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22 June 2019

Mrs. Marga Johnson
15 Sagebrush Trail
White Sulphur Springs, MT 59645

RE: Remedial Investigation Work Plan for the Van Oil Facility in White Sulfur Springs, MT. Facility #30-00478, Release #0268, WPID 10746.

Dear Mrs. Johnson,

Per Ms. Shannon Cala's request for new wells on the former Van Oil facility to address the status of ground-water quality, I have prepared this plan to complete those tasks. The primary reason for new wells is that the geothermal well drilled at the Spa Motel in 2013 lowered the water table and made the existing well array useless. However, water quality data collected by the DEQ and others during the years preceding the new well at the motel clearly showed that the monitoring data from the existing well array met the criteria for release closure, but no administrative action to address closure was taken by the DEQ.

From all this convoluted activity, it became very apparent to Ms. Cala and me that the existing well array, already historically marginal, had been compromised. The simple solution to this problem is to drill new wells on the release property at locations that will provide the soil and ground-water data necessary to get the release closed.

Figure 1 is a Google aerial view of the former Van Oil property and the important adjacent properties; the Spa Motel and the medical center. Drawdown from the 2013 geothermal well at the Spa Motel is presumed to impact the ground-water gradient and flow direction resulting in a westerly flow direction and steeper than natural gradient toward the vicinity of the new well. The proposed well locations have been selected as follows:

- Well 1: This well should, I believe, represent the up-gradient point for the areal ground water, unlike the situation we encountered in 1990 where the cooling water well at the grocery store was causing a reversal of the ground-water gradient.
- Well 2: This well is located close to and down-gradient from the tank basin to determine if there is residual contamination proximal to that critical area. This well would also serve as an indicator should the "new" USTs be experiencing issues with tank/line integrity.
- Well 3: This well serves as the replacement for well VOMW-1 that was completed to address the small release from a used oil tank.

- Well 4: There has never been a well in this down-gradient location, so I have proposed this well to see if there is contamination close to the property line or to confirm that potential contamination has not moved off the Van Oil property.

Utility Location and Migration Pathway Determination

Prior to any work on the site, the DEQ approved well locations will be clearly marked on the ground via a spray painted image and a small flag with the well number written on it. From these clearly identified well locations, underground utility locations, if any, can be marked on the site. The primary concern will be the sewer and water connections to the site building from the municipal mains. Electric service from NWE is overhead and heating for the site provided by propane.

Well Boring and Completion

Each well will be initially bored with 4-inch id hollow-stem augers allowing soil sample collection at the three depths required by Ms. Cala; the zone exhibiting the highest level of fuel contamination as screened by a field ionization instrument, at the soil-ground-water interface, and the bottom of the bore. The bottom of the bore will be determined by noting the depth of the change in soil conditions from dry or moist to saturated, which would define the "soil-water interface" and adding 10 feet rather the customary 5 foot extension. Because there are no well data that define the influence of the geothermal well at the Spa Motel, I prefer to take a conservative approach to the well completion. Ms. Cala has stated that no well shall exceed a depth of 35 feet. All cuttings from the borings shall be screened by the PID and if deemed uncontaminated, shall be used to fill low spots on the site. The soil samples collected will be analyzed for gasoline components (VPH).

If the borings are completed to a depth of 35 feet, the well would be completed with 20 feet of 0.020 slotted pvc screen and 15 feet of casing to ensure that the screened interval starts at a level higher (15 feet bgs) than the latest ground-water elevation data (16 feet bgs). The sand pack of 10/20 silica sand would extend from the bottom of the bore to 13 feet bgs, the solid casing sealed with hydrated bentonite chips to about 2 feet bgs, and the well completed with a steel flush mount concreted in place.

Well Development and Sampling

If ground-water conditions are similar to other locations in WSS, well development may be quite challenging due to the very tight geothermally altered clay that defines the aquifer. To assist with well development, I plan on using a special well cap designed to allow a submersible pump to be used in conjunction with vacuum from either a regenerative blower or engine vacuum from my van as has been done at the Rabe's site. Given the ground-water data from the historic wells, I do not anticipate that the water quality will be contaminated at all; therefore the development water would be spread on the grassed area on the south end of the site. If the water clearly is contaminated from visual indicators such as a sheen or floating product or a very heavy odor of gasoline, the water will be drummed and hauled to the local landfill to be spread on the daily cover as was done with the purged, amendment treated water from Rabe's.

