

**MODIFIED DECISION RECORD  
FOR Yates Petroleum Corporation  
Lazurite POD  
ENVIRONMENTAL ASSESSMENT – WY-070-EA09-095**

This is a modified Decision Record; it is not a new Decision Record. This modified Decision Record augments the Decision Record in the specific 10 issues addressed in SDR WY-2010-008, Part 2. The new information, analysis, and rationale under each issue here augments and thus completes the environmental record of review. Some of the new information, analysis, and decisions result in changes to COAs. New COAs are published completely replacing old COAs.

**Compliance.** This decision complies with:

- Federal Land Policy and Management Act of 1976 (FLPMA) (43 USC 1701).
- Mineral Leasing Act of 1920 (30 U.S.C. 181) and as prescribed in 43 CFR Part 3160 to include On Shore Order No. 1.
- National Environmental Policy Act of 1969 (NEPA) (42 USC 4321).
- Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC 3001).
- National Historic Preservation Act of 1966 (NHPA) (16 USC 470).
- Endangered Species Act of 1973 (ESA) (16 USC 1531).
- Bald and Golden Eagle Protection Act (16 USC 668).
- Migratory Bird Treaty Act (16 USC 703).
- Yates Petroleum v. U.S. (Consolidated Appeal of SDR WY-2006-11 Skyward and WY-2006-12 Nemesis), 176 IBLA 144.
- DOI Order 3310, Protecting Wilderness Characteristics on Lands Managed by the Bureau of Land Management, Dec 2010; BLM Manuals 6300-1 and 6300-2 (drafts).
- Powder River Basin Final Environmental Impact Statement (FEIS), and Supplement, Apr 2003.
- Buffalo Resource Management Plan 1985, Amendments 2001, 2003.
- Greater Sage-Grouse Habitat Management Policy on Wyoming Bureau of Land Management (BLM) Administered Public Lands including the Federal Mineral Estate, (WY-IM-2010-012), Jan 2010.
- Wyoming State Director Review No. WY-2010-030, Sep 2010.

**The Selected Alternative.**

**Features.** BLM’s decision was to approve a combination of Alternatives C and D as summarized below, as described in the EA<sup>1</sup> and as augmented here. BLM authorized Yates Petroleum Corporation’s Lazurite Coal Bed Natural Gas (CBNG) POD comprised of 46 Applications for Permit to Drill (APDs) (see EA WY-070-EA09-095).

BLM’s modified decision is to approve the utility corridor and two impoundments, listed below, that were previously onsited in the Yates Petroleum Corporation Lazurite POD Coal Bed Natural Gas (CBNG) POD in 2009.

	<b>Infrastructure/facility</b>	<b>Qtr/Qtr</b>	<b>Section</b>	<b>TWP</b>	<b>RNG</b>
1	Utility corridor (gas, water, electric) from the	NE1/4	9	49N	79W

<sup>1</sup> Environmental Assessment, WY-070-09-095 occurred during a period of shifting policy for sage-grouse conservation at federal, department, bureau, and state levels. Subsequent decisions and refined policy provided clarification for updated analysis, findings, and decisions. The BFO considered, approved, and issued the vast bulk of over 1,000 APDs received during that time period. About 90 APDs were denied (two-thirds of which were in two proposed developments).

	<b>Infrastructure/facility</b>	<b>Qtr/Qtr</b>	<b>Section</b>	<b>TWP</b>	<b>RNG</b>
	10BERY well location to the 9BERY well location				

**Water Management:**

In addition to the impoundments approved for use in the original Lazurite EA, the following impoundments were approved for use for water management associated with this POD.

	<b>Impoundment Name</b>	<b>Qtr/Qtr</b>	<b>Section</b>	<b>Township</b>	<b>Range</b>	<b>Capacity (Acre-Foot)</b>	<b>Surface Disturbance (Acres)</b>	<b>Lease Number</b>
12	Middaugh	NWSE	10	49	79	35	5.6	WYW147391
13	Range (s)	NWNE	8	49	79	20	4	WYW147391

(s) Secondary impoundment requiring pre-construction Sundry Notice, Form 3160-5 approval and bonding.

**Limitations.**

The following APDs are deferred: none.

The following impoundments are deferred: none.

The following APDs are denied: none.

The following impoundment is denied:

	<b>Impoundment Name</b>	<b>Qtr/Qtr</b>	<b>Section</b>	<b>Township</b>	<b>Range</b>	<b>Capacity (Acre-Foot)</b>	<b>Surface Disturbance (Acres)</b>	<b>Lease Number</b>
14	Lion Tamer	SWSE	23	49	79	7.5	1.6	WYW147395

**THE MODIFIED FINDING OF NO SIGNIFICANT ACTION.** The FONSI found no significant impacts, thus an EIS was not required. The Modified FONSI, WY-070-09-095, considered the new information, analysis, and rationale and found no significant impact on the human environment aside from those revealed in the Powder River Basin FEIS and Supplement (2003).

