

# ▶ Mine Unit B ACL Application Update

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# Mine Unit B ACL

- **Welcome and Introduction**
- **Mine Unit B ACL Application Status**
- **Mine Unit B ACL RAI Discussion**

# ▶ Mine Unit B ACL

## Introduction

- **Mine Unit B**

- Cameco Resources submitted Mine Unit B Restoration Report to the WDEQ on Aug. 5, 2004.
- Mine Unit B Restoration approve by WDEQ, March 31, 2008.
- April 2009 NRC Issues Regulatory Issue Summary 2009-05
- NRC expressed concerns with the Mine Unit B Restoration Submittal Sept. 29, 2009
- Cameco begins review NRC Mine Unit B Comments
- 2011 Cameco Informs NRC of Intent to work on ACL License Amendment for Mine Unit B
- Oct. 2011 Cameco Meets with NRC staff to discuss the outline of the ACL Amendment.

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## Introduction

- **Mine Unit B**

- Sept. 2012 Cameco meets with the NRC Staff to discuss preliminary modeling results and final form of the ACL License Amendment.
- Mine Unit B was first ACL for ISR ever submitted to NRC (June 2013)
- NRC replied to the Mine Unit B ACL submittal in Jan. 2014 with technical questions (RAI's) in the meeting summary
- Cameco has been working on addressing NRC's concerns since Jan. 2014
  - ◆ Collection of additional quarterly water samples

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## Introduction

- **Mine Unit B**
  - Considerable effort has been expended in the MU-B Restoration
    - ◆ Large volumes of groundwater has been treated and flushed through the mine unit. (GWS, RO treatment, Reductant Circulation, and RO treatment with bio amendment)
    - ◆ Extensive samples have been and continue to be collected

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## Introduction

- **Restoration Criteria**

- NRC 2009-005 RIS outlined NRC new restoration groundwater standards
- Elise Stritz, NMA 2013 Presentation *ISR Wellfield Background and Restoration Ground Water Quality Data: Collection Statistical Analysis and Public Access (ML13115A115)*
  - ◆ Slide 40 (pdf) summarized NRC stated goals for restoration
  - ◆ Slide 25 (pdf) flow chart review standards
- Location of POC and POE Wells
  - ◆ Slide 24 (pdf) shows examples of ACL well locations
  - ◆ For ISR POC wells are in the source
  - ◆ Conventional tails dams: the POC is at the edge of the source
  - ◆ POE Wells Aquifer Exemption Boundary

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## Mine Unit B ACL Application Status

- **Current Research at SRH**

- State of Wyoming funded Research

- ◆ Research presented April 21, 2015 at UW

- ◆ Cameco participated in four of the research projects, all related to ISR restoration.

- Stimulated the interest of other researchers from the following institutions

- ◆ Los Alamos National Labs

- ◆ Lawrence Berkeley National Labs

- ◆ USGS



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## Mine Unit B ACL Application Status

- **Long lead time items required for responses:**
  - Four additional quarters of ground water sampling
  - Core Samples from down gradient and mining area for the geochemical model
  - Update well inventory for wells within 2km of Mine Unit B

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## Mine Unit B ACL Application Status

- **Additional Stability Sampling**

- Four additional quarters of ground water sampling

- ◆ Started March 2014,
- ◆ Fourth round of sampling completed Dec. 2014
- ◆ Groundwater sampling is ongoing
- ◆ Data has been analyzed using ProUCL5 using various methods (Box Plots, Trend Analysis)
- ◆ Investigating other statistical methods that are applicable.

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## Mine Unit B ACL Application Status

- Major items required for responses:
  - Update well inventory for wells within 2km of Mine Unit B
    - ◆ Well inventory has been completed
    - ◆ Additional data is being gathered on some of the wells in the inventory

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## Mine Unit B ACL Application Status

- **Major items required for responses:**
  - Core Samples gathered from down gradient and mining area for evaluation
  - Core has been evaluated at the University of Saskatchewan and the University of Wyoming
    - ◆ Thin sections for mineralogy
    - ◆ Synchrotron studies (U of S)
    - ◆ Characterization and quantification of clay content in core

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## Mine Unit B ACL RAI's

- **Hydrologic Model**

- Model presented in the original application was regional
- Use regional model to develop a mine unit specific model
- Cameco will provide a hydrologic impacts assessment with the revised ACL application
- Cameco will provide thorough documentation for the hydrologic model

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## Mine Unit B ACL RAI's

- **Geochemical Model Concerns**

- Some of the concerns will be addressed with a revised hydrologic model
- Cameco has retrieved site specific core to be used to refine the model
- Cameco may try a different model approach based on the results of recent research efforts
- Cameco will provide better documentation for the geochemical model

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## Mine Unit B ACL RAI's

- **Human Health Hazard and Exposure Assessment**
  - Cameco will provide a more detailed radiological and cumulative risk assessment
  - Exposure assessment will be part of the risk report
- **Ground Water Monitoring Program**
  - A continued groundwater monitoring plan will be included in the ACL application
    - ◆ Propose revisiting the scope and duration of monitoring in future mine units as experience is gained with the current efforts

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## Mine Unit B ACL RAI's

- **Corrective Actions And Mitigation Measures**

- Cameco will provide a more detailed corrective action summary
  - ◆ Provide scenarios, assumptions, and cost estimates for different levels of corrective action
  - ◆ Cameco will provide additional discussion on the WDEQ deed notice

- **ALARA Analysis**

- Additional groundwater restoration data will be provided to support the ALARA analysis
- The revised corrective action estimate(s) will be used for the ALARA analysis



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## Conclusion

- **Outstanding work once field data is compiled:**
  - Review and calibrate the hydrologic model and provide the electronic model inputs to NRC
  - Revise the geochemical model using site specific data and provide the electronic model inputs to NRC
  - Improve the risk assessment
  - Improve and revise the cost estimate for the corrective action plan
  - Include an extended monitoring program



# ▶ Questions

**The End**



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