



Environmental Resources

P.O. Box 5305, Bozeman, Montana 59717 Phone (406) 582-8491 Email ruwaller@gmail.com

October 29, 2019

Valley County Commissioner
Paul Tweeten, Chairman
Valley County
501 Court Square, Box 1
Glasgow, MT 59230

Subject: Corrective Action Work Plan
Former Ed's Sinclair, Glasgow, MT
DEQ Facility ID No. 53-04210
DEQ Release No. 1588 Work Plan 33910

Dear Mr. Seiler,

Environmental Resources is pleased to submit this Corrective Action Work Plan to outline activities associated with additional subsurface investigation and remediation pilot testing at the above referenced petroleum release site. Submittal of this work plan was requested by the Montana Department of Environmental Quality (DEQ) in a letter dated July 29, 2019.

Site Location

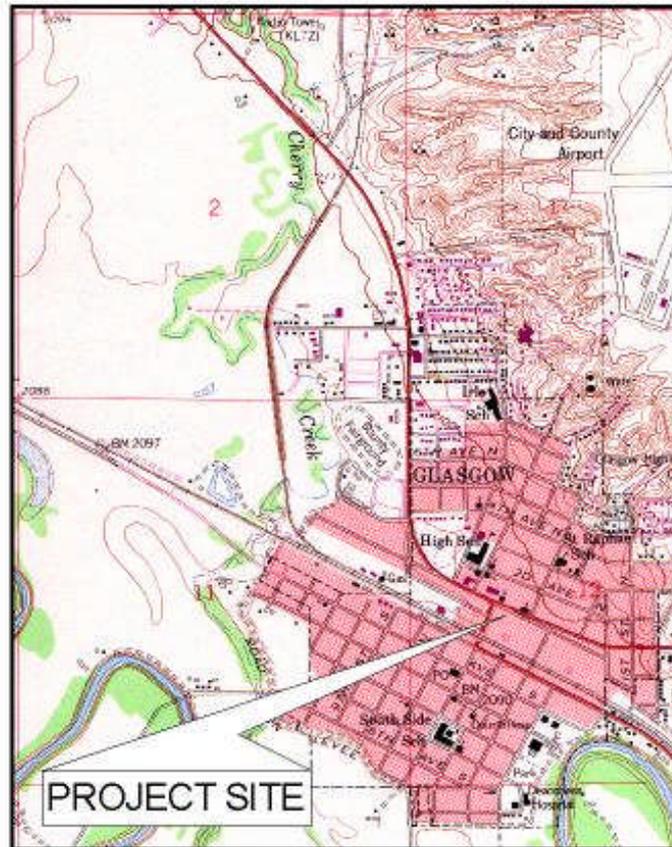
The former Ed's Sinclair project site is located along the south side of U.S. Highway 2 (1st Avenue North) between 5th and 6th Streets in Glasgow, Montana and is situated in the northeast quarter of the southwest quarter of Section 12, Township 28 North, Range 39 East, Montana Principal Meridian (Figure 1). The site is bounded by 1st Avenue North (U.S. Highway 2) to the north, the Great Northern Railroad right-of-way to the south, Valley Motor Supply to the east, and vacant land to the west.

Site Geology

Soils at the project site consist of fine-grained fluvial sediments associated with the Milk River, which is situated approximately 1600 feet southeast of the project site. Local bedrock consists of the Cretaceous Bearpaw Shale. Groundwater is first encountered at approximately 18-22 feet below ground surface and is semi-confined, rising to approximately 11-12 feet below ground surface. Highly plastic,

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dense silty clay and sandy clay interbedded with fine- to coarse-grained sand intervals is encountered from 2-18 feet below ground surface and acts as a leaky



SCALE: 1" = 2000'



ENVIRONMENTAL RESOURCE
MANAGEMENT, INC.
Consulting Geologists and Environmental Scientists

FORMER ED'S SINCLAIR
GLASGOW, MONTANA
SITE INVESTIGATION
FIGURE 1, REGIONAL SITE LOCATION MAP

confining layer over the aquifer. Aquifer materials at 18-22 feet below ground surface consist of coarse- to very coarse-grained sand underlain by silty clay. The local groundwater flow direction fluctuates from north to northeast away from the Milk River.