**COMMENT OR NEW INFORMATION SUMMARY.**

Several critical items of new information became available requiring augmenting the EA through this modified Decision Record, in accordance with BLM NEPA Handbook, 8.5.1, Documenting the Decision, and web guide examples (last updated July 29, 2010). The most important new information was receipt of sage-grouse policy<sup>1</sup>. We received updated consultation in civil engineering, DOI Wilderness Policy, and guidance from a state director review.

Receipt of this new information guided the augmented analysis – an analysis that allowed decisions that in total approved 46 APDs, deferred 0 APDs, denied 0 APDs, approved 13 impoundments, deferred 0 impoundments, denied 1 impoundment, and approved 1 utility corridor right-of-way.

The new information, the analysis, and decision rationale follow.

**DECISION RATIONALE.**

The imperative new information is the sage-grouse policy in WY-IM-2010-012. Other new information was found in the Lazurite POD SDR No. WY-2010-008, Part 2. This modified Decision Record follows

the format of the 10 numbered issues (in bold, below) from the SDR.

### **1. Denial of three produced water impoundments and buried utility corridor**

#### State Director Remanded: impoundments

“We remand the decision to deny the three impoundments to the BFO. An alternative that considers denying an important component of the proponent’s project must consider the effect of such denial on the proposed operations. The BFO is instructed to prepare a modified decision record. The BFO is instructed to complete the environmental record of review and, in their modified decision, address the fate of these three impoundments (in light of more recent BLM guidance for the protection of sage-grouse.)”

#### Buffalo Field Office Reply and Rationale:

The Middaugh impoundment is approved.

The WY BLM sage-grouse management strategy solidified (BLM Instruction Memorandum WY-2010-012) and aligned with the State of Wyoming’s Greater Sage-grouse Core Area Protection (WY EO 2010-4). As such, the impoundment does not occur within sage-grouse Key habitats (Wyoming Core, BFO Focus, and Connectivity), and its construction is in conformance with the Wyoming BLM policy to manage sage-grouse seasonal habitats and maintain habitat connectivity to support population objectives set by the Wyoming Game and Fish (WGFD).

The Range impoundment is approved as a secondary impoundment and will not be constructed at the present time, nor will it be bonded for reclamation. Should the operator decide the reservoir is needed, they will submit a Sundry Notice, Form 3160-5, which addresses the active erosion feature previously identified in the Lazurite POD EA, WY-070-EA09-095, and to post a reclamation bond prior to starting any construction.

The Lion Tamer impoundment is denied.

As outlined in Appendix B, the operator had the opportunity to provide a mitigation alternative that would have allowed BLM to be assured that the impoundment location would be stable and environmentally sound. By offering no additional or alternative mitigation to prevent headward erosion, leaking at the head cut or saturated soil movement, the potential for undesirable environmental impact exists. The Lazurite SDR remand instructed BFO to review the impoundment denials in light of whether the water management plan was viable. The operator’s original water management plan requested approval of 318 acre feet of storage for produced water. With the additional approval of the Middaugh and Range impoundments, the operator now has approval for a total of 311.5 acre feet of storage. The proposed Lion Tamer impoundment represented 7.5 acre feet of storage (2.4%) of the total water management plan. BFO has determined that with 311.5 acre feet of produced water storage, the water management plan is viable.

BLM maintains authority over surface disturbance at the point of discharge of water produced in association with Federal minerals as detailed in Onshore Order No. 7, Disposal of Produced Water, 58 Fed. Reg. 47,354, 47,365 (Sept. 8, 1993), as cited in SDR-WY-2011-001, pp. 3-7.

For additional information regarding the analysis for the recommendation for the Lion Tamer impoundment, see Appendix B, Lion Tamer Impoundment and Lion Tamer Attachments, 1-4, to this modified Decision Record.

#### Remanded: buried utility corridor

“We remand the denial of this utility corridor to the BFO, with instruction complete the environmental record of review and, in their modified decision, address the fate of this buried utility corridor (and in light of more recent BLM guidance for the protection of sage-grouse).”

Buffalo Field Office Reply and Rationale:

The buried utility corridor is approved.

The WY BLM sage-grouse management strategy solidified (BLM Instruction Memorandum WY-2010 - 012) and aligned with the State of Wyoming's Greater Sage-grouse Core Area Protection (WY EO 2010-4). As such, the corridor does not occur within sage-grouse Key habitats (Wyoming Core, BFO Focus, and Connectivity), and its construction is in conformance with the Wyoming BLM policy to manage sage-grouse seasonal habitats and maintain habitat connectivity to support population objectives set by the Wyoming Game and Fish (WGFD).

**2. Application of COAs: (a) Site Specific COA Number 1**

Reversed and Remanded:

“Application of COAs: (a) Site Specific COA Number 1, No access or surface activity is allowed on or off the affected leases....until right-of-way....Grants authorized. COA is unclear....instruct the BFO to remove it when issuing the modified decision (and modified COAs).”

Buffalo Field Office Reply and Rationale: Removed COA.

**3. Application of COAs: (b) Site Specific COA Number 4**

Reversed and Remanded:

“The BFO's decision to apply this COA is reversed. The BFO is instructed to remove this COA.”

