



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 16, 2022

Mr. Kyle Wendtland
Land Quality Administrator
Department of Environmental Quality
Herschler Building
122 West 25 Street
Cheyenne, WY 82002

SUBJECT: ANC GAS HILLS COST ESTIMATE TO COMPLETE DECOMMISSIONING

Dear Mr. Wendtland:

I am writing in response to your office requesting the U.S. Nuclear Regulatory Commission (NRC) provide a cost estimate regarding the funding necessary to complete decommissioning for the American Nuclear Corporation (ANC) Gas Hills site in Wyoming. Wyoming Department of Environmental Quality (WDEQ) indicated it needs this cost estimate to support the State government plan to move forward to request funding to complete decommissioning on this site. Completion of decommissioning of the ANC Gas Hills site would allow the site to be transferred to the U.S. Department of Energy, Office of Legacy Management for long-term care and maintenance in accordance with the requirements of the Uranium Mill Tailings Radiation Control Act of 1978.

This cost estimate is based on a review of the 2014 Cost Estimate prepared by the NRC (Agencywide Documents Access and Management System (ADAMS) Accession No. ML14343A159), the 2018 cost estimate prepared by Lidstone and Associates (ADAMS Accession No. ML16237A011) and the 2019 Project close out report also prepared by Lidstone and Associates (ADAMS Accession No. ML19302E943). This information is summarized in the first table of the enclosure. The cost estimates for each task have been adjusted for inflation and those portions of each action that were identified as complete in the close out report removed, then an adjustment was made to account for the use of professional services for project management, engineering, quality assurance and design changes by the contractor. An additional adjustment was made to cover the costs associated with management and oversight of the contractor by WDEQ. The assumptions and adjustments are captured in the enclosure. The final costs are captured in the second table of the enclosure.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Part 2, "Agency Rules of Practice and Procedure," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC website at <http://www.nrc.gov/reading-rm/adams.html>.

If you have any questions, please contact Martha Poston-Brown via e-mail at martha.poston-brown@nrc.gov.

Sincerely,



Clark, Theresa signing on behalf
of Williams, Kevin
on 05/16/22

Kevin Williams, Director
Materials Safety, Security, State and
Tribal Programs
Office of Nuclear Material Safety
and Safeguards

Docket No. 040-4492

Enclosure: As stated

cc: Brandi O'Brien, WDEQ
Nicole Keller, DOE-LM
Paige Schwarz, DOE- LM Contractor

References:2014: [Cost Estimate to Finish Decommissioning of the ANC Gas Hills Site and Transfer to DOE. \(ML14343A159\)](#)2016: [ANC Uranium Mill Tailings Site Report of Engineering Evaluation / Cost Analysis and Prioritization of Reclamation Activities. \(ML16237A011\)](#)2019: [American Nuclear Corporation Uranium Mill Tailings Site Project Closeout Report. \(ML19302E943\)](#)

Task No.	Task Description	NRC 2014 Sub-tasks	NRC 2014 Estimate	LA 2016 Sub-tasks	LA 2016 Estimate
1	Repair Rock Dam on Tailings Pond 1		\$517,243		\$6,745,000
2	Place Cover on Tailings Pond 1		\$2,104,659		
3	Cleanup Windblown Tailings		\$317,217		
4	Construct Diversion Channels and Rock Aprons		\$2,601,862		\$2,547,000
	• Two Tailings Pond 2 Rock Aprons	\$708,699* [\$498,752]		\$0	
	• Northwest Diversion			\$755,000	
	• South Diversion	\$1,893,163* [\$2,103,109]		\$554,000	
	• Northeast Diversion			\$196,000	
	• Willow Springs Draw Diversion – Ore Road Culverts			\$890,000	
	• Campsite Draw Diversion			\$152,000	
5	Repair Tailings Pond 2		\$2,471,750		<i>not necessary</i>
6	Determine Final Long-Term Care Boundary		\$708,500		\$270,000
7	Install Monitoring Wells and Conduct Sampling		\$384,653		<i>not included</i>
8	Transfer License to DOE		\$4,000,000		\$4,000,000
"A"	Reclamation and Stabilization of Upstream Spoils		\$0		\$0
	Contingency (NRC used 25% / LA used 15%)		\$3,276,471		included above
	TOTAL		\$16,382,355		\$13,822,000

