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Utah Division of Oil, Gas & Mining
Utah Coal Program
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, UT 84114-5801

January 7, 2019

Attn: Steve Christensen
Interim Permit Supervisor

Re: West Ridge Mine C/007/041
Culvert Replacement

Dear Mr. Christensen,

Please see the included 2 Clean Copies for the amendment to the West Ridge Mine C/007/041 MRP to replace a culvert and clean up the text in Appendix 7-4. The associated map is included.

If you have any questions, or need any additional information regarding this change, please contact me directly at 435-888-4000.

Sincerely,



Karin Madsen
Environmental Engineering Tech
UtahAmerican Energy, Inc.

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- e) During active mining, some water is discharged from the mine. Before the mine was sufficiently developed to provide large settling sumps, the water was pumped into the upper cell of the sediment pond, for settling prior to discharge. At that time, calculations were updated to show the affected disturbed ditches and culverts were adequate to carry an additional 0.51 cfs or 230 gpm of mine water.

Under the present scenario, large sumps are generally made available underground to provide adequate settling to allow the mine water to be discharged directly into the bypass culvert UC-EE at the UPDES 002 outfall, as shown on Map 7-2. The bypass culvert calculations have also been upgraded to reflect the potential flow increase from this mine water; however, since this is clean water and does not have to flow through the ditches for disturbed area culverts, the calculations reflect a higher potential of up to 2.0 cfs for direct discharge water.

In the event mine water would still have to be routed through the sediment pond, the flow from the mine would not exceed the 0.51 cfs as previously approved. In this case, mine water will be discharged from a 6" pipe into ditch DD-4A, to culvert DC-4A to ditch DD-5 to culvert DC-6 to culvert DC-6 to ditch DD-6 to culvert DC-7, to ditch DD8A, to culvert DC-8AR, to ditch DD-11, to culvert DC-11, to culvert DC-13 and into the upper cell (A) of the sediment pond.

When mine water is determined to meet UPDES discharge standards, it may be discharged directly into the bypass culvert from the mine. In this case, up to 2.0 cfs of mine water would flow into the bypass culvert UC-EE via a 10" pipe. The water would flow from UC-EE through sections UC-GG, UC-LL, UC-NN, and exit through UC-OO, as shown on Map 7-2.

- f) In 2003, DC-8AR was designed and installed to serve as a relief culvert to DC-8A due to its continual maintenance issues. In 2008 it was determined that DC-8A was poorly designed and was ultimately installed in a location which was hindering mining operations, and so it was removed. DC-8AR is now used in place of DC-8A.

All affected culverts and ditches have been sized to adequately carry the required 10 year- 24 hour runoff, plus the mine water if necessary.

**TABLE 10
DRAINAGE STRUCTURES**

Structure	Drainage From:	Remarks:
UC-AA	UA-AA, DA-X	Right Fork Undisturbed + ASCA-X
UC-DD	UA-DD	Right Fork Undisturbed
UC-EE	UC-AA and UC-DD	Right Fork Undisturbed + ASCA-X
UC-FF	UA-FF	Right Fork Undisturbed
UC-GG	UC-AA Thru UC-FF	Right Fork Undisturbed + ASCA-X
UC-HH	UA-HH, DA-Y	Left Fork Undisturbed+ ASCA-Y
UC-JJ	UA-JJ	Left Fork Undisturbed
UC-KK	UC-HH and UC-JJ	Left Fork Undisturbed+ ASCA-Y
UC-LL	UC-AA Thru UC-KK	Main Canyon
UC-MM	UA-MM	Main Canyon
UC-NN	UC-AA Thru UC-MM	Main Canyon
UC-OO	UC-NN + Sediment Pond Overflow	Main Canyon + Ponds
UC-PP	UA-PP	Main Canyon (Below Pond)
UC-RR	1/3 OF UA-PP	Main Canyon (Below Pond)
UD-Z	UA-PP	Main Canyon (UC-PP)
UD-15	UA-15, DA-15	County Road
DD-1	UA-1a, UA-1b, DA-1	
DD-2	DD-1, UA-2a, UA-2b, DA-2	
DD-3	UA-3, DA-3	
DD-4	DD-2, DD-3, DA-4	
DD-4a	DA-4a, UA-4	
DD-5	DD-4a, UA-5, DA-5	
DD-6	DA-6, DD-4, DD-5	
DD-8	DA-8, UA-8	
DD-8a	DD-6, DD-8	
DD-9	UA-7, DA-7, UA-9, DA-9	
DD-10	UA-10a, UA-10b, UA-10c, DA-10	
DD-11	DA-11	
DD-12	DD-10, UA-12, DA-12, DD8A, DC-8AR DD-8a	
DD-13	DA-13 DC-8AR	