Buffalo Field Office Reply and Rationale: Removed COA.

**4. Application of COAs: (c) Site Specific COAs – Civil Engineering, Numbers 1, 3, and 5**

***Number 1, Grading W***

Remanded:

“We remand the BFO's requirement that Grading W aggregate be used within the entire Lazurite POD. BFO did not demonstrate (or evaluate) whether adverse impacts would occur under the alternative proposed by Yates. We instruct the BFO to carefully consider the views of the surface owners when considering a road design standard for access located on private surface. We encourage BFO to document the views of other landowners in the POD related to this issue. For the access roads located on BLM-administered surface, the BFO need only evaluate the potential benefits and adverse consequences of requiring Grading W.”

Buffalo Field Office Reply and Rationale:

Removed the COA.

The Buffalo Field Office has the authority to require the site-specific use of Gravel aggregate on Federal surface and recommends it on private surface.

The BLM encourages operators to contact the private surface owners to determine the best source of surfacing material on private surface. Seven of the eight landowners were contacted (see attached Appendix A, Conversation Record), of which, five of the seven responded favorably to the use of gravel on their surface within the Lazurite POD boundary. Yates was not contacted as a landowner, as their recommendations are already stated in the State Director Review. Two of the seven landowners were unable to reply.

The Buffalo Field Office has the authority to require site specific use of Gravel aggregate on Federal surface and recommends it on private surface, specifically gravel that meets the requirements of Gradation W as outlined in the WY Highway Department specifications for road and bridge construction per the BLM Manual Supplement WYSO for 9113, BFO Oil and Gas Road Guidelines for APD's, and

the BLM Engineering Technical Standards. It is important to use a surfacing material that is hard and durable so that it can be compacted, minimizes dust, and minimizes maintenance.

The benefit of gravel that meets the requirements of Gradation W is that it is a hard durable material that can be compacted, has minimal dust and requires minimal maintenance. The adverse impact of Gradation J is that it cannot be compacted due to the minimal particle distribution sizes. (Gradation J and scoria were discussed in Yates' appeal.) The adverse impact of scoria is that it is neither hard nor durable and lacks a distribution of particle sizes. Vehicles have better traction with a road when the surfacing material is compacted, creating a safer driving surface. Because scoria is a soft material, during compaction, it breaks down into dust rather than being compacted where as gravel, specifically gravel that meets Gradation W, has a distribution of particle sizes that are designed to interlock when compacted - creating a solid driving surface. A solid driving surface also promotes sheet flow of surface run-off directing water away from the road; whereas scoria tends to promote infiltration into the road bed. The benefit of keeping water off or away from the road is to lessen maintenance costs. The benefit of scoria is that it is readily available and more economical. The adverse consequence of gravel is that there are fewer gravel sources and gravel is more costly due to the gradation requirements.

Yet despite these general benefits and adverse impacts of one material over another, the analysis is lacking as to whether adverse impacts would occur under the alternative proposed by this operator on this specific and entire POD. Thus by elimination I must remove the COA.

The above analysis was directed in the SDR Remand. The WYSO and BFO field offices are aware this issue is appearing in future SDRs, and thus it is prudent to lay an analytical framework for benefits, adverse impacts, and the need for site-specific analysis so decision makers can make informed decisions.

### ***Number 3, 4 Inches of Aggregate***

#### **Affirmed and Remanded:**

“We affirm the BFO's use of this COA, as hereby modified:

*Place a minimum of 4 inches of aggregate on road segments where grades exceed 8%.”*

Buffalo Field Office Reply and Rationale: Modified COA.

### ***Number 5. Construction of Engineered Road Segments Prior to Drilling***

#### **Affirmed:**

“We affirm the BFO's application of this COA.”

### **5. Application of COAs: Site Specific COAs – Water Management, Number 3**

#### **Affirmed:**

“We disagree with Yates' assertion that “[m]isters were proposed by Yates at all reservoir locations and analyzed in the EA (Oral Presentation Slide 68). Resultantly, Yates must first request written approval for use of misters, before the BFO obligated to issue a decision regarding their use. In accordance with On Shore Order No. 7, Yates must now submit a Sundry Notice (Form 3160-5) requesting approval to use misters. We affirm the BFO's use of this COA requiring Yates to submit a Sundry Notice.”

### **6. Application of COAs: (e) Site Specific COAs – Water Management, Number 5**

#### **Remanded:**

“We remand the application of this COA to BFO. We instruct the BFO to replace the COA with a requirement to (1) sample all approved impoundments located on Federal oil and gas leases prior to the discharge of produced water and (2) provide for reclamation of the approved on-lease impoundments consistent with the new direction provided in BFO's July 19, 2010 letter to the operators.”

Buffalo Field Office Reply and Rationale:

Modified the COA to require specific water sampling. As stated in the PRB FEIS, one of the issues raised was the potential for sedimentation to concentrate compounds in impoundments and downstream channels that may require special handling at the time of reclamation (see PRB FEIS page 4-120). In order to establish soil chemistry goals for reclamation, baseline soil samples will be collected from the 11 proposed impoundments and analyzed for the standard WYPDES permit suite of parameters plus soil specific characteristics, as stated in the Buffalo Field Office Impoundment Reclamation Guidance.

