



Gannett Fleming

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January 24, 2018

File #55929.005

James Hager

Robert Fuller

WRR Environmental Services, Co., Inc.

5200 State Road 93

Eau Claire, WI 54701-9807

Re: Estimated Costs for Environmental Remedial Activities through Regulatory Closure

WRR Environmental Services Facility – Eau Claire, Wisconsin

WDNR BRRTS No. 02-18-000274

WDNR FID No. 618 026 530

EPA ID No. WID 990 829 475

Dear Jim and Bob:

As requested by WRR Environmental Services, Co., Inc. (WRR), and required by the Wisconsin Department of Natural Resources (WDNR) under ch. NR 664, Subch. H, Wis. Adm. Code and CFR Title 40, Vol. 40 Section A § 264.142, this report provides the estimated costs associated with environmental remediation of the WRR site in Eau Claire through closure by the WDNR. The estimates were prepared assuming third-party consultants and contractors would conduct the necessary work at 2018 unit rates based on recently obtained contractor quotes.

Below is a list of the remedial activities that are anticipated to be necessary to achieve site closure. Assumptions for each of the activities are included with a brief description of each activity, as follows:

1. Installation of passive diffusion sample (PDS) bags in each of the monitoring wells and piezometers that are sampled on a routine, semi-annual basis. A work plan for installation of the PDS bags was submitted to the WDNR in May 2013 and approved, with amendments, by the WDNR. PDS bags were installed into 10 wells in Fall 2013, and a round of samples was collected in October 2014. However, sampling using PDS bags was discontinued after that round because some of the duplicate samples collected via pumping from wells that had PDS bags contained concentrations of some volatile organic compounds (VOCs) that varied more than 10 percent from the samples collected from the PDS bags. Additionally, the semi-permeable membrane of the PDS bags was incompatible with ketones and alcohols, so they would not have been able to have been used in all wells for all compounds. Since then, the manufacturer of the PDS bags has developed a PDS with dual-membranes for polar and non-

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polar compounds, so that should no longer be an issue. The cost associated with this activity includes submitting a work plan to the WDNR for approval and purchasing and installing PDS bags and associated equipment in Spring 2018 before the next round of samples is collected.

2. Collection and analyses of groundwater samples from on- and off-site monitoring wells on a semi-annual basis. This activity is estimated to be conducted until Spring 2022, after which the remediation systems will be turned off and post-remediation samples will be collected on a quarterly basis. A separate cost estimate is provided as Task #12 for the collection of eight rounds of post-remediation groundwater samples.
3. Included with the estimate for this activity is the collection and analyses of water samples from two private wells located southwest of the WRR property on Wild Rose Lane. This activity is anticipated to be conducted annually until the post-remediation sampling has been completed in Fall 2024. Sampling and maintenance of two soil vapor extraction (SVE) systems and current groundwater pump-and-treat operations. The SVE systems are composed of four wells: SVE-5 (being vented by one, relatively small vacuum blower) and SVE-4, RW-10, and RW-11 (being vented by a second, relatively large vacuum blower). Groundwater remediation is currently conducted by pumping groundwater from WRR's production well and ten recovery wells (RW-2, RW-4, and RW-6 through RW-13). The pumped water is treated using an air stripper and then discharged into an aeration pond where it is mixed with non-contact water used in production before being discharged to an adsorption pond southwest of the WRR facility.

Because each of the SVE and groundwater recovery wells are in different portions of the site, we plan to monitor the mass of VOCs removed by each well and turn each well off when the mass being removed becomes asymptotically low. For estimating purposes, the following assumptions were made for each remediation system's operation:

- The SVE systems connected to SVE-4 and SVE-5 will begin operating in February 2018 and will operate continuously until June 2021. Exhaust gas samples will be collected from the vacuum blowers that extract vapors from SVE-4 and SVE-5 once each day during the first three days of operation, weekly for the next three weeks, monthly for the next three months, and quarterly thereafter.
- The vacuum blower attached to RW-10 and RW-11 also vents SVE-4. The SVE system connected to SVE-4, RW-10, and RW-11 will operate continuously until June 2021.

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Exhaust samples will be collected from the blower venting these wells as described in the previous bullet-point.

- Groundwater recovery wells will operate continuously until the dates listed below:
 - RW-4 and RW-9 will operate until October 2018 and then be turned off for the remainder of the project.
 - RW-2 and RW-8 will operate until October 2019 and then be turned off for the remainder of the project.

Because of historically low pumping rates and VOC concentrations measured in recovery wells RW-2, RW-4, RW-8, and RW-9, the pumped water from these wells is mixed together before being metered and sampled. Therefore, only one composite quarterly sample would be collected from these four wells while they are operating. All other wells would be sampled individually on a quarterly basis to determine the mass of VOCs being removed by them.