Scope of Work

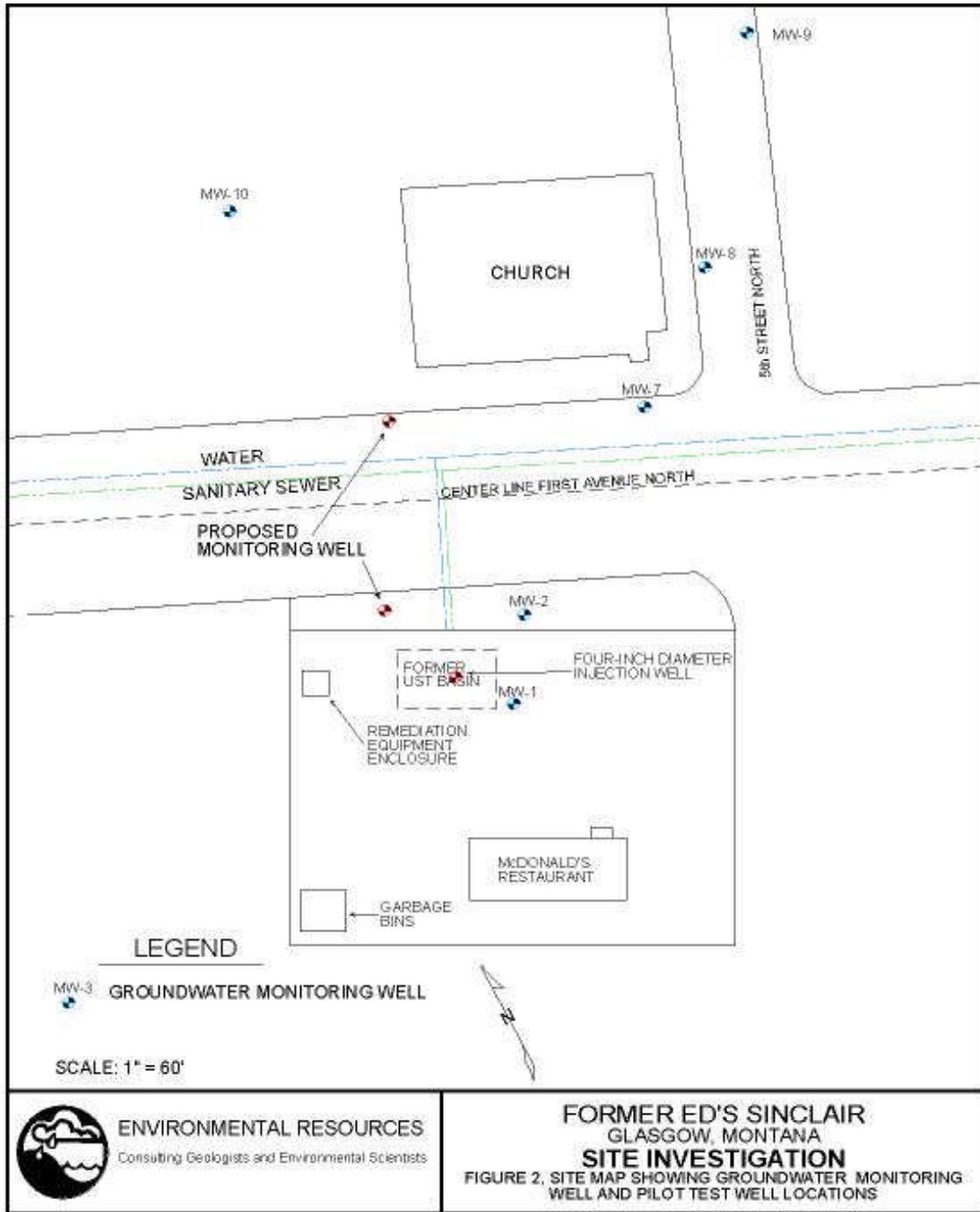
Proposed tasks to be performed within the scope of this work plan include the following:

