October 23, 2013

Mr. John Schmuck
Senior Permitting Manager
Cameco Resources
2020 Carey Ave., Suite 600
Cheyenne, Wyoming 82001

SUBJECT: SUMMARY OF SEPTEMBER 4, 2013, TELECONFERENCE REGARDING OPEN ISSUES, CROW BUTTE RESOURCES, INC., MARSLAND EXPANSION AREA LICENSE AMENDMENT APPLICATION (TAC J00683)

Dear Mr. Schmuck:

On September 4, 2013, U.S. Nuclear Regulatory Commission (NRC) staff held a category 1 public teleconference with representatives of Crow Butte Resources, Inc. (CBR) to discuss NRC's Requests for Information (RAIs) (ADAMS Accession No. ML13177A344) associated with CBR's Marsland Expansion Area license amendment application. The teleconference centered on the adequacy of the revised application dated August 1, 2013 (ADAMS Accession No. ML13233A074) in addressing several of the RAIs as well as CBR's proposed responses to other RAIs. A summary of the teleconference discussion with associated follow-on actions is found as attachment 3 of the enclosed meeting summary.

Within 30 days of receipt of this letter, please provide the information identified in the meeting summary and all RAIs that CBR has not addressed or inform us of the date you expect to provide the information. If you have any questions, please contact me at 301-415-6563 or, by email, at thomas.lancaster@nrc.gov

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

**/RA/**

Tom Lancaster, Project Manager
Uranium Recovery Licensing Branch
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No. 40-8943

Enclosure: Meeting Summary

cc: Doug Pavlick, CBR
Michael Linder, NDE
Meeting Attendees

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| Office | DWMEP | DWMEP | DWMEP | DWMEP |
|---|---|---|---|---|
| Name | TLancaster | BGarrett | ASnyder | TLancaster |
| Date | 10/18/13 | 10/23/13 | 10/23/13 | 10/23/13 |

OFFICIAL RECORD COPY

**MEETING SUMMARY**

DATE: September 4, 2013

TIME: 10:00 a.m. – 2:00 p.m.

PLACE: U.S. Nuclear Regulatory Commission (NRC)
Two White Flint North
Room T7A4
Rockville, Maryland

PURPOSE: To discuss issues relating to Crow Butte Resources, Inc.'s (CBR's) Marsland Expansion Area (MEA) in situ recovery (ISR) license amendment application.

ATTENDEES: SEE ATTACHED ATTENDEE LIST

BACKGROUND:

The purpose of this meeting was to discuss issues relating to CBR's MEA ISR license amendment application. The meeting was publicly noticed on the NRC webpage on August 8, 2013.

DISCUSSION:

The teleconference started at 10:00 a.m. Eastern Time in Room T8C1. An opening statement was presented by Mr. Tom Lancaster, NRC. The meeting continued with a discussion of issues relating to CBR's MEA ISR license amendment application. Attached is a summary of this discussion.

ACTIONS:

For individual actions associated with this teleconference, see the attached summary.

ATTACHMENTS:

1. Attendee List
2. Meeting Agenda
3. NRC and Crow Butte Resources, Inc.
   Discussion Summary

Enclosure

**MEETING ATTENDEES**

September 4, 2013

Teleconference to Discuss Issues Relating to Marsland Expansion Area ISR License Amendment Application

| NAME | AFFLIATION | PHONE NUMBER | EMAIL |
|---|---|---|---|
| Tom Lancaster | USNRC | 301-415-6563 | Thomas.Lancaster@nrc.gov |
| Ron Burrows | USNRC | 301-415-6443 | Ronald.Burrows@nrc.gov |
| Gary Comfort | USNRC | 301-415-6106 | Gary.Comfort@nrc.gov |
| John Schmuck (via phone) | Cameco Resources | | |
| Doug Pavlick (via phone) | Cameco Resources | | |
| Larry Teahon (via phone) | Cameco Resources | | |
| Wade Beins (via phone) | Cameco Resources | | |
| Jack Cearly (via phone) | Cameco Resources | | |
| Sabrina Fox (via phone) | Cameco Resources | | |

Attachment 1

MEETING AGENDA
Cameco Resources Crow Butte Operations
September 4, 2013

MEETING PURPOSE: Meeting to Discuss the Revisions to the Marsland ISR License Amendment Application dated August 1, 2013, and NRC Staff's Request for Information (RAI) Regarding the Marsland License Amendment Application dated July 3, 2013.