- RW-10 through RW-13 will operate until June 2022 and then be turned off for the remainder of the project.
- WRR's production well will operate through the anticipated date of closure in October 2024. Note that the production well was not installed as part of the remedial activities conducted at this site; however, it is removing VOCs from the lower aquifer on site, so it is effectively acting as a recovery well. With the operation of RW-12 located approximately 40 feet south of the production well, we do not believe that continued operation of the production well is necessary as part of the remedial activities at this site. Therefore, maintenance and electrical costs associated with the production well's operation were not included as part of this estimate, only the collection and analyses of water samples from it.

Samples of the pumped water from these wells will be collected and analyzed on a quarterly basis to determine the mass of VOCs being removed by each well (or group of wells).

The estimates for the activities included with this task include the electrical costs to operate the blowers for the SVE systems, the sprayers and bubblers in the aeration reservoir, and the pumps for the recovery wells.

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4. Abandonment of 11 non-essential monitoring wells in the spring of 2018. Gannett Fleming submitted a request to the WDNR on January 19, 2018, to abandon wells MW-101A, MW-102 & -102A, MW-103 & -103A, MW-108 & -108A, W-10 & -10A, W-20, and W-22. A request to abandon long-screened wells W-20 and W-22 was previously submitted to the WDNR and approved for abandonment in the WPDES permit reissued on November 22, 2012. All other wells listed above have not been sampled in over 10 years.
5. Remediation of groundwater impacted by chlorinated VOCs using reducing reagents. An injection work plan will be submitted to the WDNR in early February 2018. The reducing reagents would be injected into the groundwater in areas not being remediated by the current pump-and-treat systems. Pilot test injections are scheduled for the spring of 2018, with full-scale injections planned for the late summer/early fall of 2018. The cost of preparing a short report summarizing the results of the pilot test injections and our recommendations for full-scale injections are included in the estimate for this activity.
6. Collection and analyses of bi-monthly discharge samples from the aeration reservoir. These sampling events will continue through June 2022 when the groundwater recovery wells are turned off. If pumping from WRR's production well continues after that time, the cost of collecting and analyzing discharge samples will be part of the facility operating costs, not the costs associated with the environmental remediation of the site, so no costs were included for those activities past June 2022.
7. Preparation of monthly WPDES discharge monitoring reports (DMRs) through June 2022, after which the costs to prepare the DMRs will be considered part of WRR's ongoing operating costs.
8. Preparation of annual Operations & Maintenance (O&M) reports through June 2022, the anticipated time that all remedial systems will be turned off.
9. Preparation and execution of a work plan for assessment of the vapor intrusion pathway (VIP) after active remediation is complete. As stated in previous correspondence, because solvents, petroleum products, and other VOCs are routinely stored, handled, treated, and discharged to the air at the WRR facility, we believe it would be difficult, if not impossible, to differentiate between aboveground and belowground sources of VOCs in the indoor air. Therefore, the VIP assessment would include collecting sub-slab vapor and indoor air radon samples as a surrogate for VOCs to develop attenuation factors for the concrete slabs and foundations for each of the on-site buildings. Sub-slab vapor samples will also be collected for VOC analyses

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and used with the attenuation factors to determine the potential for sub-slab vapors to enter each building at concentrations above the indoor air vapor action levels. The estimate for this activity includes the costs for preparing a report summarizing the results of the vapor intrusion assessment.

10. Collection of post-remediation soil samples after the SVE systems have been turned off. For estimating purposes, it is assumed this activity will occur in Fall 2021.
11. Collection and analyses of quarterly groundwater samples to verify that VOC concentrations do not rebound significantly after the remediation systems have been turned off. For estimating purposes, this activity is assumed to occur starting in October 2022 through October 2024. As discussed in phone and email correspondence with Mae Willkom in November 2017, only a select number of wells will need to be sampled for all eight rounds. Wells that have been previously impacted with high VOC concentrations will be sampled on a quarterly basis, along with any sentinel wells upgradient of private wells (i.e. wells W-30A&B). Other wells that have historically contained low or no VOC concentrations will be sampled on a semi-annual or annual basis. Wells that are located far off site that have contained low or no VOC concentrations and were/are unlikely to be affected by operation of the remediation systems will only be sampled on the last round of sampling. A work plan for the collection of post-remediation samples will be included in the last O&M report prior to shutting off the remediation systems. For estimating purposes, Table 1 lists the frequency of the wells that would be sampled as part of the post-remediation sampling events.
12. Preparation of a closure request following completion of remedial activities and achieving concentrations of VOCs in the soil and groundwater that are protective of human health and the environment. The closure request would include GIS registry of areas where VOC concentrations in the soil and groundwater are above regulatory standards. For estimating purposes, this activity is assumed to occur in Fall 2024.
13. Post-closure abandonment and removal of groundwater monitoring and recovery wells. For estimating purposes, this activity is assumed to occur in 2025.
14. Decommissioning of the aboveground portions of the SVE and groundwater remediation systems. For estimating purposes, this activity is assumed to occur after the site achieves regulatory closure in 2025.

