

**CAMECO RESOURCES  
CROW BUTTE OPERATION**



86 Crow Butte Road  
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January 5, 2023

**ELECTRONIC DELIVERY**

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

Annual Report of Changes, Tests, or Experiments  
License No. SUA-1534  
Docket No. 40-8943

ATTN: Document Control Desk:

Crow Butte Resources, Inc. (CBR) d/b/a Cameco Resources – Crow Butte Operation (CBO) is providing this annual report summarizing the changes, tests or experiments made under License Condition 9.4 of SUA-1534 during calendar year 2022. This report is made in accordance with the reporting requirements contained in License Condition 9.4 (E).

CBR's second renewal of its source material license was received November 5, 2014. The renewed license contained Performance Based License Conditions (PBLC). In a PBLC, CBR is allowed to make changes or conduct tests and experiments under certain conditions. These changes, tests, and experiments must be reviewed and approved by the CBR Safety and Environmental Review Panel (SERP). During 2022, the CBR SERP approved one change.

The following materials are attached to provide the required summary information and documentation required by License Condition 9.4 (E).

- SERP Evaluation Index, which summarizes each SERP Action and tracks any modifications to an approved action affected by subsequent SERP actions
- A copy of the text of each approved SERP Evaluation. These evaluations describe the change or test approved and the safety and environmental evaluation performed by the SERP. Supporting documentation is maintained on site for NRC review.

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- Only one SERP evaluation was performed during 2022. This evaluation reviewed and approved the process to accept, as equivalent feed, municipally loaded resin and process the Uranium Loaded Resin (ULR) to produce yellowcake.

By letter dated October 19, 2009, in the response to violation of 10 CFR 40.42 (h)(1) and 10 CFR 40.42 (i), CBO submitted a request for an alternate decommissioning (groundwater restoration) schedule for mine units 2 through 5. CBO also indicated in this request that an annual review of the groundwater decommissioning schedule would be added to the Annual Summary of Changes list. By letter dated October 28, 2022, CBO requested an alternate decommissioning schedule for the full site.

Mine Unit 2 was returned to stability monitoring during the first quarter of 2022. If an Alternate Concentration Limit (ACL) is required, CBO will begin work on the ACL after stability monitoring is completed.

While ensuring stability trends in MU3, well P246 (WH7 MU3) exceeded the restoration value for uranium. The value for uranium went from .09 (9/26/14) to 4.04 (3/29/17). Based on a discussion with Nebraska Department of Environmental and Energy (NDEE), MU3 was returned to IX / RO treatment on September 15, 2017 in order to spot treat the well. This treatment has been completed and Mine Unit 3 has been returned to stability monitoring, with the first stability samples collected in September 2018. The mine unit currently remains in stability monitoring. CBO has collected coring data from MU3 and anticipates submitting an ACL request for the affected constituents.

Similar to the situation in Mine Unit 2, Mine Unit 4 was removed from stability monitoring and treatment activities resumed in September 2020. The mine unit was returned to stability monitoring in the first quarter of 2022. If an ACL is required, CBO will begin work on the ACL once stability monitoring is completed.

CBO initiated stability monitoring in Mine Unit 5 late in August 2018 where the mine unit remains. If an ACL is required, CBO will begin work on the ACL after stability monitoring is completed.

Mine Unit 6 is nearing the end of treatment and is currently being monitored for suitability to begin stability monitoring. CBO projects that Mine Unit 6 will be placed in stability monitoring in the first quarter of 2023. If an ACL is required, CBO will begin work on the ACL after stability monitoring is completed.

On November 6, 2018, CBO ceased mining in Mine Unit 7 and initiated restoration activities in this mine unit. Treatment activities continue in Mine Unit 7 and are projected

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to continue through the second quarter of 2024 and then enter stability monitoring. If an ACL is required, CBO will begin work on the ACL after stability monitoring is completed.

On March 29, 2021, CBO received approval of the Mine Unit 8 restoration plan. Restoration activities were initiated, and treatment is ongoing in Mine Unit 8. Stability monitoring is projected to be initiated during the first quarter of 2025. If an ACL is required, CBO will begin work on the ACL after stability monitoring is completed.

The remaining mine units (9-11) are currently in standby mode. A Gant chart demonstrating the projected restoration schedule for Mine Units 2-8 as well as the planned schedule for Mine Unit 9-11 is attached at the end of this report.

If you have any questions or require further information, please do not hesitate to contact me at (308) 665-2215 ext. 121.