MEETING PROCESS:

| Time | Topic | Lead |
|---|---|---|
| 10:00 a.m. | Introductions | All |
| | Discussion of the Revisions to the Marsland License Amendment Application And NRC Staff's RAI Regarding the Marsland Expansion Area License Amendment Application | All |
| | Summary of Action Items | Moderator |
| | Public Comment/Questions | Moderator |
| 2:00 p.m. | Adjourn | |

Attachment 2

**U.S. Nuclear Regulatory Commission and Crow Butte Resources Inc.'s Meeting Summary**
September 4, 2013 Public Teleconference
Marsland Expansion Area ISR License Amendment

The following table identifies the U.S. Nuclear Regulatory Commission's (NRC's) Requests for Information (RAIs) discussed in the September 4, 2013 public teleconference with Crow Butte Resources Inc. (CBR). The table also summarizes comments made and follow-on actions that were agreed upon during the teleconference. In addition to the RAIs listed in the table, staff also indicated that several administrative issues (refer to ADAMS Accession No. ML13177A344) have been resolved by the Revised Marsland Application (ADAMS Accession No. ML13233A074). The administrative issues that have been resolved include application section two items 2, 3, 6, 9, 10, 11, 14, 15, and 16, section five items 5 and 6, and section six item 2.

Table, Request for Additional Information Discussion

| **Section 2 – Site Characterization** | **Meeting Comments and Follow-on Actions** |
|---|---|
| **RAI 5** Description of Deficiency Staff cannot confirm the value of the MILDOS default mixing height of 100m proposed by the applicant.<br>Basis for Request The applicant defines the mixing height as the height of the atmosphere above the ground that is well mixed due either to mechanical turbulence or convective turbulence, noting that the layer above this height is stable. Staff observes that this definition is consistent with the definition given by Holzman (refer to page 3 of EPA, 19721).<br>On page 2-91 of the TR, the applicant stated that the MILDOS default mixing height is 100 m and used this default value in its dose calculations. However, on page 2.7 of NUREG/CR-2011, *MILDOS – A Computer Program for Calculating Environmental Radiation Doses from Uranium Recovery Operations*, US NRC1981, a default mixing height of 1000 m is recommended.<br>Request for Additional Information Please provide the following information:<br>A. Provide the reference for the 100 m default mixing height value, or correct the statement in the TR regarding the default value of the mixing height; and<br>B. Revise MILDOS calculations if the default value is different than what was originally used, or demonstrate that the calculations used are conservative. | CBR - See revisions to Section 2.5.3.8 of the application dated 6/26/2013.<br><br>NRC - RAI resolved by Revised Application. |
| **RAI 6** Description of Deficiency Staff cannot complete its evaluation of NUREG-1569, Acceptance Criterion 2.5.3(1).<br>Basis for Request NUREG-1569, Acceptance Criterion 2.5.3(1), states, in part: "The on-site program should be designed in accordance with Regulatory Guide (RG) 3.63, 'Onsite Meteorological | CBR - See revisions to Sections 2.5.3.7 of the application dated 6/26/2013.<br><br>NRC - RAI resolved by Revised |

