



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Record of Decision

In the Matter of

Applicant AREVA Resources Canada Inc.

Subject Application to Renew the McClean Lake
Operation Uranium Mine Operating Licence

Public Hearing
Date(s) June 7 and 8, 2017

RECORD OF DECISION

Applicant: AREVA Resources Canada Inc.

Address/Location: P.O. Box 9204 – 817 – 45th Street West, Saskatoon, SK S7K 3X5

Purpose: Application to renew the McClean Lake Operation Uranium Mine Operating Licence

Application received: August 22, 2016

Date(s) of public hearing: June 7 and 8, 2017

Location: Kikinahk Friendship Centre, 320 Boardman Street, La Ronge, Saskatchewan

Members present: S. McEwan, Panel Chair
 S. Soliman D.D. Tolgyesi
 S. Demeter R. Seeley

Secretary: M.A. Leblanc
 Recording Secretary: P. McNelles
 Senior General Counsel: L. Thiele

Applicant Represented By	Document Number
V. Martin, President and Chief Executive Officer D. Huffman, Vice President, Health, Safety, Environment and Regulatory Relations T. Van Lambalgen, Vice President, Corporate Affairs & General Counsel E. Pacquet, Vice President, Operations & Projects V. Laniece, General Manager, McClean Lake Operation T. Searcy, Manager, Regulatory Relations C. Inglis-McQuay, Senior CSR Advisor G. Lafleur, Manager, Northern Affairs	CMD 17-H9.1 CMD 17-H9.1A CMD 17-H9.1B
CNSC staff	Document Number
R. Jammal, H. Tadros, M. Rinker, R. Lojk, S. Akhter, A. McAllister, B. Dowsley, E. Dagher, C. Ducros, K. Glenn, A. Levine and J. McManus	CMD 17-H9 CMD 17-H9.A CMD 17-H9.B
Intervenors	Document Number
See appendix A	

Others	
Environment and Climate Change Canada: K. Corcoran	
Province of Saskatchewan, Population Health Unit: J. Irvine	
Saskatchewan Ministry of the Environment: T. Moulding and B. England	
Saskatchewan Ministry of Labour Relations and Workplace Safety: K. Coates and L. Kaskiw	

Licence: Renewed

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1.0 INTRODUCTION

1. AREVA Resources Canada Inc. (AREVA) has applied to the Canadian Nuclear Safety Commission¹ for a 12-year renewal of the Uranium Mine Operating Licence for its McClean Lake Mine and Mill Operation (MLO).
2. The MLO is located in the Athabasca Basin of northern Saskatchewan, approximately 750 kilometres north of Saskatoon. The MLO includes the JEB milling area, Sue mining area, the tailings management facility (TMF), and the undeveloped McClean, Midwest and Caribou ore deposits. The construction of the MLO commenced in 1994, and the McClean Lake Mill was commissioned in 1999. Mining and milling of uranium ore from five open-pit mines has been completed and conventional mining has not been carried out at the MLO since 2008. Mill tailings have been deposited in the JEB TMF, and the MLO mill expansion project was completed in 2009, during the current licence period, to provide the necessary radiation protection features in order for the mill to receive and process undiluted high-grade uranium ore.
3. On July 1, 2009, the Commission issued an eight-year Uranium Mine and Mill Operating Licence, as described in the 2009 *Record of Decision*.² That licence was amended by the Commission in October 2012 to increase the annual production limits of uranium concentrate (U₃O₈) from 3,629,300 kg to 5,909,090 kg, to authorize the operation of the high-grade ore slurry receiving circuits, and to adopt the new licence format, with a Licence Conditions Handbook (LCH), as indicated in the 2012 *Record of Decision*.³ In February 2016, AREVA applied to increase its annual production rate to 10,909,090 kg. CNSC staff reviewed that application, and after determining that the proposed production increase was within the licensing basis⁴ and that the health and safety of workers and the environment would remain protected, accepted the requested production increases in May 2016. The Commission wishes to make clear that as AREVA's 2016 request for a production increase was determined by CNSC staff to be within the licensing basis, CNSC staff had the authority to approve that request. The Commission recognizes that the increase in production from the MLO mill has not resulted in an unreasonable risk to the health and safety of persons or to the environment.
4. The current licence authorizes AREVA's McClean Lake Operation to produce up to 10,909,090 kg of uranium concentrate per year, along with associated operations. Additionally, the licence authorizes AREVA to process uranium ore slurry from Cameco

¹ The *Canadian Nuclear Safety Commission* is referred to as the "CNSC" when referring to the organization and its staff in general, and as the "Commission" when referring to the tribunal component.

² Canadian Nuclear Safety Commission Record of Proceedings, Including Reasons for Decision – *Application to Renew the McClean Lake Operation Uranium Mine Operating Licence and Revoke the Midwest Uranium Mine Site Preparation Licence*, AREVA, 2009.

³ Canadian Nuclear Safety Commission Record of Proceedings, Including Reasons for Decision – *Application to Amend the Uranium Mine Operating Licence for the McClean Lake Operation*, AREVA, 2012.

⁴ The licensing basis for a regulated facility or activity is to achieve the level of protection of the health, safety, and security of the public and workers, and the protection of the environment that were identified in environmental and human health risk assessments that were carried out in support of the licence application (LCH, Licence Condition G.1).

Corporation's Cigar Lake Operation, also located in northern Saskatchewan.

5. AREVA's renewal application for the operating licence would allow the continuation of operations that are authorized by the current licence, which include the following activities:
 - Operate and modify a nuclear facility for the mining of uranium and the production of uranium concentrate
 - Mine a nuclear substance (uranium ore) and produce a uranium concentrate
 - Import, possess, use, store, transfer and dispose of nuclear substances and radiation devices that are required for or associated with laboratory studies, field studies, fixed gauge use and borehole logging devices

AREVA does not propose new activities for this facility.

6. AREVA also requested the Commission's approval of a revised financial guarantee (FG), based on the 2016 update to the Preliminary Decommissioning Plan (PDP).

Issues

7. In considering the application, the Commission was required to decide:
 - a) what environmental assessment review process to apply in relation to this application;
 - b) whether AREVA is qualified to carry on the activity that the licence would authorize; and
 - c) whether, in carrying on that activity, AREVA would make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

Public Hearing

8. Pursuant to section 22 of the NSCA, the President of the Commission established a Panel of the Commission to review the application. The Commission, in making its decision, considered information presented for a public hearing held on June 7 and 8, 2017 in La Ronge, Saskatchewan. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*.⁵ During the public hearing, the Commission considered written submissions and heard oral presentations from AREVA

⁵ *Statutory Orders and Regulations (SOR)/2000-211.*

(CMD 17-H9.1, CMD 17-H9.1A, CMD 17-H9.1B) and CNSC staff (CMD 17-H9, CMD 17-H9.A, CMD 17-H9.B). The Commission also considered oral and written submissions from 10 intervenors (see Appendix A for a list of interventions). The hearing was webcast live via the CNSC website, and video archives are available for a three-month period following the hearing. The written transcripts for the hearing have been made available on the CNSC website, and recordings of the hearing are also available in Cree and Dene. A *Summary Record of Decision*⁶ was issued on June 29, 2017.

2.0 DECISION

9. Based on its consideration of the matter, the Commission concludes that AREVA is qualified to carry on the activity that the licence will authorize. The Commission is of the opinion that AREVA, in carrying on that activity, will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed. Therefore,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews the Uranium Mine Operating Licence issued to AREVA Resources Canada Inc. for its McClean Lake Operation located in the Athabasca Basin in Saskatchewan. The renewed licence, UMOL-MINEMILL-McCLEAN.00/2027 is valid for a 10-year period, from July 1, 2017 until June 30, 2027, unless suspended, amended, revoked or replaced.

10. The Commission includes in the licence the conditions as recommended by CNSC staff in CMD 17-H9, with the following revised licence condition 9.2:

The licensee shall, where the effluent concentration reaches or exceeds the discharge limits specified in the *Metal Mining Effluent Regulations*⁷ **as amended from time to time**, immediately investigate and take corrective action to ensure that the effluent concentration is maintained below the discharge limits.

11. The Commission authorizes the delegation of authority with respect to licence condition 3.2 and with respect to the compliance verification section of the LCH in relation to licence condition 3.3, as recommended in section 4.9 of CMD 17-H9. The Commission notes that CNSC staff can bring any matter to the Commission as applicable. The Commission directs CNSC staff to inform the Commission on an annual basis of any changes made to the LCH.
12. The Commission accepts AREVA's revised FG for the decommissioning of the MLO for

⁶ Canadian Nuclear Safety Commission Summary Record of Decision – *Application to Renew the McClean Lake Operation Uranium Mine Operating Licence*, AREVA, 2017.

⁷ *Metal Mining Effluent Regulations* (SOR/2002-222)

the amount of C\$107,241,000, as well as the financial instruments used for the FG.

13. The Commission considers the environmental review that was conducted by CNSC staff to be acceptable and thorough. The Commission also encourages AREVA and CNSC staff to align future environmental reviews and analysis with the ten-year licence period.
14. The Commission takes particular notice of the selenium management program at the MLO, and instructs CNSC staff to report on the progress related to the selenium management plan and selenium effluent as part of each annual *Regulatory Oversight Report*.
15. On the evidence provided, the Commission is satisfied with the level of Aboriginal engagement and consultation that was undertaken in relation to this licence renewal. The Commission expresses its appreciation for the information provided by the intervenors representing Indigenous groups.
16. For any future licence renewal or licence amendment applications which may be submitted for this facility, the Commission directs CNSC staff to include in the staff recommendations either an appendix listing notable non-compliance incidents at the MLO, or to provide more detailed information on specific examples of non-compliances at that facility.
17. With this decision, the Commission directs CNSC staff to report annually on the performance of the MLO, as part of an annual *Regulatory Oversight Report*. CNSC staff shall present this report at a public proceeding of the Commission, where members of the public will be able to participate.

3.0 ISSUES AND COMMISSION FINDINGS

18. In making its licensing decision, the Commission considered a number of issues relating to AREVA's qualification to carry out the proposed activities and the adequacy of the proposed measures for protecting the environment, the health and safety of persons, national security and international obligations to which Canada has agreed. These issues encompassed all 14 relevant Safety and Control Areas (SCAs).

3.1 Management System

19. The Commission examined AREVA's Management System which covers the framework that establishes the processes and programs required to ensure that the MLO achieves its safety objectives and continuously monitors its performance against these objectives, and fosters a healthy safety culture. Based on information submitted by AREVA and CNSC staff, the Commission considered the following specific areas of this safety and control area (SCA):

- Management System
- Organization
- Safety Culture
- Performance Assessment, Improvement and Management Review
- Change Management
- Management of Contractors

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016.

20. The Commission considered AREVA's management system at the MLO, including the Integrated Quality Management System (IQMS), which applies to regulated activities performed by the employees and contractors and is used to provide assurance to regulatory agencies, clearly define the roles and responsibilities of all workers, and to ensure the continuous improvement of the processes and operations of the MLO. AREVA stated that the IQMS is compliant with the requirements of ISO 14001:2004,⁸ ISO 17025:2005,⁹ and OHSAS 18001:2007¹⁰ standards, and that AREVA is working towards receiving certification for the ISO 14001:2015¹¹ standard by 2018. AREVA reported that periodic management reviews, as well as both internal and external audits, are performed on its management system and on its compliance with the aforementioned standards. An Environmental Health and Safety (EHS) compliance audit is undertaken every three years to assess the MLO compliance with the relevant legislation, site permits, and federal and provincial EHS regulations. AREVA added that it maintains an appropriate contractor management program and change control/design program, and that AREVA continues to seek new opportunities to improve safety performance and reduce risks at the MLO.
21. CNSC staff monitors the implementation of the management system at the MLO through several compliance verification activities, including on-site inspections and desktop reviews. CNSC staff noted that the inspections and desktop reviews performed in 2015 and 2016 outlined certain non-compliances and areas of improvement in areas of low safety-significance. CNSC staff stated that AREVA submitted a corrective action plan and addressed all identified non-compliances, therefore all non-compliance issues have been closed. CNSC staff stated that AREVA used the findings from these inspections and reviews to revise its IQMS, which is being adapted to conform to CSA standard N286-12, *Management System Requirements for Nuclear Facilities*.¹² CNSC staff stated its opinion that AREVA has a mature, effective management system at the MLO, and that it satisfies all regulatory requirements.

⁸ International Organization for Standardization (ISO) – ISO 14001:2004, *Environmental management systems – Requirements with guidance for use*, 2004.

⁹ International Organization for Standardization/International Electrotechnical Commission – ISO/IEC 17025:2005, *General requirements for the competence of testing and calibration laboratories*, 2005.

¹⁰ Occupational Health and Safety Assessment Series (OHSAS) – OHSAS 18001:2007, *Occupational Health and Safety Management*, 2007.

¹¹ International Organization for Standardization – ISO 14001:2004, *Environmental Management Systems – Requirements with guidance for use*, 2015.

¹² CSA Group – CSA N286-12, *Management system requirements for nuclear facilities*, 2012.

22. The Commission noted that AREVA and Cameco collaborate on various environmental initiatives and community outreach programs, and asked if there were similar levels of collaboration regarding safety-related programs. The Cameco representative responded that both companies are members of the Saskatchewan Mining Association, and that as part of that association, there has been a concerted effort to share experience and lessons learned regarding safety through means such as meetings, presentations, and the informal sharing of knowledge and experience. The AREVA representative stated that both companies are leaders in safety stewardship within the Saskatchewan Mining Association, and that there is a safety committee that holds regular meetings to share information on events and promote activities that will improve safety across the mining industry. The AREVA representative added that information is shared regarding dangerous occurrences on the sites, and that for the last few years these organizations have met along with other companies at a joint safety summit in Saskatchewan, to share safety experiences and information on safety improvements. The AREVA representative also noted that there are several committees within this organization, including environmental, human resources, diversity, and training committees.
23. Asked about actions taken in the event of irreconcilable differences between workers and management, the AREVA representative confirmed for the Commission that there is an operational plan in place to stop the operation of the facilities at the MLO and place them in a safe shutdown state, should this event occur. The AREVA representative added that the water treatment plant would need to continue functioning, and there are people on-site who are trained to operate it.
24. Based on its consideration of the information that was presented, the Commission concludes that AREVA has appropriate organization and management structures in place and that the operating performance at the MLO in the current licence period provides a positive indication of AREVA's ability to adequately carry out the activities under the proposed renewed licence.

