



Dave Freudenthal,  
Governor

# Department of Environmental Quality

To protect, conserve and enhance the quality of Wyoming's  
environment for the benefit of current and future generations.



John Corra,  
Director

May 28, 2010

Mr. John Cash  
Lost Creek ISR, LLC  
5880 Enterprise Dr. Suite 200  
Casper, WY 82609

RE: TFN 4 6/268, Clarification of comments discussed during May 6, 2010 meeting, Mine Unit 1, Second Round of Review Comments

Dear Mr. Cash,

The purpose of this letter is to summarize and provide clarification and follow-up to several of the comments discussed during the meeting, between Lost Creek (LC) and Land Quality Division (LQD or "the Division") personnel, held in Lander on May 6, 2010.

During the May 6, 2010 meeting LQD and LC personnel discussed in detail most of the 21 outstanding comments on the Mine Unit 1 Review (MU1R). By the end of the meeting, there were five comments from the MU1R for which LQD committed to providing a more detailed response. Those comments were comment numbers 4, 11, 23, 26 and 33.

Clarification of those five comments is provided below.

Comment 4 pertains to the request for a more detailed site lay out map which will clearly designate the anticipated site disturbance, indicating how those disturbances will be minimized and managed. This comment also addresses sediment control in the context of the above-requested details. Brian Wood (LQD Lander) provided LC with suggested language and generic ASCM designs in an electronic mail (e-mail) to John Cash on May 7, 2010 in order to address this comment. Additionally, Mark Moxley (LQD Lander) provided LC with specifics and/or recommendations for the text in an e-mail to John Cash on May 14, 2010. Copies of the e-mail correspondence and attachments send by Mr. Wood and Mr. Moxley are provided (see enclosures).

Comment 11 pertains to observation wells. LQD expects that Attachment OP-2 will describe exactly how and when observation wells will be used. The details of LQD's expectations with regard to this comment will be combined with Comment 33. Therefore, please refer to Comment 33 below for more information on this topic.

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Comment 23 pertains to characterization of the fault zone relative to production. The two primary questions that LC had for LQD regarding this comment are listed below with LQD's answers following the question.

*Question 1: What distance should the replacements for wells HJM-101 and HJM-110 be from the fault to be satisfactory?* Given that all other cross-fault monitoring wells lie within 50 – 75 feet of the fault, the Division is requesting a similar distance for the replacement wells. A distance of  $\leq 100$  feet would be acceptable. Please also include some predictions on travel time in the over- and under-lying sands given the chosen ( $\leq 100'$ ) distance from the fault zone.

*Question 2: What else does LC need to provide to LQD to describe the fault?*

- The angle of the fault needs to be determined, stated, and depicted so that its position relative to the production zone at depth is known.
- The fault trace at depth should be indicated on the site maps (Figures MU1.5-1, 5-2, 5-3, and 5-4) relative to the production zones.
- The production zones must maintain a buffer zone or set back from the fault zone. At a minimum, this buffer zone should be equal to the flare distance.

Comment 26 pertains to the issue of adequately monitoring all four of the HJ sands in the monitoring well ring. Given that there are four discreet sands proposed to be mined in the production zone at the LC project, LQD requests that all four of the HJ sands be monitored independently at each ring well location.

Options for monitoring all four HJ sands include: 1) recompleting existing wells in all four sands and then discreetly sampling (with sampling ports and packers similar to Schlumberger's West Bay system) each sand for new baseline, 2) installing a new well in each of the sand intervals not currently screened and then sampling each well for new baseline, 3) some combination of the above.

Discreet sampling of each of the four sands at the monitor well ring will:

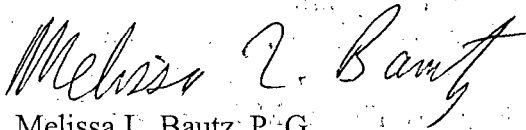
- Reduce the amount of pumping prior to sampling (which has a number of benefits);
- Reduce the possibility of dilution of a zone on excursion from being diluted;
- Enable the operator to immediately know which of the four zones is having the problem; and
- Eliminate the problem of obtaining a representative sample across multiple sands.