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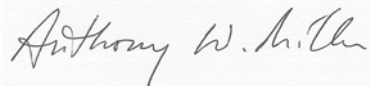
15. Miscellaneous correspondence between the consultant, WRR, and the WDNR regarding operations of remediation systems and sampling activities.

Table 2 presents a summary of the estimated costs for completing Tasks #1 through #16. All costs were prepared using 2018 dollars and then a 10 percent contingency was added to the total estimated cost. Attachment A presents spreadsheets with a breakdown of the costs used to prepare the estimates for each task shown in Table 2. Where applicable, WDNR review fees are included with the costs to prepare the reports and work plans. We believe applying the 10 percent contingency rates to WDNR review fees and annual electrical powers costs is unnecessary, but we included those costs in the estimates, as required by the WDNR.

Please review the attached estimates and let us know if you have any questions.

Sincerely,

GANNETT FLEMING, INC.



Anthony W. Miller, P.S.S.
Senior Environmental Scientist



Clifford C. Wright, P.E, P.G.
Senior Project Engineer

AWM/jec

Enc.

ecc: Becky Anderson (WRR)

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TABLE 1

POST-REMEDATION GROUNDWATER MONITORING SCHEDULE
OCTOBER 2022 THROUGH OCTOBER 2024

Sample Point Name	WDNR Well ID	Sampling Frequency
Production Well	010	Q
Drinking Water Well	020	SA
Lowes Creek Park Hand Pump ⁽¹⁾	040	SA
W-1	100	SA
W-1A	103	Q
W-1D	109	Q
W-2	112	Q
W-2A	115	A
W-2B	118	A
W-3	121	BA
W-3A	124	BA
W-3B	127	BA
W-4	130	BA
W-5	133	SA
W-6	136	Q
W-7	139	SA
W-7A	142	Q
W-17	169	BA
W-17A	172	Q
W-17B	175	SA
W-18	178	BA
W-18A	181	SA
W-19R	185	Q
W-20	187	SA
W-22	193	Q
W-26	205	SA
W-27	208	SA
W-28	211	SA
W-29	214	BA
W-30A	217	Q
W-30B	220	Q
W-31A	223	Q
W-31B	226	Q
W-32	228	Q
W-33	233	Q
W-34	235	Q

Sample Point Name	WDNR Well ID	Sampling Frequency
MW-106	330	BA
MW-106A	333	BA
MW-111	357	BA
MW-111A	360	Q
MW-111B	363	SA
MW-112	366	A
MW-112A	369	A
MW-112B	372	A
MW-113	375	Q
MW-113A	378	Q
MW-113B	381	Q
MW-114	384	SA
MW-114A	387	SA
MW-114B	390	SA
MW-115	393	Q
MW-115A	396	Q
MW-115B	399	Q
MW-116	402	BA
TW-1	404	Q
RW-2	503	Q
RW-4	509	A
RW-5	512	Q
RW-6	515	Q
RW-7	518	Q
RW-8	521	SA
RW-9	524	A
RW-10	527	Q
RW-11	530	Q
RW-12	532	Q
RW-13	534	Q
Seep 2N (2nd Seep N)	610	A
Seep 7N	612	BA
Seep 8N	614	BA
Seep 9N	616	BA
Method Blank	995	1 per event
Field Blank	997	1 per event
Trip Blank	999	1 per cooler
Duplicate		1 per 10 samples

NOTES:

- Q = Quarterly sampling in First, Second, Third, and Fourth Quarter of each year.
- SA = Semi-annual sampling in Second Quarter of 2023 and 2024 and Fourth Quarter of 2022 and 2023.
- A = Annual sample collected in the Second Quarter of 2023 and 2024.
- BA = Biennial sample collected in the Second Quarter of 2024.

SUMMARY OF SAMPLES PER QUARTER:

Number of samples include collection of duplicate samples from ten percent of wells each quarter plus one method and field blank.