Sincerely,  
CAMECO RESOURCES  
CROW BUTTE OPERATION

A handwritten signature in blue ink, appearing to read 'Casey Yada', with a stylized flourish at the end.

Casey Yada  
SHEQ Coordinator

Enclosures: As Stated

cc: Deputy Director, Division of Decommissioning  
Ron Burrows

CBO – File

cc: CR – Electronic File



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**2022 SERP Evaluation Index**

## 2022 SERP Index

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**SERP 22-01 Evaluation**



## **CROW BUTTE RESOURCES, INC.**

**SERP 22-01**

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**Crow Butte Resources, Inc.**

**Safety and Environmental Review Panel**

**Evaluation Report – SERP 22-01**

**Approval to Receive and Extract Uranium from Uranium Loaded Resin (ULR)  
from a Small Community Water System (CWSs)**

**December 28, 2022**

The Crow Butte Resources, Inc. (CBR) Safety and Environmental Review Panel (SERP) met to review and approve receiving and processing an equivalent feed (uranium loaded resin) from community water treatment facilities.

The SERP appointed for this evaluation consisted of the following members:

<u>Name</u>	<u>Title</u>	<u>Area of Expertise</u>
Tate Hagman	Restoration Manager	Management
Casey Yada	SHEQ Coordinator	Safety / Compliance
Tami Dyer	Radiation Safety Officer	Radiation
Brian Taylor	Plant Foreman	Operations

Mr. Hagman is the SERP Chairman. Mr. Yada was appointed SERP Secretary for this evaluation.

### **Purpose of SERP Evaluation**

The purpose of this evaluation by the CBR SERP was to review and approve the process of receiving, from Small Community Water Systems (CWSs), resin loaded with uranium through a municipal treatment system, the extraction of the uranium from such resin and either the return of the stripped resin to a water treatment facility, disposal as byproduct material, or reuse in CBR's facility.



## **CROW BUTTE RESOURCES, INC.**

### **SERP 22-01**

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On April 16, 2012, the NRC Regulatory Issued Summary (RIS) 2012-06. The RIS outlines the NRC's policy regarding submittal of amendments for processing of equivalent feed at licensed uranium recovery facilities.

The NRC staff has determined that NRC and Agreement State-licensed uranium recovery facilities should be permitted to accept uranium loaded resin (ULR) as equivalent feed without the need for a license amendment so long as the receiving facility can demonstrate the ULR meets the equivalent feed criteria (i.e., it is physically and chemically essentially the same as the resin being processed at the facility, can be processed on the current equipment at the facility, processing the equivalent feed is within the facilities safety and environmental review envelope, and the processing does not exceed the license's uranium production limit).

License Condition 9.4 allows CBR to make changes in the facility or procedures or conduct tests or experiments that are not presented in the approved application if such changes do not:

- i. Result in any appreciable increase in the frequency of occurrence of an accident previously evaluated in the license application (as updated);
- ii. Result in any appreciable increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the license application (as updated);
- iii. Result in any appreciable increase in the consequences of an accident previously evaluated in the license application (as updated);
- iv. Result in any appreciable increase in the consequences of a malfunction of an SSC previously evaluated in the license application (as updated);
- v. Create a possibility for an accident of a different type than any previously evaluated in the license application (as updated);
- vi. Create a possibility for a malfunction of an SSC with a different result than previously evaluated in the license application (as updated);
- vii. Result in a departure from the method of evaluation described in the license application (as updated) used in establishing the final safety evaluation report (FSER) or the environmental assessment (EA) or the technical evaluation reports (TERs) or other analysis and evaluations for license amendments.
- viii. For the purposes of SERP evaluations, SSC means any SSC which has been referenced in a staff SER, TER, EA, or environmental impact statement (EIS) and supplements and amendments.

The SERP reviewed the proposal and supporting documentation and evaluated this information as compared with the requirements of the licensing basis, including the following documents:





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- Title 10, Code of Federal Regulations;
- Source Materials License SUA-1534, Amendment No. 5 dated March 4, 2021;
- *Application for Renewal of USNRC Radioactive Source Materials License SUA-1534*, Crow Butte Resources, Inc. November 2007;
- *Environmental Assessment for Renewal of Source Materials License No. SUA-1534*, USNRC October 2014;
- *Safety Evaluation Report for Renewal of Source Materials License No. SUA-1534*, USNRC August 2014;
- Technical Evaluation Reports issued in support of amendments to SUA-1534.
- RIS-2012-06: *NRC Policy Regarding Submittal of Amendments For Processing of Equivalent Feed at Licensed Uranium Recovery Facilities*

#### **Title 10 Code of Federal Regulations**

The proposed change will have no impact on CBR's ability to meet all applicable NRC regulations.