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| Measurement Program for Uranium Recovery Facilities—Data Acquisition and Reporting' (NRC, 1988)." RG 3.63 provides guidance on the siting of meteorological instruments, including the effects from, and the location of, instruments in relationship to natural or man-made obstructions.<br>Staff has found no discussion on the characteristics of the site where the MEA meteorological instruments are, or were, located which would address the siting guidance in RG 3.63.<br>Request for Additional Information Please provide a description of the location of the MEA meteorological instruments (topography, obstructions or lack thereof, etc.) consistent with RG 3.63. | Application. |
| **RAI 7** Description of Deficiency Staff cannot complete its evaluation of NUREG-1569, Acceptance Criterion 2.5.3(2).<br>Basis for Request NUREG-1569, Acceptance Criterion 2.5.3(2), states, in part: "The impacts of terrain and nearby bodies of water on local meteorology are assessed, and the occurrence of locally severe weather is described and its impact considered."<br>While staff found a discussion on severe thunderstorms in TR Section 2.5.1, staff found no discussion on any consideration of potential impacts of severe weather on MEA operations.<br>Request for Additional Information Consistent with NUREG-1569, Acceptance Criterion 2.5.3(2), please provide a discussion on the occurrence of locally severe weather and a consideration of its impacts, or provide a location in the TR where this can be found. | CBR - See revisions to Section 7.5.6.1 of the application dated 6/26/2013.<br><br>NRC - RAI resolved by Revised Application. |
| **RAI 8** Description of Deficiency Staff cannot complete its evaluation of NUREG-1569, Acceptance Criterion 2.5.3(3).<br>Basis for Request NUREG-1569, Acceptance Criterion 2.5.3(3), states: "The meteorological data used for assessing impacts are substantiated as being representative of expected long-term conditions at and near the site." In addition, RG 3.63 provides guidance on determining the long-term representativeness of the onsite meteorological data collected over a minimum of 12 months. This includes various aspects of the National Weather Service meteorological station chosen for comparison.<br>In TR Section 2.5.1, the applicant indicated that the Scottsbluff meteorological station was chosen as the regional station to most represent MEA meteorology. This appears to be based mainly on distance (less than 50 miles) and the availability of hourly data for the last 15 years.<br>Request for Additional Information Please address the following issues related to determining the long-term representativeness of the MEA meteorological data:<br>A. Consistent with RG 3.63, please provide additional information on why the Scottsbluff station was chosen to represent the vicinity of the MEA site, including geographical and topographical descriptions, etc. | CBR - See revisions to Section 2.5.1 of the application dated 6/26/2013.<br><br>NRC – Staff indicated that RAI 8C(2) has been resolved by Revised Application and provided clarification regarding the RAI and the type of information that has been acceptable to the staff in similar applications. |

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| B. The Scottsbluff station has only 15 years of data. This is not consistent with the RG 3.63 recommendation for long-term analysis (e.g., 30 years). Please provide justification for using only 15 years of data.<br>C. TR Figures 2.5-30 and 2.5-31 provide a statistical analysis of the 15-yr and baseline-year wind speed and wind direction for the Scottsbluff meteorological station. Please provide the following information on these analyses:<br>1. NUREG-1475, Rev.1, *Applying Statistics*, US NRC 2011, describes linear regression as a model that relates a dependent variable to a single, or multiple, independent variable(s). Please explain the validity of the proposed linear regressions when there appears to be no independent variable and it is unclear to staff what the regression equations in Figures 2.5-30 and 2.5-31 represent.<br>2. p-values for the linear regression equations presented in TR Figures 2.5-30 and 2.5-31. | |
| **RAI 9** Description of Deficiency The information provided in TR Section 2.6 does not meet the applicable requirements of 10 CFR Part 40, using the review procedures in Section 2.6.2 and acceptance criteria in Section 2.6.3 of NUREG-1569.<br>Basis for Request Staff did not find information that is necessary to allow for an understanding of the project's geologic setting and likely ability of the strata to isolate production fluids consistent with Criteria 1 and 6 in Section 2.6.3 of NUREG-1569. Specifically,<br>(a) TR Section 2.6 (page 2-216) describes the pre-mining exploratory drilling program, but does not provide the number of drill holes, logging methods, and drill hole abandonment/plugging procedures.<br>(b) TR Section 2.6.1.3 (page 2-227) does not mention the Niobrara River structural feature in TR Figure 2.6-12 (page 2-313). According to Stout et al. (1971), this structural feature is a fault located south of the MEA site along the Niobrara River. The Bureau of Reclamation3 indicates that the Nebraska Geological Survey mapped this fault along the length of the river valley at the site of Box Butte Dam.<br>Request for Additional Information<br>(a) Please provide information on the pre-mining exploratory boring program (e.g., the number of drill holes, logging methods, and abandonment/plugging procedures).<br>(b) Please provide information pertaining to Niobrara River structural feature and any other known geological structural features in the vicinity of the MEA. **Within and near the MEA, please further demonstrate the location of the Niobrara River fault that is proposed by Stout et. al. (1971). This demonstration should include structural contour maps of the tops of the Basal Chadron and the Upper Chadron. Additionally, please further demonstrate (1) the fault's structural form (e.g., fault or fold), (2) the natural confinement of the Basal Chadron Sandstone where the Nibrara River Structural** | CBR –<br>(a) Response being prepared<br>(b) See revisions to Section 2.6.1.3 of the application 6/26/2013.<br><br>NRC – Staff indicated that assurance of the proper plugging of all pre-mining exploratory drill holes must be provided. Staff provided additional clarification of RAI 9(b) and added the clarification to end of the RAI as seen in bold face to the left. |

