

GEIS



# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
Wyoming State Office  
P.O. Box 1828  
Cheyenne, Wyoming 82003-1828



In Reply Refer To:  
3800 (922Heffern)

7/28/08

70 FR 43795

Michael Lesar  
Chief, Rules and Directives Branch  
Division of Administrative Services  
Mailstop: T-6D59  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

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RULES AND DIRECTIVES  
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Dear Mr. Lesar:

The U.S. Bureau of Land Management (BLM) in Wyoming is submitting the attached comments on the Draft Generic Environmental Impact Statement (GEIS) for In-Situ Uranium Leach Milling (NUREG-1910). Attachment 1 lists our general comments and Attachment 2 provides our specific comments. The attachments are a compilation of comments from our State Office Division of Minerals and Lands and Division of Resources, and our Buffalo, Casper, Lander, and Rawlins Field Offices. Some of these comments may be for one GEIS region in Wyoming but may apply to other regions. By this letter, we are also formally requesting cooperating agency status in preparation of this GEIS, as described in 40 CFR 1501.6, because of our special expertise and jurisdictional responsibilities.

Most of the proposed uranium operations in Wyoming are at least partly on BLM surface or mineral estate and involve Federal mining claims. BLM is responsible for balancing different resource uses on the lands the American public has given us the duty to manage. BLM has jurisdiction over surface management of uranium operations on BLM lands in Wyoming, according to the 43 CFR 3809 regulations for locatable minerals. BLM must approve a plan of operations and set a bond before an applicant can start uranium recovery on BLM surface (and on split estate in some cases), even if the company has Nuclear Regulatory Commission (NRC) approval. However, the split between jurisdictional responsibilities of BLM and those of NRC are poorly defined in the GEIS.

The BLM in Wyoming has a Memorandum of Understanding (MOU) with the State of Wyoming Department of Environmental Quality, Land Quality Division (already a cooperating agency in the GEIS) to coordinate surface management responsibilities for locatable minerals, including uranium. On a national basis, BLM is starting to prepare an MOU with NRC which should help to better define our respective responsibilities and provide protocols for working together. It is redundant to prepare two separate site-specific EA/EIS documents for a single uranium mine project - one compiled by NRC and one compiled by BLM. Both agencies should work together

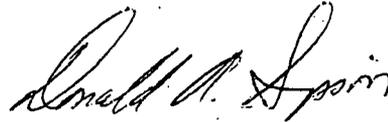
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to prepare a single document that meets both our regulatory needs. We therefore request a meeting before the final GEIS is prepared, to discuss cooperating agency status. We have discussed these comments with BLM staff in New Mexico – the other State in the GEIS with a large amount of BLM land. Please contact Ed Heffern at 307-775-6259 to set up a meeting.

Sincerely,



Robert A. Bennett  
State Director

2 Attachments

- 1 - General comments
- 2 - Specific comments

cc:

Don McKenzie, Wyoming State Land Quality Division

Bill Dalness, BLM New Mexico State Office

Director (320) Room 501 LS

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Jon Kaminsky, Lander FO

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## Attachment 1

To: Nuclear Regulatory Commission

From: Wyoming State Office, U.S. Bureau of Land Management

Subject: General Comments on Draft Generic EIS (GEIS) on Uranium In-Situ Leaching

General Comments

1. The GEIS makes little mention of coordination with other agencies. Most of the proposed uranium operations identified by the GEIS are located in Wyoming with the majority on public lands administered by the BLM. So that regulatory and jurisdictional roles and responsibilities for both NRC and the BLM regarding certain aspects of uranium exploration and mining are clarified, we request that the BLM and the NRC enter into a Memorandum of Understanding (MOU). The MOU would spell out procedures by which both agencies would coordinate with each other and with the State of Wyoming (Wyoming) in the permitting process. Currently the Wyoming BLM and Wyoming Land Quality Division have an MOU on surface management and bonding of locatable minerals including uranium. Industry as well as BLM would like clarification of these jurisdictional matters. BLM encourages the NRC to also coordinate with State agencies such as the Wyoming Department of Environmental Quality, and Wyoming Game and Fish. The NRC should also coordinate with the Federal Highway Administration and the Wyoming Department of Transportation regarding transportation of materials.
2. The GEIS is largely silent on jurisdictional responsibilities of affected Federal and State agencies. The GEIS needs to spell out how BLM fits into the picture – jurisdictional responsibilities, mining claims, exploration drilling, 43 CFR 3809 plans of operation, bonding requirements, etc.
3. The BLM also administers public lands where the surface estate and the Federal mineral estate are in different ownership. If the surface estate is held by any individual or non Federal agency, this situation is known as “split estate”. The GEIS does not acknowledge BLM responsibilities for managing the Federal mineral estate. Most of the uranium operations within the GEIS “Wyoming East Region” affect split estate lands with subsurface Federal minerals, where the surface estate was patented under the Stock Raising Homestead Act of 1916 but the mineral (uranium) estate was retained by the Federal government. Other ownership patterns in this region may include acquired public lands as well as public lands surface/Federal mineral estate. Because of this, most uranium activity occurs on mining claims adjudicated by BLM, including those where the surface is privately owned, and there may also be uranium leasing on acquired lands.