#### **Source Materials License SUA-1534 Requirements**

Amendment No. 5 to SUA-1534 dated March 4, 2021 was reviewed for specific requirements related to receiving and processing ULR from CWSs. The specific requirement for receiving and processing ULR is outlined in RIS-2012-06.

License Condition 9.2: This License Condition requires that CBR conduct operations in accordance with the representations contained in the LRA. Section 3.1.4 of the LRA discusses the uranium recovery process. Processing the ULR is within the representations contained in the LRA

#### **Environmental Assessment**

The SERP reviewed the contents of the Environmental Assessment (EA) prepared by NRC in October 2014 to determine whether the proposed change could cause substantive safety or environmental impacts. No substantial environmental impacts were identified.

#### **Financial Surety**

The proposed change is covered in the NRC-approved financial surety maintained by CBR and approved by Amendment No. 5 to SUA-1534 in the amount of \$56,121,073.



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### **Safety Evaluation Report**

The Safety Evaluation Report (SER) principally provides the basis for worker safety at Crow Butte and does not specifically address the issues related to chemical safety.

### **Technical Evaluation Reports**

The SERP reviewed the Technical Evaluation Reports (TERs) prepared by NRC staff dated October 5, 2017. The TER does not directly address issues related to processing ULR from a CWSs.

### **RIS-2012-06: NRC Policy Regarding Submittal of Amendments For Processing of Equivalent Feed at Licensed Uranium Recovery Facilities**

The SERP reviewed RIS-2012-06 prepared by NRC staff to support licensed uranium recovery facilities receiving and processing ULR from CWSs. The RIS states that a license amendment is not required if the licensed facility meets the following requirements:

1. The resin is chemically and physically essentially the same as that which is currently used at the facility.

The SERP reviewed the Material Safety Data Sheets for the Z-92® resin and in concurrence with the RIS found that it meets the definition of equivalent feed.

2. The processing uses the facility's existing equipment.

On September 12, 2012, a previous CBR SERP held a conference call with Steve Cohen from the NRC to get further clarification on using the facility's existing equipment. Mr. Cohen indicated that if processing municipal resin would require the licensee to add additional infrastructure, then a license amendment would be required. The SERP concluded that no license amendment would be needed as the existing infrastructure is in place to process the small community water system's ULR.

3. The additional uranium will not exceed the license's uranium production limit.

License Condition 10.2.3: This condition states that the plant throughput shall not exceed a maximum flow rate of 9000 gpm, excluding restoration flow. Annual yellowcake production shall not exceed 2 million pounds. The proposal is well within the limitations of this license condition. CBO's commercial production of yellowcake is expected to remain significantly below the licensed



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limitations. Yellowcake generated from the processing of the ULR is estimated to be less than 500 pounds per year.

4. The process will stay within the facility's environmental and safety review envelope. The procedure will be the same one used to process uranium from the commercial production circuit in the Central Processing Plant. The proposal will stay within the facility's environmental and safety review envelope.

As described in Enclosure 2 of the RIS, the stripped resin can be recycled, becoming the property of CBR and kept for future use, returned to a water treatment facility, or considered byproduct material and disposed of in accordance with NRC regulations. The totes and PES shipping vessels will not be returned to the municipalities. They will be disposed of as 11(e)(2) byproduct waste.

#### **Degradation of Essential Safety or Environmental Commitment**

SUA-1534 allows CBR to make changes as long as they do not degrade the essential safety or environmental commitments made in the application. The SERP determined that safety commitments made in the LRA and discussed in the EA have been met and that when uranium is removed from ULR the safety and environmental commitments will not be degraded.

Based upon this evaluation, as well as the pilot test approved by SERP 12-10, and the assessment of the licensing basis and RIS-2012-06, the CBR SERP hereby approves the process to accept, as equivalent feed, municipally loaded resin and process the ULR to produce yellowcake.



## CROW BUTTE RESOURCES, INC.

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Approved this 28<sup>th</sup> day of December 2022.

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Tate Hagman, Restoration Manager  
SERP Chairman

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Casey Yada, SHEQ Coordinator  
SERP Secretary

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Tami Dyer, Radiation Safety Officer

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Brian Taylor, Plant Foreman



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Restoration Gant Chart