3.2 Human Performance Management

25. Human performance management encompasses activities that enable effective human performance through the development and implementation of processes that ensure licensee staff is sufficient in number in all relevant job areas and have the necessary knowledge, skills, procedures and tools in place to safely carry out their duties. The Commission considered the following specific areas of this SCA:

- Human Performance Program
- Personnel Training

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016.

26. The Commission considered information related to training programs and activities at the

MLO. AREVA provided detailed information on this topic, including on the overall training process and training methods, evaluation and testing methods, record-keeping system and the collaborations with outside organizations such as colleges and universities. AREVA reported that the MLO training activities are performed in accordance with its IQMS and adheres to the Systematic Approach to Training (SAT). AREVA added that, throughout the licence period, training programs were continuously reviewed and updated as per the requirements of the SAT, and that future reviews of the various training programs are planned.

27. CNSC staff reported that it endorses SAT frameworks for training programs at uranium mines and mills, and that AREVA reports annually on improvements to its training programs and on the training provided to MLO workers. CNSC staff stated that AREVA's training programs and records are reviewed through periodic compliance inspections, and that a 2015 inspection of the MLO resulted in a small number of minor deficiencies and recommendations. All non-compliances were corrected to the satisfaction of CNSC staff. CNSC staff noted that AREVA's training and record-keeping programs are in compliance with Version 1 of REGDOC-2.2.2, *Human Performance Management, Personnel Training*.¹³ CNSC staff informed the Commission that, from its review of the relevant sections of the IQMS and all of AREVA's training documentation, CNSC staff is satisfied with the training system at the MLO, and that it will review and propose modifications to AREVA's training programs as part of on-going compliance activities.
28. The Commission notes that AREVA will be expected to be fully compliant with Version 2 of REGDOC-2.2.2, *Human Performance Management, Personnel Training*¹⁴ by December 31, 2017. This is reflected in the LCH.
29. Asked about the training of new hires at the MLO, the Unifor Local 48 representatives provided an overview of the training for new mill operators, such as safety training, equipment training and chemical training, as well as additional details on the mill operator training program, including the mentoring and supervision of new workers.
30. Based on its consideration of the presented information, the Commission concludes that AREVA has appropriate programs in place and that current efforts related to human performance management provide a positive indication of AREVA's ability to adequately carry out the activities under the proposed licence.

3.3 Operating Performance

31. Operating performance includes an overall review of the conduct of the licensed activities and the activities that enable effective performance as well as improvement plans and significant future activities at the MLO. Based on information submitted by AREVA and

¹³ Canadian Nuclear Safety Commission Regulatory Document – REGDOC-2.2.2, *Human Performance Management, Personnel Training*, (Version 1), August, 2014.

¹⁴ Canadian Nuclear Safety Commission Regulatory Document – REGDOC-2.2.2, *Human Performance Management, Personnel Training*, (Version 2), December, 2016.

CNSC staff, the Commission considered the following specific areas of this SCA:

- Conduct of Licenced Activities
- Procedures
- Reporting and Trending

CNSC staff evaluated the performance of the MLO in this SCA and rated it as satisfactory for the period 2009-2016. These specific areas will be discussed concurrently in this section.

32. The Commission assessed the information regarding AREVA's operating activities over the current licence period, including large projects such as the shutdown and restart of the mill, the increases in annual production limits of uranium concentrate, the JEB TMF optimization project, and other notable projects and accomplishments. The AREVA representative stated that unplanned events are reported as required, and added that all incidents were reported to CNSC staff in a timely manner and were of low safety significance.
33. The Commission notes that the MLO reports annually on its operating performance and safety performance to CNSC staff. The Commission also notes that AREVA provides notification to CNSC staff of any event that occurs outside of normal operations in the annual report.
34. CNSC staff reported that the compliance of the MLO operations with respect to regulatory requirements is verified through desktop reviews, on-site inspections, and Regulatory Oversight Reports, and stated that it is satisfied with AREVA's reporting, internal investigations, responses to information requests, and corrective actions. CNSC staff noted that AREVA has operated the MLO facility in accordance with regulatory requirements, and also noted that improvements to the operation, equipment and programs are identified on a continuous basis and implemented. Based on its assessment of the operations of the MLO, CNSC staff indicated its view that AREVA has continuously improved its operational performance, and has made adequate provision for the safe operation of the MLO.
35. Asked to address the concerns raised by the Saskatchewan Environmental Society (SES) that AREVA's proposed significant and future activities, as described in section 2.3 of CMD 17-H9.1 could be considered new activities, CNSC staff explained that these future significant projects would need to be assessed by CNSC staff as per the regulatory process, to determine if the proposed activities are within the licensing basis. If a proposed activity was within the licensing basis, then CNSC staff would make the decision on its acceptability. If the project was outside of the licensing basis, then it would need to be brought before the Commission for a decision. The representative from the SES noted their appreciation for the clarification provided by AREVA and CNSC staff regarding this issue.

36. Asked about any challenges posed due to uranium in the tailings, the AREVA representative stated that, as part of the tailings optimization and validation program, the tailings are sampled on a periodic basis to ensure that the behaviour of the uranium in the tailings will not pose a risk to the environment. The AREVA representative added that AREVA does not see the uranium concentration in the tailings to be an environmental concern. CNSC staff stated that AREVA has robust programs in place and is in compliance with regulatory requirements, therefore CNSC staff reported that the uranium concentration in the tailings does not pose any unreasonable risk to the environment or the health and safety of people.
37. Based on the above information, the Commission concludes that the operating performance at the MLO during the current licence period provides a positive indication of AREVA's ability to carry out the activities safely under the proposed licence.

3.4 Safety Analysis

38. Safety analysis is a systematic evaluation of the potential hazards associated with the conduct of a proposed activity or the operation of a facility, and considers the effectiveness of preventive measures and strategies in reducing the effects of such hazards. It supports the overall safety case for the facility. Based on information submitted by AREVA and CNSC staff, the Commission examined the following specific areas of this SCA:
- Hazard Analysis
 - Management of Safety Issues

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016.

39. The Commission considered information regarding the licensee's safety analysis programs. AREVA provided an overview of these programs, their individual uses, their frequency of use, and examples of each of the different safety analysis methodologies utilized at the MLO. AREVA stated that the facilities at the MLO are designed in accordance with the OHSAS 18001¹⁵ standard requirements for hazard identification and risk assessment. AREVA reported that the hazard and operability assessments (HAZOP) analyses were used to identify a comprehensive set of hazards as well as the safeguards needed to mitigate those hazards, and also reported that the Fire Hazard Assessments (FHAs) were conducted by a third party and in accordance with the National Fire Code of Canada¹⁶ (NFCC) and the National Building Code of Canada¹⁷ (NBCC). AREVA noted that an action plan was created to address the deficiencies identified during the FHA and

¹⁵ Occupational Health and Safety Assessment Series (OHSAS) – OHSAS 18001:2007, *Occupational Health and Safety Management*, 2007.

¹⁶ National Research Council Canada – *National Fire Code of Canada, 2010*, < http://www.nrc-cnrc.gc.ca/eng/publications/codes_centre/2010_national_fire_code.html>.

¹⁷ National Research Council Canada – *National Building Code of Canada, 2010*, < http://www.nrc-cnrc.gc.ca/eng/publications/codes_centre/2010_national_building_code.html>.

was submitted to CNSC staff, as was AREVA's radiation performance conformation plan, and that recommendations from CNSC staff are considered and incorporated into the MLO processes to continuously improve safety.

40. CNSC staff informed the Commission that, in accordance with CNSC requirements, AREVA is required to implement and maintain a process to continually identify and address hazards and risks at the MLO. CNSC staff reported that safe work plans are conducted for any work that is considered to be high-risk and non-routine. CNSC staff noted that, prior to the implementation of significant modifications or changes to the MLO operations, CNSC staff is provided with an assessment of the potential risks and the proposed mitigation measures for the identified risks. CNSC staff stated that the compliance verification activities for this SCA included on-site inspections, such as a January 2016 inspection that confirmed the MLO's compliance with the regulatory requirements, as well as desktop reviews of AREVA's compliance reporting and revisions to the program documentation relevant to this SCA. CNSC staff stated its view that from its assessments that AREVA is in compliance with the regulatory requirements and CNSC staff's expectations regarding the development and maintenance of the safety analysis for the facility.
41. On the basis of the information presented, the Commission concludes that the systematic evaluation of the potential hazards and the preparedness for reducing the effects of such hazards are adequate for the operation of the MLO and the activities under the proposed licence.

3.5 Physical Design

42. Physical design includes activities to design the systems, structures and components to meet and maintain the design basis of the facility. The design basis is the range of conditions, according to established criteria, that the facility must withstand without exceeding authorized limits for the planned operation of safety systems. Based on information submitted by AREVA and CNSC staff, the Commission considered the following specific areas of this SCA:

- Design Governance
- Site Characterization
- Facility Design
- System Design

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016. These specific areas will be discussed concurrently in this section.

43. The Commission examined AREVA's physical design program, change control processes and design control processes. AREVA reported that all facilities are designed, installed, operated, and modified in accordance with the physical design program as described in the

IQMS. AREVA stated that the change control processes ensure that all changes to the facilities, personnel and operating methods are implemented safely, and that the design control processes ensure that design functions are performed adequately and that appropriate consideration is given to each stage of the design lifecycle. AREVA reported that these aforementioned processes assess risks and determine the mitigation methods to reduce the risks.

44. AREVA stated that several improvements were made to the design control process over the current licence term and provided several examples of those improvements, such as the implementation of a tiered training program. AREVA reported that the Quality Control manual was also revised and updated over the current licence period and was approved by the Technical Safety Authority of Saskatchewan. AREVA added that the McClean Lake mill underwent a safe shutdown and restart, and that a detailed report on the construction, commissioning and operation performance of the mill had been submitted to CNSC staff.
45. CNSC staff reported that AREVA's MLO physical design is described and documented in its facility description manual and that the design control and change control processes were reviewed and accepted by CNSC staff. The Commission noted that the mill design was previously proposed according to subsection 5(2) of the *Uranium Mines and Mills Regulations*.¹⁸ CNSC staff provided a detailed description of the design of the JEB tailings facility, as well as key design components of the milling circuits. CNSC staff reported that inspections that occurred in 2016 verified the continuous improvements on the MLOs change control processes, and also verified that the MLO was in compliance with this SCA, as all identified non-compliances were of low safety-significance and the recommendations to correct those deficiencies were adequately addressed.
46. CNSC staff stated that the MLO has a mature physical design system in place and has implemented and maintained a design control process that verifies and validates the design to ensure the safety and dependability of the facility. CNSC staff will continue to monitor the performance of this SCA through on-site inspections and desktop reviews. CNSC staff confirmed that AREVA made significant improvements to the MLO during the current licence period, that all changes made were in accordance with the licence conditions with no major deficiencies or events, and that the relevant documentation and analyses submitted by AREVA were satisfactory.

Tailings Management Facility (TMF)

47. Regarding the concerns expressed by the SES regarding possible embankment failure at the TMF, the Commission asked about design guidance used in the development and construction of the TMF. The AREVA representative responded that the TMF expansion was developed in accordance with the Canadian Dam Guidelines, and that AREVA performed additional assessments to ensure that the TMF was constructed with a suitable margin of safety. The AREVA representative added that an assessment was conducted to evaluate the potential impacts of an embankment failure at the TMF. CNSC staff stated

¹⁸ *Uranium Mines and Mills Regulations* (SOR/2000-206)

having reviewed the design and confirmed that it has a sufficient safety margin and was consistent with the available technical standards. CNSC staff added that, following the August 4th, 2014 Mount Polley mine accident,¹⁹ the Commission ordered a review of all existing or future dam designs based on the lessons learned, and that the existing TMF design, and future plans for the TMF, met regulatory requirements.

48. Asked if earthquakes and other external events were considered during the design of the TMF, CNSC staff responded that the Canadian Dam Safety Guidelines do account for seismic events, such as a 1 in 10,000-year earthquake event, as well as other external events like changes to the maximum water levels in the lake adjacent to the TMF. The AREVA representative stated that the design of the TMF is consistent with the seismic activity in the Athabasca Basin, which overall is very low. The AREVA representative added that the potential increase in precipitation due to climate change was considered, and that the TMF was designed to cope with excessive rainfall and severe storms. The AREVA representative added that the embankment will be removed during the decommissioning of the MLO. The SES noted their appreciation of AREVA's consideration of climate change for the long-term plans for the MLO.
49. Addressing information requested on the need for potential future TMF expansions, the AREVA representative stated that, at the current level of activity at the MLO, AREVA would not come before the Commission with another request for a TMF expansion during the proposed licence period. The Commission noted that the safety margin of the TMF was approximately four percent, and asked CNSC staff if it was of the opinion that that aforementioned safety margin was acceptable. CNSC staff stated having reviewed the assessments performed by AREVA, and that all of the proposed changes were within the licensing basis and considered acceptable. CNSC staff added that the performance of this facility will be brought before the Commission on a yearly basis.
50. The Commission noted the technical workings of the TMF, including the pumping and water flow systems, and asked how AREVA will ensure that there will be no water movement out of the TMF and into the outside environment. The AREVA representative responded that there are three overall ways in which this outflow will be prevented, and provided an overview of those methods, stating:
- Geochemical controls on the contaminants (engineered mineralogy)
 - Lower hydraulic conductivity of the tailings compared to the surrounding sandstone therefore forcing the water flow around the tailings
 - Low-permeability TMF cover, to prevent the infiltration of tailings during decommissioning

CNSC staff stated that it was aware of this issue, and noted that there were challenges with respect to the segregation of the tailings and several changes to the TMF before AREVA arrived at the current design. CNSC staff provided further details with respect to

¹⁹ Government of British Columbia – *Mount Polley Mine Tailing Dam Breach*,
< <http://www2.gov.bc.ca/gov/content/environment/air-land-water/spills-environmental-emergencies/spill-incidents/past-spill-incidents/mt-polley>>

the hydraulic conductivity of the tailings and the geochemical controls. CNSC staff stated that AREVA published several technical publications with respect to the geochemistry of their tailings management, and CNSC staff performed independent research to confirm that AREVA's work is correct. CNSC staff added that for these reasons, it was of the view that outflow would not occur from the TMF. Regarding the use of the bentonite liner along the glacial till, the AREVA representative stated that this liner is meant to hold water during the operating period of the MLO, and once the tailings are placed and consolidated, it will not be of use as the TMF will have a specific engineered cover.

51. On the basis of the information presented, the Commission concludes that the design of the MLO is adequate for the operation over the licence period authorized by the Commission.