* LA incorrectly summarized these NRC values in its 2016 report. NRC's actual 2014 estimates are provided in brackets

Main Tasks 1 and 2: Complete Cover on Tailings Pond 1 (TP-1)

In 2014, NRC assumed the dam face would be rebuilt to 5H:1V, creating a 675-ft by 306-ft dam face using 8 inches of D₅₀ 4" rock. This would require 225,000 cubic yards (CY) of sand and 5,100 CY of rock. The TP-1 cover would be 1-ft of clay radon barrier (77,440 CY), 3 ft of clean sand as a frost protection layer (232,320 CY), and 6-in rip rap rock cover (32,267 CY). These items total \$2,321,902 in 2014 dollars (sum of Main Tasks 1 and 2).

However, in 2016, Lidstone & Associates (LA) assumed clean sand would be difficult to obtain. Therefore, LA assumed 10-ft of unclassified material (mine spoils available nearby) graded to an 8H:1V slope at the tailings dam and final cover, and 5H:1V on the sideslopes. This requires 675,000 CY of unclassified excavation and 50,000 CY of rock cover material. LA also assumed higher unit rates for clay radon barrier material (\$10/CY versus NRC's estimate of \$1.74/CY), and considered other costs (e.g., mobilization, fencing, grading), which increased the LA estimate to \$6,745,000. The NRC staff also noted that the unit rate for the rock cap on TP-1 was assumed by LA to be \$60/CY. A value of \$90 is used to account for current long haul distances to the nearest available quarry. This adds \$1,452,000 to the cost. **Also, for these tasks and all subsequent engineering tasks, the NRC staff added 10% for professional services related to such things as changes in design; project management; work site engineering supervision; and quality assurance.** Therefore, the staff's estimate for Main Tasks 1 and 2 is (\$6,745,000 + \$1,452,000) + 10% = **\$8,197,000**.

(In its 2019 report, LA described the actual final TP-1 interim cover (over the existing TP-1 cover) from bottom layer to top layer: 1.3-ft unclassified fill; 3-in sand wicking barrier; 0.5-ft amended unclassified fill; 0.8-ft of topsoil; and seeded.)

Main Task 3: Cleanup of Windblown Tailings

No significant difference between NRC and LA estimates. LA's estimate is based on a 2015 survey, which determined that 130 acres, and not 500 acres, needs to be remediated. NRC staff used its estimate of \$317,217 + 10% = **\$348,939**.

Main Task 4: Construction of Diversion Channels and Rock Aprons

NRC assumed that two Tailing Pond 2 (TP-2) rock aprons (NE side; and N and NW sides) and Southwest Diversion Channel would cost \$2,601,862. LA assumed that no rock aprons were required on TP-2; but that five diversion channels would be required on the Northwest Channel; South Channel; Northeast Channel; Willow Springs Draw; and Campsite Draw. The cost difference is not significant. Some diversions were completed under Task Order 4 in April-May 2018 (p. 3 of 2019 closure report). The NRC staff assumes these will have to be revisited if additional rock cover and grading is performed on TP-1. In addition, the NRC staff assume that ongoing degradation of the Ore Road culverts has continued and would require \$1,000,000, not \$890,000. The adjusted 2016 LA value of \$2,547,000 + \$110,000) + 10% = **\$2,922,700** is used here.

Main Task 5: Repair Tailings Pond 2 (TP-2)

NRC assumed that additional rock is needed on TP-2: 6-in of D₅₀ 3-4" rock on entire surface, and 8 acres on the east side with 12" of D₅₀ 3-4" rock, at a cost of \$2,471,750. LA stated that this additional rock cover is not needed, and that, in any case, NRC's assumed source (Rattlesnake Quarry) is no longer viable. LA stated that if additional rock were required, actual costs would be \$60-\$75 / CY. The NRC staff revised its NRC 2014 cost estimate using \$85-\$90 / CY, on account of higher fuel costs and even longer distances to available quarries, which raises the cost of this task to about \$6,582,400 to \$6,969,600. The upper end of this range + 10% = **\$7,666,560**.