Quarter	# of Samples
3rd Qtr 2022	37
4th Qtr 2022	54
1st Qtr 2023	37
2nd Qtr 2023	63
3rd Qtr 2023	37
4th Qtr 2023	54
1st Qtr 2024	37
2nd Qtr 2024	79

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TABLE 2

COSTS TO CLOSURE BY TASK (2018 PRESENT VALUE)

Task	Description	Estimated Annual Costs								
		2018	2019	2020	2021	2022	2023	2024	2025	Total
1	Install passive diffusion sample (PDS) bags into monitoring wells	5,150								5,150
2	GW sampling Mar 2018 - Jun 2022 & private well sampling thru Oct 2024	11,143	11,143	11,143	11,143	5,717	290	290	290	51,160
3	SVE/GW remediation system sampling/O&M thru Jun 2022	28,985	26,745	26,745	26,745	13,373				122,593
4	Abandon 11 non-essential monitoring wells	6,300								6,300
5	Conduct pilot-test & full-scale injections	85,305								85,305
6	Aeration reservoir sampling thru Jun 2022	1,860	1,860	1,860	1,860	930				8,370
7	Submittal of monthly DMRs (11 in 2018, 12/yr in 2019-21, 6 in 2022)	2,035	2,220	2,220	2,220	1,110				9,805
8	Prepare and submit annual O&M/progress reports	4,900	4,900	4,900	4,900	4,900				24,500
9	Prepare/submit work plan & conduct vapor intrusion assessment					8,420				8,420
10	Post-remediation soil sampling (Fall 2022)					13,860				13,860
11	Post-remediation groundwater (GW) sampling Oct 2022 - Oct 2024					7,067	14,720	8,800		30,587
12	Closure request submittal in Dec 2024							11,300		11,300
13	Post-closure well abandonment (Spring 2025)								38,610	38,610
14	Decommission remediation systems								3,000	3,000
15	Miscellaneous correspondence with WRR and WDNR	5,000	5,000	5,000	5,000	5,000	5,000	5,000	2,500	37,500
Sum		150,678	51,868	51,868	51,868	60,376	20,010	25,390	44,400	456,459

Add 10% contingency = 45,646

Grand total = \$502,105

NOTES:

The cost estimates summarized above are based on the following assumptions:

Local consultant conducts sampling, etc. Labor cost breakdown, etc. included on spreadsheets used to prepare estimated cost(s) for each task (see Attachment A).

Direct bill subcontractor costs to client.

Task #3 includes \$3,385/\$2,040/\$14,000 annual electricity costs for the SVE/groundwater recovery well/turbo stripper & pond aerator systems, respectively.

Tasks #5, #9, & #10 include \$700 WDNR review fee.

Task #12 includes \$1,050 for WDNR closure, \$350 for groundwater database, and \$300 for soil database fees.

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TASK 1- PREPARE WORK PLAN & INSTALL PDS BAGS INTO WELLS

Scope - Prepare work plan and submit to WDNR; purchase and install PDS bags into all MWs.

Assumptions - Does not include fees for WDNR review; previous approval of PDS bags did not require WDNR fee. WDNR will approve installation of PDS bags in time for them to be installed before Spring 2018 sampling event.

Labor	Rate/Hr	Hours	Cost
Engineer #3	\$130		\$0
Engineer #2	\$100		\$0
Engineer #1	\$75		\$0
Environmental Scientist #3	\$120		\$0
Environmental Scientist #2	\$90	4.0	\$360 Prepare WP
Environmental Scientist #1	\$70		\$0
Geologist #3	\$100		\$0
Geologist #2	\$75		\$0
Geologist #1	\$50	10	\$500 Prepare table for WP
Environmental Technician #3	\$90		\$0
Environmental Technician #2	\$70		\$0
Environmental Technician #1	\$50	16	\$800 Install PDS bags
Administration #3	\$60		\$0
Administration #2	\$45	2.0	\$90
Administration #1	\$35		\$0
Subtotal:			\$1,750
PDS Bags			\$3,400
			\$5,150

Subcontractor Costs

PDS bag purchase including tethers, weights, caps, etc. \$3,400 EON quote 1/23/18

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TASK 2- GW SAMPLING MAR 2018-JUN 2022 & PRIVATE WELL SAMPLING THRU OCT 2024

Scope - See task title above.

Assumptions - PDS bags have been installed; two-person field team (G#1 and FT#1) takes 20 min/well average; and samples 7 wells in Q1/Q3, 65 wells in Q2, and 36 wells in Q4. QA/QC samples included.

Sample monitoring wells

Labor	Rate/Hr	Hours				Cost	
		Q1	Q2	Q3	Q4		
Engineer #3	\$130					\$0	
Engineer #2	\$100					\$0	
Engineer #1	\$75					\$0	
Enviro. Scientist #3	\$120					\$0	
Enviro. Scientist #2	\$90					\$0	
Enviro. Scientist #1	\$70					\$0	
Geologist #3	\$100					\$0	
Geologist #2	\$75					\$0	
Geologist #1 (G#1)	\$50	6.3	25.7	6.3	16.0	\$2,717	Includes 4 hr/Q to coordinate
Field Tech #3	\$90					\$0	
Field Tech #2	\$70					\$0	
Field Tech #1 (FT#1)	\$50	2.3	21.7	2.3	12.0	\$1,917	Help sample monitoring wells
Administration #3	\$60					\$0	
Administration #2	\$45					\$0	
Administration #1	\$35					\$0	
Subtotal:						\$4,633	

