

October 6, 2017

Mr. Elliott R. Russell
Colorado Division of Reclamation, Mining and Safety
Department of Natural Resources
1313 Sherman Street, Room 215
Denver, Colorado 80203

Re: Adequacy Review Response TR-04; M-2000-041; D&A Job No. CG-0212.010.00

Dear Mr. Russell:

This letter response has been prepared by Deere & Ault Consultants, Inc. (D&A) to address the adequacy items to the Division's satisfaction that are listed in your letter of September 8, 2017 to John P. Ary. The original TR-04 filing only contained D&A's slurry wall plans. We have updated the plans to address your comments, and these are included in **Appendix A**. Also included are the technical specifications as **Appendix B**, and the original D&A design report, dated February 2016, attached as **Appendix C**.

We have conducted new analysis to address your comments. Flood hydrology analyses are presented in **Appendix D**. Groundwater modeling to address potential mounding is attached as **Appendix E**. Slope stability analysis (seismic) is presented as **Appendix F**.

1. *Within AM-01 Exhibit M - Other Permits and Licenses, the Operator identified a Dam Safety Permit and a Reservoir Construction Permit are required prior to commencement of final reclamation of Phase I Parcel 4. Please clarify whether these permits are still required and if so, whether a copy of the approved permits will be submitted with TR-04 materials.*

The reclamation has been changed from an above-grade ring dike to a below grade slurry wall as shown in the D&A plans. No water storage will occur above the ground surface; thus, no dam safety permit is required.

A Special Use Permit for reclamation from Pueblo County was obtained on September 20, 2017 and is attached as **Appendix G**.

2. *Within AM-01, the Operator committed to submitting a Technical Revision to address specifics for reservoir bank vegetation for final reclamation. Please clarify whether TR-04 will address seeding details of reservoir bank vegetation.*

The area around the reservoir will be seeded as agreed to for the County Special Use Permit. The proposed, approved, seed mix is as follows:

Species - Variety	Drilled Seed Rate (pure live seed per acre)
Western Wheatgrass	4.8
Sideoats Gramma	2.7
Alkali Sacaton	0.3
Sand Dropseed	0.1
Yellow Sweetclover	0.7
Fourwing Saltbush	0.5

The approved mixture will be seeded the first spring or fall after construction is completed, and would be mulched with 2 tons per acre of straw, crimping the straw into the soil.

- The maps submitted with TR-04 identify the property boundary but do not label or delineate the permit boundary. Please confirm this property boundary is the permit boundary and revise the legend accordingly on the Existing Conditions (Sheet 2). Portions of the slurry wall platform, slurry wall, and crest road are shown north of the northern property line on the Slurry Wall Platform Plan (Sheet 5) and Final Reservoir Grading Plan (Sheet 10). Please note, proposed activities occurring outside of the approved permit boundary will require an amendment to increase the size of the permit to include these areas.*

The slurry wall alignment has been moved to stay within the permit boundary. The permit boundary is shown on Sheet 2 as requested. The County Special Use Permit has approved the road and temporary platform that is all on Stonewall Springs property and do not believe a change in permit boundary is required since the permanent slurry wall was realigned to stay 100 percent within the permit boundary.

- Please confirm the various stockpiles located on the reservoir floor on the Existing Conditions (Sheet 2) will be removed as shown in Final Reservoir Grading Plan (Sheet 10). Please note, pursuant to Rule 3.1.5(7), if stockpiles are to remain, slopes within 5 feet above to 10 feet below the expected water line can be no steeper than 3H:1V. The current plan depicted on the Reservoir Excavation Plan (Sheet 3) and Reservoir Excavation Sections (Sheet 4) shows the southwest squeegee stockpile having 2H:1V slopes at or just below the high water level and are thereby in conflict with Rule 3.1.5(7).*

The squeegee stockpiles and others within the pit have already been partially removed, and the remaining piles are to be removed as part of final reservoir grading. We have added a note to Sheet 10 requiring any remaining piles to be removed, or flattened to 3:1 (horizontal to vertical) near the high water line.