Comment 33 pertains to the need for more detail on how excursions will be prevented in Attachment OP2. This requires a more detailed discussion of the criteria used to generate the rose diagrams as well as the frequency with which the rose diagrams will be updated. Additionally, a discussion must be included of the following: piezometers' usage, an explanation of why production zone wells are or aren't used as a monitoring tool, a discussion explaining that excursions are an increase/change in constituents and the method with which they are monitored versus a discussion explaining how water levels are used as a monitoring tool to assess fluid control.

It should be noted that comment numbers 4 and 11 will be moved to the Main Permit Review and comment number 11 will be combined with comment number 33 which will be moved to the Main Permit Review. Comment numbers 23 and 26 will remain in the MU1R.

I hope this letter helps to clarify some of the recent MU1R comments. Please feel free to call to discuss if you require any further direction.

Sincerely,



Melissa L. Bautz, P.G.  
Natural Resources Analyst  
WDEQ/LQD – District 2 (Lander)

Enclosures Copy of the May 7, 2010 e-mail correspondence from Brian Wood to LC  
Copy of the May 14, 2010 e-mail correspondence from Mark Moxley to LC

Cc: Mr. Harold Backer, Ur-Energy USA, 10758 W. Centennial Rd. Suite 200, Littleton, CO, 80127 (w/encl)  
Mark Newman – BLM Rawlins, P.O. Box 2407, Rawlins, WY 82301 (w/encl)  
Tanya Oxenberg, U.S. Nuclear Regulatory Commission, Federal and State Materials and Environmental Management Programs Uranium Recovery Licensing Branch, Mail Stop T-8F5, Washington, D.C. 20555-0001 (w/encl)  
Don McKenzie – LQD Cheyenne (w/encl)  
Mark Moxley/Amy Boyle/Brian Wood – LQD Lander (w/encl)  
Chron

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**From:** Wood, Brian  
**Sent:** Friday, May 07, 2010 3:49 PM  
**To:** Cash, John  
**Cc:** Moxley, Mark; McKenzie, Don; Bautz, Melissa  
**Subject:** Text  
**Attachments:** Erosion and Sediment Control.docx; Generic\_ASCM\_designs.pdf

John,

Per my commitment during our meeting Thursday (5/6), attached please find some text concerning the sediment control issue. I also took the liberty of revising some text in the Roads section to open the opportunity of using "Fords" at stream crossings. I think they are useful in relatively shallow channels and/or where traffic volume is limited.

You'll note in my text the idea of locating pipe and power lines adjacent to roads (in essence in the road corridor). This is but one example of where I think one can reduce the areal extent of disturbance. If one can maximize the amount of vegetative buffer, then sediment does not tend to migrate; I believe this is LC's indirect goal. However, there are issues with some of the plans presented by LC. As an example, if Plate OP-1 is reviewed it shows the pipe and power line leading to the proposed deep disposal well in Section 16 following a completely different alignment than the access. Under this proposal one is going to dig a trench to install the lines, reclaim it, only to re-disturb the whole thing all over again during reclamation phase, and possibly sooner if maintenance is required along the route. From a disturbance / topsoil – native vegetation maintenance standpoint, it would seem much more prudent to either follow the proposed access (an existing two-track) or, alternately, establish a new access route and reclaim the existing two track. When we discussed topsoil protection the other day, the whole idea was to minimize the disturbance footprint and from my point of view this particular example (there are others illustrated on the referenced Plate) does not.

I think Mark will also offer some other comments along the same line.

Please call or e-mail me if you have any questions.

Respectfully,

Brian

## **OP 2.6 (Alternative text to the 2<sup>nd</sup> to last paragraph on page OP-17)**

New or upgrades to existing roads may require the establishment of a stream crossing. Stream crossings maybe constructed using either culvert installation or establishment of a ford and in either case, to the degree possible, will be oriented perpendicular to the channel. Lost Creek ISR may elect to construct fords in cases where the stream channel is relatively shallow, on the order of three feet deep or less. Where fords are established, each entrance will be graded to a slope of 5(h):1(v) or less and the base lined with gravel and cobbles to assure traction.