Sample private wells and submit a letter to each private well owner

Labor	Rate/Hr	Hours				Cost	
		Q1	Q2	Q3	Q4		
Geologist #2	\$75		1.0			\$75	Prepare letter
Geologist #1	\$50		2.0			\$100	Sample wells
Administration #1	\$35		1.0			\$35	Submit letter
Subtotal:						\$210	

ODC

Field equipment- monitoring well samples				ABC Unit Rates
Water level meter	\$20	5	\$100	
DI water for PDS bags	\$100	2	\$200	Only recovery wells in Q1/Q3
Replacement PDS bags	\$100	2	\$200	Only recovery wells in Q1/Q3
	ODC Subtotal		\$500	
Lab analysis-monitoring well samples	\$40	143	\$5,720	ALS 2018 Unit Rates
Lab analysis-private well samples	\$40	2	\$80	

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TASK 3 - SVE/GW REMEDIATION SYSTEM SAMPLING/O&M THRU JUN 2022

Scope - See task title above.

Assumptions - FT #1 conducts monthly O&M and collects samples (4 hr/month). FT #2 conducts non-routine O&M and repairs (10 hr/Q). Allocations for equipment repair/replacement, electricity, as shown.

Labor	Rate/Hr	Hours				Cost	
		Q1	Q2	Q3	Q4		
Engineer #3	\$130					\$0	
Engineer #2	\$100					\$0	
Engineer #1	\$75					\$0	
Enviro. Scientist #3	\$120					\$0	
Enviro. Scientist #2	\$90					\$0	
Enviro. Scientist #1	\$70					\$0	
Geologist #3	\$100					\$0	
Geologist #2	\$75					\$0	
Geologist #1	\$50					\$0	
Field Tech #3	\$90					\$0	
Field Tech #2 (FT#2)	\$70	10.0	10.0	10.0	10.0	\$2,800	Non-routine O&M
Field Tech #1 (FT#1)	\$50	12.0	12.0	12.0	12.0	\$2,400	Routine O&M/sampling
Administration #3	\$60					\$0	
Administration #2	\$45					\$0	
Administration #1	\$35					\$0	
Subtotal:						\$5,200	

Remediation system equipment repair/replacement : \$1,000

Annual electrical cost for SVE systems : \$3,385

Annual electrical cost for groundwater recovery wells : \$2,040

Annual cost for turbo stripper & pond aeration: \$14,000

Annual electricity costs subtotal : \$19,425

Lab analysis-SVE exhaust gas samples in 2018	\$140	24	\$3,360	ALS 2018 Unit Rates
Lab analysis-SVE samples/year >2018	\$140	8	\$1,120	

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TASK 4- ABANDONMENT OF 11 NON-ESSENTIAL MONITORING WELLS

Scope - Work Plan submitted to WDNR for abandonment of 11 MWs on 1/19/18.

Assumptions - Does not include fees for WDNR review; previous approval of well abandonment did not require WDNR fee; wells will be abandoned in 2018; no sub markup fees.

Labor	Rate/Hr	Hours	Cost
Engineer #3	\$130		\$0
Engineer #2	\$100		\$0
Engineer #1	\$75		\$0
Environmental Scientist #3	\$120		\$0
Environmental Scientist #2	\$90	4	\$360 Coordinate well abandonment
Environmental Scientist #1	\$70		\$0
Geologist #3	\$100		\$0
Geologist #2	\$75		\$0
Geologist #1	\$50		\$0
Environmental Technician #3	\$90		\$0
Environmental Technician #2	\$70		\$0
Environmental Technician #1	\$50	8	\$400 Oversight during well abandon
Administration #3	\$60		\$0
Administration #2	\$45	2	\$90 prepare PO
Administration #1	\$35		\$0
Subtotal:			\$850

Subcontractor Costs

Abandon wells and remove well pro tops. **\$5,450** Stevens Drilling (1/22/18)

Total Task Costs \$6,300

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TASK 5- CONDUCT PILOT TEST AND FULL-SCALE INJECTIONS OF REDUCING REAGENTS

Scope - Conduct pilot-test and full-scale injections of reducing reagents in areas with elevated CVOC concentrations in GW.

Assumptions - Work plan is submitted to WDNR in January 2018 and approved by March 31st; All PT and FS injections conducted in 2018; assume 3 days for PT and 15 days for FS injections.