3.6 Fitness for Service

52. Fitness for Service covers activities that are performed to ensure the systems, components and structures at the MLO continue to effectively fulfill their intended purpose. Based on information submitted by AREVA and CNSC staff, the Commission assessed the following specific areas of this SCA:

- Equipment Fitness for Service/Equipment Performance
- Maintenance
- Chemistry Control
- Periodic Inspection and Testing

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016. These specific areas will be discussed concurrently in this section.

53. The Commission considered information regarding AREVA's programs and procedures related to fitness for service. These programs and procedures encompass asset management, predictive and preventative maintenance (PM), an in-service inspection program, and maintenance and operating parameters. AREVA provided an overview of its in-service inspection program and the testing of its fire protection systems, and stated that third-party reviews of the tests and inspections performed on the fire protection systems are submitted to CNSC staff.
54. AREVA informed the Commission that its PM program is established in the IQMS, is monitored for completeness and accuracy, and ensures that systems, structures and components are maintained in good working order and within the design specifications. AREVA reported that several improvements were made to its PM program throughout the current licence period and provided several examples of these improvements. AREVA stated that it continues to review and make improvements to its PM program.

55. CNSC staff reported that the MLO has a change control procedure in place to control and record changes to the MLO facilities, which was reviewed and accepted by CNSC staff. CNSC staff informed the Commission that, through the use of inspections and desktop reviews, CNSC staff have verified that AREVA maintains its procedures, processes, structures, systems and components in accordance with regulatory requirements. CNSC staff also verified that AREVA has identified the safety-significant structures, systems and components at the MLO and implemented a PM program to ensure that these remain in proper working order. CNSC staff stated that its review and inspections of AREVA's maintenance management system at the MLO confirm that the PM activities are scheduled, completed and recorded, and that the associated maintenance records are also acceptable. CNSC staff reported that compliance verification activities confirmed that AREVA's maintenance program at the MLO is well documented and correctly implemented. From its assessments of the MLO documentation, CNSC staff reported that AREVA's maintenance program met the applicable requirements and performance objectives for the MLO, and is of the view that AREVA continues to maintain the MLO facilities to ensure that the structures, systems and components remain effective.
56. Addressing the backlog in maintenance work required for the secondary containment structure, the AREVA representative reported that there is a system in place to manage all work orders for the mill, and that the amount of work orders in backlog is closely monitored. The AREVA representative stated that, as of April 2017, the backlog stands between one month and one and a half months. On the comparison of backlogs between the MLO and the industry in general, CNSC staff noted that the backlog is a key indicator with respect to the fitness for service SCA, and it is tracked by CNSC staff. CNSC staff stated that AREVA identified safety significant structures at the MLO, and that AREVA has implemented a preventative maintenance program. CNSC staff reported that maintenance records and monitoring records are verified during inspections to determine if any backlog exists, and to ensure that AREVA takes appropriate action if necessary.
57. The Commission is satisfied with AREVA's programs for the inspection and lifecycle management of key safety systems. Based on the above information, the Commission concludes that the equipment as installed at the MLO is fit for service.

3.7 Radiation Protection

58. As part of its evaluation of the adequacy of the measures for protecting the health and safety of persons, the Commission considered the past performance of AREVA in the area of radiation protection. The Commission also considered the radiation protection program at the MLO to ensure that both radiation doses to persons and contamination are monitored, controlled and kept as low as reasonably achievable (ALARA), with social and economic factors taken into consideration. Based on information submitted by AREVA and CNSC staff, the Commission assessed the following specific areas of this SCA:
- Application of ALARA
 - Worker Dose Control

- Radiation Protection Program Performance
- Radiological Hazard Control

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016. These specific areas will be discussed concurrently in this section.

59. The Commission considered information regarding AREVA's radiation protection program (RPP) at the MLO, which is maintained in order to meet the requirements of the *Radiation Protection Regulations*²⁰ and the *Uranium Mines and Mills Regulations*. AREVA provided an overview of all the program elements of the RPP, each of which is supported by a system procedure describing the activities that must be performed in order to comply with the program objectives. AREVA reported that the RPP includes a Radiation Protection Code of Practice (RCOP) to support the applicable mining and milling operations. AREVA stated that the RPP was developed with respect to the ALARA principle and is verified through a dosimetry monitoring program. AREVA also informed the Commission on the internal assessment of the RPP and on several ALARA initiatives that were implemented during the current licence period. CNSC staff informed the Commission that it assessed AREVA's documentation and analyses of the RPP at the MLO, as well as AREVA's adherence to the ALARA principle, and found them to be acceptable.
60. The Commission examined CNSC staff's review of AREVA's RPP. CNSC staff informed the Commission that the RPP at the MLO demonstrates a commitment to the ALARA principle and was developed in-line with CNSC regulatory guide G-129, *Keeping Radiation Exposures and Doses "As Low As Reasonably Achievable (ALARA)"*.²¹ CNSC staff stated that AREVA established key performance indicators for parameters such as RP training and workplace monitoring and established ALARA targets focused on worker dose reduction initiatives. CNSC staff is satisfied with AREVA's measures with respect to the application of the ALARA principle. The Commission notes that, at the MLO, AREVA uses a combination of aspects such as design features, staff training and qualification, and dose management tools to control worker doses.
61. The Commission assessed AREVA's routine radiological monitoring, contamination control monitoring and worker bioassay sampling performed at the MLO site, the reporting of those results, as well as additional enhanced monitoring as described in its Radiation Protection Confirmation Plan (RPCP). The Commission notes that the RPCP was submitted to CNSC staff in September 2016 and was reviewed and accepted. AREVA noted that enhanced monitoring was implemented at the mill after it began operations to monitor and assess the high-grade ore that was processed at the facility. AREVA also informed the Commission on the radiation safety training provided to workers at the MLO.

²⁰ *Radiation Protection Regulations* (SOR/2000-203)

²¹ CNSC Regulatory Guide G-129, *Keeping Radiation Exposures and Doses "As Low As Reasonably Achievable (ALARA)"*, October, 2004.

62. The Commission recognizes that AREVA's RPCP was developed to validate the radiological design for the mill for processing high-grade uranium ore, and that measures taken by AREVA continue to protect the health and safety of the workers and the environment with respect to the increase in ore production. CNSC staff reported that the dose contributions following the increase in ore grade and production levels are consistent with historical levels, and that no worker at the MLO received a dose that exceeded the dose limits pursuant to the *Radiation Protection Regulations*.
63. CNSC staff confirmed that radiological and contamination control programs have been established at the MLO to control and minimize radiological hazards and the spread of radioactive contamination. CNSC staff stated that AREVA has established contamination limits for each zone of the MLO, and that the zone boundaries are more clearly delineated following the results of a May 2016 compliance inspection.
64. The Commission notes that there were two RCOP action level exceedances during the current licence period, both of which occurred in 2015 and were presented to the Commission in December 2016 as part of the annual Regulatory Oversight Report (ROR).²² The Commission further notes that CNSC staff accepted the corrective actions taken by AREVA to address these exceedances and to prevent future occurrences.
65. The Commission noted that the average radiation doses (maximum and average) received by workers were trending upwards for the period 2014 to 2016, and that there were several action level exceedances in 2015 and 2016. The AREVA representative commented that this upward trend is due to the re-start and ramp-up of production at the mill, and that AREVA anticipates that this trend will now reach a plateau. CNSC staff noted that these doses were less than the doses anticipated for the increases in production from the MLO mill, and that the values for these doses are below the regulatory limits. Regarding the action level exceedances, the AREVA representative stated that these exceedances were related to dust exposure, and that in these cases the workers were not following procedures, leading to increased exposure. The AREVA representative noted that, in one of these cases, the exceedance was due to the choice of protection factor with respect to a certain respirator, and that AREVA has applied to improve that factor for future dose calculations. CNSC staff reported that action level exceedances are known to occur when performing certain work functions (such as opening up pipes or process systems), and that the few exceedances that did occur were mostly the result of human performance issues. CNSC staff added that they did perform a follow-up inspection after these exceedances, noting that AREVA has strengthened the work permit requirements. CNSC staff is of the view that this matter has been rectified. The Commission is concerned about the increasing trend in radiation doses to the workers and the number of action level exceedances. The Commission urges AREVA to implement any appropriate corrective actions in order to reverse this upward trend in radiation doses and action level exceedances.

²² Canadian Nuclear Safety Commission Regulatory Oversight Report, *Regulatory Oversight Report on Uranium Mines, Mills, Historic and Decommissioned Sites:2015*, December, 2016.

66. The Commission is of the opinion that, given the mitigation measures and safety programs that are in place or will be in place to control radiation hazards, AREVA provides adequate protection to the health and safety of persons and the environment.

3.8 Conventional Health and Safety

67. Conventional health and safety covers the implementation of a program to manage workplace safety hazards. This program includes compliance with Part II of the *Canada Labour Code*²³ and conventional safety training. Based on information submitted by AREVA and CNSC staff, the Commission assessed the following specific areas of this SCA:

- Performance
- Practices
- Awareness

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016. These specific areas will be discussed concurrently in this section.

68. AREVA stated that the MLO is engaged in activities to continuously improve the conventional health and safety performance of the facility during the licence period and provided several examples of those activities. AREVA added that the MLO will continue to implement new safety standards and to identify new opportunities to improve its safety programs.
69. The Commission notes that AREVA maintains the OHSAS 18001:2007 certification at the MLO and participates in annual maintenance audits to verify its adherence to that certification. AREVA added that, as part of its commitment to the OHSAS 18001 certification, internal objectives and targets were developed to promote continual improvement of the health and safety management system at the MLO.
70. The Commission considered information with respect to the occupational health and safety program at the MLO, including the development, implementation and maintenance of the health and safety policies, programs, and procedures at the operational and corporate levels in order to promote a safe workplace and minimize worker illnesses and injuries. AREVA reported that its health and safety program meets the federal requirements of the *Canada Labour Code, Part II*, as well as the provincial requirements of the *Occupational Health and Safety Act, 1993*,²⁴ and *The Occupational Health and*

²³ R.S.C., 1985, c. L-2

²⁴ Formerly Chapter O-1.1* of the Statutes of Saskatchewan 1993, (effective October 30, 1993) as amended by the Statutes of Saskatchewan, 1996, c.19; 2001, c.25; 2007, c.34; 2012, c.25; and 2013, c.27.

*Safety Regulations, 1996.*²⁵ CNSC staff concurred with AREVA. CNSC staff informed the Commission that this program includes hazard identification and risk assessments, risk minimization processes, and work plans to identify workplace hazards, risks and mitigation measures. CNSC staff informed the Commission that the conventional health and safety program at the MLO assures strong safety performance and continuous improvement via multiple provisions, and provided examples of those provisions. AREVA stated that regular management review meetings are held to review and identify any necessary changes to this program. The Commission notes that the conventional health and safety program is reviewed at a minimum every two years.

71. AREVA reported that an Internal Responsibility Service (IRS) is used to ensure the safety of the workers at the MLO. AREVA reported that the IRS makes certain that every worker is responsible for safety at the facility through the identification, reporting and elimination of hazards. AREVA provided an overview of the purposes of the IRS, including promoting safety culture and best practices.
72. CNSC staff stated that conventional health and safety inspections were performed by the Ministry of Labour Relations and Workplace Safety (LRWS) during the licence period, and that all safety related findings were investigated and corrected in a timely manner. The Commission notes that the LRWS inspection results are shared with CNSC staff.
73. AREVA added that an Occupational Health Committee (OHC), comprising both employee and employer members, exists to review and improve upon the existing procedures and processes. The minutes for its regular meetings are posted to on-site bulletin boards and forwarded to the Saskatchewan Ministry of Labour Relations and Workplace Safety.
74. CNSC staff stated that weekly meetings are held by each MLO department to discuss safety topics, and that workers are expected to report all incidents to their supervisors. These incidents are inspected by AREVA's safety group. The Commission notes that an industrial hygienist also performs hazard monitoring.
75. AREVA informed the Commission that the number of Lost-Time Injuries (LTIs) which occur each year is reported to CNSC staff and presented to the Commission annually in the ROR. The Commission notes that a total of 9 LTIs occurred during the period 2009-2016, and that CNSC staff has verified that all corrective actions were effective and remain in place.
76. CNSC staff stated that safety practices at the MLO were observed and verified during compliance inspections, and that AREVA reported safety events in a timely manner. CNSC staff stated that key performance indicators are used to monitor preventative efforts, and that health and safety objectives are developed based on hazards, inspection reports and other safety reviews. CNSC staff reported that contractor risk is effectively

²⁵ Formerly under The Occupational Health and Safety Act, 1993 which was repealed by Chapter S-15.1 of the Statutes of Saskatchewan, 2013 (effective April 29, 2014). These Regulations continue in force under The Saskatchewan Employment Act (S-15.1).

managed, as contractors must follow AREVA's safety program or follow an equivalent program, and must be knowledgeable, trained and experienced in the work they perform. CNSC staff stated that AREVA performs safe work planning for all work to identify, assess, and mitigate the risks of those hazards, and that hazard specific procedures were developed to assist in work planning and risk mitigation. CNSC staff noted that new employees are provided with basic safety training, and ongoing training is provided to ensure all employees remain knowledgeable with respect to safety matters.

3.8.1 Sulphur Dioxide Emissions

77. The Commission notes that the restart of the mill in 2014 led to elevated levels of sulphur dioxide (SO₂) emissions from an exhaust stack, and that AREVA implemented measures to control SO₂ emissions and exposures and submitted an SO₂ management plan to CNSC staff. AREVA reported that the variable SO₂ stack emissions are now controlled. CNSC staff reviewed and accepted AREVA's SO₂ management plan, and also confirmed through the review of environmental reports and site inspections that the corrective measures implemented to control SO₂ emissions were effective.
78. Addressing the cause and prevalence of increased SO₂ emissions, the AREVA representative noted that there were a few SO₂ environmental action level exceedances, which were largely related to the start-up and operation of the acid plant and from emissions from the calciner stack. The AREVA representative provided an overview of the mitigation methods used to reduce SO₂ emissions, such as staff retraining and temperature control of the piping at the acid plant.
79. The Commission noted that increasing the calciner stack height was listed by AREVA as a method of improvement for SO₂ emissions. This would lead to better dispersion of the SO₂, and would not change the overall volume that was released. The AREVA representative reported that the stack extension was performed to prevent the SO₂ releases from being sucked into the ventilation system, therefore it was done as a means to protect the workers at the site.