Culvert design criteria are based on WDEQ/LQD Guideline 8 that factors the design life of the planned facility along with hydrologic return period or flood frequency probability. Culvert design for the main access roads will be based on estimated peakflow from the 25-year, 6-hor storm event. Culvert design for the secondary roads, including mine unit access roads, will be based on estimated peakflow from the 10-year, 6-hour storm event. Based on guidance from Section 9113 of the BLM Manual, in no case will a culvert smaller than 18 inches in diameter be utilized. Culvert design sizing criteria are presented in Table OP-4.

### **OP 2.11.1 Surface Water**

As discuss in **Appendix D6, Section D6.1.1**, all of the drainages at the site are ephemeral and relatively small. The only anticipated temporary impacts to the drainage system during operations may occur along roads where it may be necessary to construct a stream crossing (see **Section OP 2.6**) or route runoff around the Facilities Area (see **Attachment OP-4**). These features should not have any discernable impact on water quantity or quality because of: (1) the limited runoff from the associated low relief drainage basins and (2) the stream crossings and diversions have been / will be appropriately designed to handle the reasonably anticipated flood event given the design life of the structure. All disturbance associated with the installation of a stream crossing or diversion will be reclaimed immediately after construction (see **Section OP 2.7**).

#### **OP 2.11.1.1 Drainage, Erosion and Sediment Control**

Sediment production and control associated with Lost Creek ISR project will be controlled using variety of approaches. It is Lost Creek ISR's goal to limit the extent of site erosion. First Lost Creek ISR's well field development plan calls for establishing a traffic pattern whereby access to each well and header house is via a route delineated by the environmental / engineering staff (see **Section OP 2.6**). Pipe and power line installation will occur directly adjacent to access roads, which during construction will limit the overall disturbance footprint. As discussed in **Section OP 2.5**, Lost Creek ISR's goal is to ensure that 50% or less of a Mine Unit's areal extent is left undisturbed, thus, in many instances a vegetative buffer can be maintained between the disturbed area and a drainage.

There will be areas where maintaining adequate vegetative buffer strip may not be adequate, thus, some form of sediment control will be required. Lost Creek ISR does not propose to construct any type of retention pond rather Alternate Sediment Control Measures (ASCM's), as described in the WDEQ/LQD Guideline 15, will be utilized. ASCM's anticipated to be utilized include silt fence, various types of check dams, small berms/diversions to capture or intercept and divert overland flow toward a structure (e.g., a porous rock check dam) for treatment. In some instances, depending on the areal extent of contributing