Reclamation of all impoundments located on BLM surface or over Federal minerals will also be conducted according to the reclamation guidance at the time when CBNG production ceases. As stated, if at that time the operator wished to relinquish an impoundment located on private surface to the landowner, information identified in the reclamation guidance document must be submitted to the BFO for review and approval.

**7. Application of COAs: (f) Table at Beginning of COAs [errant typo]**

Reversed:

“In this case, the asterisk was unintentional, and the BFO has agreed to remove it in their modified decision and COAs.”

Buffalo Field Office Reply and Rationale: Removed \* (asterisk).

**8. Application of COAs: (g) Table at Beginning of COAs**

Reversed:

“The COA table also denoted that the Lawrence impoundment is a “secondary” impoundment. The WMP designated this impoundment as primary. The EA does not provide any explanation as to why the BFO would change this designation, and so we believe this was a mistake. The BFO is instructed to, when issuing their modified decision and COAs, remove the “secondary” designation for this impoundment and manage the Lawrence impoundment accordingly.”

Buffalo Field Office Reply and Rationale: Removed designation.

**9. Application of COAs: (h) Site Specific COAs – Raptors, Number 3**

Reversed:

“The BFO is instructed to remove the COA.”

Buffalo Field Office Reply and Rationale: Removed COA.

**10. Application of COAs: (i) Site Specific COAs – Water Management, Number 7**

Reversed in part, Affirmed in part, and Remanded:

“The WSO has addressed Yates' arguments and our position on this COA, in detail, when responding to Yates' request for stay (our March 19, 2010 decision-Part 1). In that decision, we determined that an APD is not the appropriate permitting mechanism for the BLM to consider a groundwater monitoring well in this instance, and a voluntary ROW submittal by Yates would allow the BLM to authorize the activities in consideration of our environmental obligations, while providing Yates the necessary documentation to carry out the activities on public lands.

Our decision also determined an agreement does not exist that would compel Yates to submit APD(s) for the monitoring well site, in part because the 2003 Groundwater Monitoring Agreement (GMA) has

expired. However, Yates has agreed to drill a groundwater monitoring well under the now-expired agreement.

In our final review of the record, we still hold that it is satisfactory for the BLM if Yates would submit a ROW for the monitoring well sites to be located on BLM-administered surface estate. We understand that the BFO and Yates, during a field trip on April 20, 2010, agreed upon such a location for the monitoring well site.

Upon receipt of Yates' ROW application for this monitoring site (Form SF-299), we instruct the BFO to waive the ROW rentals under 43 CFR 2806.15(b) (2), as the monitoring wells would be provided for the BLM's (and public's) benefit to monitor impacts arising from our management decisions, and in order for the BLM to comply with the 2003 PRB ROD.

The BFO is further instructed to remove this COA when issuing a modified decision.”

Buffalo Field Office Reply and Rationale: Removed COA.

**RATIONALE:** The decision to authorize a utility corridor and 2 impoundments, as described in the attached Environmental Assessment (EA), is based on the following:

The decision to authorize the utility corridor and 2 impoundments is based on the following:

1. The additional infrastructure will not result in any undue or unnecessary environmental degradation.
2. This federal action is clearly lacking wilderness characteristics because it has surface areas with extensive coal bed methane development.
3. The selected alternative will help meet the nation's energy needs, and help stimulate local economies by maintaining workforce stability.
4. The Operator, in their POD, committed to:
  - Comply with all applicable Federal, State and Local laws and regulations.
  - Obtain the necessary permits from other agencies for the drilling, completion and production of these wells including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
  - Offer water well agreements to the owners of record for permitted water wells within ½ mile of a federal CBNG producing well in the POD.
  - Provide water analysis from a designated reference well in each coal zone.
5. The Operator certified that a Surface Use Agreement was reached with the Landowners.
6. Since the subject utility corridor and reservoirs were denied, the WY BLM sage-grouse management strategy solidified (BLM Instruction Memorandum WY-2010 -012) and has aligned with the State of Wyoming's Greater Sage-grouse Core Area Protection (WY. EO 2010-4). As such, the proposal does not occur within sage-grouse Key habitats (Wyoming Core, BFO focus, and connectivity), and is in conformance with the Wyoming BLM policy to manage sage-grouse seasonal habitats and maintain habitat connectivity to support population objectives set by the Wyoming Game and Fish (WGFD). The proposed infrastructure will not affect the current WGFD development thresholds for leks within Key habitats.

**ADMINISTRATIVE REVIEW AND APPEAL:** Under BLM regulations, this decision is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this decision must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, P.O. Box 1828, Cheyenne, Wyoming 82003, no later than 20 business days after this Decision Record is received or considered to have been received.