3.8.2 Workplace Safety

80. The representative from the Canadian Nuclear Workers Council (CNWC) voiced his belief that a unionized workforce is a safer one, and provided his reasons for that opinion. The representative from Labour Relations and Workplace Saskatchewan (LRWS) stated that the LRWS does not note a difference in safety between unionized and non-unionized workplaces, and that the provincial legislation in Saskatchewan is very strict with respect to the safety of mine workers. The LRWS representative added that his organization has positive experiences with AREVA, and that the incident rate in Saskatchewan's mining industry is very low. The LRWS representative noted that one of the challenges in the mining industry is that some of the injuries that do occur can be very significant.
81. Regarding mechanisms for feedback between the community and AREVA with respect to health and safety, the Kineepik Métis Local Inc. (#9) (Kineepik Métis) representative

stated that he is the primary lead on community engagement and environmental stewardship, and therefore engages with licensees, applicants, and CNSC staff regarding environmental matters. He noted that CNSC staff is very helpful and provide him with a great deal of information. The Kineepik Métis representative reported that each mine has its own health and safety committee and processes, and that both AREVA and Cameco encourage their employees to report safety problems without fear of reprisal. He noted that there is no formal relationship between himself and AREVA or Cameco. However, if a community member reported to him that he/she was mistreated, that he would investigate the matter.

82. Based on the information presented, the Commission is of the opinion that the health and safety of workers and the public was adequately protected during the operation of the facility for the current licence period, and that the health and safety of persons will also be adequately protected during the continued operation of the facility.

3.9 Environmental Protection

83. Environmental Protection covers AREVA's programs that identify, control and monitor all releases of radioactive and hazardous substances, and minimize the effects on the environment which may result from the licensed activities. It includes effluent and emissions control, environmental monitoring and estimated doses to the public. Based on information submitted by AREVA and CNSC staff, the Commission considered the following specific areas of this SCA:

- Effluent and emissions control (releases)
- Environmental Management System (EMS)
- Assessment and Monitoring
- Protection of the Public
- Environmental Risk Assessment (ERA)

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016.

3.9.1 Effluent and Emissions Control

84. The Commission considered information regarding AREVA's monitoring and control of hazardous and radioactive effluent from the MLO. AREVA reported that all contaminants in the effluent were consistently below action levels and discharge limits, and that many of the concentrations of contaminants showed a decreasing trend over the current licence period. AREVA added that there were two action level exceedances for pH level in August 2016. However, the discharge of that effluent produced negligible environmental effects and preventative actions were implemented to prevent further action level exceedances.

85. The Commission notes that new provincial regulation on air quality due to industrial sources will come into effect for the MLO on January 1, 2020,²⁶ and that AREVA is making efforts in order to be compliant with those upcoming regulations. The Commission expects AREVA to be compliant with all relevant federal and provincial legislation, and as such, expects the MLO to be compliant with these new air quality regulations by the date required by the province of Saskatchewan.
86. CNSC staff reported that AREVA monitors and controls liquid releases to the environment at the MLO in accordance with its environmental and radiation protection programs, and that the treated effluent that is released to the environment must meet the limits denoted in the *Metal Mining Effluent Regulations* (MMER). The effluent discharge is tested regularly pursuant to the MMER, and monitoring has verified that this effluent complies with those regulations. The Commission notes that action levels are captured in AREVA's Environmental Code of Protection (ECOP). CNSC staff informed the Commission that molybdenum, uranium and selenium effluent concentrations increased with the re-start of the mill in 2014, and the molybdenum and uranium effluent concentrations have decreased since then as the mill operation was optimized.

Selenium Management

87. The Commission notes that the 2014 restart of the mill led to increased concentrations of selenium in effluent, although those levels remain below administrative levels described in the MLO ECOP, and that AREVA submitted a selenium management plan which CNSC staff reviewed and verified to ensure that AREVA would take adequate measures to manage and control selenium effluent releases. AREVA reported a selenium investigation, management and mitigation project that began in 2008, and improvements to the tailings preparation circuit were made in 2010 to remove selenium, with additional improvements to the MLO occurring after the 2014 mill restart. AREVA provided an overview of the four main elements of its 2016 Selenium Management Plan. The Commission notes that CNSC staff accepted this plan in November 2016 and has made a request for the formalization of the MLO Selenium Adaptive Management Plan. AREVA stated that it will monitor and report on the progress and improvements with respect to selenium, and that AREVA predicts that this increase in concentration is a temporary fluctuation due to selenium in the Cigar Lake uranium ore.
88. The Commission noted that selenium is not bio-accumulative in the body, as it is eliminated via the kidneys, and asked if there should be a set value for the maximum concentration for selenium effluent. The Saskatchewan Ministry of Health representative responded that the most effective way to predict and limit the selenium uptake by humans was to consider the selenium concentration in the fish that is consumed by humans, and to place limits on the concentration of selenium in the fish. The Saskatchewan Ministry of Health representative stated that there are screening values available through the U.S. Environmental Protection Agency (EPA), various states, and in B.C., which have been replicated in northern Saskatchewan. The Saskatchewan Ministry of Health representative

²⁶ Chapter E-10.22* of The Statutes of Saskatchewan, 2010 (effective June 1, 2015) as amended by the Statutes of Saskatchewan, 2013, c.20, c.27 and c.32; and 2014, c.E-13.1.

provided the example of the area around Beaverlodge mine in northern Saskatchewan, where there is a fish advisory in place to advise the residents to limit their consumption of fish, but it does not explicitly state that fish should never be consumed. The Saskatchewan Ministry of Health representative recommended that a selenium concentration limit of 2.5 ug/g in fish would be protective of human health. CNSC staff added that the modelling done by AREVA as part of its risk assessment showed that levels of releases of selenium below 0.04 mg/L in the bodies of water would be protective of fish. The Commission recognizes that even at its highest levels, the selenium concentration in fish represents approximately 37% of the Tolerable Daily Intake (TDI) for selenium, and that no adverse health effects are expected to occur from the public consumption of fish.

89. Clarifying the information provided by AREVA with respect to selenium management, the AREVA representative stated that the peak of the selenium management challenge has passed, and that AREVA has provided information on the projections for selenium effluent concentration. The AREVA representative stated that several scenarios were included in the ERA, and that AREVA continues to work towards an even better understanding of the selenium issue. The AREVA representative described the different selenium effluent concentrations around the facility, and noted that, at the edge of the lease boundary for the MLO, the selenium concentration will meet provincial surface water quality objectives. CNSC staff stated that the lake is not used for fishing or other sustenance, and that the Independent Environmental Monitoring Program (IEMP) confirmed that the environment is protected and provides for continuous monitoring. CNSC staff reported that AREVA was proactive in implementing techniques and other improvements which were effective in reducing the selenium concentrations, and as such the selenium concentrations in the effluent are projected to drop. The representative from the Saskatchewan Ministry of the Environment (SMOE) added that the current selenium measurements are meeting objectives downstream of the MLO, that these levels will be monitored continuously, and that they are satisfied with the work done by AREVA on this issue.
90. The Commission notes that enhanced selenium monitoring and management programs are in place in McClean Lake East basin and is satisfied with the work being performed at the MLO with respect to selenium monitoring and management. The Commission accepts at this time that AREVA has an interim administrative and action level for selenium in its ECOP, to be reviewed annually, and that the ECOP is part of the compliance verification criteria set out in the LCH. The Commission instructs CNSC staff to report on the progress related to the selenium management plan and selenium effluent as part of the annual *Regulatory Oversight Report*.

MLO Greenhouse Gas Emissions

91. The research presented by D. Parker, in his intervention, outlined his research on the lifecycle greenhouse gas (GHGs) emissions from the nuclear power industry. This research sought to improve the understanding of the lifecycle GHG emissions from uranium mining and milling in Canada, with a specific focus on the Mc-Arthur-Key Lake Operations, Rabbit Lake Operation, and McClean Lake Operation. The results of this

study showed that uranium mining and milling operations contribute minimally to the total lifecycle GHG emissions with respect to the overall nuclear fuel cycle, and that this research was published in the *Journal of Environmental Science and Technology*.

92. CNSC staff stated that, in its review of AREVA's submissions, it considered if AREVA was compliant with federal and provincial GHG reporting requirements, such as the *Canadian Environmental Protection Act*²⁷ and the National Pollutant Release Inventory.²⁸ CNSC staff added that the ERA considers GHGs, such as those produced from diesel and propane. However, those contributions are minimal. The AREVA representative provided clarification regarding the total amount of CO₂ equivalent released from the MLO in 2016. The Commission notes that the GHG emissions from the MLO were well below the threshold for the reporting requirements.
93. The Commission noted that Mr. Parker's work has been published in a scientific journal and noted the quality of his work and the usefulness of lifecycle analysis with respect to environmental protection.

3.9.2 Environmental Management System

94. The Commission examined AREVA's EMS at the MLOP. AREVA informed the Commission that its EMS provides a system to control for current and future environmental issues and was developed to meet the requirements of the CNSC, SMOE and Environment and Climate Change Canada (ECCC). The EMS was also developed in accordance with internal requirements and the ISO 14001:2004 standard, and AREVA is in the process of updating its processes to meet the requirements of the 2015 edition of that standard. AREVA stated that the EMS has proven to be successful in the prevention of unreasonable risk to the environment and to human health and safety, and that the EMS is a system that is continuously reviewed and updated based on new data, assessments and scientific modelling. Site inspections, environmental training, reviews of environmental monitoring data, and audits of the EMS are performed routinely to improve upon environmental protection, and objectives and targets are set each year to drive continuous improvement.
95. CNSC staff confirmed that AREVA has implemented and maintained an EMS to describe its activities associated with environmental protection of the MLO. CNSC staff verified that AREVA's environmental protection program at the MLO meets the requirements of the ISO 14001:2004 standard. CNSC staff stated that AREVA conducts internal audits on the implementation and effectiveness of the EMS, and any deficiencies that are discovered are documented and corrected. CNSC staff note that AREVA verifies its EMS through an annual review, where minutes and follow-up actions from internal audits are documented. CNSC staff reported that it verifies the MLO's EMS through desktop reviews of environmental reports and annual compliance reports, and through on-site inspections.

²⁷ *Canadian Environmental Protection Act*, 1999 (S.C. 1999, c. 33)

²⁸ National Pollutant Release Inventory – Environment and Climate Change Canada, 2016.
< <https://www.ec.gc.ca/inrp-npri/> >

CNSC staff added that AREVA performed a review and gap analysis to ensure its Environmental Monitoring Program (EMP) is in alignment with CSA Group standard N228.4, *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*,²⁹ and N288.5, *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*.³⁰ AREVA's updated EMP documentation is currently under review by CNSC staff.

3.9.3 Assessment and Monitoring

96. The Commission considered AREVA's environmental monitoring programs and monitoring data, and the inclusion of that data in quarterly and annual reports. AREVA reported that these reports are incorporated into the Environmental Performance Technical Information Document (EPTID), which presents environmental performance data, predictions and assessments, and was updated in 2012 and 2016, over the current licence period. The Commission noted the following:
- Total suspended particles in the air are below the provincial standard and corrective measures have been implemented to decrease the SO₂ concentrations in ambient air.
 - AREVA maintains an extensive groundwater monitoring program at the MLO. Most of the areas do not indicate any significant trends in effluent concentrations, and the water quality of Bena Lake is not predicted to exceed Saskatchewan Surface Water Quality Objectives³¹
 - Spills and reportable incidents did occur at the MLO. However, all of these incidents were reported to CNSC staff and the SMOE as required and were thoroughly cleaned so there was a negligible impact on the environment.
97. The Commission examined AREVA's terrestrial monitoring program at the MLO, which determines the effect of particulates and absorbed metals and radionuclides on the environment around the facility. CNSC staff reported that AREVA submitted the *McClellan Lake Operation Environmental Performance Technical Information Document Volume 1 – Environmental Monitoring* in May 2016, which provides updates on the environmental monitoring data in the time since the previous submission in 2012. CNSC staff stated that the EPTID contained enough information to complete a review of the environmental performance of the MLO from 2011-2015 with respect to the 2012 ERA. CNSC staff confirmed that the environment and human health around the facility remains protected. Regarding specific monitoring activities, the Commission notes that:

²⁹ CSA Group - CSA Standard N288.4, *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*, 2015.

³⁰ CSA Group – CSA Standard N288.5, *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*, 2016.

³¹ *Surface Water Quality Objectives* (EPB 356, June 2015)

- Soil metal parameters are below the *Canadian Environmental Quality Guidelines*,³² and the radionuclide concentrations were at or near background levels
- Levels of airborne particulate contaminants produced by the MLO are low, acceptable and do not pose a risk to vegetation or animals
- MLO radon levels in the air are consistent with background levels for that region of Saskatchewan, and the Total Suspended Particulate concentrations in the air are within the Saskatchewan *Environmental Management and Protection Regulations*³³
- The surface water quality monitoring and sampling results demonstrate that there is minimal risk to the environment
- The IEMP monitored the facility for metals, total suspended solids, radionuclides and other contaminants, and confirmed that the public and environment around the MLO are safe

Dust, Noise, and Spill Control

98. Addressing the potential issue of dust, noise, and spillage during the expansion of the TMF, the AREVA representative reported that these factors were considered during the staged expansion of the TMF, and that practices are in place to mitigate dust during the transportation of materials on-site. The AREVA representative added that AREVA has been successful in managing dust and spillage during transportation up to and including the current stage of the TMF Expansion project. The AREVA representative reported that there are dust samplers around the perimeter of the TMF, and that the data from those monitors show no transportation incidents due to the movement of materials around the MLO site. The Commission notes that the environmental monitoring information from the TMF is part of the annual report, and that members of the public may access that report by requesting it through AREVA's website. CNSC staff stated that its assessment of the TMF expansion program considered the noise suppression measures for vehicles and machinery, and that AREVA is following best practices with respect to reducing noise impacts on the environment. The Commission recognizes that CNSC staff inspected the MLO site to ensure all activities relating to the TMF expansion project remain within the licensing basis.

Groundwater Monitoring

99. Asked to respond to concerns expressed by the SES regarding mitigation measures with respect to groundwater contamination, the AREVA representative provided verbally an overview of the groundwater protection methods utilized at the MLO, with the two main protection methods stemming from geophysical and geochemical controls. The AREVA representative provided examples of mitigation measures, such as hydraulic containment during the operating period of the MLO and the development of the TMF in a way such

³² Canadian Council of Ministers of the Environment (CCME) – *Canadian Environmental Quality Guidelines*, 2014, <http://www.ccme.ca/en/resources/canadian_environmental_quality_guidelines/>

³³ E-10.22 Reg 2 - The Environmental Management and Protection (Saskatchewan Environmental Code Adoption) Regulations

that hydraulic conductivity contrast will cause groundwater to flow around the tailings after the closure of the MLO facility.