Labor	Rate/Hr	Hours	Cost
Engineer #3	\$130		\$0
Engineer #2	\$100		\$0
Engineer #1	\$75		\$0
Environmental Scientist #3	\$120	4.0	\$480 Set up Pos for Subs
Environmental Scientist #2	\$90	6.0	\$540 Prepare WP for field staff
Environmental Scientist #1	\$70		\$0
Geologist #3	\$100		\$0
Geologist #2	\$75		\$0
Geologist #1	\$50	180	\$9,000 Includes PT & FS Inj
Environmental Technician #3	\$90		\$0
Environmental Technician #2	\$70		\$0
Environmental Technician #1	\$50	180	\$9,000 Includes PT & FS Inj
Administration #3	\$60		\$0
Administration #2	\$45	4.0	\$180 Set up Pos for Subs
Administration #1	\$35		\$0
Subtotal:			\$19,200
Drilling			\$32,405
Reagents			\$33,000
WDNR Review Fee			\$700
Total Cost for Task			\$85,305

Subcontractor Costs

Pilot Test - assumes 3 field days

Drilling	\$6,991	Stevens Drilling 1/15/18
Reagents - includes EVO, Z-Loy, DHC Microbes, OS, & Shipping	\$6,600	RNAS 11/29/17 quote
	\$13,591	

Full-Scale Injections - Assume 12 days in field

Drilling	\$25,414	Adjusted Stevens Quote
Reagents	\$26,400	Adjusted reagents quote (x 4)

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TASK 7 - PREPARE MONTHLY DISCHARGE MONITORING REPORTS

Scope - Prepare monthly DMRs until GW remediation systems/RWs are turned off in June 2022.

Assumptions - No GW remediation systems will be used after June 2022.

Labor	Rate/Hr	Hours	Cost
Engineer #3	\$130		\$0
Engineer #2	\$100		\$0
Engineer #1	\$75		\$0
Environmental Scientist #3	\$120		\$0
Environmental Scientist #2	\$90	1.0	\$90
Environmental Scientist #1	\$70		\$0
Geologist #3	\$100		\$0
Geologist #2	\$75		\$0
Geologist #1	\$50	1.0	\$50
Environmental Technician #3	\$90		\$0
Environmental Technician #2	\$70		\$0
Environmental Technician #1	\$50		\$0
Administration #3	\$60		\$0
Administration #2	\$45	1.0	\$45
Administration #1	\$35		\$0
			\$185 per report
Number of events 2/18 through 6/22:			53 reports
Subtotal:			\$9,805

Year	# of DMRs	\$/DMR	Annual Cost
2018	11	\$185	\$2,035
2019	12	\$185	\$2,220
2020	12	\$185	\$2,220
2021	12	\$185	\$2,220
2022	6	\$185	\$1,110
Total	53		

Subcontractor Costs

No subcontractor costs.

WRR ENVIRONMENTAL SERVICES, INC.
EAU CLAIRE, WISCONSIN

TASK 8- PREPARE ANNUAL O&M REPORTS

Scope - Prepare annual O&M reports

Assumptions - No active remediation will be conducted after June 2022.

Labor	Rate/Hr	Hours	Cost
Engineer #3	\$130	4	\$520
Engineer #2	\$100		\$0
Engineer #1	\$75		\$0
Environmental Scientist #3	\$120	10	\$1,200
Environmental Scientist #2	\$90		\$0
Environmental Scientist #1	\$70		\$0
Geologist #3	\$100		\$0
Geologist #2	\$75		\$0
Geologist #1	\$50	30	\$1,500
Environmental Technician #3	\$90		\$0
Environmental Technician #2	\$70		\$0
Environmental Technician #1	\$50	30	\$1,500
Administration #3	\$60		\$0
Administration #2	\$45	4.0	\$180
Administration #1	\$35		\$0
Subtotal:			\$4,900
Number of events 2018 through 2023:			5
Total:			\$24,500

Subcontractor Costs

No subcontractor costs.

WRR ENVIRONMENTAL SERVICES, INC.
EAU CLAIRE, WISCONSIN

TASK 9 - PREPARE WORK PLAN & CONDUCT VAPOR INTRUSION ASSESSMENT

Scope - Prepare work plan (WP) and submit to WDNR. Conduct vapor intrusion assessment in seven on-site buildings and submit summary report.

Assumptions - Work will be conducted in 2022 & consist of collecting VOC & radon sub-slab samples and indoor radon samples and calculating attenuation factors for each building. Field work will take one 10-hour day by Geo #1 and FT #1.