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| **Feature is located at and/or in close proximity to the MEA, (3) whether ground water in the Basal Chadron is leaking through the Niobrara structural feature to the overlying aquifer, and (4) that the structural feature is not a safety concern for the Marsland operation.** | |
| **RAI 11** Description of Deficiency The information provided in TR Section 2.9.3.2 does not meet the applicable requirements of 10 CFR Part 40, using the review procedures in Section 2.7.2 and acceptance criteria in Section 2.7.3 of NUREG 1569.<br><br>Basis for Request NUREG-1569, Acceptance Criterion 2.7.3(5), states: "The applicant has provided an assessment of seasonal and the historical variability for potentiometric heads and hydraulic gradients in aquifers and water levels of surface-water bodies. This assessment should include water levels or water potentials measurements over at least one year and collected periodically to represent any seasonal variability."<br><br>The applicant indicated that water level measurement events were conducted at Brule and Basal Chadron monitoring wells on February 22, 2011, and on August 12, 2011.<br><br>Potentiometric maps were provided for the February 22, 2011, water levels measurements. Consistent with NUREG-1569, Acceptance Criterion 2.7.3(5), staff did not find one year of seasonal water level data in the application.<br><br>Request for Additional Information Please provide one year of seasonal water level data for the Brule and Basal Chadron monitoring wells. For each monitoring event, please provide potentiometric maps of the potentiometric surface. Additionally, please provide time period when irrigation wells near MEA are active and their rates of groundwater extraction. | CBR - See discussion and attached map of monitoring wells in its email submittal dated 8/28/2013.<br><br>NRC – Staff indicated that the number of sampling wells that CBR has identified may not be adequate to demonstrate hydraulic effects from agricultural water wells.<br><br>CBR –Planned to further evaluate additional the monitoring wells. |
| **RAI 12** Description of Deficiency Staff can't complete its evaluation of NUREG-1569, Acceptance Criterion 2.9.3(1).<br>Basis for Request 10 CFR Part 40, Appendix A, Criterion 7, requires: "At least one full year prior to any major site construction, a preoperational monitoring program must be conducted to provide complete baseline data on a milling site and its environs. Throughout the construction and operating phases of the mill, an operational monitoring program must be conducted to measure or evaluate compliance with applicable standards and regulations; to evaluate performance of control systems and procedures; to evaluate environmental impacts of operation; and to detect potential long-term effects."<br>RG 4.14 provides guidance on preoperational environmental monitoring at uranium mills. NUREG-1569, Acceptance Criterion 2.9.3(1), states: "Monitoring programs to establish background radiological characteristics, including sampling frequency, sampling methods, and sampling location and density are | CBR –<br>A. See revisions to Section 2.5.3.7 of the application dated 6/26/2013.<br>B. See discussion and attachments to its email submittal dated 8/27/2013.<br>C. See revisions to Table 2.9-1 of the application dated 6/26/2013.<br>D. Response being prepared.<br>E. Response being prepared.<br>F. Response being prepared. |