1. Install two groundwater monitoring wells to more adequately define the extent and magnitude of soil and groundwater contamination. Collect soil samples and analyze samples for Volatile Petroleum Hydrocarbons (VPH) and lead scavengers.
2. Collect groundwater samples from all new and existing groundwater monitoring wells and analyze samples for VPH, lead scavengers and Intrinsic Biodegradation Indicators (IBIs).
3. Conduct a petroleum vapor intrusion assessment at the First Methodist Church situated downgradient from the release site..
4. Install one four-inch diameter injection well to be used for pilot testing.
5. Conduct a pilot test to determine if In Situ Chemical Oxidation (ISCO) is a viable remedial alternative for use at the project site.
6. Validate all lab data using DEQ's Data Validation Summary Form.
7. Update the Release Closure Plan (RCP).
8. Prepare and submit a Standardized Abbreviated Generic Applications Report (AR-07).

Groundwater Monitoring Well Installation

Two groundwater monitoring wells will be installed to 25 feet below ground surface using a hollow stem auger drilling rig at the locations shown on Figure 2. The wells will be completed with fifteen feet of two-inch diameter 0.020" slotted well screen and five ten of blank casing. The annulus around the well screens will be filled with 10-20 mesh Colorado silica from total depth to approximately one foot above the top of the screened interval and bentonite chips will be used to fill the remaining annulus to ground surface. Each well will be completed with a bolt-down steel manhole cover and fitted with a locking compression plug.

A lithologic log will be completed for each boring. All drilling logs will be completed in the field as the boring is drilled. All borings will be completed in accordance with all applicable local, state and federal laws, rules and administrative requirements.



Material Sampling

Drill cuttings will be logged for lithology, texture, color, moisture and volatile petroleum content. All soil samples will be visually classified for texture using the Unified Soil Classification System (USCS) according to ASTM-D-2488. Soil samples from two foot intervals and from obvious areas of petroleum discoloration will be analyzed for volatile petroleum hydrocarbons using a Photovac 2020 photo ionization detector (PID) with a standard heated jar headspace method. Laboratory soil samples will be retained from the interval that exhibits the highest headspace reading, from the air-water interface and from total depth in each boring. Soil samples will be analyzed for VPH, 1,2 EDB and 1,2 DCA at an approved laboratory.

Groundwater Monitoring

Groundwater samples will be collected from all of the newly installed and existing groundwater monitoring wells. Prior to sample collection, data will be collected from all onsite monitoring wells and recorded in a field notebook. All of the well covers will be opened and the locking compression caps will be removed upon arrival at the project site. The wells will be allowed to equilibrate to the atmosphere for at least 30 minutes prior to measuring static water levels. Following the equilibration period, a thoroughly decontaminated electronic water level indicator will be used to measure the static water level in each well casing. The water level indicator tip will be scrubbed in an Alconox or similar wash solution and triple rinsed with de-ionized water prior to and following each measurement. All of the depth to water measurements will be collected from a reference point used to determine the casing elevation for each well.

Following collection of all of the static water level measurements, groundwater sample purging will commence using a low flow sampling pump. Purge water from each monitoring well will be constantly monitored for oxidation-reduction potential (ORP), pH, conductivity, temperature and dissolved oxygen content using Hanna Instruments field meters or equivalent. Groundwater sample collection will begin when the all or the majority of the indicator parameter values stabilize. Each groundwater sample will be decanted into appropriate sample containers, preserved where necessary and placed on ice while awaiting shipment to the analytical laboratory. Sample shipment will occur through Fed Ex originating from the Bozeman, Montana. All of the collected groundwater samples will be analyzed for VPH and for IBIs at Alpine Analytical in Helena, Montana. Lead scavenger analyses will be conducted by Energy Labs subcontracted through Alpine Analytical.