Labor	Rate/Hr	Hours	Cost
Engineer #3	\$130	4	\$520 Review WP & report
Engineer #2	\$100		\$0
Engineer #1	\$75		\$0
Environmental Scientist #3	\$120		\$0
Environmental Scientist #2	\$90	24	\$2,160 Prepare WP & report
Environmental Scientist #1	\$70	10	\$700 Calculate attenuation factors
Geologist #3	\$100		\$0
Geologist #2	\$75		\$0
Geologist #1	\$50	20	\$1,000 Collect samples, tabulate results
Field Technician #3	\$90		\$0
Field Technician #2	\$70		\$0
Field Technician #1	\$50	20	\$1,000 Install vapor pins
Administration #3	\$60		\$0
Administration #2	\$45	4.0	\$180
Administration #1	\$35		\$0
Labor Subtotal			\$5,560
ODC Subtotal			\$200
Lab Subtotal			\$1,960
WDNR Fees			\$700
Total Task Cost			\$8,420

ODC

Field Equipment

			ABC Unit Rates
Hammer Drill	\$50	1	\$50
Vapor Pins	\$50	1	\$50
Air pumps	\$15	1	\$15
Level D PPE	\$25	1	\$25
Shipping	\$60	1	\$60
ODC Subtotal			\$200

Lab

			2018 ALS Unit Rates
ALS - VOC (TO-15)	\$140	7	\$980
Radon Samples	\$70	14	\$980
Lab Subtotal			\$1,960

WRR ENVIRONMENTAL SERVICES, INC.
EAU CLAIRE, WISCONSIN

TASK 10- POST-REMEDATION SOIL SAMPLING

Scope - Prepare work plan and submit to WDNR; WDNR review fee included.

Assumptions - collect soil samples over two, 10-hr days with 2 ABC staff in field. Analyze up to 20 soil samples for VOCs (only).

Labor	Rate/Hr	Hours	Cost
Engineer #3	\$130	4	\$520 Review WP & report
Engineer #2	\$100		\$0
Engineer #1	\$75		\$0
Environmental Scientist #3	\$120		\$0
Environmental Scientist #2	\$90	24	\$2,160 Prepare WP & report
Environmental Scientist #1	\$70		\$0
Geologist #3	\$100		\$0
Geologist #2	\$75	24	\$1,800 Collect samples
Geologist #1	\$50	30	\$1,500 Help sample & tabulate data
Environmental Technician #3	\$90		\$0
Environmental Technician #2	\$70		\$0
Environmental Technician #1	\$50	10	\$500 Tabulate data/figures for rep
Administration #3	\$60		\$0
Administration #2	\$45	4	\$180
Administration #1	\$35		\$0
Labor Subtotal			\$6,660
		Field Eq	\$200
		Drilling	\$4,900
		Lab	\$1,400
		WDNR Fee	\$700
Total Estimate for Task			\$13,860

ODC

Field Equipment

			ABC Unit Rates
FID	\$75	2	\$150
Level D PPE	\$25	2	\$50
ODC Subtotal			\$200

Drilling -			\$4,900 Stevens Unit Rates
Laboratory Analysis	\$70	20	\$1,400 ALS 2018 Unit Rates

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TASK 11- POST-REMEDATION GW SAMPLING OCT 2022 THRU OCT 2024

Scope - See task title above.

Assumptions - Two-person field team (G#1 and FT#1) takes 20 min/well average and samples wells as summarized below. QA/QC samples included (see Table 1 of report).

Sample monitoring wells in 2022 (31 wells in Q3 and 46 wells in Q4)

Labor	Rate/Hr	Hours				Cost	
		Q1	Q2	Q3	Q4		
Geologist #1 (G#1)	\$50			14.3	19.3	\$1,683	Includes 4 hr/Q to coordinate
Field Tech #1 (FT#1)	\$50			10.3	15.3	\$1,283	Help sample monitoring wells
Subtotal						\$2,967	

Sample wells in 2023 (31 wells in Q1/Q3, 54 in Q2, and 46 wells in Q4)

Labor	Rate/Hr	Hours				Cost	
		Q1	Q2	Q3	Q4		
Geologist #1 (G#1)	\$50	14.3	22.0	14.3	19.3	\$3,500	Includes 4 hr/Q to coordinate
Field Tech #1 (FT#1)	\$50	10.3	18.0	10.3	15.3	\$2,700	Help sample monitoring wells
Subtotal						\$6,200	

Sample monitoring wells in 2024 (31 wells in Q1 and 68 wells in Q2)

Labor	Rate/Hr	Hours				Cost	
		Q1	Q2	Q3	Q4		
Geologist #1 (G#1)	\$50	14.3	26.7			\$2,050	Includes 4 hr/Q to coordinate
Field Tech #1 (FT#1)	\$50	10.3	22.7			\$1,650	Help sample monitoring wells
Subtotal						\$3,700	

ODC

Field equipment for MW samples in 2022 (Q3/Q4) and 2024 (Q1/Q2) ABC Unit Rates

Water level meter	\$20	3	\$60
DI water for PDS bags	\$100	2	\$200
Replacement PDS bags	\$100	2	\$200
ODC Subtotal			\$460

Field equipment for MW samples in 2023 (Q1-Q4) ABC Unit Rates

Water level meter	\$20	4	\$80
DI water for PDS bags	\$100	4	\$400
Replacement PDS bags	\$100	4	\$400
ODC Subtotal			\$880

Lab analysis-MW samples in 2022	\$40	91	\$3,640	ALS 2018 Unit Rates
Lab analysis-MW samples in 2023	\$40	191	\$7,640	
Lab analysis-MW samples in 2024	\$40	116	\$4,640	

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TASK 12 - CLOSURE REQUEST PREPARATION AND SUBMITTAL IN DEC 2024

Scope - See task title above.