Any party who is adversely affected by the State Director's decision may appeal that decision to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

Field Manager:  Date: 1/12/11

**Appendix A to Modified Decision Record for Lazurite POD SDR WY-2010-008, Part 2**  
Responses from Landowners Concerning Grading W Road Surface

1. Timothy Marton, private landowner, Lazurite POD area of operations. Mr. Marton said that for uniformity he preferred a gravel road surface since that was the preference of 3 of his neighbors. December 3, 2010 at 07:30 am MST.
2. Bruce Barton, private landowner, Lazurite POD area of operations. Mr. Barton said he prefers gravel as a road surface on his private land. December 2, 2010 at 11:56 am MST.
3. Lawrence Grocki, private landowner, Lazurite POD area of operation. Mr. Grocki said that he preferred a gravel road surface on private land as it would reduce his maintenance needs. December 2, 2010 at 12:10 pm MST.
4. Lawrence Middaugh, private landowner, Lazurite POD area of operation. Buffalo Field Office left one message with a return phone number and received no reply. December 2, 2010 at 12:30 pm MST.
5. Duane Stranahan, private landowner, Lazurite POD area of operation. Buffalo Field Office called but there was no answer and no messaging service. December 2, 2010 at 12:35 pm MST.
6. Anne Harris, State of Wyoming, land steward for the citizens of the State of Wyoming, 307.777.7331/6358. The state land stewards highly prefer gravel on state surface as opposed to scoria. Ms. Harris specifically referenced the Lazurite POD. December 17, 2010 at 08:45 am, MST.
7. BLM, Buffalo Field Office, land steward for the citizens of the United States. The BLM's position is that it requires Grading W on roads on federal surface.
8. Yates Petroleum. Since Yates Petroleum appealed the COA requiring Grading W on private surface in this and in the Congaree SDR it is clear the company's position is to not require Grading W on roads transitioning private surface throughout an entire POD lacking a site-specific analysis.

**Appendix B, to Modified Decision Record for Lazurite POD SDR WY-2010-008, Part 2**  
Lion Tamer Impoundment and Lion Tamer Attachments, 1-3, for Lazurite POD  
1-6-2011

The use of the Lion Tamer impoundment in the Lazurite water management strategy was denied in the original Environmental Analysis (FONSI Pg 3, EA pg 50).

The proposed location of the Lion Tamer dam and impoundment is in the SW $\frac{1}{4}$ SE $\frac{1}{4}$  Sec. 23, T49N, R79W, on private surface, Federal minerals. The proposed location is in an ephemeral drainage where active erosion is taking place and there is an active head cut below the proposed dam location. Pictures of the drainage and active head cut are in Appendix B, Attachment 1.

At the onsite inspections, the Buffalo Field Office (BFO) raised issues with the Lion Tamer dam location and the head cut. Because there is active erosion in the channel below the proposed impoundment, BFO determined the site was not a good location for a dam.

BFO discussed relocating the dam to an existing impoundment approximately 400 feet up channel in the drainage. The operator did not want to move the Lion Tamer dam location due to the presence of mature trees on and around the existing up channel dam structure. BFO approved the proposed High Wire impoundment in the same drainage, approximately 300 yards to the northwest of the Lion Tamer.

The head cut issue was identified at the onsite and included in the Post-Onsite Deficiency letter. Per Appendix D of the Powder River Basin Record of Decision, the operator was provided the opportunity to address mitigation measures and designs for erosion control and stabilization of minor head cuts and eroding channel sections in their water management plan.

The operator responded to the Post-Onsite Deficiency letter with a letter from Lowham Engineering LLC (Lowham), see Appendix B, Attachment 2. To recap, Lowham found that "The walls of the incised channel below the headcut are near vertical and currently support sparse vegetation. Near the headcut, the surrounding valley is narrow enough to prohibit regrading the channel walls to the slope necessary to promote stability and vegetation. Attempting to regrade the walls will result in the loss of existing vegetation, which currently adds to the stability of the headcut and limits erosion." Lowham further states "Due to the geometry and orientation of the headcut, typical "repair" efforts will result in an exceedingly large disturbance area and will likely increase the potential for further erosion." In summary, the operator proposed that the head cut not be mitigated.

BFO reviewed the operator's Post-Onsite Deficiency mitigation proposal. Approximately 140 feet down channel from the toe of the proposed reservoir the low gradient ephemeral channel becomes much steeper and more incised at a feature commonly referred to as a headcut. This headcut feature causes the channel to drop approximately 20 feet over a down-channel distance of 60 feet. While the headward slope of the channel is not alarmingly steep, at approximately 2H: 1V, the lateral channel slopes (side-slopes) are nearly vertical. Approximately 100 feet to the south of the incised channel, there is a second, deeply incised ephemeral channel. These two channels are separated by a "nose" ridge, and confluence approximately 200 feet down-channel from the headcut.

The BFO's assessment found that Lowham's evaluation of the conditions of the site and likely outcomes was accurate. Furthermore, the BFO used Lowham's measurements and measurements BFO made in the field, to estimate that mitigation efforts would require approximately 2 acres of surface disturbance in order to stabilize the head cut. Lowham suggests in the letter that the effects and placement of the reservoir will reduce the rate of flow over the headcut and minimize additional erosion. BFO agrees with the premise that rate of surface flow over the headcut could be reduced by the placement of a reservoir

upgradient of the head cut, but disagrees that the reservoir would minimize erosion since Lowham only considered surface water runoff in that assessment, and does not account for subsurface flow.

