

**CAMECO RESOURCES
CROW BUTTE OPERATION**



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July 13, 2016

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

40-8964

Attn: Document Control Desk, Director
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Summary of June 14, 2016, Teleconference Regarding Open Issues
Marsland Expansion Area License Amendment (CAC NO. J00683)

Dear Director:

By e-mail dated July 6, 2016, the U.S. Nuclear Regulatory Commission (NRC) staff submitted a summary of the June 14, 2016 teleconference regarding open issues associated with CBR's application for the Marsland Expansion Area (MEA). The NRC staff requested, within seven (7) days of the receipt of the letter, responses to open issues 6, 7, 13, and 14.

Issue #6: License Condition (LC) 11.10

The NRC staff has not received a response to its comments on the applicant's contamination survey program, including a demonstration of minimum detectable concentrations (MDC) for survey instruments.

Discussion

By letter dated February 24, 2016, the NRC staff transmitted comments on the applicant's proposed contamination survey program (NRC, 2016a). The NRC staff has not received a response to these comments.

NRC Staff Comment

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Since the contamination survey program for the MEA facility is contingent on the NRC staff's verification of the applicant's response to LC 11.10, the NRC staff can't begin its review of Section 5.7.6 of the applicant's TR until this verification is complete.

CBO Response

As a result of the June 14, 2016 meeting that was held to discuss the MEA open issues, the NRC and industry have been working towards setting up a meeting to discuss health physics issues like those described in this open issue. Upon completion of the meeting, Cameco will have a better estimate on when the NRC will receive responses to this issue and will provide an updated schedule at that time.

Issue #7: Airborne Effluent Monitoring

The applicant's proposed airborne effluent and environmental monitoring program for the Marsland facility is not consistent with what has been approved for the main facility.

Discussion

By letter dated January 6, 2016 (NRC, 2016b), the NRC staff verified the adequacy of the applicant's response to LC 11.11 (NRC, 2014). This verification occurred after the submittal of the most recent revised application (CBR 2015). As a result, the proposed airborne effluent and environmental monitoring program is sufficient to demonstrate compliance with 10 CFR 40.65, 10 CFR 20.1302, and 10 CFR 20.1501.

The NRC staff recognizes that certain "as built" drawings are not available to demonstrate compliance for items such as tank vents and general ventilation discharge points.

NRC Staff Comment

Please update the Marsland application to reflect commitments made to address LC 11.11 (NRC, 2014) for the main facility. Please also specifically address those aspects of the facility that will have to be submitted at a later date (e.g., tank vents and general ventilation discharge points). The NRC staff can't begin its review of Section 5.7.7 of the applicant's TR until these action items are completed.

CBO Response

The necessary information to address this open issue will be submitted within the third quarter of 2016.



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Issue #13: Identification of the Orella Member of the Brule Formation

In Sections 2.7.2 of the Revised 2015 Technical Report (TR) (CBR, 2015), the Brown Siltstone Member of the Brule Formation is described as constituting the first overlying aquifer above the production zone. However, in a letter dated April 20, 2016, to the Nebraska Department of Environmental Quality (NDEQ) in support of its Aquifer Exemption Application (AEP) (CBR, 2016), CBR makes the following statements:

Geophysical logs in Figure 6 of "Cenozoic Paleogeography of Western Nebraska", show several ash beds in relation to accepted formational boundaries of the Arikaree, Brule and Chadron Formations. A review of geophysical logs from the MEA show similar log traces for some of these air-fall tuff horizons; in particular, the Nonpareil, upper Whitney, and lower Whitney ash zones.... Therefore, in the revised AEP, the base of the Brule Formation has been moved downward, below the lower Whitney Ash.

Discussion

NRC staff notes that, although the Orella Member of the Brule Formation is identified in the TR as the lowermost Brule unit above the Chadron Formation, it is not mentioned in these representations to NDEQ, which appears to reflect that information sent to the NDEQ is inconsistent with information sent to NRC.