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**TABLE 10 (Continued)
DRAINAGE STRUCTURES**

DC-2	DD-2 + DD-3	
DC-4a	DD-4a	
DC-5	DA-5, UA-5	
DC-6	DD-5	
DC-7	DD-6, DD-8	
DC-8	DA-8	
DC-8ar	DD-8a, DD-8a DA-8, DC-8	
DC-9	DD-9	To Upper Pond
DC-10	DA-10	
DC-10A	DD-10	
DC-11	DD-11	
DC-12	DD-12	To Lower Pond
DC-13	DD-11, DD-13	To Upper Pond

TABLE 11 (Continued)
DRAINAGE STRUCTURE FLOW SUMMARY

Structure	10/6 Cfs	10/24 Cfs	25/6 Cfs	100/6 Cfs	Flows To:
DC-2	5.01	19.65	9.61	16.96	Sediment Pond
DC-4a	5.08	18.32	9.24	15.83	Sediment Pond
DC-5	0.57	1.25	0.82	1.18	Sediment Pond
DC-6	1.26	2.81	1.84	2.68	Sediment Pond
DC-7	7.88	24.55	13.32	21.75	Sediment Pond
DC-8	0.62	1.37	0.89	1.27	Sediment Pond
DC-8ar	7.3	23.43	12.51	20.6	Sediment Pond
DC-9	1.26	2.86	1.88	2.75	To Upper Pond
DC-10	2.58	7.44	4.09	6.52	Sediment Pond
DC-11	7.58	24.05	12.92	21.18	Sediment Pond
DC-12	4.11	13.51	6.99	11.62	To Lower Pond
DC-13	7.86	24.66	13.32	21.74	To Upper Pond

**TABLE 14
DISTURBED CULVERT DATA**

Culvert ID	Length	Slope %	Manning's No.
DC-2	45	2.0%	0.020
DC-4A	170	6.0%	0.020
DC-5	25	2.0%	0.020
DC-6	80	2.0%	0.020
DC-7	50	2.0%	0.020
DC-8	50	10.0%	0.020
DC-8AR	40	16.0%	0.020
DC-9	120	25.0%	0.020
DC-10	85	25.0%	0.020
DC-10A	60	20.0%	0.020
DC-11	60	5.0%	0.020
DC-12	75	10.0%	0.020
DC-13	65	5.0%	0.020

DC-8A replaced by DC-8AR

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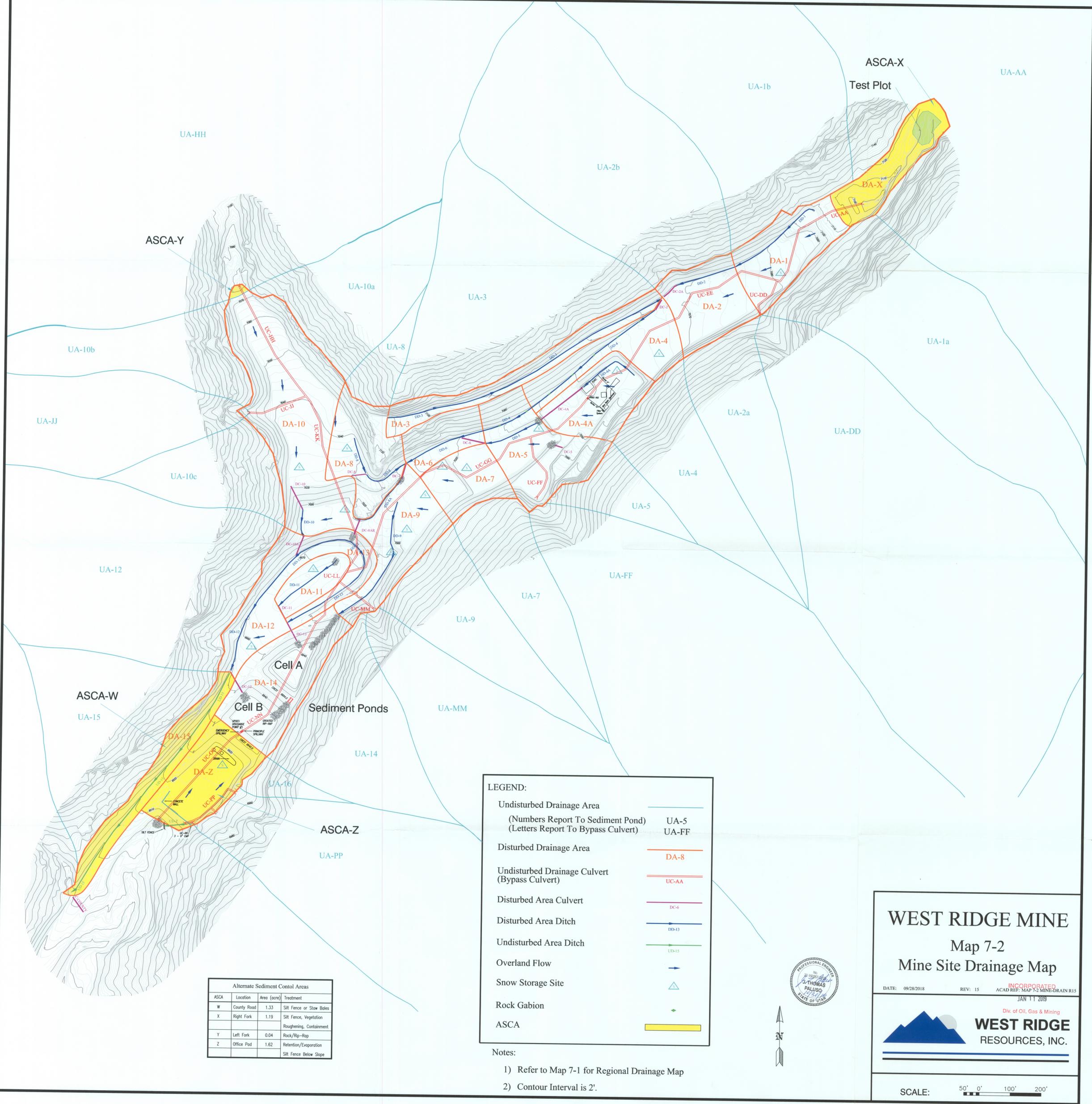
**TABLE 15
DISTURBED CULVERT DESIGN SUMMARY**