100. The SES expressed concern over the long-term management of the TMF after the MLO site is decommissioned, citing geological faults in the area. CNSC staff responded that groundwater contamination has been a matter of importance for AREVA and for CNSC staff since the first licence was issued to the MLO. CNSC staff stated that there used to be a licence condition in place for AREVA to maintain the Tailings Optimization and Validation Program, to ensure that the groundwater would not travel through the MLO site and to protect the surrounding lakes from contaminants such as arsenic. CNSC staff noted that this condition was lifted only after AREVA demonstrated that the groundwater would be protected. CNSC staff concurred with the SES intervention with respect to the importance of long-term surveillance for this facility. The Commission notes that, as long as the facility is under institutional control, it will be continuously monitored by the responsible government authorities.

Caribou Migration Studies

101. An intervenor, Dr. McLoughlin reported that, in his opinion, the operations of the MLO would not pose a significant risk to the woodland caribou population over the proposed licence period. Dr. McLoughlin noted that more research needs to be performed, such as testing the effect of selenium levels on the caribou. However, his research has not discovered evidence of a significant risk to the caribou population due to the MLO activities. Dr. McLoughlin added that the study will continue for at least two more years. Addressing the use of the results from, and the future plans for, the caribou studies, Dr. McLoughlin stated that he is unsure how the various regulatory bodies will use the caribou results. However, he hopes that those results will be used for evidence-based decision-making. Addressing potential effects of mining on caribou migration patterns, Dr. McLoughlin stated that the boreal woodland caribou, which inhabit the areas around the mine, are not known for migration. However, the migratory patterns that are observed appear to be normal and unaffected by mining activities. The ECCC representative stated that the area around the MLO has not been designated as a “critical habitat”³⁴ for caribou, and that ECCC will use the results of Dr. McLoughlin’s studies to help identify critical habitat.
102. The Commission notes that, based on the research results in the submission from Dr. McLoughlin, the boreal caribou population in northern Saskatchewan is stable or slightly increasing. The Commission also notes that the submission from the Buffalo River Dene Nation and the Birch Narrows Dene Nation (the Nations) claimed that the migratory patterns and population of boreal caribou have been greatly affected by uranium mining, making it more difficult to locate the herds. Addressing the results of the caribou studies performed by Dr. McLoughlin, the Nations representative stated that, in his experience, the caribou population has been decreasing year over year in the area around

³⁴ Critical habitat means the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species’ critical habitat in the recovery strategy or in an action plan for the species (*Species at Risk Act*).

his trap lines, in the region around Cree Lake in northwestern Saskatchewan. Dr. McLoughlin stated that the distribution of boreal caribou is widespread, and that the boreal caribou across the border in Alberta is known to have difficulties, and noted that it would take additional research to ascertain exactly where the boreal caribou around Cree Lake have migrated too. After considering the evidence provided by Dr. McLoughlin, the Commission concludes that the continued operation of the MLO does not present a significant risk to the woodland caribou population in northern Saskatchewan,

Eastern Athabasca Regional Environmental Monitoring

103. Regarding the availability of the results to the public from the Eastern Athabasca Regional Monitoring Program (EARMP), the representative of the intervenor Cameco noted that this is a provincial program and that it was mentioned as an example of community-based monitoring beyond the programs required by licensees such as AREVA and Cameco. The Cameco representative stated that the EARMP website provides summary information to the public, and that information is also communicated to the communities. The Cameco representative stated that one of the strengths of this program is that the sample collection is done by community members, so the program provides a good reflection of the communities' use of the land and resources.

3.9.4 Protection of the Public

104. The Commission notes that AREVA is required to demonstrate that the health and safety of the public are protected from exposures to hazardous and radioactive nuclear substances released by the MLO, and that the effluent and environmental monitoring programs currently conducted by AREVA at the MLO confirm that releases of hazardous material will not affect public health. CNSC staff reported that it receives reports of discharges from AREVA as per the requirements laid out in the MLO licence and explained in the LCH. A review of those reports indicate that there were no significant risks to the public or the environment from discharges during the licence period, and that the public remains protected from the MLO effluent releases and emissions.

3.9.5 Environmental Risk Assessment (ERA)

105. The AREVA representative reported that the ERA is performed in accordance with CSA standard N288.6-12, *Standard for Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills*,³⁵ and was submitted to CNSC staff in 2016 as part of the EPTID.
106. The Commission considered CNSC staff's review of the ERA for the MLO. CNSC staff informed the Commission that it reviewed AREVA's ERA for the MLO and determined that it was in compliance with CSA N288.6. The Commission notes that the predicted ecological and human health risks due to releases from the MLO are within the

³⁵ CSA Group – CSA N288.6-12, *Standard for Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills*, 2012.

predictions from the previous ERAs and Environmental Impact Statements (EIS) as accepted by the Commission in the licensing basis and LCH, with the exception of the short-term exposure of aquatic organisms to selenium. CNSC staff reported that AREVA continues to monitor selenium concentrations through enhanced environmental monitoring and surface water quality monitoring. The Commission notes that, with respect to the issue of selenium effluent, AREVA must conduct additional inspections and investigate additional selenium control and treatment technologies, and that there will be increased regulatory controls and oversight in the coming licence term.

107. Asked if AREVA considered the input from Indigenous groups and local communities near the plant during the selection of the Valued Ecosystem Components (VECs) for the risk assessments, the AREVA representative responded that the selection of VECs was influenced by the engagement with local communities. The Commission notes that the intervention from the SES described some inconsistencies between the VEC's listed in the EA report for the EA under the NSCA and the VECs listed in AREVA's EPTIDs. CNSC staff stated that the reasons for these discrepancies are two-fold; the first being that updates were made to the listed species pursuant to the *Species at Risk Act*³⁶ and the Saskatchewan Conservation Data Centre in 2016 after the EPTID was completed. CNSC staff stated that the second reason was that there may be differences between the federal and provincial species that must be considered during the EAs. CNSC staff agreed with the SES intervention that these lists should be consolidated.
108. The Commission noted that, under the proposed twelve-year licence period, the next licence renewal hearing would occur in 2029. However, the last reporting cycle for the EPTIDs would finish in 2025. CNSC staff stated that, in addition to the ERAs, there are annual compliance reports from AREVA which also inform CNSC staff on the performance of the MLO.
109. Regarding the difference between the reports from the five-year reviews and the annual reports, CNSC staff submitted that the monitoring and trending data is reported on annually, while the risk assessment on the impacts of the MLO operation to human health and safety and the environment are updated every five years.

3.9.6 Conclusion on Environmental Protection

110. The Commission considers the environmental review that was conducted by CNSC staff to be acceptable and thorough. The Commission also encourages AREVA and CNSC staff to align future environmental reviews and analysis with the ten-year licence period.
111. Based on the assessment of the application and the information provided at the hearing, the Commission is satisfied that, given the mitigation measures and safety programs that are in place to control hazards, AREVA will provide adequate protection to the health and safety of persons and the environment.

³⁶ *Species at Risk Act* (S.C. 2002, c. 29)

3.10 Emergency Management and Fire Protection

112. Emergency Management and Fire Protection cover AREVA's measures for preparedness and response capabilities which exist for emergencies and for non-routine conditions at the MLO. Based on information submitted by AREVA and CNSC staff, the Commission assessed the following specific areas of this SCA:

- Conventional Emergency Preparedness and Response
- Nuclear Emergency Preparedness and Response
- Fire Emergency Preparedness and Response

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016.

3.10.1 Conventional and Nuclear Emergency Preparedness and Response

113. The Commission considered AREVA's emergency preparedness and response plans for the MLO. AREVA informed the Commission that its emergency planning for the MLO adheres to the NSCA and associated regulations, the licence and the LCH, as well as applicable requirements from the ECCC and SMOE. AREVA stated that emergency planning at the MLO considers a wide variety of scenarios, such as fires and environmental spills. AREVA reported that the MLO maintains a trained Emergency Response Team (ERT) to respond to emergencies, that routine training is provided by AREVA and/or outside consultants in a variety of fields, such as HAZMAT response and industrial fire brigade training, and that all training sessions meet applicable standards. AREVA provided examples of emergency exercises and drills undertaken by the ERT and in conjunction with external organizations. AREVA added that the MLO ERT competed in the annual Saskatchewan Mining Association Mine Rescue competition four times during the current licence period.

114. CNSC staff informed the Commission that AREVA's emergency response plans and programs contain all the necessary information to allow MLO workers to appropriately respond to all emergencies. The Commission notes that, pursuant to CNSC regulations and Saskatchewan's *The Mines Regulations, 2003*³⁷, AREVA must train ERT members, and that the ERT members are trained using a combination of classroom training, field training, drills and exercises, as well as competing in emergency mine rescue and industrial fire and response competitions. CNSC staff reported that it verified AREVA's implementation of its emergency response program at the MLO in accordance with CNSC regulatory requirements through on-site inspections and desktop reviews over the course of the licence period, including a September 2015 inspection focusing on emergency preparedness. CNSC staff stated that the inspection resulted in one low-risk non-compliance and four recommendations. CNSC staff reported that AREVA provided a corrective action plan in a timely manner and took all appropriate corrective actions, and

³⁷ Chapter O-1.1 Reg 2 (effective July 16, 2003).

that these actions were verified and accepted by CNSC staff.

115. The Commission notes that AREVA has committed to the implementation of the relevant sections of CNSC regulatory document REGDOC-2.10.1, *Nuclear Emergency Preparedness and Response*,³⁸ by December 31, 2017, and that CNSC staff will monitor the implementation of that document through regulatory oversight activities.

3.10.2 Fire Emergency Preparedness and Response

116. The Commission considered the Fire Hazard Assessments (FHA) with respect to the MLO. AREVA reported that an FHA was performed in 2012 and was revised to include the mill upgrade and other construction projects such as the new powerhouse and the leaching circuit. AREVA stated that the FHA was revised based on past lessons learned, and that it created an action plan to address the remaining deficiencies. CNSC staff stated that it reviewed the action plan, and it was found to be acceptable and met expectations. The Commission notes that the FHA will be revised in 2017 to include the changes to the site since the last iteration of the FHA.
117. AREVA provided details of its Fire Protection Program (FPP) which is intended to prevent fires from starting, extinguish fires that do start, as well as ensure that emergency responders are adequately trained, that the MLO complies with existing federal and provincial requirements, and that there is continuous monitoring and reporting with respect to the FPP. CNSC staff reported that AREVA has an FPP in place in order to minimize the occurrences and consequences of a fire at the MLO. The FPP is in compliance with the NBCC 2015 and NFCC 2015. CNSC staff stated that AREVA's Fire Safety Plan at the MLO describes the facilities, systems, activities, and training to prevent outbreaks of fire and to ensure the health and safety of persons in the event of a fire. The Commission notes that the Fire Safety Plan is a requirement of the NFCC 2015 and the provincial *Occupational Health and Safety Regulations*,³⁹ and that additional fire protection requirements applicable to mines are administered pursuant to *The Mines Regulations, 2003*. CNSC staff reported that the maintenance, tests and inspections performed on the MLO fire protection systems are in accordance with the NFCC 2015, NBCC 2015, provincial regulations and the OHSAS:18001 standards, that AREVA utilizes third party reviews and evaluations of the FPP which CNSC staff reviewed. The Commission notes that an FHA was performed in 2015 by a third party to demonstrate the fire protection objective of the MLO, and that CNSC staff reviewed the FHA and corresponding corrective action plan and found them to be acceptable. The Commission notes that the LRWS also conducts inspections related to fire protection, and that those inspection results are shared with CNSC staff.

³⁸ Canadian Nuclear Safety Commission Regulatory Document – REGDOC 2.10.1, *Nuclear Emergency Preparedness and Response* (Version 2), February, 2016.

³⁹ Chapter O-1.1 Reg 1 (effective December 4, 1996, except for Part XXXII, effective December 4, 1997) as amended by Saskatchewan Regulations 6/97, 35/2003, 112/2005, 67/2007, 91/2007, 109/2008, 18/2009, 54/2009, 75/2012, 5/2014, 43/2016 and S-15.1 Reg 6.

118. Regarding the mutual aid agreements between organizations and mining sites in northern Saskatchewan in the event of a forest fire, the AREVA representative reported that all emergency services on-site are self-contained; however, mutual aid agreements are in place with neighbouring mine sites should additional help be required. The AREVA representative stated that the emergency response teams at the MLO are trained to all the applicable standards and legislation, and that joint response exercises with Cameco are conducted on occasion.
119. Addressing the protection of workers during a potential situation where a forest fire would prevent a plane from landing, the AREVA representative responded that the MLO emergency response teams are integrated with the provincial firefighters, have close interactions with their provincial counterparts, and are in communication with fire authorities to manage fire risks. The AREVA representative noted that the 2015 wildfires were a challenge to the overall industry and the province, and produced a wealth of experience and lessons learned. The AREVA representative stated that there is always an alternative landing place for planes, in case the primary landing spot is threatened. The Commission recognizes AREVA's preparedness with respect to fire-related emergencies at the MLO.

3.10.3 Conclusion on Emergency Management and Fire Protection

120. Based on the above information, the Commission concludes that the fire protection measures and emergency management preparedness programs in place at the facility are adequate to protect the health and safety of persons and the environment.

3.11 Waste Management

121. Waste management covers the MLO's site-wide waste management program. CNSC staff evaluated AREVA's performance with regards to waste minimization, segregation, characterization, and storage. Based on information submitted by AREVA and CNSC staff, the Commission considered the following specific areas of this SCA:

- Waste Characterization
- Waste Minimization
- Waste Management Practices
- Decommissioning Plans

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016. These specific areas will be discussed concurrently in this section.

122. The Commission assessed AREVA's submissions regarding its waste management plan and processes as described in its IQMS, including waste management training provided to the workers at the MLO. AREVA stated that many domestic and industrial waste products are recycled, and that the waste volumes are tracked and reported annually to CNSC staff

as part of the MLO annual report. AREVA reported that the effects of the clean waste rock piles are monitored. Those results demonstrated that the waste rock piles have been properly segregated and that waste disposed in the Sue A and Sue C pits is not expected to result in concentrations of contaminants that exceed the Saskatchewan Surface Water Quality Objectives for receiving surface water bodies. The Commission notes that those monitoring results and conclusions are reported to CNSC staff and that the quantity, density and concentration of contaminants in solids and in the water are monitored and reported, and that all contaminants of concern were below action levels throughout the licence period. AREVA noted that hazardous industrial waste is stored on the HAZMAT pad before being sent to registered disposal facilities, and that chemically and radiologically contaminated wastes are placed in a temporary contaminated landfill.