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| established in accordance with pre-operational monitoring guidance provided in Regulatory Guide 4.14, Revision 1, Section 1.1 (NRC, 1980). Air monitoring stations are located in a manner consistent with the principal wind directions reviewed in Section 2.5 of the standard review plan."<br>During its review, staff found multiple examples of gaps in data presentation on the proposed preoperational effluent environmental monitoring program for the MEA. Staff requires additional information on, or clarification of, noted deficiencies in the background radiological section to draw its safety conclusions.<br><u>Request for Additional Information</u> Please address the following issues regarding the proposed preoperational environmental monitoring program for the MEA:<br>A. Please provide criteria consistent with RG 4.14, Regulatory Position 1.1.1, used for determining air monitoring locations, or indicate where this information can be found in the application.<br>B. Surface water and sediment sampling point N-2 appears to be over three miles from the south site boundary. This location does not appear to be consistent with RG 4.14 (i.e., not immediately downstream of the area of influence). Please provide a surface water and sediment sampling location for N-2 that is consistent with Acceptance Criterion 2.9.3(1) or justification for an alternate program.<br>C. Please submit the results of the preoperational/preconstruction monitoring program described in TR Section 2.9, including the survey discussed in TR Section 2.9.5.2, or a revised schedule for these items.<br>D. Please provide the calibration records for the air samplers used during the first year of monitoring.<br>E. Please provide the laboratory reports for all radiological baseline monitoring results.<br>F. In TR Section 2.9.6, the applicant stated that transects will be made across the MEA to collect surface and subsurface soil samples in areas of the proposed well field. While general guidance in RG 4.10 was followed in preparing the proposed baseline soil sampling program, staff cannot determine that the full extent of operations within the proposed MEA will have the necessary baseline soil sampling performed to meet 10 CFR Part 40, Appendix A, Criterion 7, requirements. Please provide a more detailed description of where surface and subsurface oil sampling will be performed.<br>G. In TR Section 2.9.8, the applicant described its baseline direct radiation monitoring program. Please provide the following:<br>(1) As noted in staff's review of the baseline soil sampling program, staff cannot determine that the full extent of operations within the proposed MEA will have the necessary baseline direct radiation monitoring performed to meet 10 CFR Part 40, Appendix A, Criterion 7, requirements. Please provide a more detailed description of where direct radiation monitoring will be performed.<br>(2) In TR Section 2.9.8, the applicant stated: "The type of survey instrument and procedures would be as | G. Response being prepared.<br>H. Response being prepared.<br><br>NRC - Staff indicated that RAI 12B and 12C have been resolved by CBR's 6/27/13 e-mail submittal and provided clarification regarding the RAI and the type of information that has been acceptable to the staff in similar applications. |

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| described below..." However, there is no text provided that addresses these issues. Please provide the type of survey instrument used for performing baseline direct radiation monitoring and the procedures used, as indicated in TR Section 2.9.8.<br>H. RG 4.14 provides recommended values for the lower limit of detection (LLD) for radionuclides in various environmental media. The applicant provided a description of its laboratory measurements in regards to significant figures reported for environmental media measurements in TR Appendix Q. Several reported LLD values are not within RG 4.14 recommended values, even after taking into account the applicant's rationale described in TR Appendix Q (i.e., reporting LLD values with one significant figure, consistent with RG 4.14).<br>The following examples are not consistent with RG 4.14 recommended LLD values:<br>Table 2.9-5 – Radiological Analysis for Private Water Supply Wells Recommended Reported<br>March 2011 Well 723, Pb-210 (pCi/L) (dissolved) 1 1.6<br>Table 2.9-26 – Niobrara River Dissolved Radiological Water Quality Recommended Reported<br>March 2011 sample at N1 for Th-230 (pCi/L) 0.2 0.3<br>April 2011 sample at N1 for Pb-210 (pCi/L) 1 1.6<br>July 2011 sample at N2 for Th-230 (pCi/L) 0.2 0.4<br>October 2011 sample at N1 for Th-230 (pCi/L) 0.2 0.3<br>Table 2.9-27 - Niobrara River Suspended Radiological Water Quality Recommended Reported<br>June 2011 sample at N1 for Pb-210 (pCi/L) 1 9<br>Table 2.9-33 – Total Radionuclides and Metals in Tissue of Northern Pike<br>Recommended Reported<br>Ra-226 (microCi/kg) 5 x 10-8 2 x 10-7<br>Th-230 (microCi/kg) 2 x 10-7 8 x 10-6<br>Please provide all environmental media samples with measured values that have an LLD consistent with RG 4.14 or justification for an alternate program. | |
| **RAI 13** Description of Deficiency Staff cannot complete its evaluation of NUREG-1569, Acceptance Criterion 2.9.3(2).<br>Basis for Request 10 CFR Part 40, Appendix A, Criterion 7, requires: "At least one full year prior to any major site construction, a preoperational monitoring program must be conducted to provide complete baseline data on a milling site and its environs. Throughout the construction and operating phases of the mill, an operational monitoring program must be conducted to measure or evaluate compliance with applicable standards and regulations; to evaluate performance of control systems and procedures; | NRC - RAI resolved by Revised Application. |