4. It is redundant to prepare two separate site-specific EA/EIS documents for a single uranium mine project – one compiled by NRC and one compiled by BLM. Both agencies should work together to prepare a single document that meets both of our regulatory needs.
5. Section 7.2 of the BLM's NEPA Handbook H-1790-1 (January 2008) states that approval of a mining operation where the area to be mined, including any area of disturbance, over the life of the mining plan is 640 acres or larger in size, normally requires preparation of an EIS. BLM's cost recovery regulations in 43 CFR 3800.5(a) state that the applicant must pay BLM a case-by-case processing fee if BLM determines that review of an applicant's proposed plan of operation requires an EIS. The fee is not required for EAs.
6. Although the State of Wyoming Department of Environmental Quality is listed as a cooperating agency in the GEIS, their Land Quality and Air Quality Divisions have submitted comments and concerns to you regarding the draft GEIS. We concur with many of their comments.
7. The GEIS assumes that the operator would adhere to existing standards on water disposal, and therefore impacts would be small. However, the State has recently levied a \$1.4 million fine and doubled the bond on the one existing in-situ leach operation in Wyoming, because the operator did NOT construct enough reverse osmosis facilities, deep injection wells, and evaporation ponds within the past twenty years to keep pace with expansion of the operation. In effect, the operator idled well fields that they said were in reclamation and did not sweep enough pore volumes of groundwater to reduce the concentration of contaminants in the aquifer back to baseline levels.
8. In the Pumpkin Buttes District of the Wyoming East Region (and possibly the Crooks Gap District of the Wyoming West Region), coal bed methane is being developed on Federal leases from formations several hundred feet underneath the proposed uranium ISL operations. What are the safeguards to ensure lixiviant or waste fluid injected into deeper formations will not flow into the coal beds? Lixiviant is an oxidizing fluid, commonly containing oxygen, sodium bicarbonate, and/or carbon dioxide. The coal bed methane is formed in a reducing environment with little or no oxygen, and any introduction of oxidizing fluids may have potential to harm coal bed methane extraction. In the Pumpkin Buttes District, for example, the confining layers between the uranium-bearing sands in the Wasatch Formation and the Big George coal zone near the top of the underlying Fort Union Formation, when assessed over a large area, may be leaky and discontinuous. Uncontrolled excursions of production fluid could leak downward into the coal aquifer. Coal bed methane exploration and production wells already go through the uranium deposits to reach the coal, and wastewater disposal wells for excess water from decommissioning or groundwater sweeps would pass through the coal zones into

underlying formations such as the Lance or Madison. Also, could the chemical composition of the lixiviant corrode metal or cement in the coal bed methane wells where they pass through the uranium-producing aquifer?

9. The distinction in the GEIS among the Wyoming West, Wyoming East, and Nebraska/South Dakota/Wyoming regions is somewhat arbitrary and repetitive. Moreover, the boundaries between regions are blurred. For example, CAMECO's proposed satellite facility in the Gas Hills (Wyoming West Region) would transport resin beads by truck to the existing ion exchange plant at their Smith/Highland Ranch facility (Wyoming East Region). The document could be shortened quite a bit by combining these three regions into a single region, with a discussion of resources unique to certain areas (for example, groundwater in the Chadron Formation versus the Wasatch Formation).
10. The transportation sections address larger roads where there would be more human impact, but do not address the resource damage and hazards of the smaller feeder roads.
11. The economic and other data from the 2000 census is outdated due to the coal bed methane and natural gas booms in both the Wyoming West and Wyoming East regions. An attempt should be made to update the numbers to the present.
12. The GEIS is a good source of information regarding the ISL process in the four identified geographic regions, but does not provide a NEPA analysis that contains enough detail. For example, when tiering from the GEIS to a site-specific analysis, two areas that will need much more detail and attention are groundwater restoration and prevention of spills and/or loss of leachate. If the GEIS contained more information on common elements, such as T&E species stipulations and soil reclamation and revegetation potential, later site specific analysis would be made easier.
13. Portions of the Wyoming East region are in the Platte River Recovery Program. Water usage or depletions above a certain quantity require consultation with the U.S. Fish and Wildlife Service for Federal actions. This should be discussed in Chapter 3.
14. The Oregon-California National Historic Trail crosses the Wyoming West and Wyoming East regions and the Bozeman National Historic Trail crosses the Wyoming East region. This should also be discussed in the cultural section of Chapter 3.
15. The BLM is including a short discussion on climate change in its NEPA documents. We have worked with our solicitors to develop general climate change language. If a general climate change discussion were included in the GEIS, we could tier off this discussion in the site specific analyses.

16. The GEIS does not include adequate air quality modeling. If air quality modeling were included at the GEIS stage, in cooperation with EPA and the State agencies delegated to enforce air quality laws, air quality modeling may not be needed at the site specific stage.
17. In Wyoming, the typical uranium producing layer is said to be stratabound, confined within low-or semi-permeable units. Assuming that is true, the GEIS does not explain the implications for ISL of these types of deposits, such as the degree to which such confining layers may transmit water and solutes and the areal extent of confining layers. Certain geologic settings by nature are discontinuous (e.g., fluvial derived sandstone lenses intercalated with overbank muds) with respect to water transmitting zones.
18. The entire analysis of impacts follows the approach of reliance on activities being "temporary". For example, spills or breaks will be detected "quickly" and disturbed soil will be reclaimed shortly after decommissioning. The GEIS lacks factual analysis that supports these assumptions, yet they form the basis for the determination that environmental impacts are "small". Has our experience been that impacts from ISL facilities are as benign as portrayed?
19. Sage Grouse are a sensitive species and have been the subject of much recent study and controversy. The BLM has developed management guidance and mitigation measures for Sage Grouse management in an attempt to prevent the listing of Sage Grouse as a T&E species. A general discussion of Sage Grouse management practices would be helpful in the GEIS.

