TECHNICAL MEMORANDUM
Utah Coal Regulatory Program

December 11, 2008

TO: Internal File

THRU: Dave Darby, Team Lead

FROM: James D. Smith, Environmental Scientist III JDS 01/26/09

RE: Lila Canyon Detailed Design Changes, UtahAmerican Energy, Inc, Horse Canyon Mine, Permit # C/007/0013, Task ID # 3017

SUMMARY:

The applicant has submitted design changes to the current mining and reclamation plan for the Lila Canyon Mine. This memo will include a review of the changes in the hydrology aspects of the application.

DEFICIENCIES:

R645-301-121.200-JDS, The Permittee needs to remove the incomplete version of Appendix 7-4 from both the hard and electronic copies of the submittal, and submit a complete copy of the revised Appendix 7-4 with the PE stamp(s) signed and dated.

R645-301-121.200, -150-JDS, The Permittee must provide Figures 1, 2, 3, 4, 4a, 5a, 5b, 6a, 6b, and 7 of Appendix 7-4 in both electronic and hard copies of the submittal.

R645-301-121.100, -200-JDS, The Permittee needs to correct the statement in Section 553 that states:

Some minor cut slopes along the reclaimed road may be left after reclamation due to the difficulty and inability to reclaim all material pushed over the side while making the road cut. See plate 5-7B-1, cross- section 16+00 for details.

to state that cross-section 16+00 is on Plate 5-7B-2 rather than 5-7B-1.

The Permittee should also confirm that the new cross-section 16+00 shows the details mentioned.

R645-301-121.100, -200-JDS, The Permittee needs to clarify the statement in Section 553

All underground development waste brought to the surface and coal processing waste generated on the surface as a result of coal processing will be placed in the coal mine waste (refuse) disposal area and reclaimed in accordance with R645 regulations.

According to several statements in the MRP, rock-slope underground development waste will be disposed of at the Lila Canyon Mine; all other underground development waste brought to the surface and processing waste will go to Wildcat Loadout.

R645-301-R645-301-121.200-JDS, Peak Flow used in the pond volume calculations in Table 11a includes flow from UA-5, which is not identified. There is no information on watershed UA-5 on Plates 7-2 and 7-5, nor in Tables 1, 3, 4, 5, or 6 (although there is an unlabeled item between UA-4 and UA-6 in Table 3). The Permittee must identify watershed UA-5 on Plates 7-2 and 7-5 and include the parameters and calculations related to this watershed wherever appropriate in Tables 1 through 13b, and include the Watershed Calculations sheet for this watershed.

R645-301-121.200-JDS, The Permittee needs to clarify the proposed size of culvert UC-1.

Culvert UC-1		**48 inch (4 ft) diameter**	**60 inch (5 ft) diameter**
	Chapter 5		Section 520 – page 15
	Chapter 7	Section 744.100 - page 86	
		Plate 7-6a	
	Appendix 7-4		Introduction – page 3
			Section 3.1 b) – page 39
		Table 10 - page 37	
		Section 4.2 - page 53	
			Page 20 of the Culvert Flow Velocity Calculation Worksheets
		Appendix 1 of Appendix 7-4; Culvert Outlet Rip-Rap Apron Flow Velocity Calculation	

R645-301-R645-301-121.200-JDS, The Runoff Volume line in Table 11a indicates "8.73 acres*1.01 ac-in/12 in/ft": the notation "ac-in" is incorrect and confusing. The Permittee needs to replace "ac-in" with simply "in".)

R645-301-R645-301-121.200-JDS, The 31.44 cfs value for Peak Flow (item 5) for Sediment Pond #1 Design in Table 11a is less than the total of the indicated component flows [26.58 cfs (disturbed watersheds reporting to Pond #1, Table 5) + 7.65 cfs (AU-5, footnote 2 of table 11a) = 34.23 cfs], so how the Permittee determined a peak flow of 31.44 cfs is not clear. The Permittee needs to clarify how this Peak Flow was calculated.

R645-301-413.100, -532, 722.500-JDS, Sections 2.2 and 2.9, and Tables 1, 3, and 4 of Appendix 7-4 and Plates 7-2 and 7-5 identify UA-7 (the disturbed area around the upper ventilation fan) as undisturbed. There may be other sections of the plan containing the same inaccuracy. The Permittee needs to correct this wherever it occurs in the submittal.

R6435-301-536.510-JDS, The Permittee must provide references to the sections of the Wildcat Loadout MRP that describe the management and reclamation of the Wildcat refuse pile.