123. CNSC staff reported that AREVA has an effective waste management program at the MLO to control the waste products at the facility. With respect to the management of the various waste types at the MLO, the Commission notes the following:
- CNSC staff continues to monitor AREVA's management of the waste rock at the MLO to verify compliance with regulatory requirements.
 - CNSC staff reviewed the tailings management TID, and all comments from CNSC staff were adequately addressed by AREVA and CNSC staff will continue to verify that the management of the tailings is protective of the environment and human health and safety.
 - Through compliance reporting and on-site inspections, CNSC staff verified that solid and liquid wastes are disposed of in an appropriate manner and in approved facilities.

3.11.1 MLO Environmental Remediation and Final State After Decommissioning

124. Regarding the involvement of the Athabasca Joint Environmental Subcommittee (AJES) in remediation and closure planning for the eventual decommissioning of the MLO, the Ya'thi Néné Lands and Resources Office representative stated that, as AREVA is a member of the AJES, it will communicate information to all group members, and if any specific community members have questions, comments or concerns related to decommissioning or closure, they can be brought to the AJES via the community representative(s). The representative added that they feel confident that there will be a clear exchange of information as the decommissioning planning moves forward, and also noted that decommissioning is not slated to take place in the near future.
125. The Commission noted that there were several radiological and non-radiological criteria of importance with respect to the traditional land use of the MLO site after decommissioning and remediation, as stated in the intervention submitted by the Ya'thi Néné in CMD 17-H11. Addressing the final state of the MLO facility site after decommissioning and remediation, CNSC staff confirmed that the objective is to return the site to full traditional land use. CNSC staff stated that, in terms of remediation, it will consider radiological criteria and the overall impact of the MLO site on the environment. The province of Saskatchewan maintains an institutional control program, and the

province will also work to ensure that the site is returned to its original form.

126. The SES representative voiced her concern over the long-term state of the MLO site after decommissioning, stating that the final state of the site should not depend on the current regulatory bodies, as there may be changes to the regulatory regimes in the future. CNSC staff responded that it has significant experience with respect to mine decommissioning projects, and that the lakes and territories at and around those decommissioned sites are open to traditional land use. CNSC staff noted that the eventual decommissioning process will require authorization from the Commission, and that the site will still be subject to monitoring by government agencies. CNSC staff added that one of the objectives of decommissioning will be to reduce the concentration of contaminants in the surrounding lakes to below the Surface Water Quality Objectives, and to remove any health and safety hazards from the site.

3.11.2 MLO Landfill Facilities

127. Elaborating on the potential need for expanded or additional landfill facilities at the MLO, the AREVA representative stated that, during the proposed licence period, AREVA may reach the capacity at the current industrial landfill, and may need to extend it. The AREVA representative added that the approval process for that extension would be mostly carried out with the province of Saskatchewan, as that landfill does not contain contaminated material or hazardous waste. The AREVA representative further added that the landfill extension project would not be a serious technical challenge. However, it would be an administrative challenge. Addressing the challenges posed by the disposal of sludge, the AREVA representative reported that this sludge has accumulated in a surge pond, and that at present the sludge is not causing any issues with respect to the MLO operations, except for the reduction of the capacity of that surge pond. The AREVA representative stated that AREVA is considering the options for managing that sludge, and will mostly likely bring an application before the Commission to dispose of this sludge along with other hazardous material, due to the elevated levels of ammonia in the sludge. The AREVA representative added that the aforementioned application would likely be submitted in several years.

3.11.3 Conclusion on Waste Management

128. Based on the above information and considerations, the Commission is satisfied that AREVA is safely managing waste at the MLO.

3.12 Security

129. Security covers the programs required to implement and support the security requirements stipulated in the relevant regulations and the licence. This includes compliance with the applicable provisions of the GNSCR and the *Nuclear Security Regulations*.⁴⁰ Based on information submitted by AREVA and CNSC staff, the Commission assessed the

⁴⁰ SOR/2000-209

following specific areas of this SCA:

- Response Arrangements
- Security Practices

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016. These specific areas will be discussed concurrently in this section.

130. The Commission considered information submitted by AREVA with respect to its security measures, which were implemented and maintained to prevent the loss of nuclear substances and acts of sabotage at the facility. AREVA reported that the IQMS outlines the responsibilities of the security group with respect to site security site access and emergency response. The Commission notes that the MLO has undergone multiple Security Threat and Risk Assessments (STRAs) over the course of the current licence period, and that CNSC staff accepted the most recent STRA report that was submitted in November 2016. AREVA reported that findings and recommendations issued by the CNSC are used to improve the overall security program.
131. CNSC staff reported that, based on a review of AREVA's potential vulnerability at the MLO and the associated security processes and procedures, the security risk is considered to be low and there is no evidence of any threats to the MLO. CNSC staff informed the Commission that, over the current licence period, there were no reported thefts of nuclear material and no history of sabotage or planned sabotage, and that the security measures in place at the MLO are adequate. CNSC staff stated that AREVA's security program at the MLO is verified through compliance verification activities, and that an inspection was conducted in January 2016. In response to those inspection findings, AREVA submitted an updated STRA, which was reviewed by CNSC staff, and CNSC staff reported that it met regulatory requirements.
132. AREVA reported that it reviews and updates the STRA on a regular basis and has committed to be compliant with the applicable sections of CNSC Regulatory Document REGDOC 2.12.3, *Security of Nuclear Substances: Sealed Sources*⁴¹ by December 31, 2017. CNSC staff stated that AREVA will perform a gap analysis regarding its procedures at the MLO and the requirements of REGDOC 2.12.3, and CNSC staff will monitor the implementation of that REGDOC through on-site inspections and desktop reviews of AREVA's compliance reports.
133. The Commission is satisfied that AREVA's performance with respect to maintaining security at the facility has been acceptable. The Commission concludes that AREVA has made adequate provision for the physical security of the facility, and is of the opinion that AREVA will continue to make adequate provision for it during the proposed licence period.

⁴¹ Canadian Nuclear Safety Commission Regulatory Document – REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources*, May, 2013.

3.13 Safeguards and Non-Proliferation

134. The CNSC's regulatory mandate includes ensuring conformity with measures required to implement Canada's international obligations under the Treaty on the Non-Proliferation of Nuclear Weapons (the Treaty). Pursuant to the Treaty, Canada has entered into safeguards agreements with the International Atomic Energy Agency (IAEA). The objective of these agreements is for the IAEA to provide credible assurance on an annual basis to Canada and to the international community that all declared nuclear material is in peaceful, non-explosive uses and that there is no undeclared nuclear material or activities in this country. Based on information submitted by AREVA and CNSC staff, the Commission assessed the following specific areas of this SCA:

- Nuclear Material Accountancy and Control
- Access and Assistance to the IAEA

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016. These specific areas will be discussed concurrently in this section.

135. The Commission considered AREVA's nuclear material accountancy program for the MLO. AREVA informed the Commission that periodic audits of the inventory system are conducted internally by AREVA, as well as externally by the CNSC and IAEA, and that uranium accountability controls and practices are in place and compliant with CNSC regulatory requirements. AREVA reported that its uranium inventory system, which tracks and records every shipment of uranium, is maintained in accordance with CNSC Regulatory Document RD-336, *Accounting and Reporting of Nuclear Material*,⁴² and that CNSC inventory change documents are submitted for each shipment of radioactive material, as well as the annual reports that are submitted to CNSC staff using the IAEA protocol reporting software. The Commission notes that the MLO grants access to the IAEA as requested, and that the most recent audits of this SCA occurred in May 2016 (IAEA), November 2016 (CNSC staff) and December 2016 (AREVA internal audit). AREVA reported that the MLO will continue to comply with IAEA requests and will continue to work with the IAEA and the CNSC in order to continuously improve upon this SCA.

136. The Commission notes that the CNSC provides the mechanism, through the NSCA, associated regulations and the licence conditions, for the IAEA to implement safeguards agreements at the MLO, and that the conditions for the application of IAEA safeguards are contained in the operating licence. CNSC staff reported that compliance with the aforementioned conditions includes the timely provision of reports on the movement and location of nuclear materials, as well as the provision of access and assistance to IAEA inspectors for verification activities. CNSC staff provided an overview of the processes and procedures utilized by AREVA to ensure that the MLO complies with the safeguard

⁴² Canadian Nuclear Safety Commission Regulatory Document – RD-336, *Accounting and Reporting of Nuclear Material*, June, 2010.

agreements, such as maintaining an up-to-date inventory of uranium concentrate. CNSC staff informed the Commission that, in May 2016, it received a request from the IAEA to perform an inspection at the MLO, and that both the IAEA and CNSC staff were able to carry out all of the planned activities and were satisfied with AREVA's compliance with the inspection, as well as the documentation it provided.

137. Based on the above information, the Commission is satisfied that AREVA has, and will continue to have adequate measures in the areas of safeguards and non-proliferation at the MLO that are necessary for maintaining national security and measures necessary for implementing international agreements to which Canada has agreed.

3.14 Packaging and Transport

138. Packaging and transport covers the safe packaging and transport of nuclear substances and radiation devices to and from the licensed facility. The licensee must adhere to the *Packaging and Transport of Nuclear Substances Regulations*⁴³ (PTNSR) and Transport Canada's *Transportation of Dangerous Goods Regulations*⁴⁴ (TDGR) for all shipments leaving the facility. Based on information submitted by AREVA and CNSC staff, the Commission assessed the following specific areas of this SCA:

- Packaging and Transport
- Registration for Use

After evaluating the MLO's performance in this SCA, CNSC staff rated it as satisfactory for the period 2009-2016. These specific areas will be discussed concurrently in this section.

139. The Commission assessed AREVA's procedures and supporting documents related to the handling, storing, loading, transporting and receipt of nuclear substances and other dangerous goods. AREVA reported that nuclear substances transported to and from the MLO site are in compliance with the TDGR and PTNSR, and detailed the responsibilities and training of the different groups of workers who are responsible for packaging, loading, monitoring, handling, labelling, marking, shipping and receiving of dangerous and/or radioactive products. AREVA stated that the MLO verifies that the recipients of its radioactive shipments hold the necessary licence(s) to possess the prescribed substances. If necessary, the MLO will verify that the recipients obtain an import or export licence from the CNSC, pursuant to the *Nuclear Non-Proliferation Import and Export Control Regulations*.⁴⁵ AREVA added that it maintains an Emergency Response Action Plan (ERAP), which was approved by Transport Canada and is a requirement under the TDGR with respect to radioactive shipments.

⁴³ *Packaging and Transport of Nuclear Substances Regulations* (SOR/2000-208)

⁴⁴ *Transportation of Dangerous Goods Regulations* (SOR/2001-286)

⁴⁵ *Nuclear Non-proliferation Import and Export Control Regulations* (SOR/2000-210)

140. The Commission notes that AREVA has expressed a commitment to continually improve the packaging system in order to control ambient long-lived radioactive dust within the enclosures at the MLO.
141. AREVA informed the Commission that, during the current licence period, CNSC staff was notified seven times regarding reportable events related to the shipment of ore slurry totes in exceedance of surface contamination limits as prescribed by the PTNSR. The Commission notes that, after each such event, AREVA implemented corrective actions, and that none of those events caused negative environmental impacts. CNSC staff added that, with respect to these events, none of the incidents resulted in human health or radiological effects or releases to the environment, and that the corrective actions taken by AREVA were satisfactory. The Commission is concerned about the frequency of these exceedances and exhorts AREVA to not only implement corrective actions after these incidents but to also prevent further exceedances.
142. CNSC staff reported that AREVA had implemented a packaging and transport program for the MLO that is in compliance with the TDGR and PTNSR for all shipments. CNSC staff noted that all of the ore slurry shipped to the MLO for milling is shipped in containers that have a proven history of use and are in compliance with the PTNSR. CNSC staff informed the Commission that AREVA submitted documentation related to packaging and transport. After some areas of improvement were addressed by AREVA, CNSC staff concluded that those documents met the applicable regulatory requirements. CNSC staff reported that, during the licence period, it conducted compliance inspections at the MLO regarding the transport and packaging program, including an October 2016 focused transportation inspection. After AREVA addressed minor deficiencies, CNSC staff stated that the MLO's transportation and packaging program and associated procedures were in compliance with regulatory requirements.
143. Addressing the division of responsibility between Cameco and AREVA with respect to the shipments of ore from Cigar Lake to the MLO, the Cameco representative stated that they have a great deal of experience managing these shipments, all of which are done in accordance with the relevant licences and the applicable federal and provincial legislation. The Cameco representative added that the ore containers are certified and meet all the necessary requirements, and that the ore shipments are the responsibility of Cameco until they reach MLO, where they become the responsibility of AREVA. The AREVA representative stated that there is a mutual aid agreement in place between the two companies, to lend assistance to each other in case of an emergency at one of the northern mine sites.
144. Based on the above information, the Commission is satisfied that AREVA is meeting regulatory requirements regarding packaging and transport.

3.15 Application of the *Canadian Environmental Assessment Act*

145. The Commission recognizes that several EAs were performed for various projects at the

MLO, under the *Canadian Environmental Assessment Act, 1992*,⁴⁶ as the *Canadian Environmental Assessment Act, 2012*,⁴⁷ was not in effect at that time. The Commission notes that an EA under the NSCA and associated regulations was appropriate for this licence renewal application. The Commission further notes that the NSCA provides a strong regulatory framework for the protection of the environment, and is satisfied that AREVA will continue to make adequate provision for the protection of the environment and the health and safety of persons.