Mitigating the headcut is unlikely to reduce the chances of subsurface flow from seeping into the down-gradient channel, or into the adjacent channel. Given the soil and erosive characteristics, the BFO believes there is a strong likelihood that mass wasting will occur below the proposed reservoir regardless of whether the head cut is mitigated or not. Therefore, to minimize likelihood of mass wasting head cut mitigation is probably not an adequate cure and the better solution is not allowing disturbance at this site.

In numerous instances in the Powder River Basin, reservoirs in similar topographic and geologic conditions have resulted in subsurface water flow down-gradient of the reservoir. These subsurface flows often follow preferential flow paths in areas with high hydraulic conductivity, such as sandy soils or highly fractured geologic stratigraphy, and resurface in these deeply incised channels as seeps. Visual observances of the surrounding topography, and soil stratigraphy in the incised channel, suggests a strong likelihood that preferential flow paths are present that will direct infiltrated water from the reservoir to the down-gradient channels. A thorough geotechnical study of the site that includes a subsurface hydraulic conductivity assessment would most likely confirm this speculation. The BFO has observed occurrences of these seeps changing flow regimes in stream channels from ephemeral to perennial, thereby saturating channels that have evolved under dryer conditions. These changes have caused steep side slopes to slump off into the channel, or meanders in channels to be further under-cut by continuous flows. These accelerated erosive processes contribute excessive amounts of sediment to stream channels that can result in negative impacts to fisheries, wetlands, and riparian areas. Occasionally the additional sediment can cause violations in water quality standards that are regulated by the State of Wyoming. Examples of these types of occurrences are found at Yates' Nemesis POD and the Router POD, see Appendix B, Attachment 3, for photographs.

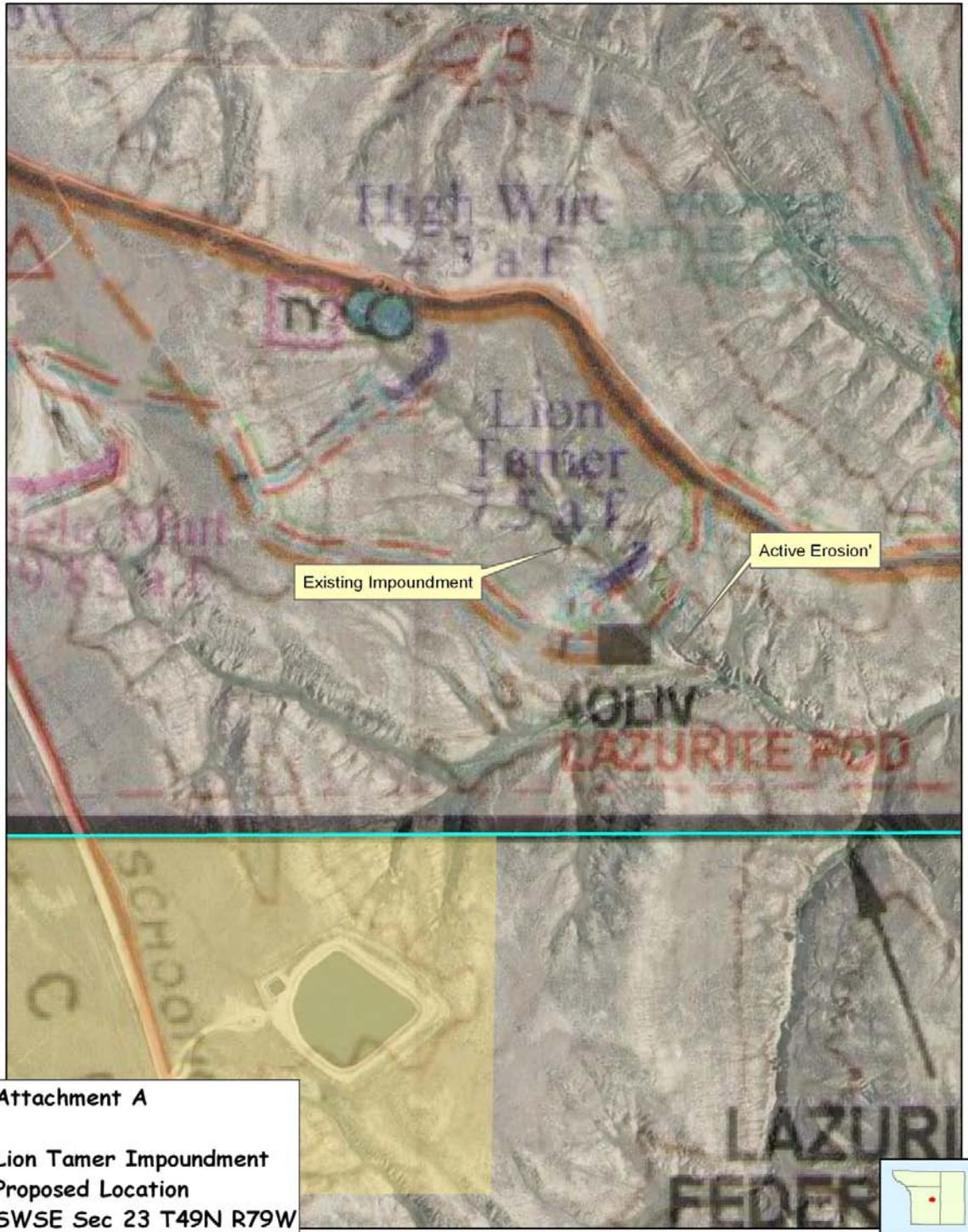
The operator had the opportunity to provide a mitigation alternative that would have allowed BLM to be assured that the impoundment location would be stable and environmentally sound. (BLM recognizes that it does not corner the market on mitigation ideas.) On January 6, 2011, Kathy Brus (Supervisory Natural Resource Specialist Technical Services), Keith Anderson (Hydrologist), and Brent Sobotka (Hydrologist) of the BLM/BFO revisited the location to affirm the original onsite conditions still exists. Their finding continues to be that this location is not suitable for an impoundment. By offering no additional or alternative mitigation to prevent headward erosion, leaking at the head cut or saturated soil movement, the potential for undesirable environmental impact exists. Their recommendation is that the Lion Tamer dam location not be approved.