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| to evaluate environmental impacts of operation; and to detect potential long-term effects."<br>RG 4.14 provides guidance on the preoperational and operational aspects of effluent and environmental monitoring at uranium mills. NUREG-1569, Acceptance Criterion 2.9.3(2), states: "Soil sampling is conducted at both a 5-cm [2-inch] depth as described in Regulatory Guide 4.14, Section 1.1.4 (NRC, 1980) and 15 cm [6 in] for background decommissioning data."<br>During its review, NRC staff found no 15-cm soil samples proposed in the TR.<br>Request for Additional Information Please provide justification for not performing soil samples at 15-cm depths, or indicate where this can be found in the TR. | |
| **RAI 14** Description of Deficiency The information provided in TR Section 2.9.3 does not meet the applicable requirements of 10 CFR Part 40, using the review procedures in Section 2.9.2 and acceptance criteria in Section 2.9.3 of NUREG 1569, and using Regulatory Guide 4.14.<br>Basis for Request TR Section 2.9.3 (p. 2-394) states: "Water quality analyses for private water wells provided in this section is for March 25 to December 20, 2012. Groundwater samples for the CBR monitor wells were collected from March 4 to May 3, 2011 for the Brule monitor wells and March 12 to April 11, 2011 for CBR Chadron monitor wells. Quarterly groundwater sampling will continue until 1 year of data have been obtained and reported to the NRC."<br>Staff has not received the above-referenced quarterly groundwater sampling results for private wells consistent with RG 4.14.<br>Request for Additional Information Please provide one year of quarterly sampling results for private wells consistent with RG 4.14. For private wells located at or within 2 km of the MEA that have not been included in this sampling program, please sample these wells quarterly for one year or provide justification for not sampling these wells. | CBR - See revisions to Section 2.9.3 of the application dated 6/26/2013.<br><br>NRC - RAI resolved by Revised Application. |
| **Section 3 – Description of Proposed Facility** | **Meeting Comments** |
| **RAI 15** Description of Deficiency The information provided in TR does not meet the applicable requirements of 10 CFR Part 40, using the review procedures in Section 3.1.2 and acceptance criteria in Section 3.1.3 of NUREG 1569.<br>Basis for Request In accordance with NUREG 1569, Section 3.1.3 Criterion (5)(f), the application did not provide an acceptable analysis of the ground water hydraulic effects of nearby agricultural wells. Specifically,<br>(a) Considering the possible occurrence of regulated material releases to the overlying aquifer (e.g., from a potential surface spill or a potential well casing failure) within the MEA, the application does not provide an analysis of the possible ground water hydraulic effects that | RAI 11 and 15 are related. Refer to RAI 11 comments . |