Specific Comments	Uranium GEIS	Attachment 2
Page	Line	Comment
xxxiii		Discuss the difference between agreement and non-agreement states in more detail. Which States are agreement States?
xxxviii		Somewhere in this summary, discuss which phases of the ISL operation are within NRC's jurisdiction, which phases are within BLM's jurisdiction, and which are joint duties. The reader needs to know the division of responsibilities among BLM, the State regulatory agency such as the DEQ Land Quality Division in Wyoming, and NRC.
1-4	25-27	NRC does not operate in a vacuum. Revise the sentence "The purpose and need for each ISL application will be addressed in the site-specific environmental review that NRC will conduct" to include the need for coordination and partnering with other agencies such as BLM who also have responsibilities to review and approve ISL operations. Same comment for page 1-5, line 38.
1-12	45-47	The GEIS states that it does not address the environmental impacts of national transportation of yellowcake uranium because it was analyzed in environmental documents thirty years ago. It is extremely unlikely that documents published shortly after NEPA was adopted would serve as adequate NEPA analysis. While NEPA does not have specific time limits, case law has held that tiering is appropriate only where the underlying analysis is still timely. Terrorist threats are a new issue and should be addressed in the transportation of nuclear materials or waste.
1-13	18	NRC states that resolution of dual regulation issues are outside the scope of this EIS. We disagree. BLM permitting requirements go hand-in-hand with what NRC requires, as we have stated in our cover letter and general comments.
1-15	8-11	This one vague sentence is the extent of discussion about NRC coordination with BLM. A separate section needs to discuss BLM notices and plans of operation for exploration and ISL operations, and how they interface with NRC. BLM and USFS must comply with 43 CFR 3809 regulations for hardrock mining on Federal lands. We cannot just review applications for these facilities as the GEIS suggests. These regulations require BLM or USGS approval for ISL through Plans of Operations, applicable NEPA documents, and public comment periods.

1-15	36-46	<p>While NRC may consider ISL operations MILLING activity, BLM, as well as the Wyoming DEQ Land Quality Division, consider ISL facilities MINING operations that are permitted under our respective regulations. BLM and the WDEQ have a MOU, signed in 2003, to coordinate surface management responsibilities for exploration and mining of locatable minerals, such as uranium. Operators must post a joint bond payable to both our agencies if BLM surface is involved, before beginning operations. BLM needs to develop an MOU with NRC to expedite the process, and prevent duplication of work between the Federal agencies as has happened with the East Gas Hills and Reynolds Ranch amendments to CAMECO's Smith-Highland Ranch license.</p>
1-19	31-39	<p>In Wyoming, will underground injection of ISL fluids be treated as Class I or III, or Class V? We heard Class V was being considered for underground injection of some waste. Page 1-22 of this document, lines 44-45, states that in Wyoming, "UIC Class V permits are required for injection wells leaching from older conventional operations." This appears to contradict lines 31-39 and the box on page 1-19, which state that all injection of uranium lixiviant and waste would be done under Class I or III permits, and do not bring up Class V waste disposal.</p>
1-21	33-42	<p>This description of NRC's interaction with BLM is too vague and should describe our mining claim adjudication process as well as our exploration and mining approval process in more detail. On line 37, add "If operations are located on lands patented under the Stock Raising Homestead Act (split estate) and the licensee does not have the written consent of the surface owner, then the licensee must submit a plan of operations and obtain BLM's approval. Where the licensee has surface owner consent, the licensee does not need a notice or a plan of operations for BLM's approval." On lines 38-39, add "To the extent possible, the application shall contain information to satisfy the requirements of the BLM and State in one document". On line 41, change "BLM land" to "BLM surface", because BLM land includes split estate, which is discussed later in the sentence.</p>
1-22	45-49	<p>This sentence should also state that the Wyoming Land Quality Division holds joint bonds with BLM for exploration and mining on BLM lands, as well as the fact that we have a joint MOU for surface management of locatable mineral operations.</p>

1-26		Section 1.8.3 discusses <b>NRC's</b> site-specific review but does not mention the need for coordination with BLM on site-specific NEPA reviews, except for a mention of "consultation with appropriate agencies" on line 22. We understand that our Washington Office is discussing this matter with NRC and is working on a MOU to better define our respective responsibilities. On lines 44-45, add "Approval of any ISL operation where the area of disturbance, over the life of the mine plan, is 640 acres or larger in size, normally requires preparation of an EIS".
1-27		Again, Sections 1.8.4 and 1.8.5 only talk about <b>NRC</b> determining if a site-specific EA is appropriate, and an <b>NRC</b> decision. BLM needs to be part of this picture.
2-4	31	A typical ISL facility, according to this sentence, covers 2,500 to 16,000 acres. The BLM H-1790-1 planning handbook, page 70, states that "approval of any mining operation where the area to be mined, including any area of disturbance, over the life of the mining plan is 640 acres or larger in size", normally requires preparation of an EIS. If an EIS is required, the BLM 43 CFR 3800.5(a) cost recovery regulations for plans of operation on mining claims state that the applicant must pay BLM a processing fee to cover our costs for preparing and/or reviewing the EIS. Our 2003 MOU with the Wyoming State Land Quality Division on surface mining and exploration for locatable minerals gives BLM the lead responsibility for NEPA concurrence.
2-8	Fig. 2.3.1	The hexagonal pattern in the middle of the figure should be labelled as a 7-spot pattern rather than a 5-spot pattern.
2-11	15-44	Include a discussion of best management practices for drilling wells which may go through drinking water aquifers.
2-14	3-5	Will interim stabilization or reclamation be required for buried pipelines? What happens if the pipelines leak and what measures are typically taken to correct the situation?
2-23	20-21	These lines mention that the offgas scrubber is 95 to 99 percent efficient. We assume that one to five percent of the uranium particulates are released into the atmosphere. How much, in terms of volume, is released in a typical plant?
2-26	25-27	Please describe the requirements for groundwater protection that this rulemaking will address.
2-32	21-39	One could possibly add data comparing total emissions of nuclear, wind, and hydroelectric power in the exploration, construction, and operations phases.
2-36	19-22	Add a discussion on transportation of 11e(2) byproduct wastes to a licensed disposal facility and the risks involved. Where are these