Ground-water samples will be collected from the completed wells after development removes at least 3 bore volumes of water from the well. Each sample will be analyzed for VPH and for the lead scavengers 1,2 DCE and 1,2 EDB. Sampling will be done via low flow techniques using a decontaminated bladder pump and a new bladder for each sample. The cost per well will NOT be based on the PTRCB approved rate schedule, but rather the cost data I submitted in late 2018 which were neither reviewed nor approved by the PTRCB for 2019. Each sample will be properly labelled and logged into the project field book and placed in a cooler with ice for delivery to the lab in Helena. While low-flow samples are being pulled from the

well, conductivity, pH, and temperature will be constantly measured so the sample is collected at the point where these parameters do not change more that 10% over a one minute time frame. However, because this site is proximal to a known geothermal hot spot, sample collection may be influenced by variations in temperature from this system; thus I may have to resort to field judgement when collecting the water sample. Field parameters of pH, conductivity and ORP will be measured externally while DO and temperature will be measured downhole using a YSI 550 DO/Temp meter.

Upon receipt of the lab data and verifying those data using the DEQ required Date Validation Form, I will ensure that Ms. Cala receives the first round data so we can discuss changes to be made, if necessary, to ensure the guidance of the WP is followed.

Respectfully,

Earl F. Griffith P.G.
Wyoming #1033

Cc: Ms. Shannon Cala, Mt. DEQ

Medical Center
Spa Motel
1
2
3
4
Van Oil
Proposed well locations
E Houston St
Warm Springs Creek
© 2018 Google
Google earth

Figure 1

Cost Estimate 23 June 2019

Former Van Oil Facility, White Sulphur Springs, MT
Facility; ID # 30-00478, Release #268, WPID #33845

Task 1: Standard Initial Work Plan/Cost Estimate Preparation-RI-01

gec Labor	Units	Rate	Cost
	PTRCB Fixed Cost Task 1		**$1,085.00**

Task 2: Mobilization; Helena to WSS, and Back, Mileage: 160 miles (includes 2 hours of prep/demob)

(115.00 + 134.75) X 1/60 (avg. speed) = 4.16
249.75 /160 (total miles) = 1.56
Vehicle cost per mile = 0.55
Calculated cost per mile $6.27/mile

Estimated Costs Task 2: 160 miles X $6.27 = $1,003.35

Task 3: Well Boring, Completion, and Development. Estimated costs based on Staff Scientist rate to log soils, sample soils, and conduct head space screening.

gec Labor	Units	Rate	Cost
Staff scientist	8	134.75	$1,078.00
	Estimated Labor Task 3		**$1,078.00**

Direct Costs	Units	Rate	Cost
Soil samples			
VPH	4	$125	$500.00
PID rental	1 day	$90.00	$ 90.00
Sample fee	4	$10.00	$ 40.00
Contracted services (see attached bids)			
Well boring and completion-Awaiting bids			$?

Estimated well completion/analytical costs Task 3 $

Estimated Costs Task 3 $

Task 4: Flush Mount Placement and Well Development with vacuum assist

gec Labor	Units	Rate	Cost
Staff engineer	8	115.00	$920.00
	Estimated gec labor Task 4:		**$920.00**

Direct Costs	Units	Rate	Cost
Purge pump	1 day	$53.00	$53.00
	Estimated Direct Costs Task 4:		$53.00
	Estimated Costs Task 4:		**$973.00**

Task 5: Well Monitoring-Includes one duplicate sample for QA/QC compliance

Direct Costs	Units	Rate	Cost
Well Sampling	4	$325.00	$1,300.00
	Estimated Sampling costs		**$1,300.00**

Analytical Costs	Units	Rate	Cost
VPH	5	$125.00	$625.00
EDB and DCA (MW-1)	4	$165.00	$660.00
Fee	4	$10.00	$ 40.00
	Estimated Analytical Costs		**$1,325.00**

Direct Costs	Units	Rate	Costs
Meals	2 days	$23.00	$46.00
	Estimated Direct Costs		**$46.00**
	Estimated Costs Task5		**$2,671.00**

Task 6: Well survey-datum established 1995 by SE&A at fire hydrant in front of hospital on west hydrant bolt at 5032.57 feet.

gec Labor	Units	Rate	Cost
Proj. scientist	2	$134.75	$269.50
Staff engineer	2	$115.00	$230.00
	Estimated labor Task 7		$499.00

Direct Costs	Units	Rate	Costs
Survey equipment rental	2	$24.00	$48.00
	Estimated Costs Task 6		**$547.00**

Task 7: Project Management-liaison with DEQ case manager, discuss investigation results with case manager and alter WP as necessary

gec Labor	Units	Rate	Cost
Senior Scientist	8.0 hrs.	$151.00 hr.	$1,208.00
	Estimated Costs Task 7		**$1,208.00**

Task 8: Data Validation Form

gec Labor	Units	Rate	Cost
Senior Scientist	3.0 hrs.	$151.00hr.	$453.00
	Estimated Costs Task 8		**$453.00**

Task 9: Initial RI Report-after second sampling event **$3,175.00**

Total Estimated Costs