R6435-301-536.600, -553-JDS, Section 553.250 states the refuse pile (rock slope disposal area) design is shown in Appendix 5-7, but Appendix 5-7 contains only a sketchy narrative of the proposed rock-slope underground development waste refuse pile construction and reclamation.
The Permittee must provide information on the design, construction, operation, maintenance, and removal or reclamation of the rock-slope underground development waste refuse pile.

The Permittee must provide mass balance accounting for the material to be redisturbed and recontoured from the refuse pile, coal stockpile, and bathhouse-office-parking pads at reclamation, especially the 28,000 yd^3 of rock-slope underground development waste.

Redisturbance of the soils covering the rock-slope underground development waste refuse pile, when the pads are recontoured during reclamation, must be discussed.

R645-301-742.124-JDS, Table 8 shows expected flow from a 10-yr, 6-hr storm in ditch DD-2c exceeds 5 fps, the criterion for lining a ditch with rip-rap, yet Table 8 indicates this ditch is not planned to be rip-rapped. The Permittee must resolve this discrepancy.

R645-301-742.330-JDS, From Sedimentation Pond #2, both spillways will report to an unnamed 24 in CMP culvert that will discharge to the Middle Fork of Lila Canyon. The

Permittee must identify this culvert, show it on appropriate maps, and present design specifications and calculations similar to those provided for the other culverts.

R645-301-742.332-JDS, The Permittee needs to include an updated Figure 3 in Appendix 7-4 (along with other Figures). Figure 3 tabulates ditch flow depth and area based on a 10-yr, 24-hr storm. The currently approved Figure 3 is out-of-date: it does not include all the proposed ditches and values shown do not agree with those in Table 8 of the current submittal

TECHNICAL ANALYSIS:

GENERAL CONTENTS

PERMIT APPLICATION FORMAT AND CONTENTS

Regulatory Reference: 30 CFR 777.11; R645-301-120.

Analysis:

The C2 form states that all of Appendix 7-4 is being replaced. Appendix 7-4 includes ten figures, Figures 1, 2, 3, 4, 4a, 5a, 5b, 6a, 6b, and 7. These figures are in the electronic copy of the currently approved Appendix 7-4 that was included with the submittal, but not in either the electronic or hard copy of the submittal. The Permittee needs to integrate these figures into both the electronic and hard copies of the submittal.

There are two versions of Append 7-4, in both the hard and electronic copies: the first version is PE stamped by both Dan Guy and Jay Marshall, and Mr. Marshall's stamp is dated and signed; however, the pages after page 42 are illegible and pages are missing (when compared to the second version). The second version appears complete, but Mr. Guy's PE stamp is not dated or signed and this version does not have Mr. Marshall's stamp.

Findings:

R645-301-121.200, -150-JDS, The Permittee must provide Figures 1, 2, 3, 4, 4a, 5a, 5b, 6a, 6b, and 7 of Appendix 7-4 in both electronic and hard copies of the submittal.

R645-301-121.200, The Permittee needs to remove the incomplete version of Appendix 7-4 from both the hard and electronic copies of the submittal, and submit a complete copy of the revised Appendix 7-4 with the PE stamp(s) signed and dated.

OPERATION PLAN

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Coal Mine Waste

The Permittee intends to treat the rock-slope underground development waste differently from other coal-mine waste; however, it is coal mine waste and the Permittee must handle and dispose of it in accordance with all R645 rules that pertain to coal mine waste and refuse piles.

Refuse Piles

Language in the following sections of the MRP, which address the refuse pile and coal mine waste, is vague and potentially confusing.

The Permittee needs to correct the statement in Section 553,

> *Some minor cut slopes along the reclaimed road may be left after Reclamation due to the difficulty and inability to reclaim all material pushed over the side while making the road cut. See plate 5-7B-1 cross section 16+00 for details.*

to state that cross section 16+00 is on Plate 5-7B-2 rather than 5-7B-1. The Permittee should also confirm that the new cross section 16+00 shows the details mentioned.

The Permittee needs to clarify the statement in Section 553

All underground development waste brought to the surface and coal processing waste generated on the surface as a result of coal processing will be placed in the coal mine waste (refuse) disposal area and reclaimed in accordance with R645 regulations.

Rock-slope underground development waste will be disposed of at the Lila Canyon Mine; other "underground development waste brought to the surface" will go to Wildcat Loadout.