2-38	22-38	Although the GEIS splits out activities by production region, the transport of ion exchange resin beads for processing may sometimes cross production regions. An example is the satellite ISL facility proposed by CAMECO for the eastern Gas Hills, in the Wyoming West region. Resin beads would be trucked for processing to CAMECO's Highland/Smith Ranch facility, in the Wyoming East region. The chapters on transportation activities and impacts need to address these activities that cross production regions.
2-41	32-33	Self-insurance is not an acceptable form of surety for BLM either. The acceptable forms of financial guarantees are spelled out in 43 CFR 3809.555.
2-48	Table 2.11-4	Are the groundwater values for post-uranium recovery at Irigary before or after groundwater sweep? If after, the concentration of some constituents are still very high compared to baseline and bring into question whether groundwater can be restored to baseline conditions. These numbers need to be explained, especially since Irigary could be considered typical for the Wyoming East region.
3.2-1	5-14	The ownership section does not discuss split estate. There are mining claims on private surface underlain by BLM minerals as well.
3.2-1	45-47	The uses of BLM land are much more varied than just grazing. They include oil and gas development, provision of wildlife habitat, and public recreation, to name a few.
3.2-4	Table 3.2-1	Change "Land Ownership" in the title to "Surface Ownership". On much of the "private land", BLM manages the minerals because only the surface was patented.
3.2-8	15	The Precambrian is older than approximately 540 million years ago, not 453 million years.
3.2-13	2-4	Only part of the Crooks Gap District is within the Sweetwater River watershed. The rest is within the Great Divide closed basin.
3.2-17	23-28	The Upper Colorado River Basin aquifer system is generally in SW Wyoming and only covers the southern part of the Wyoming West region. The northern part (such as the Gas Hills) lies in the Wind River Basin, which drains into the Bighorn and Yellowstone Rivers.
3.2-19	6	Change "low permeable" to "impermeable".
3.2-19	11	Change " is underlain" to "are underlain" and delete the words "Formation and".
3.2-34	Fig. 3.2-14	No white-tailed deer wintering areas are shown on the map. If there aren't any, you don't need a figure, just say so in the text.
3.2-50	Fig. 3.2-16	Should the Class 1 PSD map refer to the Wyoming West rather than the Wyoming East region?

3.2-63	30-36	The visual/scenic resources information does not include the most recent inventory that has been completed as part of the Lander Field Office RMP revision process.
3.2-67 thru 75	Figs. 3.2-14 thru 17	The demographic data in these tables is pretty old (year 2000), especially considering all the energy development that has taken place in SW Wyoming since then.
3.3-1	8	The Wyoming Basin is to the west, not east.
3.3-1	23	Delete "South Dakota" as part of the Black Hills lie in Wyoming.
3.3-1	29-35	It's important to stress that although BLM does not own a lot of surface rights in the Wyoming East region, it DOES own mineral rights under land patented under the the Stock Raising Homestead Act of 1916. This paragraph is misleading. BLM may manage only 10 percent of the surface, but BLM manages half of the mineral estate. Also there is a lot of land acquired by the Federal government under the Bankhead-Jones Act during the Great Depression. The right to mine uranium under acquired land is obtained by a Federal lease rather than by a mining claim.
3.3-4	9-14	There has been rapid development of the CBM in the Big George coal zone near and underneath the Pumpkin Buttes. There are potential problems if oxidizing uranium fluids in the Pumpkin Buttes District intermix with reducing waters in the CBM play.
3.3-4	26-27	Note that this rail spur services the coal mines in the Powder River Basin, which together produce over a third of our nation's coal. Traffic is so heavy that there are as many as four parallel tracks in places.
3.3-7	Table 3.3-3	Why would uranium yellowcake be trucked south on I-25 to Denver and through heavy traffic there? Wouldn't it be more logical to go north to Gillette and then east on Interstate 90?
3.3-8	5	The Precambrian is older than approximately 540 million years ago, not 453 million years.
3.3-8	9-11	The Powder River Basin did not exist prior to the Laramide orogeny. In this area, most of the uplift of the Bighorn Mountains and Black Hills and development of the basin inbetween was concurrent with deposition of the Fort Union Formation in the Paleocene Epoch and Wasatch Formation in the Eocene Epoch. The Powder River Basin did not form during Late Cretaceous time, 65-99 million years ago. It was more like 50-70 million years ago.
3.3-8	23-24	The Pumpkin Buttes in the Powder River Basin are capped by the Oligocene White River Formation. Although erosion has removed most of the Miocene and Oligocene units in the basin, a few remnants such as the Pumpkin Buttes remain.