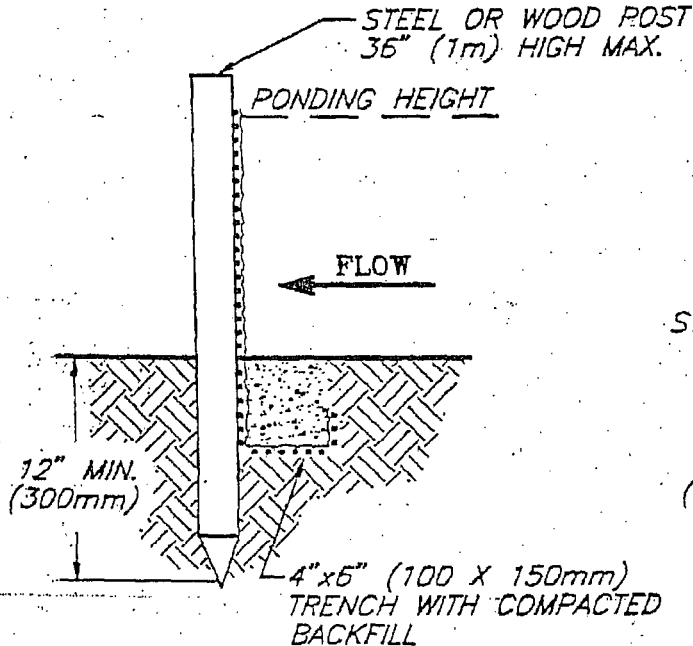
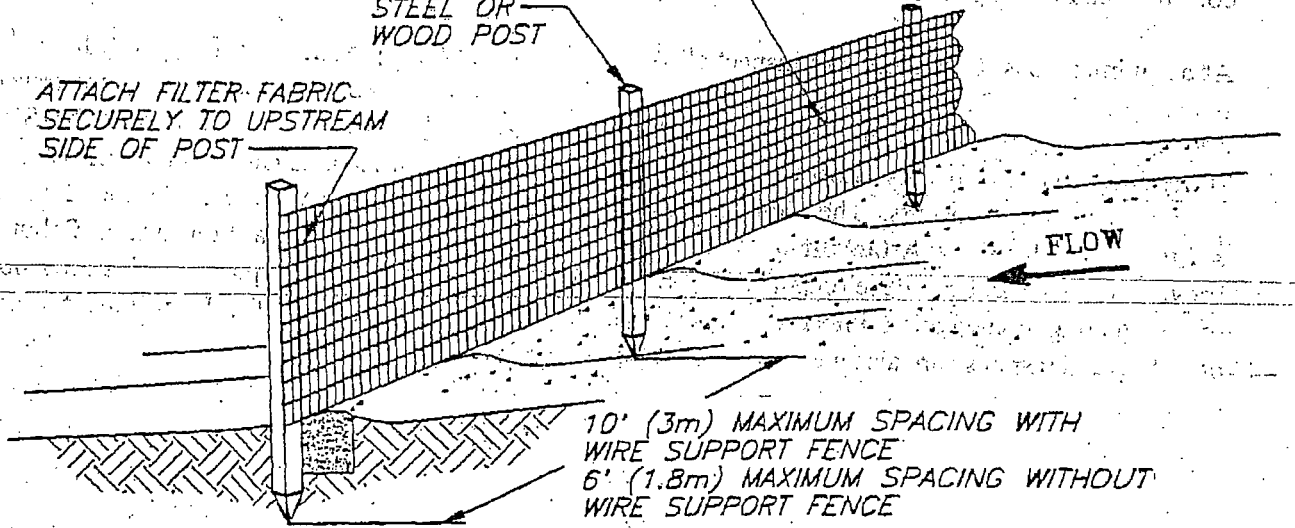
drainage area, Lost Creek, ISR may utilize ASCM's in series in order to provide adequate sediment control. Generic designs for various ASCM's are presented in Attachment OP-4A.

At a minimum Lost Creek ISR will inspect all ASCM's at the beginning of the runoff season (March 1 to November 1) and after each runoff event. Through the runoff season, ASCM's will be inspected at least once a month. An inspection and maintenance log will be kept to document the condition of each ASCM at the time of each inspection. Lost Creek ISR log and repair any significant damage to an ASCM as soon as possible after it occurs. The Stormwater Permit issued by WDEQ/WQD can be found in the **Adjudication Section, Attachment ADJ-3** and as a permit requirement a Stormwater Pollution Prevention Plan has been developed and will be on file at the Mine Office. The plan contains provisions for evaluating construction impacts and unanticipated impacts, such as spills. Provisions for spill detection and response are also addressed in **Section OP 2.9**.