NRC Staff Comment

The applicant should revise the TR as necessary with respect to the identification of the Orella Member of the Brule Formation at the site.

CBO Response

The application will be revised once the data has been collected from the geophysical log of the additional wells. (See response to Issue #14).

Issue #14: Additional Characterization of the Lower Brule Formation

CBR notes in its letter to NDEQ (CBR, 2016) that:

As the base of the Brule Formation has been revised downward, a corresponding decrease in the thickness of the upper Chadron Formation is observed...As these lower portions of the Brule Formation were not monitored for water quality and water levels, CBR proposes to install additional monitoring wells to assess quarterly water quality and



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water levels for this portion of the Brule Formation for a period of one year to assess seasonal conditions.... The original Marsland pump test did not assess potential impacts to this lower portion of the Brule Aquifer. Therefore, CBR proposes to perform an additional pumping test, once the above monitoring wells are completed, to assess if any hydrologic connections exist between the mining zone and the lower portion of the Brule Formation.

Discussion

The proposed additional characterization of the lower Brule Formation described above to the State is new information that the NRC has not seen before and is not mentioned in the TR submitted to NRC.

Criterion 5G (3) of Appendix A requires that the applicant supply information about the "Location, extent, quality, capacity and current uses of any ground water at and near the site." In reference to the ground water resources adjacent to ISR facilities, Section 2.7.1(3ii) of NUREG-1569 calls for "a description of aquifer properties, including material type, formation thickness, effective porosity, hydraulic conductivity, and hydraulic gradient." An aquifer is defined in 10 CFR 40, Appendix A, as "...a geologic formation, group of formations, or part of a formation capable of yielding a significant amount of ground water to wells or springs." Section 2.7.2 of NUREG-1569 also calls for an evaluations of "the site hydrogeologic conceptual model for ground water flow in potentially affected aquifers" as well as an examination of "...pumping tests that are used to investigate vertical confinement or hydraulic isolation between the ore production zone and upper and lower aquifers."

If an aquifer deeper than the previously identified one in the Brown Siltstone Member is determined to represent the first overlying aquifer within the Brule Formation, additional pump test and chemical data to demonstrate the isolation of such an aquifer from the production zone would be required. Furthermore, the vertical and horizontal effects of the groundwater flow system of water withdrawals from a deeper Brule aquifer (if found) would have to be evaluated by the applicant. The vertical and horizontal effects of the groundwater flow system of water withdrawals from a deeper Brule aquifer (if found) would also have to be evaluated by the applicant.

NRC Staff Comment

The applicant should revise the TR to encompass the additional characterization of the Brule Formation and the address the related NRC regulatory requirements.

CBO Response

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As stated in the open issue, CBO has indicated that additional wells will be installed in the lower portion of the Brule Formation. CBO will install these new wells near the existing AOW and BOW wells with a total of ten (10) targeted for installation. If this portion of the Brule Formation is found to be an aquifer as defined in 10 CFR 40, Appendix A, quarterly water quality and water level samples will be collected. In addition, prior to operation, CBO will perform a pumping test to assess if any hydrologic connections exist between the mining zone and the lower portion of the Brule Formation. The pumping test will utilize similar wells as the previous pumping test in addition to the newly installed deep Brule Formation wells.

Installation of the ten (10) new wells is scheduled to be completed by the middle of December 2016. It is estimated that the laboratory results from the first quarterly water samples will be received by the middle of January 2017. A summary of the first quarter laboratory data and additional information describing the lower Brule Formation will be submitted to the NRC by the end of February 2017.

If there are any further questions or concerns feel free to contact me at (308) 665-2215 ext. 114.

Sincerely,

A handwritten signature in cursive script that reads "Larry Teahon".

Larry Teahon
SHEQ Manager

cc: Deputy Director
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Uranium Recovery and Waste Programs
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
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CBO- File

cc: CR - SRH
Tom Lancaster – Project Manager