3.3-10	7	The Wasatch Formation in the Powder River Basin also contains thick coal beds.
3.3-10	14-24	This paragraph appears to be trying to extend geologic formations in the Wyoming West Region over to the Wyoming East region. The formations are different. The Moonstone, Split Rock, and Wagon Bed Formations do not exist in the Powder River Basin. In the Powder River Basin, the White River Formation is only present at the Pumpkin Buttes and along the southern edge south of Douglas. The White River Formation does not wedge out against Precambrian rocks, rather, it originally buried the lower parts of the Bighorn Range before it was mostly eroded. The Arikaree Formation does not cap prominent ridges in the Powder River Basin; it is absent from the Basin.
3.3-11	2-4	In the Powder River Basin, the Fort Union Formation also contains thick, continuous coal beds that merge with and split from each other. These are the thickest coal beds in the U.S. and host the largest coal mines in the U.S. They produce over 400 million tons of coal per year - over a third of the nation's coal production. The coal beds are also the source of large coal bed methane deposits.
3.3-11	4-6	The Lance is underlain by the Fox Hills Formation which marks the last retreat of the Cretaceous seaway from western North America. Below the Fox Hills is the thick, marine Pierre Shale.
3.3-12	36	Change "Power River" to "Powder River".
3.3-16	18-25	Delete this paragraph. The Northern Great Plains aquifer description is too general. For example, continental glacial deposits only exist in northeast Montana and the Dakotas - well outside the Wyoming East region.
3.3-16	27-35	The description of lower Tertiary aquifers only discuss sandstone beds. However, the most continuous aquifers in the Fort Union and Wasatch Formations in the Powder River Basin are the coal beds - which aren't even mentioned. In NE Wyoming, regional groundwater flow in the Fort Union and Wasatch is to the north and northwest. Recharge areas for the thick coal beds are the fractured clinker layers where the coal has naturally burned along the outcrop.
3.3-18	19-29	The major uranium-bearing beds in the Powder River Basin are in the Eocene Wasatch Formation, not the Paleocene Fort Union Formation. This is correctly stated on page 3.3-10, lines 3-12 of the GEIS, but not here. The Smith and Reynolds Ranch sites are in the Monument Hill District, not the Pumpkin Buttes District.
3.3-19	6	Change "150 m" to "150 ft".

3.3-22	44-46	The Pine Scoria Hills are named after the numerous hills capped by reddish scoria (also called clinker) rock formed by the natural burning of underlying coal beds and baking of sediments above the coal.
3.3-24	24	Add "in the" before "northwestern".
3.3-28 and 31	Figs. 3.3-11 and 14	Why have a moose map if there are no moose in the Wyoming East Region? Or a whitetailed deer map if there are no whitetailed deer? Or are you missing that information from the map?
3.3-43	1-8	You need to add the Northern Cheyenne Tribe, whose reservation is in the northern part of the Powder River Basin in southeast Montana. Several sites in northeast Wyoming and northwest South Dakota, such as Devils Tower and Bear Butte, are sacred to the Tribe.
3.3-48 through 51		The income, housing and employment discussions and figures rely on 2000 census data. This is outdated, due to recent expansion of coal mines and coal bed methane development in the Powder River Basin.
3.4-4	14-15, Table 3.4-1	Change the title of the table from "Land Ownership" to "Surface Ownership". Change "BLM-administered lands" to "BLM-administered surface". In eastern Wyoming, there is a lot of split estate land where the surface was patented to private owners but the BLM retained the mineral estate, including the uranium deposits.
3.4-6 and 7	26-35, Table 3.4-3	This paragraph and table assume that yellowcake would be transported by truck. Could yellowcake be transported by train?
3.4-8 and 10	10-12, Fig. 3.4-5	Add a sentence stating that the igneous intrusions in the northwestern Black Hills, such as Devils Tower, Bear Butte, the Bear Lodge Mountains, and Terry Peak, result from alkalic volcanism in the late Paleocene to early Eocene, 62 to 50 million years ago. Revise Figure 3.4-5 to include these rocks. Delete the reference to Paleocene rocks in line 11.
3.4-24	50, 52	Change "430,000 million gal/day" to "430,000 gal/day". Change "500,000 million gal/day" to "500,000 gal/day".
3.4-32 through 38	Figs. 3.4-12 through 18	The only wildlife on these maps is in Wyoming. There are no wildlife areas shown for South Dakota or Nebraska. Do South Dakota and Nebraska lack a wildlife inventory for sage grouse, antelope, bighorn sheep, elk, mule deer, and whitetailed deer? Why include maps if the species do not occur in the region?
3.4-49	28-29	Are Jewel Cave National Monument in South Dakota and the Northern Cheyenne Reservation in Montana still Class 1 areas?

3.4-58	9-15	Being adjacent to the Crow Butte Mining District, Fort Robinson is an important site to discuss. It figures large in Native American history, being where the Oglala Sioux chief Crazy Horse was killed, and where Dull Knife and many Northern Cheyennes broke out of confinement in the Cheyenne Autumn incident.
3.5-63	Table 3.5-16	The Native Hawaiian population is shown as 40.3% of the total population in Cibola County. This appears to be an error.
4.2-2	16-23	The GEIS states that the impact to land use will be small and that reclamation will be coordinated with the BLM. How does this happen?
4.2-2	44-47	The GEIS states that the oil and gas production will be in place prior to ISL operations. This is not necessarily true. CBM development must be considered more fully in the analysis.
4.2-2 and 3	35-50, 1-5	Development of multiple minerals on BLM land is controlled by Public Law 585 and the 43 CFR 3740 regulations. Potentially, coal bed methane development could be impacted by ISL operations if excursions are not controlled.
4.2-6	13-20	The GEIS only discusses transportation of yellowcake by trucks on a highway. What are the relative impacts of transportation by train versus by highway? Which is safer?
4.2-7	33-44	The GEIS does not address the impacts of transporting ion exchange resin a long distance - from a satellite facility in the Wyoming West region to a processing plant in the Wyoming East region, for example. This is being proposed by CAMECO.
4.2-8	38-50	Actual volumes of trash generated in decommissioning facilities and transported to waste disposal sites should be included.
4.2-9	12-22	The proponent should be required to submit construction information for well pads, roads, and infrastructure prior to approval.
4.2-9	26-38	We recommend that the nature of soil disturbance be disclosed, e.g., compaction, erosion, runoff, and sedimentation. Soil disruption, as discussed, appears only to include complete removal of soil with stockpiling. The reasonable and foreseeable acres of disturbance should be disclosed and, <i>especially within the Colorado River Basin</i> , a predictive estimate of erosion, runoff, and sedimentation should be included to address concerns from the EPA and the Colorado River Basin Salinity Control Forum (CRBSCF).
4.2-9	45-48	We recommend that topsoil and subsoil be segregated. Then, when backfilling, the general soil profile (topsoil over subsoil) should be reestablished. This isn't clear in this paragraph.