The "rock disposal area" where rock-slope underground development waste will be permanently disposed is a refuse pile by the definitions in the R645 rules. The Permittee must eschew language indicating that it is anything other than a refuse pile.

Statements at sections 536 and 553 of the MRP must clearly indicate that rock-slope underground development waste will not be mixed or stored with other types of underground development waste and coal processing waste and that all coal processing waste and underground-development waste other than the rock-slope underground development waste will be shipped to Wildcat loadout for permanent disposal. The Permittee must also provide references to the sections of the Wildcat Loadout MRP that describe the management and reclamation of the Wildcat refuse pile.

Section 553.250 states the Refuse Pile design is shown in Appendix 5-7, but Appendix 5-7 contains only a brief narrative of the proposed refuse pile construction and reclamation. The cross-sections on Plates 5-7A-1 through 5-7B-3 show there will be extensive cut-and-fill to construct the refuse pile, coal stockpile, and bathhouse-office-parking pads, yet Appendix 5-7 does not mention this. The cross-sections show that during reclamation, the cut-and-fill will need to be reversed and the rock-slope underground development waste and the subsoil cover redistributed, which is not discussed in the Appendix 5-7. There is no mass balance accounting for the material to be redisturbed and moved at reclamation; in particular, the placement of the 28,000 yd^3 of rock-slope underground development waste must be clarified.

Findings:

R6435-301-536.510, The Permittee must provide references to the sections of the Wildcat Loadout MRP that describe the management and reclamation of the Wildcat refuse pile.

R6435-301-536.600, -553, Section 553.250 states the refuse pile (rock slope disposal area) design is shown in Appendix 5-7, but Appendix 5-7 contains only a sketchy narrative of the proposed rock-slope underground development waste refuse pile construction and reclamation.

The Permittee must provide information on the design, construction, operation, maintenance, and removal or reclamation of the rock-slope underground development waste refuse pile.

The Permittee must provide mass balance accounting for the material to be redisturbed and recontoured from the refuse pile, coal stockpile, and bathhouse-office-parking pads at reclamation, especially the 28,000 yd^3 of rock-slope underground development waste.

Redisturbance of the soils covering the rock-slope underground development waste refuse pile, when the pads are recontoured during reclamation, must be discussed.

R645-301-121.100, -200, The Permittee needs to correct the statement in Section 553: that states

> *Some minor cut slopes along the reclaimed road may be left after reclamation due to the difficulty and inability to reclaim all material pushed over the side while making the road cut. See Plate 5-7B-1 cross section 16+00 for details.*

to state that cross section 16+00 is on Plate 5-7B-2 rather than 5-7B-1.

The Permittee should also confirm that the new cross-section 16+00 shows the details mentioned.

R645-301-121.100, -200, According to several statements in the MRP, rock-slope underground development waste will be disposed of at the Lila Canyon Mine; all other underground development waste brought to the surface and processing waste will go to Wildcat Loadout. The Permittee needs to clarify the statement in Section 553, "All underground development waste brought to the surface and coal processing waste generated on the surface as a result of coal processing will be placed in the coal mine waste (refuse) disposal area and reclaimed in accordance with R645 regulations".

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

General

Sections 2.2 and 2.9, and Tables 1, 3, and 4 of Appendix 7-4 and Plates 7-2 and 7-5 identify UA-7, the disturbed area around the upper ventilation fan, as undisturbed (Plate 5-2 correctly shows it as disturbed). The Permittee needs to show UA-1 as disturbed in all parts of the plan.

Diversions: General

All flows that are to be diverted are classified as miscellaneous. Locations of culverts and ditches are shown on Plate 7-5.

All proposed diversions are temporary. The Permittee has designed the diversions and committed to locate, construct, and maintain diversions and appurtenant structures so they will be stable; minimize adverse impacts to the hydrologic balance in the permit and adjacent areas; prevent - to the extent possible using the BTCA - additional contributions of suspended solids to streamflow outside the permit area; prevent material damage outside the permit area; assure the safety of the public and provide protection against flooding and resultant damage to life and property; and comply with all applicable local, State, and Federal laws and regulations (733.210, 742.110, 742.311, 751, 752.100).

The diversions will be removed at final reclamation, or before if no longer needed, and disturbed lands restored (Section 742.311); however, Carbon County will replace the culvert that currently carries the flow from the Right Fork of Lila Canyon under the road.