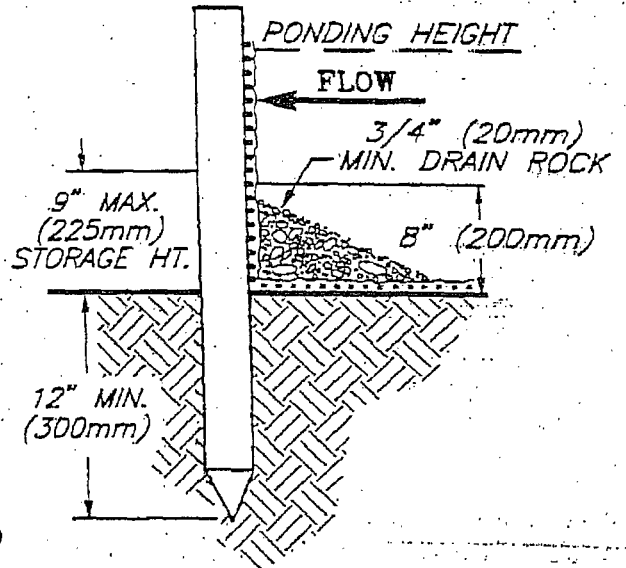
EXTRA STRENGTH FILTER FABRIC  
NEEDED WITHOUT WIRE MESH SUPPORT

STEEL OR  
WOOD POST

ATTACH FILTER FABRIC  
SECURELY TO UPSTREAM  
SIDE OF POST



**TRENCH DETAIL**



**INSTALLATION WITHOUT TRENCHING**

**NOTES:**

1. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.

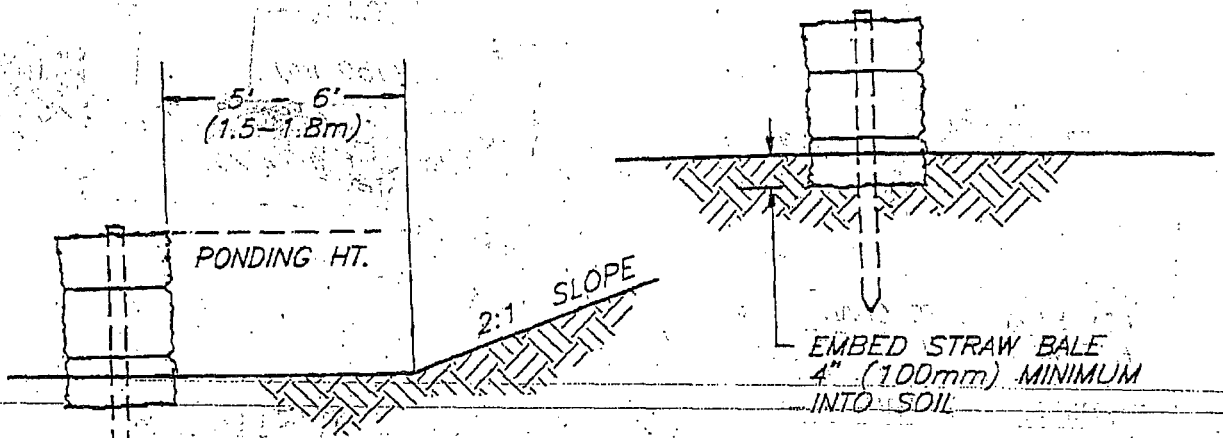
2. INSPECT AND REPAIR FENCE AFTER EACH STORM EVENT AND REMOVE SEDIMENT WHEN NECESSARY. 9" (225mm) MAXIMUM RECOMMENDED STORAGE HEIGHT.

3. REMOVED SEDIMENT SHALL BE DEPOSITED TO AN AREA THAT WILL NOT CONTRIBUTE SEDIMENT OFF-SITE AND CAN BE PERMANENTLY STABILIZED.