4.2-10	36-44	If NRC has any data to support its assertion that spills are caught and remediated promptly, this data should be cited in the GEIS.
4.2-10	22-28	What about other effects of depressuring, e.g., drawdown impacts to adjacent domestic/livestock wells and other aquifer changes?
4.2-10	39-40	Shouldn't spill response plans be mandatory (rather than expected) to comply with State regulations?
4.2-10, 12	50, 33-34	BLM may also impose reporting requirements in approving a plan of operations.
4.2-11	17-18	What evidence leads you to conclude the impacts would be temporary and small?
4.2-11	31-32	The concentrates may constitute hazardous material. This should be discussed. Also, the waste streams are treated to what level or standard?
4.2-12	1-5	It would be helpful to monitor for loss of soil productivity and changes to vegetative composition and production as well.
4.2-12	28-30	Spill reporting should be required rather than recommended and a spill response plan should be mandatory.
4.2-12	45-49	As we understand the situation, the delay in implementing aquifer restoration recently caused the Wyoming Land Quality Division to double the bond for the Smith/Highland Ranch operation and impose a significant fine.
4.2-13	12-15	Also, land application could degrade soil productivity and site potential.
4.2-13	11-27	The GEIS assumes that the States regulate land application disposal. Which agencies regulate and what criteria do they use?
4.2-13	32-33	The Wyoming State Engineer also requires plugging and abandoning of wells.
4.2-14	7-26	The requirement of "Water Management Plans" which detail water handling options (e.g., surface discharge to reservoirs vs. drainages with energy dissipators) and associated BMPs would be helpful in this section. Also, within the Colorado River drainage, an analysis of runoff and sedimentation with BMPs is expected by CRBSCF. Prescribed monitoring should include stream channel cross-sections and longitudinal profiles to ensure channel stability is maintained.
4.2-14	45-49	It would be helpful to require details of erosion control measures in a Water Management Plan so these can be considered in subsequent EA's.
4.2-15	4-9	Requiring the disclosure of such measures in a Water Management Plan would be helpful to the NEPA and resource management processes.

4.2-16	31-33	We do not understand the argument that because ISL operations are in a confined aquifer, they could not affect springs and streams. If the aquifer has artesian head or the confining layer is leaky, there could be surface impacts. Also, the Fish and Wildlife Service requires an analysis of groundwater use/surface water connections and associated water depletions in the Colorado and Platte River drainages. These need to be considered.
4.2-17	16-22	Impacts to channel stability need to be disclosed and associated monitoring and mitigation to control headcutting discussed.
4.2-20	1-5	Depressuring and removal of bleed water constitutes a consumptive use of groundwater and should be assessed as a depletion according to the FWS. Also, if production bleed is injected deeper, would there be potential for leakage into a coal aquifer below?
4.2-20	26-50	A figure displaying the drawdown for individual wells within a typical well field over a grid pattern (e.g., a well for every acres) would be helpful in characterizing the well drawdowns and their cumulative effect over a greater areal extent. It would be more understandable to the lay reader. e.g. – Adding all the components of drawdown (in feet) in each section due to pumping in that section plus all the effects of the other wells (drawdown components can be superposed, which are linear with respect to pumping rate) gives a matrix as below (the six sections with active pumping are outlined in the middle). See diagram at the end of the specific comments.  □
4.2-20	40-50	It would be helpful to include discussion of the aquifer thickness and implications of this drawdown on existing wells.
4.2-21	30-36	The GEIS notes that the licensee is required to restore aquifers to pre-operational conditions if possible. If not, the aquifer is returned only to the highest concentration of contaminants allowed by 10CFR40 Appendix A or alternate concentration limits approved by NRC. A conclusion that impacts would be small and temporary is not warranted given the exceptions outlined above.
4.2-21	34-36	Excursions would be small and temporary IF the company starts aquifer restoration in a timely manner. In practice, this has not always been the case.
4.2-22	3-4	It would be helpful to explain the nature of these actions and evidence of their effectiveness.

