Kiggavik Project Final Environmental Impact Statement

Tier 3 Technical Appendix 2T: Environmental Management Plan

September 2014

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Abbreviations

AANDC ..... Aboriginal Affairs and Northern Development Canada

CSA ..... Canadian Standards Association

CNSC ..... Canadian Nuclear Safety Commission

EA ..... Environmental Assessment

DFO ..... Department of Fisheries and Oceans

EC ..... Environment Canada

ECOP ..... Environmental Code of Practice

EMP ..... Environmental Management Plan

EIS ..... Environmental Impact Statement

EPP ..... Environmental Protection Plan

FDM ..... Facility Description Manual

GC ..... Government of Canada

GN ..... Government of Nunavut

HC ..... Health Canada

HTO ..... Hunter Trapper Organization

IMS ..... Integrated Management System

IPG ..... Institutions of Public Government

ISO ..... International Organization for Standardization

IQ ..... Inuit Qaujimjatuqangit

LCH ..... Licence Condition Handbook

MFLM ..... Mining Facility Licensing Manual

MMER ..... Metal Mine Effluent Regulations

MOU ..... Memorandum of Understanding

NGMP ..... Nunavut General Monitoring Plan

NIRB ..... Nunavut Impact Review Board

NLCA ..... Nunavut Land Claims Agreement

NMC ..... Nunavut Marine Council

NPC ..... Nunavut Planning Commission

NRCan ..... Natural Resources Canada

NSRT ..... Nunavut Surface Rights Tribunal

NSCA ..... Nuclear Safety and Control Act

NTI ..... Nunavut Tunngavik Incorporated

NWB ..... Nunavut Water Board

NWMB ..... Nunavut Wildlife Management Board

OHSAS ..... Occupational Health and Safety Advisory Services

PC ..... Parks Canada

PDP ..... Preliminary Decomissioning Plan

TC ..... Transport Canada

UMMR ..... Uranium Mines and Mills Regulations

WSCC ..... Workers; Safety and Compensation Commission

1 Introduction

1.1 Overview

This Environmental Management Plan (EMP) outlines AREVA Resources Canada's (AREVA's) systematic approach to managing project-environment interactions and potential environmental effects throughout the life of the Kiggavik Project. It defines the sequence of policy, compliance, planning, implementation, monitoring, review, and reporting processes that will ensure the Kiggavik Project is managed in an environmentally acceptable manner. This is achieved through the development of an Integrated Management System (IMS) that is adaptable, and encourages continual improvement.

The review of the Draft Environmental Impact Statement (DEIS) generated a number of Information Requests which sought clarification of Kiggavik Project Environmental Protection Plans (EPPs). As outlined in the NIRB guidelines (Section 9.0), EPPs are part of Environmental Management Plans, Monitoring and Mitigation Plans, Biophysical Environmental Plans, Socio-Economic Plans, Mine Closure and Reclamation Plans, and Follow-up and Adaptive Management Plans.

This Appendix provides the structure which aligns the various requirements outlined in the NIRB guidelines with elements of the requirements of the Canadian Nuclear Safety Commission (CNSC) for an Integrated Management System (CNSC *REGDOC- 2.9.1 Environmental Protection* and CSA Standard *N286-12 Management System Requirements for Nuclear Facilities*). The AREVA Integrated Management System (IMS) encompasses not only the management of environmental protection, but also health, safety, and quality management. The IMS provides the basis for the integration of the requirements of:

- the NIRB;
- the Nunavut Water Board (NWB), the CNSC, other regulators; and
- AREVA's policies (Environmental Protection, Health and Safety, Quality)

This appendix outlines how the various requirements of individual management and monitoring plans will be integrated into the environmental protection and management framework within the IMS. We believe this captures the elements of the requirements of the environmental protection plans and associated management, monitoring and mitigation plans requested by the NIRB, which will be required by the NWB, the CNSC, and other regulators. The environmental protection and management framework incorporates environmental assessment, continual improvement and adaptive management. The IMS is an evolving documented system that is used for planning

environmental monitoring programs, reporting environmental performance, and ensuring follow-up programs and mitigation measures are implemented.

AREVA's Integrated Management System is consistent with the Inuit Qaujimjatuqangit (IQ) concept of Papattiniq/Munakhinik; *the obligation of guardianship or stewardship that a person may owe in relation to something that does not belong to the person* (IQ-Nunavut 2008).

With the completion of the environmental assessment process and the issuance of a project certificate and conditions by the NIRB, a number of licences and permits must be obtained from a number of agencies (e.g. the NWB, the CNSC), many of which are involved in the environmental assessment review process. These licences and permits will be required to construct, operate and decommission the Project.

In Canada, all nuclear projects are regulated and licenced by the Canadian Nuclear Safety Commission (The Commission). The Commission is an independent administrative tribunal, set up at arms length from the government. Commission decisions are made transparently and according to clear rules of procedure. The Commission is supported by more than 800 scientific, technical and professional staff. These staff members review licence applications according to regulatory requirements, make licencing recommendations to the Commission, and enforce compliance with the NSCA, regulations and any licence conditions imposed by the Commission.