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| nearby agricultural wells (well locations are shown in TR Figure 2.7-6 as indicated by TR Table 2.2-11 and TR Appendix A) may have on the migration of potential MEA regulated material releases in the overlying ground water zone toward these wells. Thus, staff cannot confirm whether the applicant's monitoring, containment, corrective action programs for potential MEA regulated material releases into the overlying aquifer will be protective of the agricultural wells and other private wells (located between MEA operations and the agricultural wells).<br>(b) Staff is uncertain whether active agricultural wells (locations shown in Figure 2.7-6 as indicated by TR Table 2.2-11 and TR Appendix A) tap an unconfined or confined aquifer. Staff observes that if confining conditions exist, the application will need to demonstrate that the downward hydraulic influence of active agricultural wells (e.g., private well 732 shown in TR Figure 2.7-6) will not have an adverse effect of hydraulic containment of MEA production fluids in the Basal Chadron Formation beneath the MEA.<br>Request for Addition Information (a) Please provide an analysis of the hydraulic effects that nearby agricultural wells may have on the migration of potential MEA regulated material releases in the overlying ground water zone toward these wells. This analysis should further define the hydrostratigraphy within the Arikaree and Brule formations and should be centered on the protection of agricultural wells and other private wells (located between MEA operations and the agricultural wells) from potential MEA regulated material releases to the overlying aquifer. Results of this analysis should be used to demonstrate the effectiveness of the applicant's proposed monitoring, containment, and corrective action programs for addressing possible MEA regulated material releases into the overlying groundwater zone.<br>(b) Please further demonstrate that the ground water hydraulic influence of nearby agricultural wells will not have an adverse effect on the hydraulic containment of MEA production fluids within the Basal Chadron Formation beneath the MEA. | |
| **RAI 16** Description of Deficiency The information provided in TR Section 3.1 does not meet the applicable requirements of 10 CFR Part 40, using the review procedures in 3.1.2, and acceptance criteria in Section 3.1.3 of NUREG-1569.<br>Basis for Request The erosion and drainage characterization in TR Section 3.1.3.3 (p. 3-14) and TR Appendix K do not provide peak flows for surface drainage (e.g., during potential flooding events) at MEA. This missing information is necessary for staff to perform an independent review of floods and surface water velocities at the MEA consistent with Section 3.1.3 of NUREG-1569.<br>Request for Additional Information Please provide peak flows for surface drainage at the MEA. | CBR - See revisions to Section 3.1.4 of the application dated 6/26/2013.<br><br>NRC - RAI resolved by Revised Application. |

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| **RAI 17** Description of Deficiency The information provided in TR Section 3.1 and 6.1 does not meet the applicable requirements of 10 CFR Part 40, using the review procedures in Section 3.1.2 and acceptance criteria in Section 3.1.3 of NUREG-1569.<br><br>Basis for Request Staff cannot confirm drawdown-distance estimates that are based on the estimated volumes of water that will be pumped during ground water sweep operations. This information is necessary to determine the impact of operations on ground-water flow patterns and aquifer levels consistent with NUREG-1569, Section 3.1.3.<br><br>Request for Additional Information Please provide drawdown-distance estimates that are based on the estimated volumes of water that will be pumped during ground water sweep operations and compare to the information from existing operations. | CBR - See discussion and attachments to its email submittal dated 8/27/2013.<br><br>NRC – CBR's response is satisfactory pending staff's independent verification of the estimate. |
| **Section 4 - Effluent Control Systems** | **Meeting Comments** |
| **RAI 24** Description of Deficiency The information provided in TR Section 4.2 does not meet the applicable requirements of 10 CFR Part 40 that will be protective of human health and the environment. The application indicates that surface impoundments (i.e., ponds) will not be constructed at the MEA and a series of six storage tanks (each 50,000 gallons in capacity) will be used to provide surge capacity between the satellite plant and the MEA deep disposal well (DDW). The applicant also identified trucking contaminated wastewater off-site for disposal in an emergency situation. Considering that page 3-10 of the application identifies an annual DDW flow rate of 35,500,000 gallons per year (approximately 67.5 gallons per minute) and Figure 3.1-5 identifies a 120 gpm flow rate to the DDW, the 300,000 gallons of surge capacity would provide between 1.5 and 3 days of backup. It is not clear to the staff whether the proposed volume of the tank storage (300,000 gallons) will provide adequate surge capacity. Based on the above referenced conflicting DDW flow rates, staff is also unclear on the DDW disposal rate estimated for MEA.<br>Additionally, the application does not provide engineering and design aspects of the surge tanks and associated infrastructure (tank construction, secondary containment and any radiation protection implications). This information is necessary to determine if CBR's MEA operation will be protective of human health and the environment.<br>Request for Additional Information Please provide:<br>(a) better clarity of the anticipated DDW disposal.<br>(b) additional information that demonstrates that the tanks provide adequate surge capacity.<br>(c) a further discussion of other options for disposal of wastewater if the DDW suddenly is not available for an extended period of time. | CBR - See revisions to Section 3.1.7 of the application dated 6/26/2013.<br><br>NRC – Staff indicated that units in Appendix T need to be labeled. Staff requested the excel spreadsheets of Appendix T for their independent review. Staff requested information about the Class I deep disposal well (DDW) permit and how many DDWs the permit allows.<br><br>CBR – Acknowledged the comments and planned to send NRC a copy of the Class I permit application and the Appendix T spreadsheets.<br><br>ACTION: CBR to address comments and submit a copy of its Class I permit application and Appendix T spreadsheets to the NRC. |