Subsequent to the approval of the Lazurite POD, September 10, 2009, the operator further modified their water management plan. In August 2010, the operator submitted a Sundry Notice to remove the previously approved High Wire (4.3 ac-ft) and the Freak Show (9.6 ac-ft) impoundments from the Lazurite water management plan because they are "no longer needed for water management for the Lazurite POD." BFO approved the sundry notice to remove the impoundments from the Lazurite water management plan in November, 2010.

The operator continues to have a viable water management plan for the following reasons.

- a. The removal of Lion Tamer from the water management infrastructure for this POD reduced the total volume available for water management by 7.5 acre-feet (2.4% of the total volume proposed). The operator designed the water management system to be able to re-direct water from one discharge point to another when necessary to maintain acceptable levels within the containment structures (all wells to all outfalls). Without these two impoundments, there remained 310.9 acre-feet of storage within the approved impoundments. The operator subsequently modified the water management plan and further reduced the volume.
- b. Within ½ mile radius of the proposed location, there are five existing or approved proposed impoundments with capacity of over 70 acre-feet.
- c. Initial water production from these wells is estimated to be 11 gpm, however, typical average water production rates from CBNG wells declines significantly within 6 months of initial production. In PODs less than two miles east of the Lazurite POD, water production has declined to less than 0.5 gpm in some cases.
- d. The Range Impoundment is being permitted as secondary, which means that it will not be constructed if and until there is a need for more storage capacity in this area.
- e. Additionally, this POD is adjacent to several Yates' PODs that have existing permitted water management structures as well as water disposal wells. The total capacity for the impoundments permitted by Yates in seven Federal PODs located along Interstate 90 west of the Powder River is approximately 1760 acre-feet of volume. Because these PODs are older, water production rates in existing wells have declined significantly with time. Additional storage capacity in the POD areas would be utilized if necessary to contain excess produced water from the Lazurite POD. The MSUP for the Lazurite POD includes sections of lines where the gas and water gathering system ties into two adjacent PODs, the Nemesis POD north of I-90 and the Edisto POD south of the interstate.

Appendix B, Attachment 1: to Modified Decision Record for Lazurite POD SDR WY-2010-008,  
Part 2  
Lion Tamer Map



**Appendix B, Attachment 1 (cont.)**



Headcut in channel below proposed Lion Tamer Impoundment location

Appendix B, Attachment 2: to Modified Decision Record for Lazurite POD SDR WY-2010-008,  
Part 2

AUG 03 2009



P.O. Box 536  
Gillette, WY 82717  
(307) 685-3137  
Fax (307) 685-0175

205 S. Third St.  
Lander, WY 82520  
(307) 335-8466  
Fax (307) 335-7343

June 10, 2009

TO: Tony Wyllie, Yates Petroleum Corporation  
FROM: Bobby Thoman, P.E., Lowham Engineering LLC  
SUBJECT: **Rawhide Ranch – Lion Tamer headcut repair**

The following should be considered regarding your request for plans to repair the headcut below the proposed Lion Tamer stock reservoir. Due to the geometry and orientation of the headcut, typical “repair” efforts will result in an exceedingly large disturbance area and will likely increase the potential for further erosion.

The walls of the incised channel below the headcut are near vertical and currently support sparse vegetation. Near the headcut, the surrounding valley is narrow enough to prohibit regrading the channel walls to the slope necessary to promote stability and vegetation. Attempting to regrade the walls will result in the loss of the existing vegetation, which currently adds to the stability of the headcut and limits erosion.