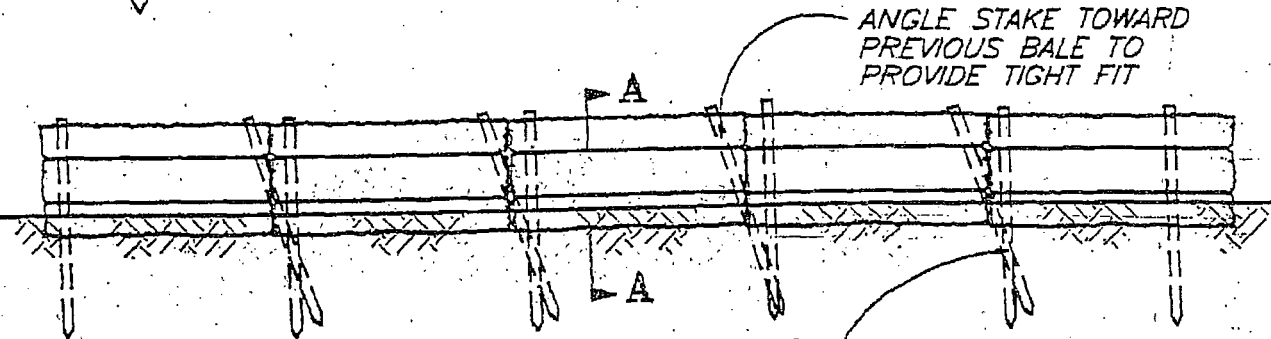
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NOT TO SCALE

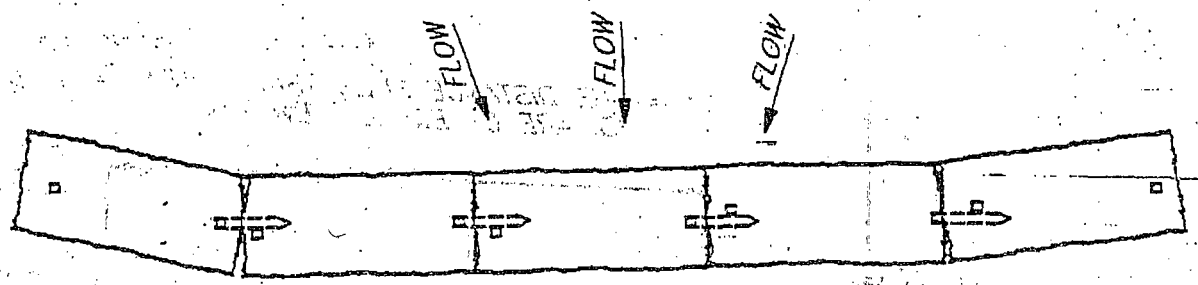
**SILT FENCE**



**SECTION A - A**



**SECTION B - B**



**PLAN**

**NOTES:**

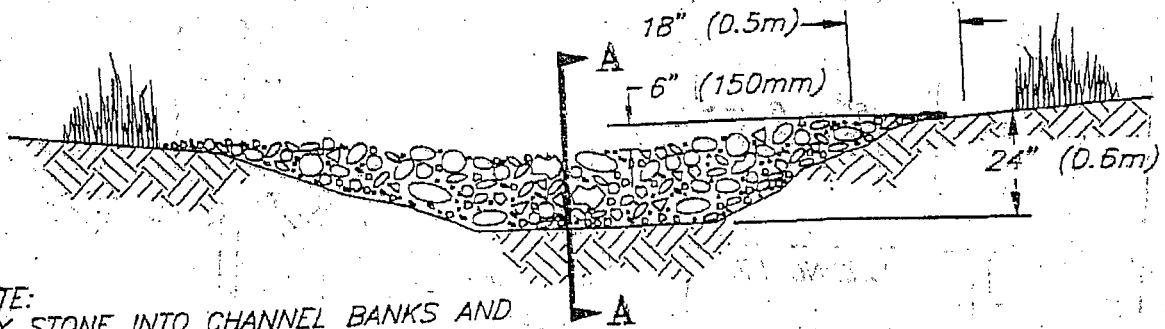
1. THE STRAW BALES SHALL BE PLACED ON SLOPE CONTOUR.
2. BALES TO BE PLACED IN A ROW WITH THE ENDS TIGHTLY ABUTTING.
3. KEY IN BALES TO PREVENT EROSION OR FLOW UNDER BALES.