Diversions: Miscellaneous Flows

In Appendix 7-4, Tables 1 and 2 identify, respectively, the undisturbed and disturbed watersheds in and adjacent to the Lila Canyon Mine. Table 3 presents the parameter values required to calculate runoff from all the watersheds. Tables 4 and 5 summarize peak runoff flows from the watersheds, based on 10-yr, 6-hr; 25-yr 6-hr; and 10-yr, 24-hr storms, plus runoff volumes for the 10-yr, 24 hr event; Table 4 also shows peak runoff flows from a 100-yr, 6-hr. storm (Section 2.1 of Appendix 7-4 shows that the 10-yr, 24-hr event and the 100-yr, 6-hr event are both 1.90 in). Table 4 is for undisturbed watersheds that do not report to either sedimentation pond while Table 5 is for undisturbed and disturbed watersheds that report to either sedimentation pond. Table 6 summarizes the interrelationships amongst the various watersheds and diversion structures. Table 7 combines the information from Tables 4, 5, and 6 to show the expected peak flows through each diversion structure for 10-yr, 6-hr; 25-yr 6-hr; and 10-yr, 24-hr storms; Table 7 also shows the 100-yr, 6-hr storm peak flow for UC-1. Table 8 summarizes ditch design parameter values, Table 9 does the same for all culverts except UC-1, and Table 10 contains the parameters for UC-1.

The Permittee used FlowMaster Version 6.0 (Haestad Methods) to calculate flow velocity for ditches and culverts, plus flow depth and area for the ditches. FlowMaster calculation sheets for ditches and culverts are in Appendix 7-4.

Details for protection of drainage control structures are provided in appendix 7-4. Adequately sized rip-rap, concrete or other approved armoring will protect all diversion discharges (Section 734). Section 2.11 of Appendix 7-4 states that ditches projected to carry

flow velocities of 5 fps or greater will be lined with rip-rap; however, Table 8 shows ditch DD-2c meets this criterion, yet it is not planned to be rip-rapped. The Permittee must resolve this discrepancy.

Appendix 7-4, Figure 3 is identified as showing typical cross-section, flow depths, and areas for all lined and unlined ditches. The Permittee needs to include an updated Figure 3 (Disturbed Ditch Sections) in the submittal. There is no Figure 3 in Appendix 7-4 of the submittal (all figures are missing from this appendix; see discussion under PERMIT APPLICATION FORMAT AND CONTENTS). Figure 3 in the current MRP tabulates ditch flow depth and area based on a 10-yr, 24-hr storm, but it is out-of-date: it does not include all the proposed ditches, and many ditch parameter values it does show do not agree with those in Table 8.

The Permittee used the Culvert Headwater Depth Nomograph in Figure 1 of Appendix 7-4 to determine the minimum culvert diameter. For culverts having either a HW/D ratio equal to or greater than 1.0 or a slope less than 2%, the Permittee used FlowMaster to determine the adequacy of proposed pipe diameters (Table 9 shows all culverts have a slope greater than 2%, and although HW/D ratios are not presented, it appears from Table 9 that all culverts were designed using FlowMaster.)

Culverts carrying runoff from disturbed areas have been sized to safely carry flows from a 10-yr, 24-hr event. This meets or exceeds the requirements of the Coal Mining Rules. Tables 9 and 10 in Appendix 7-4 summarize the culvert design parameters.

Tables 9 and 10 in Appendix 7-4 summarize the culvert design parameters, including rip-rap sizes for the outlets. FlowMaster v6.0 calculation sheets are in Appendix 7-4.

The Permittee states that culverts carrying runoff from undisturbed areas have been sized to safely carry expected flows from a 100-yr, 6-hr event. Culvert UC-1, the only culvert in this class, will divert the flow of the Right Fork of Lila Canyon under the main sedimentation pond. The amendment uses two different diameters in the discussion and calculations regarding this culvert. The Permittee needs to clarify the size of this culvert.

Culvert UC-1		**48 inch (4 ft) diameter**	**60 inch (5 ft) diameter**
	Chapter 5		Section 520 – page 15
	Chapter 7	Section 744.100 - page 86	
		Plate 7-6a	
	Appendix 7-4		Introduction – page 3
			Section 3.1 b) – page 39
		Table 10 - page 37	
		Section 4.2 - page 53	

			Page 20 of the Culvert Flow Velocity Calculation Worksheets
		Appendix 1 of Appendix 7-4; Culvert Outlet Rip-Rap Apron Flow Velocity Calculation	

Stream Buffer Zones

Plate 5-2 shows the locations where the permit area boundary lies within 100 ft of the mapped channel of Lila Canyon Wash. The Permittee will line the undisturbed areas between the wash and surface facilities with boulders and signs to alert equipment operators of disturbed area boundary limits (Sections 731.600 and 521.261, and Plate 5-2).