3.16 Aboriginal Engagement and Public Information

146. The Commission considered the information provided by CNSC staff with respect to the engagement of the public in the licensing process as enhanced by the CNSC's Participant Funding Program (PFP). CNSC staff informed the Commission that the CNSC made available up to \$75,000 through its Participant Funding Program (PFP) to assist members of the public, Indigenous groups, and other stakeholders in providing value-added information to the Commission through informed and topic-specific interventions. Based on recommendations from the Funding Review Committee, external to the CNSC, the CNSC awarded participant funding for a total amount of \$75,289 to the following recipients, who were required to submit a written intervention and make an oral intervention at the Commission's public hearing:

- Kineepik Métis Local Inc. (#9) Pinehouse
- David Parker
- Ya'thi Néné Lands and Resource Office
- Saskatchewan Environmental Society
- Dr. Philip D McLoughlin
- Angela Laventure (President of Unifor Local 48s)
- Lac La Ronge Indian Band
- Buffalo Rive Dene Nation
- Birch Narrows Dene Nation

3.16.1 Aboriginal Engagement

147. The common law duty to consult with Aboriginal peoples applies when the Crown contemplates action that may adversely affect established or potential Aboriginal and/or treaty rights. The CNSC, as an agent of the Crown and as Canada's nuclear regulator, recognizes and understands the importance of building relationships and engaging with Canada's Aboriginal peoples. The CNSC ensures that its licensing decisions under the NSCA uphold the honour of the Crown and considers Aboriginal peoples' potential or established Aboriginal and/or treaty rights pursuant to section 35 of the *Constitution Act*,

⁴⁶ *Canadian Environmental Assessment Act*, S.C. 1992, c. 37

⁴⁷ *Canadian Environmental Assessment Act*, 2012, S.C. 2012, c. 19, s. 52

1982.⁴⁸

148. The Commission assessed AREVA's Aboriginal engagement activities. AREVA stated that it is strongly committed to ensuring that opportunities are afforded to Aboriginal communities, members, and leadership to engage with AREVA regarding the MLO licence renewal process and proposed licence period. AREVA reported that it, Cameco Corporation, and several Indigenous communities have a unique engagement process with respect to the MLO for specific duties, such as the review of environmental information regarding the operations at that facility. AREVA stated that it developed a public engagement strategy to ensure that Indigenous community members and leadership would be informed and engaged regarding the MLO licence renewal process. AREVA reported that the type of engagement included information on its public website, community and leadership meetings, newsletters, sub-committee meetings, correspondence, information sharing, notices and internal media. The Commission notes that AREVA provided detailed information regarding its existing and planned Aboriginal engagement activities.
149. CNSC staff informed the Commission that it had identified six First Nation and Métis groups who may have an interest in the proposed licence renewal:
- Ya'thi Néné Lands and Resource Office (Representing Black Lake First Nation, Hatchet Lake First Nation, and Fond du Lac First Nation)
 - Métis Nation Saskatchewan – Northern Region 1
 - Kineepik Métis Local Inc. (#9) – Pinehouse Lake
 - English River First Nation
 - Prince Albert Grand Council
 - Federation of Sovereign Indigenous Nations

CNSC staff reported that these aforementioned First Nations and Metis groups and organizations had previously expressed interest in being kept informed regarding CNSC licensed activities occurring in their treaty lands and/or asserted traditional territories in relation to the MLO. CNSC staff stated that it sent letters of notification in November 2016 to the identified groups providing information on the proposed licence renewal and the availability of participant funding, and that follow-up phone calls were conducted to ensure that the letters were received, and to answer any questions that could be asked of CNSC staff. All of the groups and organizations were encouraged to participate in the licence renewal process, and to bring any concerns directly to the Commission. The Commission notes that no issues relating to the potential impacts on Aboriginal or treaty rights resulting from the licence renewal application were raised by these identified First Nation and Métis groups. CNSC staff reported that Regulatory Document REGDOC-3.2.2, *Aboriginal Engagement*⁴⁹ sets out requirements and guidance for licensees whose proposed projects may raise the Crown's duty to consult. However, as the licence renewal application does not propose any new activities, CNSC staff submitted that no consultation duty on the Crown arose.

⁴⁸ *Constitution Act, 1982*, Schedule B to the *Canada Act 1982*, 1982, c. 11 (U.K.).

⁴⁹ Canadian Nuclear Safety Commission Regulatory Document – REGDOC-3.2.2, *Aboriginal Engagement*, February, 2016.

150. Addressing the engagement with trappers in the region, the AREVA representative stated that there is a trapper compensation program in place with the Hatchet Lake and Wollaston Lake communities; however, there are no compensation programs in place with other Indigenous communities.
151. Asked if AREVA performs archeological surveys in the area, the AREVA representative responded that archeological surveys are performed, and the practice is to conduct these surveys before new land disturbances. The Commission notes that this information is included in AREVA's Technical Information Documents (TIDs), which are available to the public via AREVA's website.
152. The Commission notes that a significant proportion of the workers at the MLO self-identify as Indigenous peoples, and that many of them are active members of the Canadian Nuclear Workers Council (CNWC). Mr. Shier, representing the CNWC, stated that there is no direct communication between the CNWC and the Indigenous groups. However, there is communication through the Indigenous members of the CNWC.
153. The Commission wishes to note that it is appreciative of the historical information provided by several of the Indigenous groups who acted as intervenors for this hearing, and to the Lac La Ronge Indian Band for hosting this public hearing within their traditional Treaty No. 6⁵⁰ territory. The Commission also expressed its appreciation to the Kikinahk Friendship Centre for hosting this licence renewal hearing.

Ya'thi Néné Lands and Resource Office

154. Asked about further discussions on addressing the outstanding recommendations listed in the Ya'thi Néné Lands and Resource Office's submission, the intervenor representative responded that a joint decision was made between the Ya'thi Néné and AREVA to discuss many of the recommendations outside of the licence renewal hearing, and that several meetings took place with AREVA and CNSC staff. The representative added that, in their list of recommendations, they removed those that they believed could be addressed through the Athabasca Joint Environmental Subcommittee (AJES) or have already been addressed through meetings with AREVA and the CNSC.
155. Asked if the activities at the MLO had caused changes to the behavior or presence of wildlife in the surrounding environment, the Ya'thi Néné representative responded that they have not witnessed any effects on the wildlife due to the mining industry in the area. The representative added that there are continuous wildlife monitoring programs within the Athabasca Basin and in the area surrounding Lake Athabasca and neighbouring communities. Regarding the potential effects of the MLO operations on caribou migration, the ECCC representative stated that ECCC does have certain responsibilities concerning boreal caribou pursuant to the *Species at Risk Act*. However, the individual provinces and territories are best suited to providing information on the specific management of the boreal caribou.

⁵⁰ Treaty Texts - Treaty No. 6, (1876), < <http://www.aadnc-aandc.gc.ca/eng/1100100028710/1100100028783>>

156. Addressing the community engagement tour which occurred in the Black Lake and Fond du Lac First Nation communities in January 2017, the Ya'thi Néné representative responded that they believed having representatives from the CNSC and from industry present during the tour was very beneficial. The Ya'thi Néné representative stated that the presentations and information provided were effective, concise, informative and easily understood. The Ya'thi Néné representative added that overall, the tour was effective and they were pleased with the outcome.

Buffalo River Dene Nation and Birch Narrows Dene Nation

157. Representatives from the Buffalo River Dene Nation and Birch Narrows Dene Nation (the Nations) submitted that the MLO licence renewal would have an effect on their indigenous rights, as both groups were signatories to Treaty No. 10,⁵¹ the territory in which the MLO resides. The Commission notes that the representatives from the Nations submitted that the consultation and engagement it received from CNSC staff and AREVA was not sufficient, since they consider the licence renewal application as triggering the Crown's consultation duty.
158. CNSC staff stated that it reached out to and communicated with the Nations in December 2016 when staff became aware of the Nation's interest in this matter, through their application for PFP funding, which was subsequently awarded. The Commission notes that CNSC staff met with representatives from the Nations on May 25, 2017 in Saskatoon, Saskatchewan.
159. The representative from the Nations added that the courts have stressed the need to consider the cumulative impacts of decisions made by the Crown or representatives of the Crown, and as such, the cumulative impacts of the mining operation should be considered. The representative for the Nations stated that the continued mining operation triggers the duty to consult, and therefore AREVA and the CNSC should have engaged and consulted with the Nations to a greater degree.
160. The Commission notes that the Nations were engaged in previous projects at this site, such as the Midwest project in 2010. The representative for the Nations confirmed that engagement for past projects did occur, and stated that past engagement and submissions in prior licence renewal applications should not affect how the Commission considers submissions for the current licence renewal hearing.
161. The Commission notes that the Nations, in their written submission, stated that there was no engagement from AREVA and limited information provided by the CNSC regarding the licence renewal activities. Asked if that statement was still correct, the representative for the Nations noted that a meeting with CNSC staff had occurred in late May. The representative for the Nations stated that the engagement process was abbreviated due to the proximity of the meeting between the Nations and CNSC staff and the licence renewal hearing. The representative for the Nations also voiced concern over the lack of internal capacity for

⁵¹ Treaty Texts - Treaty No. 10, (1906), < <http://www.aadnc-aandc.gc.ca/eng/1100100028874/1100100028906>>

the Nations to review all of the detailed technical information without outside assistance, and that the consultation process should be improved to allow more meaningful engagement and consultation.

162. Addressing the concerns voiced by the Nations, the AREVA representative stated that AREVA has been building relationships with Indigenous groups and the public for the past 25 years, including periodic meetings with the Nations. The AREVA representative reported that the first instance where the Nations raised concerns regarding specific rights occurred in a February 2017 meeting, however it was not made clear to AREVA which specific rights would be affected. The AREVA representative noted that they will continue to engage with the Nations to help them better understand the MLO activities and to address any concerns. CNSC staff stated that it takes the duty to consult very seriously, and strives for meaningful, long-standing engagement with the Nations. CNSC staff explained that the Supreme Court has provided clarity regarding what constitutes the legal duty, and that in this licence renewal application, there are no requests that have not been previously assessed, no requests for projects outside of the licensing basis, and no new activities that could impact Aboriginal or Treaty rights. CNSC staff stated that it identified all Indigenous groups that had previously expressed interest in this facility, and that the facility was thoroughly assessed for its potential impact on the environment as well as Aboriginal and Treaty rights. CNSC staff noted that they received the PFP request in December 2016 and immediately followed up with the Nations on multiple occasions thereafter.
163. The Commission notes that CNSC staff met with the Nations on May 25, 2017, in Saskatoon, and that CNSC staff is committed to continued engagement with the Nations. The Commission recognizes that the environmental monitoring includes and engages Indigenous groups, and that CNSC staff is working to improve upon the engagement process to ensure that Indigenous groups are kept informed regarding regulatory oversight and the protection of the environment. Regarding the outcome of the meeting between CNSC staff and the Nations, CNSC staff provided an overview of that meeting, including information on the parties involved, the topics discussed at the meeting, and the potential impacts of the MLO on the Nations, given the distance between the facility and their respective territories. At that meeting, CNSC staff also provided information on the CNSC, its mandate, regulatory oversight, and Aboriginal engagement. CNSC staff reported that they spoke directly with the band members, Elders and Chiefs regarding the conditions on the reserves, as well as what the CNSC can and cannot provide, and CNSC staff felt that they established a rapport with the band members. CNSC staff stated that there is a lot of interest and questions regarding uranium mining in those communities. CNSC staff was asked to provide some documentation as well as information regarding its IEMP. CNSC staff added that it has committed to a systematic and proactive approach to engagement with the Nations in the future. CNSC staff noted that minutes for that meeting are available.
164. Addressing the sharing of information between the different Indigenous groups in the area near the MLO, the Nations representative reported that there are strong family connections between members of the Nations and other Indigenous groups in the area, and that

significant information sharing occurs via these familial connections. The representative also noted the importance of Aboriginal traditional evidence, as has been recognized by the courts, when coming to these licensing decisions. Another representative from the Nations added that information from the locals in the area does not always reach the general public. The Commission noted the statement by this intervenor on the importance of oral traditional evidence, and that the Nations have limited resources at their disposal to conduct their own research and assessments.

Kineepik Métis Local Inc. (#9)

165. The Commission noted that the intervenor representing the Kineepik Métis Local Inc. (#9) (Kineepik) was unable to obtain several of the references that were requested from AREVA. Asked about the effect it had on their ability to review AREVA's submission, the representative noted that there can be a cumbersome process for reviewing documents for these hearings, and that he is mindful of how technical these documents are and of the time it takes to finalize them. The Kineepik representative reported that the inability to obtain these additional documents did not affect their review of AREVA's documentation or affect their recommendations regarding the licence renewal request, by virtue of the review of AREVA's documentation from previous years. The AREVA representative apologized for this issue, and stated that AREVA will move to correct it. The AREVA representative added that, for this licence renewal application, AREVA gave unprecedented access to AREVA's collection of documentation, and noted that the documents that the Kineepik representative was unable to obtain may not have been finalized at the time the request was made.
166. The Commission noted that a small number of Pinehouse participants raised concerns over the impact of the mines on traditional land use activities and the environment, and enquired if there were any issues of which the Commission should be aware. Addressing this, the Kineepik Métis Local Inc. (#9) representative stated that those concerns were addressed appropriately and that he would re-evaluate his community engagement in order to improve upon the dissemination of information to the community.

3.16.2 Public Information

167. The Commission considered the Public Information Program (PIP) at the MLO. AREVA informed the Commission that the PIP was implemented in accordance with the NSCA, *Uranium Mines and Mills Regulations* and the assessment criteria stipulated in CNSC Regulatory Document RD/GD 99.3, *Public Information and Disclosure*.⁵² AREVA stated that various communication tools are used, such as public websites, brochures, newsletters, videos, blogs, fact-to-face meetings, and participation at community events. AREVA reported that questions, comments and concerns that are expressed during public meetings and discussions are recorded and used to determine potential changes to proposed projects, level of interest in projects, and potential areas of improvement. AREVA also responds to these questions, comments or concerns. AREVA added that

⁵² Canadian Nuclear Safety Commission Regulatory Document - RD/GD- 99.3, *Public Information and Disclosure*, March 2012.

comments from the public are collected and reported in AREVA's project specific annual reports to various regulators.

168. CNSC staff reported that, as per its normal public notification process for Commission hearings and meetings, it informed the public about the MLO licence renewal hearing and participant funding opportunities through the CNSC's website, email subscription list, social media channels, radio and print advertisements in local communities. CNSC staff also provided a "CNSC 101" information sessions in the Wollaston Post/Hatchet Lake First Nation community on October 11, 2016, and provided an additional "CNSC 101" session for leadership and staff of the Prince Albert Grand Council and the Federation of Sovereign Indigenous Nations in Saskatoon, Saskatchewan on October 12, 2016.