The CNSC licence outlines the activities the proponent is authorized to perform. The licence cross-references to a licence conditions handbook, which identifies in detail, the criteria that will be used by the CNSC staff to assess licensee compliance with licence conditions.

The CNSC provides oversight through a hierarchy of legislation, requirements and guidance, inspections and technical review of required reporting. Information on the CNSC, its responsibilities, enforcement powers, and processes are provided in Section 3.5 of this technical appendix.

The IMS, which flows from the requirements of CNSC REGDOC-2.9.1 and CSA N286-12, will incorporate the environmental performance features of each Project component and Project activity. The IMS is developed in anticipation of each of the phases of the Project lifecycle and together with detailed project engineering, is presented as part of the detailed licensing, permitting and authorization applications. In this way, assurance is provided that the project design and mitigation measures meet or exceed those outlined in the Final Environmental Assessment (FEIS). It also provides the opportunity to revisit the environmental aspects and mitigation measures outlined for each phase in the environmental assessment and to identify additional mitigation measures based on information collected during the previous phase of the project, or evolution in our understanding of project-environment interactions.

In addition to re-evaluation at the time of licensing each phase of the Project, the IMS is also reviewed and updated in response to any major change within each project phase, as prescribed by regulation, regulatory documents and standards. This process ensures that any changes to environmental aspects are captured and appropriate mitigation is incorporated into the IMS. Thus, the IMS is a document that evolves in response to changes and phases of the Project. This is commensurate with AREVA's Environmental protection and management framework (see Section 2.2) and consistent with the Inuit Qaujimajatuqangit concept of Pilimmaksarniq/Ayoikyumikatakhimanik: *skills must be improved and maintained through experience and practice* (IQ-Nunavut 2008).

The monitoring, mitigation and management plans requested in the NIRB guidelines are provided in the following Tier 3 Technical Appendices:

- Technical Appendix 2C: Explosives Management Plan
- Technical Appendix 2H: Ore Storage Management Plan
- Technical Appendix 2I: Water Management Plan
- Technical Appendix 2J: Marine Transportation
- Technical Appendix 2M: Road Management plan
- Technical Appendix 2N: Borrow Pits and Quarry Management Plan
- Technical Appendix 2P: Occupational Health and Safety Plan
- Technical Appendix 2Q: Radiation Protection Plan
- Technical Appendix 2R: Preliminary Decommissioning Plan
- Technical Appendix 2S: Waste Management Plan
- Technical Appendix 2U: Hazardous Materials Management Plan
- Technical Appendix 4C: Air Quality Monitoring and Mitigation Plan
- Technical Appendix 4F: Noise Abatement Plan
- Technical Appendix 5F: Mine Rock Characterization and Management
- Technical Appendix 5J: Tailings Characterization and Management
- Technical Appendix 5L: Conceptual Fisheries Offsetting Plan
- Technical Appendix 5M: Aquatic Effects Monitoring Plan
- Technical Appendix 5O: Sediment and Erosion Control Plan
- Technical Appendix 6D: Wildlife Mitigation and Monitoring Plan
- Technical Appendix 9D: Archaeological Mitigation Plan
- Technical Appendix 10B: Spill Contingency and Landfarm Management Plan

These plans will be incorporated into the Kiggavik Project IMS and provided for review in anticipation of the initial NWB and CNSC licensing of the Kiggavik Project. This Technical Appendix outlines the structure of the AREVA Integrated Management System with an emphasis on environmental management, monitoring, mitigation and reporting plans.

1.2 Scope

AREVA's Integrated Management System (IMS), is designed to meet both internal requirements and the requirements of stakeholders.

AREVA's IMS encompasses not only the management of environmental protection, but also health, safety, and quality. The IMS is an evolving documented system which is reviewed and revised throughout the life of the Project to ensure it meets health, safety, and environmental performance requirements. The iterative nature of the IMS allows for identification of continual improvement opportunities, future project requirements and adaptive management needs. This process of adaptive management and continual improvement (Tier 2, Volume 2, Section 17) is consistent with the Inuit Qaujimajatuqangit (IQ) concept of Qanuqtuurunnarniq/Kaujimatukanut; *the ability to be creative and flexible and to improvise with whatever is at hand to achieve a purpose or solve a problem* (IQ-Nunavut 2008),, and Pilimmaksarniq/Ayoikyumikatakhimanik; *skills must be improved and maintained through experience and practice* (IQ-Nunavut 2008).

1.3 Organization and Content

The content of DEIS Technical Appendix 2T has been retained for the FEIS, and additional information has been incorporated. This additional information is a result of supplemental information provided during the review process.