Assumptions - Active remediation is successful and RNA will address any residual contamination.

Labor	Rate/Hr	Hours	Cost
Engineer #3	\$130	8	\$1,040
Engineer #2	\$100		\$0
Engineer #1	\$75		\$0
Environmental Scientist #3	\$120		\$0
Environmental Scientist #2	\$90		\$0
Environmental Scientist #1	\$70		\$0
Geologist #3	\$100		\$0
Geologist #2	\$75	80	\$6,000
Geologist #1	\$50	40	\$2,000
Environmental Technician #3	\$90		\$0
Environmental Technician #2	\$70		\$0
Environmental Technician #1	\$50		\$0
Administration #3	\$60		\$0
Administration #2	\$45		\$0
Administration #1	\$35	16	\$560
Subtotal:			\$9,600
WDNR closure fee:			\$1,050
Groundwater database fee:			\$350
Soil database fee:			\$300
WDNR fee subtotal :			\$1,700

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TASK 13 - ABANDON MONITORING AND REMEDIATION WELLS AFTER CLOSURE

Scope - Abandon all remaining monitoring and remediation wells after closure.

Assumptions - Does not include fees for WDNR review.

Labor	Rate/Hr	Hours	Cost
Engineer #3	\$130		\$0
Engineer #2	\$100		\$0
Engineer #1	\$75		\$0
Environmental Scientist #3	\$120		\$0
Environmental Scientist #2	\$90	4.0	\$360 Coord & set up PO
Environmental Scientist #1	\$70		\$0
Geologist #3	\$100		\$0
Geologist #2	\$75		\$0
Geologist #1	\$50	10	\$500 Prep & send forms to WDNR.
Environmental Technician #3	\$90		\$0
Environmental Technician #2	\$70		\$0
Environmental Technician #1	\$50	40	\$2,000 Oversee abandonment
Administration #3	\$60		\$0
Administration #2	\$45	2.0	\$90 Set up PO
Administration #1	\$35		\$0
Subtotal:			\$2,950
Subcontractor Costs (Cascade Drilling)			\$35,660
Total for Task			\$38,610

Cascade's 6/14/17 quote revised by removing 11 wells scheduled to be abandoned in 2018.

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TASK 14 - DECOMMISSION REMEDIATION SYSTEMS

Scope - See task title above.

Assumptions - Three 10-hr shifts, two-person field crew (FT#1 and G#1).

Labor	Rate/Hr	Hours	Cost
Engineer #3	\$130		\$0
Engineer #2	\$100		\$0
Engineer #1	\$75		\$0
Environmental Scientist #3	\$120		\$0
Environmental Scientist #2	\$90		\$0
Environmental Scientist #1	\$70		\$0
Geologist #3	\$100		\$0
Geologist #2	\$75		\$0
Geologist #1 (G#1)	\$50	30	\$1,500
Field Tech #3	\$90		\$0
Field Tech #2	\$70		\$0
Field Tech #1 (FT#1)	\$50	30	\$1,500
Administration #3	\$60		\$0
Administration #2	\$45		\$0
Administration #1	\$35		\$0
Subtotal:			\$3,000

Subcontractor Costs

No subcontractor costs.

WRR ENVIRONMENTAL SERVICES, INC.
EAU CLAIRE, WISCONSIN

TASK 15 - MISCELLANEOUS CORRESPONDENCE

Scope - Miscellaneous correspondence between consultant, WRR and WDNR regarding remediation systems operations and sampling.

Assumptions - The miscellaneous costs do not include correspondence covered in other tasks included with the January 2018 cost estimates.

Labor	Rate/Hr	Hours	Cost
Engineer #3	\$130	2	\$260
Engineer #2	\$100	8	\$800
Engineer #1	\$75		\$0
Environmental Scientist #3	\$120	14	\$1,680
Environmental Scientist #2	\$90	10	\$900
Environmental Scientist #1	\$70		\$0
Geologist #3	\$100		\$0
Geologist #2	\$75		\$0
Geologist #1	\$50	10	\$500
Environmental Technician #3	\$90		\$0
Environmental Technician #2	\$70		\$0
Environmental Technician #1	\$50	10	\$500
Administration #3	\$60		\$0
Administration #2	\$45	8	\$360
Administration #1	\$35		\$0
Subtotal:			\$5,000

Subcontractor Costs

No subcontractor costs.