3.16.3 Conclusion on Aboriginal Engagement and Public Information

169. On the evidence provided, the Commission is satisfied with the level of Aboriginal engagement and consultation that was undertaken in relation to this licence renewal. The Commission expresses its appreciation for the information provided by the intervenors representing Indigenous groups.
170. The Commission appreciates the efforts made on the Commission's behalf by the CNSC staff with respect to engagement and consultation activities with Indigenous groups. The staff outreach, the administration of participant funding and the meetings undertaken by staff to engage with Indigenous groups have facilitated the Commission's understanding of their concerns and their involvement in this renewal hearing process. Respecting the Buffalo River and Birch Narrows Dene Nations in particular, while the Commission understands that their interest in the renewal matter was identified later than others', it is satisfied that they had an adequate opportunity to make submissions for the Commission's consideration and to participate meaningfully in the hearing process, as did other groups. The Commission is satisfied that the nature of this renewal decision, which authorizes no new activities, does not trigger a deep consultation duty, and that the scope of consultation activity has been appropriate in this matter.⁵³ It is satisfied that its decision to renew the licence, with the conditions it includes, accords with the honour of the Crown and satisfies the Commission's duty in this regard, given that the Commission expects no new impacts as a result of the ongoing operation, and given the evidence it has heard in this proceeding.⁵⁴ Any new activities that are not currently authorized in the renewed licence would have to be authorized in future, and would be the subject of consideration and potential consultation activities at that time. The Commission is satisfied with the CNSC staff's proactive approach to engagement with all interested Indigenous groups on an ongoing basis, and with AREVA's stated intention to continue enhancing its dialogue and information-sharing.
171. Based on the information presented, the Commission is satisfied that AREVA's public information program meets regulatory requirements and is effective in keeping Aboriginal

⁵³ *Rio Tinto Alcan v. Carrier Sekani Tribal Council*, 2010 SCC 43 at paras. 45-49

⁵⁴ *Chippewas of the Thames First Nation v. Enbridge Pipelines Inc.*, 2017 SCC 41

communities and the public informed of facility plans and operations. The Commission encourages AREVA to continue to create, maintain and improve its dialogue with the neighbouring communities and Indigenous groups.

3.17 Decommissioning Plan and Financial Guarantee

172. The Commission requires that licensees have operational plans for decommissioning and long-term management of waste produced during the life-span of the facility. In order to ensure that adequate resources are available for safe and secure future decommissioning of the MLO site, the Commission requires that an adequate financial guarantee (FG) for realization of the planned activities is put in place and maintained in a form acceptable to the Commission throughout the licence period, and for their participation in the hearing process.
173. Paragraph 3(1)(l) of the *General Nuclear Safety and Control Regulations*⁵⁵ (GNSCR) stipulates that “an application for a licence shall contain a description of any proposed FG related to the activity for which a licence application is submitted.” CNSC Regulatory guide G-206, *Financial Guarantees for the Decommissioning of Licensed Activities*,⁵⁶ covers the provision of FGs for decommissioning activities for nuclear facilities. The Commission notes that, under *The Mineral Industry Environmental Protection Regulations*, 1996, the Government of Saskatchewan also requires that mining and milling projects be covered by FGs, and that the provincial review of the Preliminary Decommissioning Plan (PDP) and FG is independent of the CNSC review. CNSC staff reported that the Memorandum of Understanding between the province and the CNSC allows AREVA to provide a single FG, subject to mutual acceptance. CNSC staff stated that AREVA continues to use letters of credit in accordance with CNSC regulatory guide G-206, and that AREVA has provided copies of those letters of credit to the CNSC. CNSC staff is of the view that the proposed FG of C\$107,241,000 and the instruments used to provide the FG are acceptable.
174. AREVA informed the Commission that it maintains a PDP pursuant to the GNSCR and the *Mineral Industry Environmental Protection Regulations*, 1996.⁵⁷ The Commission notes that AREVA is obligated to decommission the MLO at the end of its lifecycle, and that detailed plans will be provided for regulatory approval prior to the start of the final decommissioning activities. AREVA reported that the PDP is reviewed and revised every 5 years, and as such will be reviewed and updated at least twice during the proposed licence term.
175. CNSC staff confirmed that AREVA will maintain decommissioning plans throughout the lifecycle of the MLO, pursuant to Paragraph 3(a)(viii) of the *Uranium Mines and Mills Regulations* and CNSC regulatory guide G-219, *Decommissioning Plans for Licensed*

⁵⁵ *General Nuclear Safety and Control Regulations* (SOR/2000-202)

⁵⁶ Canadian Nuclear Safety Commission Regulatory Guide – G-206, *Financial Guarantees for the Decommissioning of Licensed Activities*, June, 2000.

⁵⁷ E-10.2 Reg 7 - *The Mineral Industry Environmental Protection Regulations*, 1996

Activities.⁵⁸ CNSC staff confirmed that there is a Memorandum of Understanding with the province of Saskatchewan, detailing the cooperation of the CNSC and the SMOE. CNSC staff stated that the PDP must meet the requirements stipulated in CSA standard N294-09, *Decommissioning of Facilities Containing Nuclear Substances*⁵⁹ and the requirements listed in CNSC regulatory guide G-219. CNSC staff reported that AREVA submitted a revised PDP based on current activities at the MLO, including a revised FG of C\$107,241,000. The Commission notes that CNSC staff and the SMOE reviewed the proposed PDP and FG and are of the opinion that they are acceptable and meet regulatory requirements.

176. Addressing detailed decommissioning plans, CNSC staff reported that, as the operation of the MLO nears the expected end-of-life date for the facility, the PDP will also progress into the detailed decommissioning plan, and as the expected end-of-life for the mine is 2050, no detailed decommission plans have been submitted to CNSC staff at this time. The representative from the SMOE stated that the decommissioning criteria are usually laid out in the initial environmental assessment, and that the end goal of decommissioning is unrestricted traditional land use. However, this representative also noted that the Saskatchewan Ministry of Economy may place caveats preventing future commercial or industrial use of the site after remediation. The AREVA representative noted that the objective will be to return the land to its traditional use with a minimum of land use constraints, and that local land users will be consulted when the detailed decommissioning plan is drafted.
177. The Commission noted that there are multiple parties that own a stake in the MLO, and that a large percentage of this operation is foreign-owned. The Commission asked for submissions on whether these factors pose a risk with respect to the FG for the MLO. CNSC staff responded that the FG for the MLO is a complex matter, and that a detailed review of these letters of credit had to be done. The province of Saskatchewan is the named beneficiary for the letters of credit. CNSC staff reported that the province would have access to the money in the event that the owners of the MLO were unable to fund the decommissioning and remediation of the site. CNSC staff added that the FG for the MLO was properly vetted and was approved by both the province of Saskatchewan and CNSC staff, so it awaited Commission acceptance of the instruments and the quantum.
178. Based on this information, the Commission considers that the preliminary decommissioning plans are acceptable for the purpose of the current application for licence renewal.
179. The Commission accepts AREVA's revised FG for the decommissioning of the MLO for the amount of C\$107,241,000, as well as the financial instruments used for the FG. The Commission notes that, at a minimum, the FG must be reviewed every 5 years.

⁵⁸ Canadian Nuclear Safety Commission Regulatory Guide – G-219, *Decommissioning Planning For Licensed Activities*, June, 2000.

⁵⁹ CSA Group – CSA N394-09, *Decommissioning of Facilities Containing Nuclear Substances*, 2009.

3.18 Cost Recovery

180. CNSC staff reported that OPG is in good standing with respect to the *Cost Recovery Fees Regulations*⁶⁰ requirements with respect to the MLO.

3.19 Improvement Plans and Significant Future Activities

181. CNSC staff provided information on future significant activities and improvement plans slated to occur at the MLO site. These projects are:

- Sulphur Dioxide Mitigation Project
- Selenium Adaptive Management Plan
- Job Tailings Management Facility Expansion Project

CNSC staff reported that it will review the information submitted by AREVA to determine if the proposed activities are within the licensing basis, and any changes not within the licensing basis will be brought before the Commission for its consideration. The Commission notes that the proposed activities have a specific focus on improvements with respect to controlling sulphur dioxide emissions and selenium concentrations.

182. The Commission takes notice of the selenium management program at the MLO, and instructs CNSC staff to report on the progress related to the selenium management plan and selenium effluent as part of the annual *Regulatory Oversight Report*.

3.20 Licence Length and Conditions

183. AREVA requested the renewal of the current operating licence for a period of 12 years. CNSC staff recommended the renewal of the licence for a period of 12 years, stating that AREVA is qualified to carry out the licensed activities authorized by the licence. CNSC staff also recommended that annual reports on the facility would be provided for consideration by the Commission at public meetings to be held annually.
184. The Commission notes that a twelve-year licence period would allow for AREVA to complete two full cycles of its EPTIDs, and asked for additional rationale regarding the request for a twelve-year licence period. The AREVA representative responded that the primary reason for asking for the twelve-year licence period was to align the licensing term with the EPTID, which is a key document with respect to the licence renewal process, and that it is most appropriate to align the proposed next licence renewal hearing after the second cycle of that document. The AREVA representative added that longer licence terms, supported by the annual RORs, reduce confusion with respect to the licence renewal process. The Commission notes that the most recent EPTID for the 2011-2015 period was submitted in September 2016, with the next two cycles occurring in 2021 and

⁶⁰ SOR/2003-212

2026, respectively. The Commission noted that CNSC staff performed a complete review of these EPTIDs before this hearing, and that the Saskatchewan Ministry of the Environment is still in the process of reviewing those documents.

185. The Commission notes that several intervenors were supportive of a twelve-year licence, citing the strict regulatory oversight provided by the CNSC, and the detailed assessments performed by AREVA, while other intervenors recommended a shorter licence term in the vicinity of eight to ten years.
186. After consideration of the evidence provided by AREVA, CNSC staff and the intervenors, the Commission concludes that a 10-year licence is appropriate.. The Commission notes that a 10-year licence is consistent with current practices regarding the term of the licences issued in respect of similar facilities. The Commission is also of the view that AREVA and CNSC staff can structure the cycle of environmental reviews to correspond to the ten-year licence period.
187. The Commission accepts the licence conditions as recommended by CNSC staff, with the aforementioned change regarding licence condition 9.2, as discussed previously in paragraph 10 of this *Record of Decision*. The Commission authorizes the delegation of authority as recommended in section 4.9 of CMD 17-H9, and notes that CNSC staff can bring any matter to the Commission as applicable.

4.0 CONCLUSION

188. The Commission has considered the information and submissions of the applicant, CNSC staff and all participants as set out in the material available for reference on the record, as well as the oral and written submissions provided or made by the participants at the hearing.
189. The Commission notes that an EA under the NSCA and associated regulations was appropriate for this licence renewal application. The Commission further notes that the NSCA provides a strong regulatory framework for the protection of the environment, and is satisfied that AREVA will continue to make adequate provisions for the protection of the environment and the health and safety of persons.
190. The Commission is satisfied that the applicant meets the requirements of subsection 24(4) of the *Nuclear Safety and Control Act*. That is, the Commission is of the opinion that the applicant is qualified to carry on the activity that the proposed licence will authorize and that the applicant will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.
191. Therefore, the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews the Uranium Mine Operating Licence issued to AREVA Resources Canada Inc., for its McClean Lake Operation located in the Athabasca Basin in Saskatchewan. The

renewed licence, UMOL-MINEMILL-McCLEAN.00/2027, is valid for a 10-year period, from July 1, 2017, until June 30, 2027, unless suspended, amended, revoked or replaced.

192. The Commission includes in the licence the conditions as recommended by CNSC staff in CMD 17-H9, with the following revised licence condition 9.2:

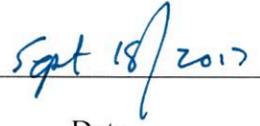
The licensee shall, where the effluent concentration reaches or exceeds the discharge limits specified in the *Metal Mining Effluent Regulations* **as amended from time to time**, immediately investigate and take corrective action to ensure that the effluent concentration is maintained below the discharge limits.

193. The Commission authorizes the delegation of authority with respect to licence condition 3.2 and with respect to the compliance verification section of the LCH in relation to licence condition 3.3, as recommended in section 4.9 of CMD 17-H9. The Commission notes that CNSC staff can bring any matter to the Commission as applicable. The Commission directs CNSC staff to inform the Commission on an annual basis of any changes made to the LCH.
194. The Commission accepts AREVA's revised FG for the decommissioning of the MLO for the amount of C\$107,241,000, as well as the financial instruments used for the FG. The Commission notes that, at a minimum, the FG and PDP must be reviewed every 5 years.
195. The Commission takes particular notice of the selenium management program at the MLO, and instructs CNSC staff to report on the progress related to the selenium management plan and selenium effluent as part of the annual *Regulatory Oversight Report*.
196. The Commission considers the environmental review that was conducted by CNSC staff to be acceptable and thorough. The Commission also encourages AREVA and CNSC staff to align future environmental reviews and analysis with the ten-year licence period.
197. For any future licence renewal or licence amendment applications which may be submitted for this facility, the Commission directs CNSC staff to include in the staff recommendations either an appendix listing notable non-compliance incidents at the MLO, or to provide more detailed information on specific examples of non-compliances at that facility.
198. On the evidence provided, the Commission is satisfied with the level of Aboriginal engagement and consultation that was undertaken in relation to this licence renewal, and invites AREVA and CNSC staff to continue to foster relationships with Indigenous groups. The Commission expresses its appreciation for the information provided by the intervenors representing Indigenous groups.
199. The Commission recognizes the quality of the information that was submitted by all intervenors, and expressed its appreciation for the work performed by these intervenors, which aided the Commission in coming to its decision.

200. The Commission acknowledges the work done with respect to the research on the caribou populations near the MLO, as well as the identification, monitoring and control of nuclear and hazardous substances, including releases to the water. The Commission also expresses its appreciation for the contributions from other federal and provincial organizations, and its appreciation for the representatives of those agencies who attended this hearing.
201. With this decision, the Commission directs CNSC staff to report annually on the performance of the McClean Lake Operation as part of an annual *Regulatory Oversight Report*. CNSC staff shall present this report at a public proceeding of the Commission, where members of the public will be able to participate.



Dr. Alexander McEwan
Panel Chair,
Canadian Nuclear Safety Commission



Date

Appendix A – Intervenors

Ya'thi Néné Lands and Resources Offices, represented by M. Dawe, V. Fern and M. Denechezhe	17-H9.11 17-H9.11A 17-H9.11B
Saskatchewan Environmental Society, represented by A. Coxworth and H. Carlson	17-H9.6 17-H9.6A
Philip D. McLoughlin	17-H9.12 17-H9.12A
Buffalo River Dene Nation and the Birch Narrows Dene Nation: Chief E. Morisson - Buffalo River Dene Nation Elder P. Sylvestre - Member of Birch Narrows Dene Nation A. Lalji – Miller Thompson – Legal Counsel to the Buffalo River Dene and the Birch Narrows Dene Nations S. Joseph, Associate at Miller Thompson and Legal Counsel to Buffalo River and Birch Narrows Dene Nations	17-H9.8
Cameco corporation, represented by L. Mooney and K. Nagy	17-H9.7 17-H9.7A
Kineepik Métis Local Inc. (#9), represented by V. Natomagan	17-H9.3
David Parker	17-H9.2 17-H9.2A
UNIFOR Local 48, represented by A. Laventure and D. Daigneault	17-H9.4
Canadian Nuclear Workers' council, represented by D. Shier	17-H9.5 17-H9.5A
Saskatchewan Mining Association	17-H9.9