**STRAW BALE  
DIKE**

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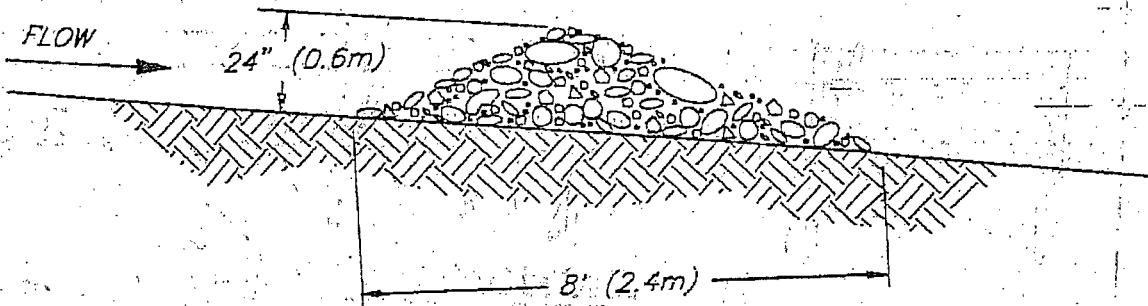
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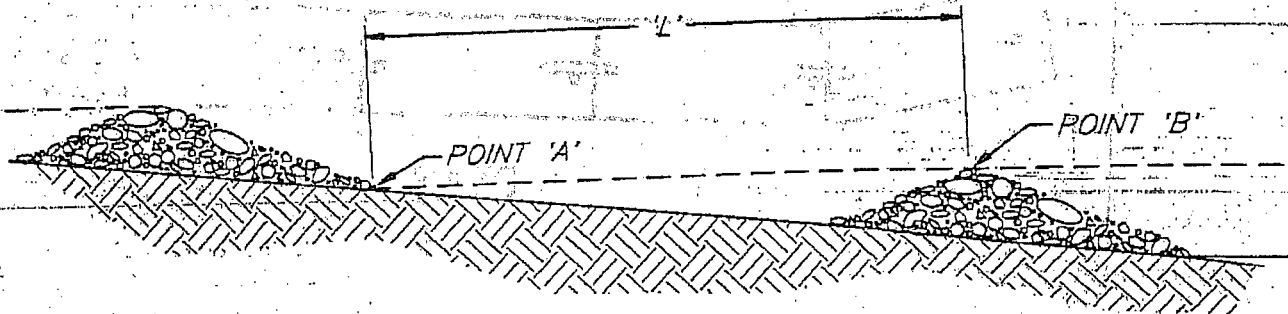
NOTE:  
KEY STONE INTO CHANNEL BANKS AND  
EXTEND IT BEYOND THE ABUTMENTS A  
MINIMUM OF 18" (0.5m) TO PREVENT  
FLOW AROUND DAM.

VIEW LOOKING UPSTREAM



SECTION A - A

'L' = THE DISTANCE SUCH THAT POINTS 'A' AND  
'B' ARE OF EQUAL ELEVATION.



SPACING BETWEEN CHECK DAMS

NOT TO SCALE

**ROCK  
CHECK DAM**

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**From:** Moxley, Mark  
**Sent:** Friday, May 14, 2010 3:00 PM  
**To:** Cash, John  
**Cc:** Bautz, Melissa; Boyle, Amy; Wood, Brian  
**Subject:** Clarification on MU1 comment no.4  
**Attachments:** MM clarification on comment no.4.docx

John,

As promised in our 5/6 meeting, I am providing some clarifications on comment no.4. I apologize for the delay. I was called out of town due to a death in the family. Please contact me or Amy if you have any questions.