Remediation Pilot Testing

Remediation pilot testing will be conducted to determine if ISCO using RegenOx manufactured by Regenesis could be used to reduce petroleum hydrocarbon concentrations in soil and groundwater beneath the project site. Regenesis provided a design and cost estimate for providing RegenOx product that consists of injecting RegenOx in a two part mixture into one injection well four times over a four to eight week time frame.

Prior to oxidant procurement, a hydraulic pump test will be conducted to determine if the aquifer will accept the proposed volume of fluid injection. A positive displacement pump fitted with a pressure gauge and flowmeter will be used to inject clean non-chlorinated well water into the injection well. Injection pressure and flow rate will be monitored and used to determine the capacity of the injection well and aquifer response. If the injection rate is acceptable, the RegenOx product will be ordered and the pilot test will proceed.

To facilitate injection of the oxidant, one four-inch diameter injection well will be installed as shown on Figure 2. The injection well will be installed to a depth of 25 feet below ground surface and will be completed with ten feet of 0.020" slotted Schedule 4 PVC well screen and 15 feet of blank casing. The annulus around the well screen will be filled with 10-20 mesh Colorado silica from total depth to approximately one foot above the top of the screened interval and bentonite chips will be used to fill the remaining annulus to ground surface. The injection well will be completed with a bolt-down steel manhole cover and fitted with a locking compression plug.

Per the Regenesis design for the pilot test, the RegenOx product will be injected in four applications one to two weeks apart. RegenOx consists of two parts, part A is the oxidant and part B is the activator. During each application, 40 pounds of part B will be mixed with 40 gallons of water and injected into the well followed by a 20 gallon water flush. Then, 70 pounds of part A will be mixed with 201 gallons of water and injected followed with a 20 gallon water flush.

Groundwater samples will be collected from all of the site monitoring wells sixty days after the last injection. Groundwater samples will be analyzed for VPH and IBIs at an approved analytical laboratory. A preliminary cleanup goal for this pilot test is set at a 20-40% reduction in dissolved petroleum concentrations following the pilot test. If this reduction is achieved, the pilot test will be considered a success.

Vapor Intrusion Assessment

It is unknown whether the petroleum release at the former Ed's Sinclair facility is impacting indoor air quality in the First Methodist Church building located at 54193 U.S. Highway 2 in Glasgow, MT. Therefore, a vapor intrusion investigation will be conducted and will consist of installing one subslab vapor sampling point within the building basement slab midway along the south wall of the building. One air grab sample will be collected from the subslab vapor sampling point. The air sample will be analyzed using EPA Method TO-15 and Massachusetts Air Phase Petroleum Hydrocarbons (APH) Method at Pace Analytical in Minneapolis, MN.

Reporting

A Standardized Generic Application Report (Report_AR-07) will be prepared that will summarize the results of the additional soil boring and groundwater monitoring well installations and the implementation and results of the pilot testing. The report will include conclusions and recommendations for future work. The facility Release Closure Plan will be updated and appended to the AR-07 report.

Investigative Methods

Methods practiced during this investigation will follow generally accepted practices of similar consulting firms in the same geographical area. Quality Assurance/ Quality Control methods will be employed throughout all phases of this investigation to ensure meaningful and reproducible results and data.

Investigation Derived Waste

Drill cuttings, excess sample materials, drilling fluids, and water removed from a well during installation, development, and aquifer testing and all other investigation derived wastes will be disposed of according to all applicable local, state and federal laws and regulations governing the disposition of investigation derived wastes.

Health and Safety

Health and safety issues will be addressed throughout this investigation to prevent exposure of site workers and other onsite personnel to potentially hazardous situations and chemical compounds. Several physical hazards will inherently be present throughout the field investigation while heavy equipment is being utilized for soil borings and monitoring well installation. Site specific health and safety precautions and information will be contained in a Health and Safety Plan which will remain onsite during all field activities.

Project Costs

Costs associated with implementation of this work plan are outlined below.