Main Task 6: Determine Long-Term Care Boundary

The NRC based its estimate on four replacement properties for sale in Fremont County, which ranged \$542 to \$2,500 per acre (average of \$1,417) and assumed that 500 acres would be replaced at a cost of \$708,500. In 2016, LA assumed that 240 acres would need to be incorporated in the long-term care boundary and used an average cost of \$1,121 per acre, for a total of \$270,000. Given the uncertainty in extent of groundwater contamination, NRC will use \$708,500 + 10% = **\$779,350**.

Main Task 7: Install Monitoring Wells and Conduct Sampling

Additional wells were installed following the NRC's 2014 cost estimate. This was addressed in LA's 2016 hydrogeologic investigation (ML16237A010). These costs were not included in LA's assessment. For this assessment, NRC assumes at least 12 new wells and six additional sampling events will be required at the original cost in NRC's 2014 estimate (\$384,653 + 10% = **\$423,118**).

Main Task 8: Transfer License to DOE

This item includes NRC's review of the Completion Review Reports, Long-term surveillance plan, and other licensing projects, which are not current subject to fee recovery by the NRC. The NRC staff estimated a transfer cost would be \$4M. LA assumed \$2M to \$4M. No basis was provided. However, for this estimate, the NRC staff used the cost associated with Scenario IV in NUREG-0706, Appendix R, "Limited Maintenance," which is an annual cost of \$10,500. Assuming a 1% rate of return, this requires an LTCF of \$1,050,000 (1978 dollars) adjusted for inflation, or \$4,723,286 (2022 dollars)

Task A: Reclamation and Stabilization of Upstream Spoils

In its 2019 report, LA explained that alternate bids to stabilize upstream mine spoils were not awarded. This would have included construction of a detention pond by Johnny Potatoes well that daylighted into the West Diversion Channel to mitigate sediment and runoff from unreclaimed spoils to the south. In December 2018, Wyoming Abandoned Mine Lands Division (AML) instead built cross-slope ditches to the detention ponds. The detention ponds and cross slope ditches failed by

September 10, 2019 (see photos in Appendix F of LA 2019 report). In December 2020, NRC staff was informed that BRS Incorporated is preparing a final grading project in this area. NRC staff assumes this issue with ANC spoils remains the responsibility of AML.

Summary of estimated costs

Task	Dollars (Year)	Inflation Adjusted (2022)
Main Tasks 1 & 2	\$8,197,000 (2016)	\$9,754,430
Main Task 3	\$348,939 (2016)	\$415,237
Main Task 4	\$2,922,700 (2016)	\$3,478,013
Main Task 5	\$7,666,560 (2014)	\$9,123,206
Main Task 6	\$799,350 (2014)	\$951,226
Main Task 7	\$423,118 (2014)	\$521,088
Main Task 8	\$4,723,286 (2022)	\$4,723,286
Contingency (25%, for all)		\$7,241,621
Total		\$36,208,000

ANC Gas Hills Cost Estimate for WDEQ DATE May 16, 2022

DISTRIBUTION:

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ADAMS Accession No.: Ltr ML22108A205

OFFICE	R-IV/DNMS/MLDB	NMSS/MSST/SLPB	OGC/GCRPS /HLWFCNS/NLO	NMSS/DUWP /URMDB
NAME	MPoston-Brown <i>MP</i>	SPoy <i>SP</i>	PJehle <i>PJ</i>	RVon <i>RV</i>
DATE	Apr 19, 2022	Apr 20, 2022	May 4, 2022	May 9, 2022
OFFICE	NMSS/MSST/SALB	NMSS/MSST		
NAME	BAnderson <i>BA</i>	KWilliams TClark for <i>TC</i>		
DATE	May 9, 2022	May 16, 2022		

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