ-PRS and Board staffs. This item should be estimated on a per mile unit rate
- (2) Soil Boring Installation: Includes all costs (labor, equipment, and materials) to drill, collect soil samples and abandon soil borings, as well as decontaminate equipment. Drilling costs should be estimated using a per foot unit rate. Unit cost should include handling of contaminated soil by stockpiling or placing in drums. Assume level "C" personal protective equipment.
- (3) Monitoring Well Installation: Includes all costs (labor, equipment, and materials) to drill, collect soil samples, and complete monitoring well to specifications and according to Montana Well Drillers Board rules, as well as decontaminate equipment. Drilling costs should be estimated using a per foot unit rate. Unit cost should include handling of contaminated soil by stockpiling or placing in drums. Assume level "C" personal protective equipment.
- (4) Drilling Standby: Drilling standby should be estimated on an hourly basis. Prior approval and justification for accumulating standby time is needed prior to billing.
- (5) Well Development: Includes all costs (labor, equipment, and materials) to develop monitoring wells. This task should be estimated using a per well unit rate.
- (6) Monitoring Well Abandonment: Includes all costs (labor, equipment, and materials) to properly abandon a well location according to the Montana Well Drillers Board rules. Abandonment costs should be estimated using a per well unit rate.

Soil Boring/Monitoring Well Installation Unit Cost Worksheet

TASK		UNIT COST	NUMBER OF UNITS	TOTAL COST
Mobilization/Demobilization (1)				
Mobilization/Demobilization: Drilling Rig	\$	2.00 /mile	450	\$ 900.00
Mobilization/Demobilization: Support Vehicle	\$	1.50 /mile	450	\$ 675.00
Soil Boring Installation (2)				
Drilling (0'-50' range per boring)	\$	30.00 /foot	60	\$ 1,800.00
Drilling (50'-100' range per boring)		/foot		\$ -
Other (please specify) _____				\$ -
Monitoring Well Installation (3)				
Drilling (0'-50' range per well)	\$	30.00 /foot	60	\$ 1,800.00
Drilling (50'-100' range per well)		/foot		\$ -
Other (please specify) _____				\$ -
Drilling Standby (4)				
-prior approval needed	\$	125.00 /hour		\$ -
Well Development (5)				
Well Development	\$	150.00 /hour		\$ -
Monitoring Well Abandonment (6)				
Abandonment	\$	100.00 /well		\$ -
Lodging may only be paid at actual costs when documented by receipts.				
Per Diem				
Lodging: number of individuals =	2	\$ 125.00 /person per day	2	\$ 500.00
Food: number of individuals =	2	\$ 23.00 /person per day	2	\$ 92.00
(Breakfast 5.00, Lunch 6.00, Dinner 12.00)				
TOTAL PROJECT EXPENSE				\$ 5,767.00

D.O.T. Drums

\$95.00

Additional Conditions/Comments/Costs:

Drill and construct 4 monitor wells to 15' each at Bigfork, MT

If you require assistance, call 406-841-5090.

Submit completed form to:

Petroleum Tank Release Compensation Board PO Box 200902, Helena MT 59620-0902

O'KEEFE DRILLING

Environmental

P.O. Box 3810 - Butte, MT 59702
Office: (406) 494-3310 Fax: (406) 494-3301
Email: info@okeefedrilling.com

Client: Applied Water Consulting
Attention: Jamie Graham
Project: Big Fork, MT
110 Swan River Road

Date: 21-Feb-19
Phone: 406-756-2556
Fax: 406-756-0527

PROJECT SPECIFICATIONS:			
Type of Rig:	<u>Mobile B-61 Auger</u>	Number of Wells:	<u>4</u>
Location:	<u>Big Fork, MT</u>	Expected Footage:	<u>15</u>
Formation:	<u>Silty Clay</u>	Completion Size:	<u>2</u>
Sampling:	<u>Yes, continuous</u>	Screen Length:	<u>10</u>
Decontamination:	<u>No</u>		
Other Details:	<u>Flushmounts</u>		

Soil Boring/Monitoring Well Installation

Unit Cost Worksheet

Task	Unit Cost	Number of Units	Total Cost
Mobilization/Demobilization			
Drill Rig:	\$ 2.75	Miles 412	\$ 1,133.00
Support Vehicle:	\$ 1.50	Miles 412	\$ 618.00
Per Diem or Crew Daily Travel			
Motel	2 \$ 90.00	Per Person Per Day 1	\$ 180.00
Food	2 \$ 23.00	Per Person Per Day 2	\$ 92.00
Soil Boring Installation			
Drilling 0-50 ft range	\$ 28.00	Per Foot 60	\$ 1,680.00
Monitor Well Installation			
2" Monitor Well Installation 0-50ft	\$ 36.00	Per Foot 60	\$ 2,160.00
Drilling Standby & Safety Meeting			
	\$ 150.00	Per Hour	\$ -
Well Development:			
Well Development	\$ 250.00	Per Well	\$ -
Other:			
DOT Drums	\$ 95.00	Each	\$ -
Asphalt Patch	\$ 16.55	Each	\$ -
Total Project Expenses			\$ 5,863.00

***Client is responsible for any line locates. Locate number can then be given to O'Keefe Drilling who then will request a ticket default.

****This bid is subject to change as warranted when the addition of prior unexpressed need for additional certifications, medical monitoring, sampling, containerization or other unforeseen change in the scope of work.



**Enviro Probe Services
Geoprobe 6600 Services**



Date: 21-Feb-19
Company: Applied Water
Contact: Jamie Graham
Project Description: Bigfork; 4 -15' soil borings converted to 2" auger wells.

Note: Enviroprobe Services is not responsible for transport or disposal of any IDW.
Note: Gravel and/or cobbles may cause drilling refusal.

<u>Geoprobe services</u>	<u>Unit Price</u>	<u>Unit</u>	<u>Quantity</u>	<u>Cost</u>
- Project Coordination/Manager	\$100.00	Hour	1	\$100.00
<u>Well Drilling/Installation</u>				
- 2-inch Well Installation	\$35.00	Foot	60	\$2,100.00
- Dual Tube Drilling	\$12.00	Foot	60	\$720.00
- 8-inch Well Cover & Completion	\$150.00	Well	4	\$600.00
<u>Misc. Costs</u>				
- Standby (As Approved)	\$100.00	Hour	0	\$0.00
- Decontamination/Cleanup	\$100.00	Hour	4	\$400.00
- Prep / Load Supplies/Equipment	\$85.00	Hour	4	\$340.00
- Support Truck	\$100.00	Day	2	\$200.00
<u>Travel & Mileage</u>				
- Per Diem	\$300.00	Day	2	\$600.00
- (Lodging Actual; Meals \$30)				
- Probe Mileage	\$2.50	Mile	420	\$1,050.00
- Support Truck	\$0.55	Mile	420	\$231.00
			Subtotal	\$6,341.00

Estimated Project Cost \$6,341.00



Client will be responsible for all permits, access permission, utility locates, and traffic control, if necessary.
 Enviro Probe Services' assumes no responsibility for any waste generated during the sampling process.
 Estimated project length is 2 days including travel.
 Motel invoiced at cost.
 Estimate Valid for 90 Days

**Enviro Probe Services
 480 East Park Street
 Butte, MT 59701
 406-782-5220**