Task 1- Well Installation

Project Management	4.0 hrs @ \$134/hr	\$536.00
AC-07 CAP preparation	10.0 hrs @ \$134/hr	1340.00
Drill logging	20.0 hrs @ \$118/hr	2360.00
PID rental	2 days @ \$90/day	180.00
Mobilization to Glasgow from Bozeman, round trip	13.0 hrs @ \$118./hr	1534.00
Mileage, 4WD field pickup	720 miles @ \$0.63/mile	453.60
Per Diem	4 days @ \$30.50/day	122.00
Lodging	3 nights @ \$110/night	330.00
Lab analyses	9 VPH soil @ \$135 ea.	1215.00
	9 EDB soil @ \$150 ea.	1350.00
	9 DCA soil @ \$150 ea.	1350.00
Sample shipping		130.00
Drill cutting disposal		300.00
Drilling services	Haztech Drilling bid	6987.00
<u>Task 1-Subtotal</u>		\$18,187.60

Task 2-ISCO Pilot Testing

Project Management	4.0 hrs @ \$134/hr	\$536.00
Prep for site work and demob	6.0 hrs @ \$118/hr	708.00
Conduct RegenOx injection, four injections over 4-8 weeks	32.0 hrs @ \$118/hr	3776.00
Mobilization to Glasgow from Bozeman, 4 round trips	52.0 hrs @ \$118/hr	6136.00
Mileage, 4WD field pickup	2880 miles @ \$0.63/mile	1814.40
Per Diem	8 days @ \$30.50/day	244.00
Lodging	8 nights @ \$110/night	880.00
Mixing tank and injection pump assembly		1200.00
RegenOx product with estimated shipping		1700.00
<u>Task 2 Subtotal</u>		\$16,944.40

Task 3- Groundwater Monitoring

Collect groundwater samples, 2 events	16 wells @ \$186/well	\$2976.00
Mobilization to Glasgow from Bozeman, 2 round trips	26.0 hrs @ \$118./hr	3068.00
Mileage, 4WD field pickup	1440 miles @ \$0.63/mile	907.20
Per Diem	4 days @ \$30.50/day	122.00
Lodging	2 nights @ \$110/night	220.00
Lab analyses	16 VPH water @ \$135 ea.	2160.00
	16 EDB water @ \$150 ea.	2400.00
	16 DCA water @ \$150 ea.	2400.00
	16 IBI water @ 120 ea.	1920.00
Sample shipping		250.00
<u>Task 3-Subtotal</u>		\$16,423.20

Task 4- Vapor Intrusion Assessment

Project management	4.0 hrs @ \$134/hr	\$536.00
Mobilization to Glasgow from Bozeman	13.0 hrs @ \$118./hr	1534.00
Mileage, 4WD field pickup	720 miles @ \$0.63/mile	453.60
Per Diem	3 days @ \$30.50/day	91.50
Lodging	1 night @ \$110/night	110.00
Vapor probe installation and sample collection	3.0 hrs @ \$118/hr	354.00
Rotary concrete hammer drill rental	1 day @ \$150/day	150.00
Misc. supplies		100.00
PID rental	1 day @ \$90.00/day	90.00
Laboratory analysis	1 TO-15/APH @ \$325 ea.	325.00
<u>Task 4-Subtotal</u>		\$3744.10

Task 5-Reporting

Standardized Generic Applications Report (AR-07)	40.0 hrs @ \$134/hr	\$5360.00
Update Release Closure Plan	2.0 hrs @ \$134/hr	268.00
<u>Task 4 Subtotal</u>		\$5628.00

Total Estimated Project Cost **\$60,927.30**

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Limitations

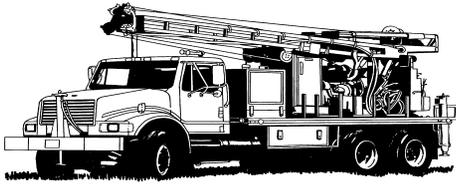
This work was performed in accordance with generally accepted practices of other consulting firms conducting similar studies. Environmental Resources observed that degree of care and skill generally exercised by other consultants under similar conditions. Our findings and conclusions must not be considered as scientific certainties, but as opinions based upon our professional judgment based upon the data gathered during the course of this investigation. Other than this, no warranty is implied or intended.