5. *The Typical Slurry Wall Detail depiction on the Slurry Wall Details (Sheet 9) misidentifies the Bentonite Slurry Wall. Please correct this call out and re-submit Sheet 9.*

Corrected.

6. *The Crest Road Detail (Typical) and Road Detail (Typical) depictions on the Final Reservoir Grading Plan (Sheet 10) does not show the slurry wall trench cap as depicted on the Slurry Wall Details (Sheet 9). Please correct these depictions and re-submit Sheet 10.*

Corrected on Sheet 10, Note 2.

7. *Please submit details and locations of various reservoir infrastructure (piping, pump stations, inlets/outlets, etc.). If these details are not known at this time, please commit to submitting a later Technical Revision to provide these details.*

This has not been designed to date, and will be the future responsibility of the water user.

8. *The maps submitted with TR-04 identify the 100-year FEMA Flood Limits. This line transects the Phase I Parcel 4 reservoir. Please discuss if the operation has caused this limit to change based on current or final configuration of the site and if the Operator intends to submit a Letter of Map Amendment (LOMA) with FEMA.*

The 100-year floodplain shown on the effective FEMA Flood Insurance Rate Map (FIRM) is a Zone A (approximate) floodplain whose limit transects the Southwest Pit as shown on **Figure D-1**. Excavation of the pit has indeed caused the floodplain limit to change. At the conclusion of reclamation, D&A expects that the footprint of the Southwest Pit will be inundated during a 100-year flood of the Arkansas River. The mining operation is not expected to significantly impact inundation limits outside the bounds of the pit. The Operator will submit a LOMA with FEMA after reclamation is complete if directed by the Pueblo County floodplain administrator.

9. *The proposed lined reservoir is within the 100-year flood plain of the Arkansas River. Please provide a flood analysis and flood control plan for Division review and approval, addressing how the operation will safely convey the expected 100-year flood event throughout the life of mine and during final reclamation, in accordance with the applicable portions of Rule 6.5(1), (2) and (3).*

The flood analysis should quantify the velocity and volume of flows expected on site from a 100-year flood event, as well as the elevation of the 100-year base flood event and its relation to the elevation of any proposed spillways and reservoir embankments.

The flood control plan shall propose mitigation measures such as pit side armoring, river side armoring, inflow and outflow channels, or other appropriate measures. The Operator shall provide the flood elevations to be expected for the 100-year flood scenario and specific mitigation measures which will be implemented to control erosion and protect offsite lands from damage during flood events, in accordance with Rules 3.1.5(3) and 3.1.6(1), (2) and (3).

A flood analysis and flood control plan is presented as **Appendix D**.

10. Pursuant to Rules 3.1.5(3) and 3.1.6, please submit a groundwater impact analysis predicting the potential shadowing and mounding effects of the proposed slurry wall of Phase I Parcel 4 at the Pueblo East Pit.

If the analysis determines a shadow or mounding effect will occur offsite impacting a groundwater user, the Operator must explain all mitigation measures to be implemented and trigger points which would put mitigation measures into effect. Typically, a trigger point of a 2 feet change from historic ground water levels may be acceptable. The mitigation measures must include a scenario for the installation of a French drain to direct groundwater around the slurry wall and restore groundwater levels to the historic elevation in area of groundwater mounding.

Please describe the effect of potential mounding will have on proposed reclamation of Phase I Parcels 1-3 where wetlands are to be developed by backfilling within a specific elevation of the static groundwater level. Please explain how potential mitigation efforts will alleviate any mounding effects.

A groundwater impact analysis is included as **Appendix E**. A 3-D MODFLOW groundwater model was utilized and predicts that mounding and shadowing effects will be less than the typical trigger value of 2 feet (see **Appendix E** and **Figure E-2**).