There will be no diversion of Lila Canyon Wash (Section 742.320). Surface flows on the proposed facilities area will be directed away from Lila Wash, and no runoff from the disturbed area will enter this drainage (Appendix 7-4 and Plates 7-2 and 7-5). No spoil will be placed in this drainage (Section 535), and there will be no road construction in the stream channel (Section 732.410). No spoil will be placed the drainages. Lila Canyon Wash channel will be monitored below the buffer zone at site L-1-S. There are no drinking water sources or state appropriated water resources on Lila Canyon Wash below the escarpment.

No potential causal relationship between the planned operation and water quality and quantity in Lila Canyon Wash has been identified by the Permittee, the Division, or other parties, and there are no proximate downstream uses. Therefore, impact of the planned mine operation on Lila Canyon Wash is expected to be nil and pre-mining water quality and quantity data for the wash are not necessary for the Division to make a finding of no adverse impact. The Division finds that the planned coal-mining and reclamation operations within 100 feet of Lila Canyon Wash will not cause or contribute to the violation of applicable Utah or federal water quality standards and will not adversely affect the water quantity and quality or other environmental resources of Lila Canyon Wash. The Division therefore authorizes the Permittee to conduct the planned coal-mining and reclamation activities within 100 feet of Lila Canyon Wash.

Sediment Control Measures

Appendix 7-4 indicates runoff from undisturbed areas UA-7 (fan site) and UA-8 (water treatment plant) and the Topsoil Storage Area is to be treated by Alternate Sediment Control such as silt fences, berms, and straw bales. The alternate methods and areas to be treated are discussed at the very end of the text (approx. pp. 56 and 57) of Appendix 7-4.

Siltation Structures: Sedimentation Ponds

The Permittee has redesigned Sedimentation Pond #1 and added Sedimentation Pond #2. Plates 7-6a and 7-6b show the pond configurations in plan view and on cross sections. The Permittee used USLE to calculate the expected erosion rate and sediment yield from the disturbed watersheds; results are in unnumbered tables on pages 42 (Pond #1) and 43 (Pond #2). Tables 11a and 11b contain the sedimentation pond design parameters, Tables 12a and 12b contain stage – volume data, and Tables 13a and 13b contain stage discharge data for the two ponds.

Plates 7-2 and 7-5 identify areas both north and south of the Right Fork of Lila Canyon as constituting undisturbed drainage UA-1. The north side is within the permit area boundary, and Runoff Volume in Table 11a (item 2) includes flow from 8.73 acres of UA-1 that lie within the permit boundary. The Permittee is not currently proposing to disturb this area but has included it because of possible future flow to the pond from this area. Although it is not clearly explained in the Plan, the 1.01 in Runoff Volume for these 8.73 acres was calculated using 1.90 in of rainfall (10-yr, 24-hr event) and a disturbed-area CN of 90. The Runoff Volume in Table 11a (item 2) indicates "8.73 acres*1.01 ac-in/12 in/ft": the notation "ac-in" is incorrect and confusing; the Permittee needs to replace "ac-in" with simply "in". The Sediment Storage Volume in Table 11a (item 3) does not include sediment from these 8.73 acres.

Peak Flow in Table 11a (item 5) has been used to size the spillways for Sedimentation Pond #1. Footnote #2 indicates that the Peak Flow of 31.44 cfs includes 7.65 cfs of flow from undisturbed area UA-5, which has been included because runoff from this area may report to the pond if the surface facilities are expanded. The Peak Flow from all other disturbed areas, based on Table 5, is 26.58 cfs. The 31.44 cfs value for Peak Flow (item 5) in Table 11a is less than the total of the component flows [26.58 cfs (Table 5) + 7.65 cfs (AU-5, footnote 2 of table 11a) = 34.23 cfs], so how the Permittee determined 31.44 cfs is not clear. The Permittee needs to clarify how this Peak Flow was calculated.

AU-5 is not identified on Plates 7-2 or 7-5. There is no information on UA-5 in Tables 1, 3, 4, 5, or 6 (although there is an unlabeled item between UA-4 and UA-6 in Table 3).