4.2-22	27-41	This section should be expanded to discuss potential impacts to CBM operations underneath the uranium deposit, both in the Wyoming West and Wyoming East regions. Could pumpage of water from a CBM well in a coal bed below a uranium ISL operation draw down the hydraulic head in the ISL aquifer enough that oxidizing lixiviant would be drawn into the CBM well and destroy the reducing conditions necessary for the methane to be produced? This could especially be a problem if the confining layer between the uranium and the coal were leaky or if CBM exploration boreholes provided a conduit for water to pass from one layer to another.
4.2-22	27-34	One might also consider and disclose effects on faults and fractures in this section.
4.2-23	15-20	Are monitoring wells needed in coal aquifers with potential for CBM production below the uranium?
4.2-24, 4.3-15	13-34, 42-49	Will injecting sodium bicarbonate or other lixiviant have potential to corrode the metal casing or cement of CBM wells that produce from a deeper coal bed?
4.2-25	4-50	In general, it would be appropriate to analyze consumptive use and FWS depletion issues in this section. Also, consideration should be given to the use of MODFLOW modeling of a typical scenario to predict the effects over a well field as well as long term recovery of the aquifers.
4.2-25	16-25	In areas of CBM production, could produced CBM water be used in aquifer restoration after treatment?
4.2-27	7-14	Impacts would be small IF the wells were properly abandoned. However, the Wyoming Land Quality Division routinely issues notices of violation for improper well plugging.
4.2-29	8-16	To minimize impact, the operator should be required to bury overhead power from main power drops to the wells.
4.2-32	37-44	All evaporation ponds should be required to be netted.
4.2-34	27-29	Why use New Mexico air quality estimates to model Wyoming emissions? Doesn't Wyoming have relevant data?
4.2-35, 4.2-60, 4.3-7	30-37, 35-50, 1-18	What happens if an evaporation pond or land disposal area dries up and wind disperses the contaminants? Include potential impacts from dust caused by precipitates from evaporation of process water in evaporation ponds or through land disposal.
4.2-43	33-44	There may be impacts on historic trails from ISL development (especially the Bozeman Trail in the Monument Hill District of the Wyoming East region).
4.2-48	21-22	It's unlikely that most of the labor force would come from within the region. The labor pool is already saturated by oil and gas and wind development in Carbon and Fremont counties.

4.2-48	37-39	The high unemployment rate in Laramie is probably due to the high college student population there - the University of Wyoming is located in Laramie. Students would be unlikely to seek employment in uranium mines.
4.3-1	18-22	Mention that many areas in the Wyoming East region are split estate. The surface may be private but the Federal government owns the mineral rights, and miners stake claims or may have to post plans of operation and a bond with BLM if no agreement can be reached with the surface owner.
4.3-9	26-28, 37-38, 48-49	Do you mean "fewer perennial streams" instead of "few or perennial streams"? If so, how do you support this statement? The Wyoming East region has more precipitation than the Wyoming West region and would be expected to have more perennial streams.
4.3-13	22-49	Could groundwater excursions affect CBM development of coal below the uranium in the Pumpkin Buttes District? See specific comments for page 4.2-22.
4.3-14	9-21	The Pierre Shale is not a good analogy for aquitard properties of shales in the Wasatch Formation in the Powder River Basin, between the layers where uranium is being produced. The Pierre is a laterally continuous, very fine grained marine shale, hundreds to thousands of feet thick. Shale layers in the Wasatch are sandy to silty and discontinuous.
4.3-14	28-30	Uranium production in the Powder River Basin is from the Wasatch, not the Fort Union, Formation.
4.3-14, 4.3-15	34-39, 30-38	Well integrity failures in deep monitoring, exploration, and injection wells that penetrate coal beds below the ISL operation could potentially damage CBM development, if oxidizing lixiviant is drawn down into the reducing environment of the CBM well.
4.3-15	13-15	This description is too simplistic. The Wasatch, not the Fort Union, is the uranium ore-bearing formation in the Powder River Basin. Even within the Fort Union and Wasatch Formations, there are discrete aquifers - coal being the most continuous, but also including sandstone and clinker.
4.3-15	30-31	Again, too simplistic. The uranium is in the Wasatch, not the Fort Union, Formation. The ore-bearing aquifer in the Wasatch is NOT confined above and below by continuous and thick confining layers like the Pierre Shale; the confining layers are discontinuous and localized.

4.3-13 thru 15	Excursions and Groundwater Quality section	Could lixiviant from an ISL operation leak into adjacent previously mined and reclaimed areas where uranium was surface mined in the past? The Monument Hill District in the Wyoming East region and the Gas Hills district in the Wyoming West region have many reclaimed pits where uranium was conventionally mined and the big pits were backfilled with spoil. Being spoil, these areas would act as unconfined aquifers and may leach out additional uranium. The potential for such excursions should be addressed.
4.3-15	45-50	We have heard that the State of Wyoming is considering Class V rather than Class III designations for deep uranium disposal wells. What effect would that have on aquifer protection?
4.3-16	8-10	Is the Madison a "karstic Paleozoic aquifer"? If so, say so.
4.3-18	11-16	Mention that there could be potential to affect coal aquifers and CBM production below the uranium production in the Powder River Basin.
4.3-21	9-17	The BLM should be involved in seed mixture determination for reclamation. Also see page 4.2-29, lines 4-6.
4.3-21	46-47	Are there any NAAQS attainment particulate emission problems from coal mining in the Gillette area? From inversions in the Sheridan area?
4.3-24	28-49	Mention that the Bozeman National Historic Trail passes through the Monument Hill mining district. In the new BLM Resource Management Plan for the Casper Field Office, there are surface use and viewshed restrictions in a narrow buffer zone surrounding the trail.
4.3-27 4.3-28	17-22, 33-35 1-2, 17-20	The Bozeman National Historic Trail passes through the Monument Hill Uranium Mining District in the Southern Powder River Basin. Is the trail a Class II viewshed area? If so, these sentences are inaccurate.
4.3-29	32-40	Campbell County, with all the its coal mines and CBM development, does NOT have a high unemployment rate. The high unemployment rate in Albany County, which includes the city of Laramie, is largely due to the student population at the University of Wyoming, who are not looking for opportunities in the uranium industry.
4.3-30	41-46	This paragraph discusses the Wyoming East region, not the Wyoming West region. We question why the boundaries of the Wyoming East region were drawn to exclude Gillette (and possibly Buffalo and Sheridan). Those towns could provide potential employment and housing for uranium development in the Pumpkin Hills District of SW Campbell County and SE Johnson County.