The monitoring plan (presented as **Appendix H** in response to Item 11) will alert if the trigger value of 2 feet is exceeded. If mounding is exceeded, for example, a perforated drain pipe would be installed at the northwest side of Phase 1 mining and discharged to the southeast to restore groundwater levels to less than 2 feet of mounding.

Mounding within the area backfilled within wash fines (northwest corner) is also predicted to mound less than 2 feet above the historic groundwater level. Historic groundwater levels are estimated to be of the order of 8 feet below the historic ground surface.

Therefore, in order to backfill 2 feet above future groundwater levels, accounting for a rise of just less than 2 additional feet, requires backfilling to within 4 feet of the historic ground surface.

11. *Please submit a monitoring plan for potential shadowing and mounding effects of the slurry wall.*

The monitoring plan is included in **Appendix H**.

12. *Please provide specific details on the construction of the slurry wall and a thorough cost estimate for the entire project. This cost estimate should also include the costs to construct any flood mitigation structures as discussed in Adequacy Review Item 8.*

Following appropriate responses to this adequacy letter, the Division will calculate a financial warranty associated with the complete construction of the slurry wall and will provide the Operator a copy of the estimate for review. Please note, the portion of the financial warranty which the Division currently holds for the previously approved plan to construct a clay liner will be applied to the proposed slurry wall's required financial warranty.

See specifications in **Appendix B** for details. The cost estimate is shown on **Table 1**.

13. *Please discuss details regarding the compaction and construction of the proposed embankment in the northwest portion of the Phase I Parcel 4 area. Please submit information regarding Quality Assurance and Quality Control for this embankment.*

See specifications in **Appendix B**.

14. *In accordance with Rule 6.5, please submit a stability analysis for the proposed slurry wall and the northwest embankment. Please note, the Division's acceptable minimum factor of safety for static conditions is 1.3, for a rapid drawdown scenario is 1.2, and seismic of 1.1.*

The stability analysis is presented in **Appendix C**, design report. Seismic stability analysis is shown in **Appendix F**. All cases meet or exceed the Division's acceptable minimum factor of safety.

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We believe this response properly addresses the adequacy items. Please call if you have any questions or comments.

Sincerely,

DEERE & AULT CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read "Don W. Deere". The signature is fluid and cursive, with the first name "Don" being the most prominent.