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| (d) additional information concerning the engineering and design aspects of the tanks and associated infrastructure (e.g., tank construction, secondary containment, and any radiation protection implications). | |
| **Section 5 – Operations** | **Meeting Comments** |
| **RAI 31** Description of Deficiency The applicant did not provide a drawing with proposed airborne uranium particulate sampling locations.<br>Basis for Request NUREG-1569, Acceptance Criterion 5.7.3.3(1), states: "The applicant provides one or more drawings that depict the facility layout and the location of samplers for airborne radiation. Locations are based, in part, on a determination of airflow patterns in areas where monitoring is needed, and determination of monitoring locations is consistent with Regulatory Guide 8.30, "Health Physics Surveys in Uranium Recovery Facilities," (NRC, 2002a)."<br>In TR Section 5.7.3.1, the applicant stated that one location near the resin transfer station will be sampled monthly for airborne uranium particulates. However, on Figure 5.7-2, there is no indication of an airborne uranium particulate sampling location.<br>Request for Additional Information Please provide, or update (e.g., Figure 5.7-2), a drawing with the proposed airborne uranium particulate sampling location or indicate where this can be found in the application. | CBR - See revisions to Figure 5.7-2 of the application dated 6/26/2013.<br><br>NRC - RAI resolved by Revised Application. |
| **RAI 38** Description of Deficiency The applicant did not provide the criteria used for determining the proposed locations for the airborne effluent monitoring stations.<br>Basis for Request NUREG-1569, Acceptance Criterion 5.7.7.3(2), states: "The proposed locations of the airborne effluent monitoring stations are consistent with guidance in Regulatory Guide 4.14, Sections 1.1.1 and 2.1.2 (NRC, 1980). The license applicant adequately considers site-specific aspects of climate and topography in determining the number and locations of off-site airborne monitoring stations and environmental sampling areas. The criteria used in selecting sampling locations should be given. All sampling locations should be clearly shown relative to the proposed facility, nearest residences, and population centers on topographic maps of the appropriate scale."<br>Request for Additional Information Consistent with NUREG-1569, Acceptance Criterion 5.7.7.3(2), please provide the criteria used for determining the proposed locations for the airborne effluent monitoring stations. | CBR - See revisions to Section 2.9.2.1 of the application dated 6/26/2013.<br><br>NRC – Staff provided clarification regarding the RAI and the type of information that has been acceptable to the staff in similar applications..<br><br>CBR – Acknowledged the comment. |
| **Section 6 – Ground-water Quality Restoration, Surface Reclamation, and Facility Decommissioning** | **Meeting Comments** |
| **RAI 39** Description of Deficiency The information provided in TR Section 6.1 does not meet the applicable requirements of 10 CFR Part 40, using the review procedures in Section 6.1.2 and acceptance | CBR - See revisions to Section 6.1.4.1 of the application dated 6/26/2013. |

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| criteria in Section 6.1.3 of NUREG-1569.<br>Basis for Request CBR's technical basis for the proposed MEA flare factor (20%) is operational experience and hydrological modeling at nearby commercial ISR operation. Consistent with NUREG-1569, Section 6.1.3(2), the applicant did not propose a vertical and horizontal flare factors for the MEA, nor did it provide a technical basis that is specific to MEA.<br>Request for Additional Information Please propose vertical and horizontal flare factors or justification for proposing one flare factor for MEA. Also, provide a technical basis for the proposed flare factor(s). | NRC - RAI resolved by Revised Application. |