4.4-1	12-15	Although much of the surface is private, there is a lot of split estate land where BLM manages the mineral estate. Also, in the Crow Butte Mining District, part of the land lies in the Nebraska National Forest; some of this land has acquired mineral estate on which the uranium would be leased by BLM rather than located by mining claim.
4.4-9 4.4-10	6-9, 30-33, 42-45 10	Precipitation in the Nebraska/South Dakota/eastern Wyoming region is greater than, not similar to, the Wyoming West region.
4.4-16	15-16	The Pierre Shale is not a sandstone.
4.4-16	24	What does MIT stand for?
4.4-17	12-16	The project is named Crow Butte, not Crown Butte. At Crow Butte, is lixiviant or any waste fluid presently being injected into deep aquifers? If so, which aquifer and what are the impacts?
4.4-18	8-17	Rather than using records from the Wyoming East region, do you have access to any groundwater sweep records for the Crow Butte mine?
4.4-29, 30	49, 17	Osage, Wyoming and Hill City, South Dakota are not near any proposed uranium mining. Why cite them? How about citing Edgemont, South Dakota, or Crawford, Nebraska instead?
4.4-30	7-8	Refer to the Nebraska-South Dakota-Wyoming region, not the Wyoming West region.
4.4-30	31	Why is Laramie, Wyoming cited? It's far away from the Nebraska-South Dakota-Wyoming region. Laramie is a college town, which is a reason for its high unemployment. More relevant would be to cite potential employment opportunities in closer high unemployment areas such as the Pine Ridge Reservation in South Dakota.
5-4	Table 5.2-1	This table provides a useful summary of historical and proposed uranium developments in Wyoming.
5-7	Table 5.2-2	Mention should be made of the different BLM EIS's related to development of the huge Jonah and Pinedale Anticline natural gas fields just west of the Wyoming West region boundaries. The GMI, Pappy Draw, Beaver Creek, and the Pathfinder/Bison Pipeline EIS's should also be included. There are also NEPA analyses of other types of development nearby including CBM, conventional oil and gas, and wind energy. Many of these developments were approved under an EA rather than an EIS. These developments can add up and are the type of cumulative effects that can be overlooked.

5-8	Table 5.2-3	Add the following recent BLM EIS near the northern boundary of the Wyoming East region, dated October 1, 2008: "Draft EIS for the South Gillette Area Coal Lease Applications WYW 172585, WYW 173360, WYW 172657, WYW 161248, Wyoming State Office, High Plains District Office".
5-8	Table 5.2-3	The table does not include any EIS's related to coal bed methane development in the Powder River Basin. Although all these EIS's predate January 2005, the CBM development is ongoing.
5-14	Table 5.3-1	Move Coal bed natural gas / methane development from the Coal-related actions box to the Natural Gas and Oil box. CBM is legally part of the oil and gas mineral estate rather than the coal mineral estate, as decided by the U.S. Supreme Court in 1998. Also under Coal-related actions, delete the "probably" before Campbell under the Mine reclamation heading, as the bulk of reclamation does occur in Campbell County, and add Sheridan County. Under Coal bed natural gas / methane development, add Campbell, Johnson, Sheridan, and Converse Counties to Carbon, Fremont, and Sweetwater Counties. Under Coal-related actions, add Sheridan County. Under Mining of other minerals, add sand and gravel.
5-15, 16	Table 5.3-2	Change "Jacobs-Run" to "Jacobs Ranch". Delete "North Rochelle" - it's now part of the Black Thunder mine. The Antelope and North Antelope-Rochelle mines are both partly in Campbell County and partly in Converse County. In Carbon County, add, add Arch Coal's Elk Mountain / Saddleback Hills mine.
5-17	Table 5.3-3	Move coal bed natural gas / methane development from the Coal-related actions box to the Natural Gas and Oil box. CBM is legally part of the oil and gas mineral estate rather than the coal mineral estate, as decided by the U.S. Supreme Court in 1998. Also under Coal-related actions, delete the "probably" before Campbell under the Mine reclamation heading, as the bulk of reclamation does occur in Campbell County, and add Sheridan County. Under coal bed natural gas / methane development, add Campbell, Johnson, Sheridan, and Converse Counties to Carbon, Fremont, and Sweetwater Counties. Under Coal-related actions, add Sheridan County. Under natural gas and oil, the counties mentioned should include those in the Powder River Basin, as this table is supposed to discuss the Wyoming East region. Under mining of other minerals, add sand and gravel, add scoria (clinker).
5-18	6-8	List the TOTAL coal production of the coal mines in the Wyoming part of the Powder River Basin in and adjacent to the Wyoming East region (over 400 million tons).

5-19	Table 5.3-4	Why is Devils Tower National Monument listed as being in New Mexico?
5-21	Table 5.3-4	List Fort Robinson in Nebraska under Cultural Resources Preservation.
7-2	30-35	Which BMPs does the NRC endorse? Will there be standard Conditions of Approval in the Record of Decision for a site-specific proposal? Are site-specific COAs attached to each mine approval?
7-3	Table 7.4-1	Geology and soils, Salvage and stockpile topsoil - BLM field offices believe that, in the well field, it is better to respread topsoil over disturbed areas than to stockpile it for years. What about plowing in the pipelines?
7-4	Table 7.4-1	Surface water - Whose reclamation guidelines should be followed?
10-6	Table 10-1	Surface waters - Temporary changes to spring and stream flow from construction activities are addressed for the Wyoming West region but not for the Wyoming East region on page 10-21.
10-25	Table 10-1	Threatened or endangered species - Timing stipulations with respect to wildlife are not addressed.
		Adding all the components of drawdown (in feet) in each section due to pumping in that section plus all the effects of the other wells (drawdown components can be superposed, which are linear with respect to pumping rate) gives a matrix as below (the six sections with active pumping are outlined in the middle).