Mark Moxley  
WDEQ-LQD District II Supervisor  
510 Meadowview Drive  
Lander, WY 82520  
phone (307) 332-3047  
e-mail [mmoxle@wyo.gov](mailto:mmoxle@wyo.gov)

**Follow-up and clarification on comment no.4 (re: mine unit site layout) from 4/28/10 review of MU #1 Package.**

There are two main issues involved in this comment: 1.) the issue of minimizing disturbance, and 2.) the layout of the production and injection wells relative to the fault. These two issues are addressed separately below:

1.) The disturbance issue originates in the regulation [Ch. 11, sec. 4.(a)(iii)] which provides that the Administrator *may authorize topsoil to remain ... provided that the minor disturbance will not destroy the vegetative cover, increase erosion, nor adversely affect the soil resource.* To date, Lost Creek has not provided sufficient detail to support such an authorization. It is LQD's position that if the cumulative disturbance associated with the development of the wellfield will result in the destruction of most of the native vegetation then topsoil may not be allowed to remain on the wellfield area. LQD has been asking for a full accounting of all disturbance as well as a detailed wellfield layout plan to illustrate how disturbance will be minimized. The following additions and clarifications are requested in order to provide assurance that the cumulative surface disturbance can and will be controlled and minimized. (MM)

a. A commitment is requested that future disturbance associated with wellfield development will, where possible, be located within existing disturbed areas, such as existing roads, staging and lay-down areas, drill sites, etc. rather than affecting additional native lands.

b. Header houses and secondary access roads are shown to be located within the pattern areas on Figures OP-6a and 6b and Plate OP-1 in the main permit document. In contrast, Figure MU1 1-3 in the mine unit package shows all of the header houses and all of the associated access roads, pipelines and power-lines to be located around the outside of the pattern areas. This proposed layout will result in additional unnecessary disturbance. It is requested that the header houses, roads, pipelines and power-lines be located within the pattern areas *as described in the permit document.* The roads should be established and stripped of topsoil prior to development of the wellfield so that they can be used throughout the installation of the wellfield to control and minimize disturbance.

c. Plate OP-1 shows the access road, pipeline and power line associated with the WDW2 deep disposal well crossing through mine unit #1. Each has a different alignment (i.e. they are not co-located). It is suggested that these utilities be co-located to minimize disturbance and that the alignments be shown on Fig. MU1 1-3.

d. Sections OP 2.5, 2.6 and 2.7 in the main permit document discuss in general terms the establishment of specific traffic routes (and zones of no disturbance) within the mine units. These traffic routes within the wellfield are not shown on any map, conceptual or otherwise. No additional details have been provided in the mine unit package. Details are needed to define the amount of disturbance that will result from these roadways. Will there be a separate roadway to each well? Will the roadways branch off the header

house/secondary roads or will they originate at the header house and extend to each well controlled by that headerhouse? Will they run parallel to each line of wells or will they run between the lines of wells and thus two lines of wells? It is requested that the traffic routes and zones of no disturbance be shown on a detailed wellfield plan as has been requested in this review comment. It is understood that the exact locations may be subject to change.

e. It is suggested that the use of mud pits be eliminated through the use of portable tanks to contain the drilling and abandonment fluids.

f. It is suggested that short-term stockpiles of excavated materials (topsoil, subsoil and underlying material) be placed on tarps or mats so as to preserve the underlying vegetation.

2.) The layout of the production and injection wells is a concern relative to their proximity to the fault and relative to the vertical relationship of the stacked ore zones. This concern originates in the regulations [Ch. 11, sec. 4(a)(xii), 10(a)(iii) and 11(d)] that require information to demonstrate that movement of mining fluids can be controlled. On Figure MU1 1-3, some of the pattern areas are shown directly abutting the fault while others appear to have been set back from the fault. Neither the permit document or the wellfield package provide any discussion regarding a setback or buffer zone from the fault. This would seem to be prudent since the exact nature and angle of the fault are not well understood. If additional information on the nature and angle of the fault is available it should be presented, and any offset from its surface expression should be indicated on the maps.

A buffer zone should be stipulated which accounts for the flare factor from the production wells and any uncertainty regarding the faults position at depth. The concern relative to the stacked ore zones is how multiple ore zones on both sides of the fault will be managed within a headerhouse module. It would be helpful in understanding LC's system of engineering controls if the proposed layout of production and injection wells were shown on a map as requested. It is understood that the exact well locations may be subject to change. This also relates to LQD's comment no. 23 from the MU1 review.