Discharge Structures

The primary and emergency spillways of Sedimentation Pond # 1 will discharge into UC-1. On Plate 7-6a, these spillways are shown as 30 in diameter CMP risers. Each spillway is designed to be large enough to safely pass the runoff from a 25-year, 6-hour precipitation event (Section 743.130), which meets the requirements of the Utah Coal Mining Rules. There will be a decant on the primary spillway, and an oil skimmer on each spillway.

The primary spillway for Sedimentation Pond #2 is to be a 12 in diameter CMP riser, and the emergency spillway a 15 in dia. CMP riser (Plate 7-6b). There will be a decant on the primary spillway and an oil skimmer on each spillway. Both spillways will report to an unnamed 24 in CMP culvert, which will discharge to the Middle Fork of Lila Canyon below the mine site: the proposed revision does not have design specifications or calculations for this culvert. Each spillway is large enough to safely pass the runoff from a 25-year, 6-hour precipitation event (Section 743.130), which meets the requirements of the Utah Coal Mining Rules.

Findings:

R645-301-121.200, The Permittee needs to clarify the proposed size of culvert UC-1.

Culvert UC-1		**48 inch (4 ft) diameter**	**60 inch (5 ft) diameter**
	Chapter 5		Section 520 – page 15
	Chapter 7	Section 744.100 - page 86	
		Plate 7-6a	
	Appendix 7-4		Introduction – page 3
			Section 3.1 b) – page 39
		Table 10 - page 37	
		Section 4.2 - page 53	
			Page 20 of the Culvert Flow Velocity Calculation Worksheets
		Appendix 1 of Appendix 7-4; Culvert Outlet Rip-Rap Apron Flow Velocity Calculation	

R645-301-742.330, From Sedimentation Pond #2, both spillways will report to an unnamed 24 in CMP culvert, which will discharge to the Middle Fork of Lila Canyon. The Permittee must identify this culvert, show it on appropriate maps, and present design specifications and calculations similar to those provided for the other culverts.

R645-301-R645-301-121.200, Peak Flow used in the pond volume calculations in Table 11a includes flow from UA-5, which is not identified. There is no information on watershed UA-5 on Plates 7-2 and 7-5, nor in Tables 1, 3, 4, 5, or 6 (although there is an unlabeled item between UA-4 and UA-6 in Table 3). The Permittee must identify watershed UA-5 on Plates 7-2 and 7-5 and include the parameters and calculations related to this

watershed wherever appropriate in Tables 1 through 13b, and include the Watershed Calculations sheet for this watershed.

R645-301-R645-301-121.200, The Runoff Volume line in Table 11a indicates "8.73 acres*1.01 ac-in/12 in/ft": the notation "ac-in" is incorrect and confusing. The Permittee needs to replace "ac-in" with simply "in".)

R645-301-R645-301-121.200, The 31.44 cfs value for Peak Flow (item 5) for Sediment Pond #1 Design in Table 11a is less than the total of the indicated component flows [26.58 cfs (disturbed watersheds reporting to Pond #1, Table 5) + 7.65 cfs (AU-5, footnote 2 of table 11a) = 34.23 cfs], so how the Permittee determined a peak flow of 31.44 cfs is not clear. The Permittee needs to clarify how this Peak Flow was calculated.

R645-301-413.100, -532, 722.500, Sections 2.2 and 2.9, and Tables 1, 3, and 4 of Appendix 7-4 and Plates 7-2 and 7-5 identify UA-7 (the disturbed area around the upper ventilation fan) as undisturbed. There may be other sections of the plan containing the same inaccuracy. The Permittee needs to correct this wherever it occurs in the submittal.

R645-301-742.332, The Permittee needs to include an updated Figure 3 in Appendix 7-4 (along with other Figures). Figure 3 tabulates ditch flow depth and area based on a 10-yr, 24-hr storm. The currently approved Figure 3 is out-of-date: it does not include all the proposed ditches and values shown do not agree with those in Table 8 of the current submittal.

R645-301-742.124, Table 8 shows expected flow from a 10-yr, 6-hr storm in ditch DD-2c exceeds 5 fps, the criterion for lining a ditch with rip-rap, yet Table 8 indicates this ditch is not planned to be rip-rapped. The Permittee must resolve this discrepancy.

RECOMMENDATIONS:

The application is not recommended for approval until all deficiencies are addressed.

O:\007013.HOR\FINAL\WG3017\jds3017f.doc