Submitted by
Environmental Resources

Robert H. Waller
Project Geologist

cc: DEQ-PTCS
MPTRCB
attachments: Drill bids

HAZ TECH Drilling, Inc.



P.O. Box 30622
 2910 Hannon Road, Suite #6
 Billings, MT 59107
 Phone: 406-896-1164 or 800-359-1502
 Fax: 406-896-1462

Proposal

TO: Environmental Resource Management, Inc.
 ATTN: Bob Waller
 P.O. Box 5305
 Bozeman, MT 59717
 Ph-406-582-8491-Cell

DATE: 8/24/2019

PROJECT: Project 95-154
 Glasgow, MT

Description:

1-4" well to 25' with 10' of .020 screen, 2-2" wells to 25' with 10' of .020 screen. All wells will have flush mounts.

TERMS: Net 30 Days

	UNITS	UNIT	AMOUNT
	EST.	PRICE	EST.
*****	*****	*****	*****
Mob/ Demob, Per Mile	580	\$3.25	\$1,885.00
Support Truck, Per Day	3	\$150.00	\$450.00
Perdiem, Per Crew Day	3	\$46.00	\$138.00
Lodging, Per Night, Estimated	2	\$250.00	\$500.00
Auger Drilling, Per Ft	75	\$20.00	\$1,500.00
2" Well Installation, Per Ft	50	\$29.50	\$1,475.00
4" Well Installation, Per Ft	25	\$31.50	\$787.50
8" X 12" Flush Mount Vaults, Each	2	\$100.00	\$200.00
12" X 12" Flush Mount Vaults, Each	1	\$125.00	\$125.00

	ESTIMATED TOTAL:		\$7,060.50

Notes:

- 1) Client is responsible to clear location of utilities.
- 2) Client is responsible for disposal of drill cuttings.
- 3) Client will be invoiced only the amounts used.
- 4) We assume that site is accessible by truck mount drill rig.

Proposal By: Paul Bray

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: *Chris Boland*

Phone: 406-761-1063

8/22/2019

Project Information and Specifications

Glasgow

Facility ID #

Release #

WP ID # 95-154

Type of Drilling Equipment

Hollow-Stem Augers x

Air Rotary

Direct Push

Other (please specify)

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

Soil Sampling

Continuous Soil Sampling

Interval Soil Sampling (specify interval)

No Sampling

Cost Estimate Explanation:

- 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.
- 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.
- 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.
- Drilling Standby: Drilling standby should be estimated on an hourly basis. Prior approval and justification for accumulating standby time is needed prior to billing.
- Well Development: Includes all costs (labor, equipment, and materials) to develop monitoring wells. This task should be estimated using a per well unit rate.
- 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.

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

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	550	\$ 1,100.00
Mobilization/Demobilization: Support Vehicle	\$	1.50 /mile	550	\$ 825.00
Soil Boring Installation (2)				
Drilling (0'-50' range per boring)	\$	30.00 /foot	75	\$ 2,250.00
Drilling (50'-100' range per boring)		/foot		\$ -
Other (please specify) _____				\$ -
Monitoring Well Installation (3)				
Drilling (0'-50' range per well)	\$	30.00 /foot	75	\$ 2,250.00
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	\$	350.00 /well		\$ -
Lodging may only be paid at actual costs when documented by receipts.				
Per Diem				
Lodging: number of individuals =	2	\$ 110.00 /person per day	2	\$ 440.00
Food: number of individuals =	2	\$ 30.50 /person per day	2	\$ 122.00
(Breakfast 5.00, Lunch 6.00, Dinner 12.00)				

TOTAL PROJECT EXPENSE \$ 6,987.00

D.O.T. Drums \$95.00

Additional Conditions/Comments/Costs:

Drill 3 soil borings to 25' each, construct 2 wells 2" diameter and 1 well 4" diameter at Glasgow site/project # 95-154

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

Submit completed form to:

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