Don W. Deere, P.E.
Principal

DWD:sp

Attachments

TABLE 1
ASI Construction LLC

		Stonewall Springs Southwest Reservoir Soil-Bentonite Cutoff Wall Cost Estimate			REV-125/25/2017	
Phase	Item	Quantity	Unit	Estimated Unit Cost	Estimated Total	Notes
Pre-Construction						
	Cutoff Wall Design - Deere & Ault					
	Geotechnical Investigation	1	LS	17,800.00	17,800	
	Design, & Construction Drawings/Specifications	1	LS	32,600.00	32,600	
				Design Subtotal	50,400	Direct Contract between SSQ and D&A
	Permitting					
	OSE Permit Fees (allowance)	1	LS	5,000.00	5,000	
				Permitting Subtotal	5,000	Direct Cost to SSQ
	Preconstruction Services - ASI					
	Construction Schedule & Cost Finalization, Contract Finalization	1	LS	15,000.00	15,000	
				Preconstruction Services Subtotal	15,000	ASI Cost July-Present
				Pre-Construction Total	70,400	
Construction						
	Construction Oversight - Deere & Ault					
	Construction Observation - Cutoff Wall	12	Week	7,960.00	95,520	
	Final Construction Report	1	LS	14,700.00	14,700	
	Leakage Test Report	1	LS	21,500.00	21,500	
				Deere & Ault Construction Oversight Subtotal	131,720	Direct Contract between SSQ and D&A
	General Conditions					
	Mobilization	1	LS	-	-	
	Contractor General Conditions	3.5	Month	20,000.00	70,000	
	Survey & Quality Control Testing	1	LS	27,500.00	27,500	
	Bonds & Insurance Requirements	0.75%	% Construction Cost	2,173,912.20	16,304	No Bond -- Buider's Risk and G/L Insurance
				Subtotal Contractor General Conditions	113,804	
	Earthwork Subcontractor - Mobilization and General Conditions					
	Earthwork Contractrator - Mobilization	1	LS	55,000.00	55,000	
	West Closure Embankment Construction					
	Subgrade Excavation	18,777	CY	2.80	52,576	
	Closure Embankment Fill	97,641	CY	4.60	449,149	
	Slurry Wall Platform					
	Grading for Slurry Wall Platform	57,506	CY	3.25	186,895	
					-	
	Squeegee Stockpile Excavation & Relocation					
	Relocate Squeegee adjacent to 3:1 slope	-	CY		-	Scope Deleted by D&A
	Construct Crest Road					
	Supply Aggregate for Crest Road	7,000	Ton	by Stonewall	-	
	Handle/Place Crest Road Aggregate	4,100	CY	19.00	77,900	Can Fremont perform this work?
	Pit Dewatering					This would allow Monks to demob once closure and platform are completed
	Dewatering/Diversion allowance for Panhandle Closure	1	LS	25,000.00	25,000	
				Subtotal Earthwork	846,519	
	Cutoff Wall - Support Items					
	Establish & Maintain Environmental Controls - Allowance	1	LS	10,000.00	10,000	
	Maintain Cutoff Wall Work Bench - Allowance	3	Month	12,500.00	37,500	
				Subtotal Cutoff Wall Support Items	47,500	
	Cutoff Wall - Specialty Subcontractopr					
	Specialty Contractor Mobilization/Bond	1	LS	69,205.00	69,205	
	Soil-Bentonite Cutoff Wall - Complete	270,950	SF	3.91	1,059,415	
	Cutoff Wall Narrow Mixing Area - SW Corner	1	LS	33,774.00	33,774	
				Subtotal Cutoff Wall Subcontractor	1,162,394	
	Powerline Relocation /Removal					
	Powerline reloction/removal - Black Hills	1	LS	20,000.00	20,000	
				Subtotal Powerline	20,000	
	Contractor Fees					
				Contractor Fees - Indirect Costs	\$ 113,804	18,778
				Contractor Fees - Self Perform Work	\$ -	-
				Contractor Fees - Subcontract	\$ 2,076,412	103,821
				Subtotal Contractor Fees		122,598
				Construction Total	2,444,535	
Construction Contingency						
	Construction Contingency	5%	Construction Cost	2,444,534.87	122,227	
				Construction Contingency Total	122,227	
	Recap of Costs by Entity					
	Deere & Ault - Design				50,400	
	Deere & Ault - Construction				131,720	
				Subtotal Deere & Ault	182,120	
	ASI - Pre-Construction				15,000	
	ASI - Construction - Self Perform				113,804	
	Earthwork Subcontractor				894,019	
	Slurry Wall Subcontractor				1,162,394	
	ASI - Fees				122,598	
				Subtotal ASI	2,307,815	
	SSQ - Permit Costs & Utility Relocate				25,000	
	SSQ - Contingencies				122,227	
				Subtotal SSQ	147,227	
				Total - Design, Construction , Contingency	2,637,162	
	Work Items by Freemont Paving					
	Re-Grade North Pit Slope to 3:1	5,000	SY	--	--	By Freemont - No Cost to SSQ or ASI
	Final Seeding/Stabilization of Site	15	Acre	--	--	By Freemont - No Cost to SSQ or ASI
	Maint. Access Rd from Hwy-50 (Blade & dust dust control)	4	Month	--	--	By Freemont - No Cost to SSQ or ASI
	Provide Access to Construction Water Supply	4	Month	--	--	By Freemont - No Cost to SSQ or ASI
	Coordinate Pit Operations with Construction	4	Month	--	--	By Freemont - No Cost to SSQ or ASI
				Subtotal Scope by Freemont		
	Annual Inspections - First 3 Years Operations	3	EA	by SSQ	-	O & M Cost by SSQ
				Inspection & Monitoring Subtotal	-	