Construction of the Lion Tamer dam will reduce the occurrence of and restrict the rate of flows over the headcut. The proposed dam is located a sufficient distance upstream, about 150 ft, to minimize any potential impact to the headcut and vice-versa. The existing headcut channel drops approximately 20 ft in elevation over a distance of 60 ft. It is my professional opinion that the headcut, in its current condition, provides an appropriate natural grade drop and that man-made repairs should not be attempted.

bt/jjb

**Appendix B, Attachment 3: to Modified Decision Record for Lazurite POD SDR WY-2010-008, Part 2**



Photo 1: April 2009 Down gradient Sunshine Impoundment  
SWSW Sec 17 T49N R78W Headcut leaking

Photo 2: June 2009 Failed headcut mitigation in the Router  
POD area.



**Appendix B, Attachment 3 (cont.)**



**Photo 3: June, 2009 Headcut progression in Router POD area**

**Photo 4: June, 2009 Leaking and headcut progression downstream of impoundment in Router POD**



**Appendix B, Attachment 3 (cont.)**



- Photos 5 & 6 August, 2009 Downstream of impoundment in Nemesis POD



**Appendix B, Attachment 3 (cont.)**



**Photo 7: Mass wasting below impoundments in the Burger Draw POD area**

**Appendix B, Attachment 4.**  
Contents.

Water Management Plan Onsite Deficiencies, Kathy Brus, December 3, 2008, 1p.  
Lion Tamer – para 4.

Post Onsite Deficiency Letter for the Lazurite POD, BLM, January 11, 2009 5pp (unnumbered).  
Lion Tamer – page 4, Hydro section, para 4.

Lazurite POD-Reply to OIM and Post Onsite Deficiency Letters, Yates, May 13, 2009, 10pp.  
Lion Tamer – page 6, para 4 refers to Bison Environmental letter that resulted in securing an unsigned opinion from Lowham Engineering, LLC, at Appendix B, Attachment 2. Note the Bison Environmental, Inc. stamp in the lower right corner.

Second Post onsite Deficiency Letter for the Lazurite POD, BLM, June 8, 2009, 7 pp (unnumbered).  
Lion Tamer – page 3, Hydro section, para 4.

Lazurite POD-Reply to Post Onsite Deficiency Letter #2, Yates, July 31, 2009, 12pp.  
Lion Tamer – page 10, para 5.

**MODIFIED FONSI FOR  
Yates Petroleum Corporation  
Lazurite POD  
ENVIRONMENTAL ASSESSMENT  
WY-070-EA09-095**

**FINDING OF NO SIGNIFICANT IMPACT:**

On the basis of the information contained in the EA, and all other information available to me, it is my determination that:

- (1) the decision to approve, a utility corridor , 2 reservoirs previously onsited in the Yates Petroleum Corporation Lazurite (CBNG) POD will not have significant environmental impacts beyond those already addressed in PRB EIS to which the EA is tiered;
- (2) The decision to authorize a utility corridor and 2 reservoirs is in conformance with the Buffalo Field Office Resource Management Plan (1985, 2001, 2003); and
- (3) The decision to authorize a utility corridor, 2 reservoirs does not constitute a major federal action having a significant effect on the human environment. Therefore, an environmental impact statement or a supplement to the existing environmental impact statement is not necessary and will not be prepared.

This finding is based on my consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR 1508.27), both with regard to the context and to the intensity of the impacts described in the EA, WY-070-EA09-095, which is incorporated here by reference.

**CONTEXT:**

Mineral development (coal, oil and gas, bentonite, and uranium) is a long-standing and common land use within the Powder River Basin. More than one fourth of the nation's coal production comes from the Powder River Basin. The PRB FEIS reasonably foreseeable development predicted and analyzed the development of 51,000 CBNG wells and 3,200 oil wells (PRB FEIS ROD pg. 2). The additional CBNG development described in Alternative B is insignificant within the national, regional, and local context.

**INTENSITY:**

The implementation of a combination of Alternatives C and D will result in beneficial effects in the forms of energy and revenue production however; there will also be adverse effects to the environment. Design features and mitigation measures have been included within the combination of Alternatives C and D to prevent significant adverse environmental effects.

The preferred alternative does not pose a significant risk to public health and safety. The geographic area of the POD does not contain unique characteristics identified within the 1985 RMP, 2003 PRB FEIS, or other legislative or regulatory processes including DOI Order 3310.

Relevant scientific literature and professional expertise were used in preparing the EA. The scientific community is reasonably consistent with their conclusions on environmental effects relative to oil and gas development. Research findings on the nature of the environmental effects are not highly controversial, highly uncertain, or involve unique or unknown risks.

CBNG development of the nature proposed with this POD and similar PODs was predicted and analyzed in the PRB FEIS; the selected alternative does not establish a precedent for future actions with significant effects.

There are no cultural or historical resources present that will be adversely affected by the selected alternative (EA sec 4.2.7). No species listed under the Endangered Species Act or their designated critical habitat will be adversely affected (EA sec 4). This federal action includes surface areas with extensive coal bed methane development therefore is clearly lacking wilderness characteristics. The selected alternative will not have any anticipated effects that would threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

Field Manager: Shawn A. [Signature]

Date: 1/12/11