Culvert	10 yr - 6 hr Event 1.30"			10 yr - 24 hr Event 2.00"			Recommended Construction Diameter (ft.)	Flow Capacity (cfs)	Rip-Rap Req'd Y/N	Rip-Rap D ₅₀
	Peak Flow Cfs	Velocity fps	Min. Diam. Req'd ft.	Peak Flow Cfs	Velocity fps	Min. Diam. Req'd ft.				
	DC-2	4.40	4.49	1.12	16.82	6.28				
DC-4A	0.69	4.27	0.45	1.56	5.23	0.62	1.5	16.72	N	-
DC-5	0.57	2.69	0.52	1.25	3.28	0.70	1.5	9.66	N	-
DC-6*	1.77	3.58	0.79	3.32	4.18	1.01	1.5	9.66	N	-
DC-7*	7.81	5.18	1.39	23.94	6.86	2.11	2.0	20.80	Y	0.50
DC-8	0.62	5.03	0.40	1.37	6.13	0.53	1.5	21.59	Y	0.50
DC-8AR*	7.81	11.30	0.94	23.94	14.95	1.43	1.5	27.31	Y	1.20
DC-9	1.26	8.47	0.44	2.86	10.39	0.59	1.5	34.14	Y	0.75
DC-10	2.58	10.13	0.57	7.44	13.20	0.85	1.5	34.14	Y	1.00
DC-10A	2.58	9.32	0.59	7.44	12.14	0.88	1.5	30.53	Y	1.00
DC-11*	8.09	7.37	1.18	24.56	9.73	1.79	2.0	32.88	Y	0.50
DC-12*	4.62	8.31	0.84	14.02	10.97	1.28	1.5	21.59	Y	0.75
DC-13*	8.37	7.43	1.20	25.17	9.79	1.81	2.0	32.88	Y	0.50

* Includes 0.51 cfs Mine Water.

** Mine Water Only.

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ASCA	Location	Area (acre)	Treatment
W	County Road	1.33	Silt Fence or Slow Boles
X	Right Fork	1.19	Silt Fence, Vegetation
Y	Left Fork	0.04	Rock/Rip-Rap
Z	Office Pad	1.62	Retention/Evaporation Silt Fence Below Slope

LEGEND:

- Undisturbed Drainage Area
(Numbers Report To Sediment Pond)
(Letters Report To Bypass Culvert) — UA-5
UA-FF
- Disturbed Drainage Area — DA-8
- Undisturbed Drainage Culvert
(Bypass Culvert) — UC-AA
- Disturbed Area Culvert — DC-6
- Disturbed Area Ditch — DD-13
- Undisturbed Area Ditch — UD-15
- Overland Flow →
- Snow Storage Site △
- Rock Gabion ◆
- ASCA

- Notes:**
- 1) Refer to Map 7-1 for Regional Drainage Map
 - 2) Contour Interval is 2'.

WEST RIDGE MINE
Map 7-2
Mine Site Drainage Map

DATE: 09/28/2018 REV: 15 **INCORPORATED**
ACAD REF: MAP 7-2 MINE-DRAIN R15
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WEST RIDGE
RESOURCES, INC.



SCALE: 50' 0' 100' 200'