The organization of the Environmental Management Plan is as follows:

- Section 1 Introduction
- Section 2 Environmental Protection
- Section 3 Regulatory Information
- Section 4 AREVA's Integrated Management System (IMS)
- Section 5 Project Phases and the Evolution of the IMS
- Section 6 References

2 Environmental Protection

2.1 Policy

The Integrated Management System (IMS) is based on the AREVA commitment to ensure that activities are systematically planned, controlled, monitored, and improved, as part of an ongoing cycle of improvement. Environmental protection is based on the AREVA Environment Policy, which follows:

AREVA recognizes that continued economic and social development depend on a healthy environment and incorporates environmental considerations into all company activities to ensure sustainable development. AREVA is committed to continually improve approaches and technology to minimize the effects of its activities on the environment.

To meet this commitment, AREVA shall:

- comply with applicable legislation and other requirements to which AREVA subscribes;
- minimize adverse environmental impacts of its activities by reducing consumption of natural resources, controlling releases and optimizing waste management;
- prevent pollution by using processes, practices, materials or products that avoid, reduce or control pollution;
- deal proactively with environmental issues by identifying potential impacts and implementing mitigating actions and/or developing effective contingency plans;
- develop internal objectives and targets to continually improve environmental performance;
- measure performance against established goals;
- conduct employee training, internal assessments and periodic reviews to ensure these operations and activities are conducted in compliance with documented procedures;
- communicate environmental requirements and corporate initiatives to employees and contractors to encourage their participation and compliance; and
- involve applicable stakeholders, with particular focus on those directly impacted, in initial planning, ongoing operations and decommissioning of AREVA activities through an open and transparent public involvement program.

This policy is made available to the public.

2.2 AREVA's Environmental Protection and Management Framework

AREVA's Values Charter put into operation our commitment to the principles of sustainable development. This commitment is reflected in our operating history in northern Saskatchewan. This history also reflects our desire to continue to improve our ability to balance social responsibility, environmental protection and economic performance. Sustainable development provides the opportunity for development to take place, the opportunity to foster stakeholder and community success, and through long-term protection of the environment, the opportunity for future generations to secure their success. Sustainable development embraces the IQ concept of Papattiniq/Munakhinik; *the obligation of guardianship or stewardship that a person may owe in relation to something that does not belong to the person* (IQ-Nunavut 2008).

The achievement of long-term sustainable development goals requires a framework which is precautionary, adaptable and identifies opportunities to improve performance. To ensure long-term environmental performance in support of sustainable development, AREVA has adopted a framework that embraces the principles of environmental assessment as a fundamental sustainable development tool. The framework, which is described below, ensures that the outcomes of the environmental assessment process are implemented, and that the environmental commitments and performance outlined in the environmental assessment are achieved. The framework consists of three main components: environmental assessment, continual improvement and adaptive management. Within the approach, assumptions and decisions are conservative, providing a precautionary approach, which reflects the level of information available at the time decisions are made.

2.2.1 Environmental Assessment

The top half of Figure 2.2-1 provides a simplified flow diagram of the environmental assessment process. The environmental assessment process is a primary regulatory tool to promote sustainable development. The purpose of the environmental assessment process is to:

- identify project-environment interactions and their potential to elicit adverse environmental effects;
- gauge the significance of the effects; and
- identify mitigation measures if significant adverse effects are determined to be likely.

The process is iterative, incorporating mitigation measures and the re-evaluation of the facility design and the potential effects of the proposed activities. As outlined in the Project Description (Volume 2), an iterative evaluation of design alternatives was undertaken in consideration of the site-specific arctic constraints imposed upon project activities. Key features of the alternatives analysis included environmental performance, economic viability and project operability. Project design considered environmental performance including:

- minimizing water and reagent use;
- optimizing water recycle;
- capturing and treating water that may have come in contact with operational areas;
- minimizing the project footprint; and
- minimizing the risk of atmospheric and treated effluent emissions.

The iterative evaluation process identified optimized and robust processes and infrastructure configurations, which, within the context of operational and economic constraints, would minimize the residual environmental effects of the project.

As part of the environmental process, mitigation measures are incorporated into the Project to avoid and minimize potential adverse environmental effects. Mitigation measures consist of industry best technologies and practices and incorporate the learning-based experiences of other development projects. Mitigation measures can generally be classified as mitigation by design and mitigation my management.

Where a Project effect can be reduced through mitigation, this has been identified and has been considered in the conceptual design, construction, operation, and decommissioning phases of the Project. Where applicable, mitigation measures are incorporated into the facility design to reduce or eliminate potential project-environment interactions. When a design approach cannot fully mitigate a potential effect, plans are developed to actively manage mitigation measures. AREVA expects that mitigation by design and mitigation by management will continue to improve over the life of the Project as information becomes available regarding the effectiveness of implemented mitigation measures and the environmental response to Project-related interactions.

Several key outcomes flow from the environmental assessment process. These elements include:

- a set of predicted effects of the project;
- the basis of a monitoring program incorporating regulatory compliance regimes and receiving environmental effects monitoring requirements;
- the basis of a follow-up program to verify the effectiveness of mitigation measures and the accuracy of the environmental predictions; and
- possible contingency measures.

Each of these elements developed during the EA process need to be integrated into the development and operation of the Project.

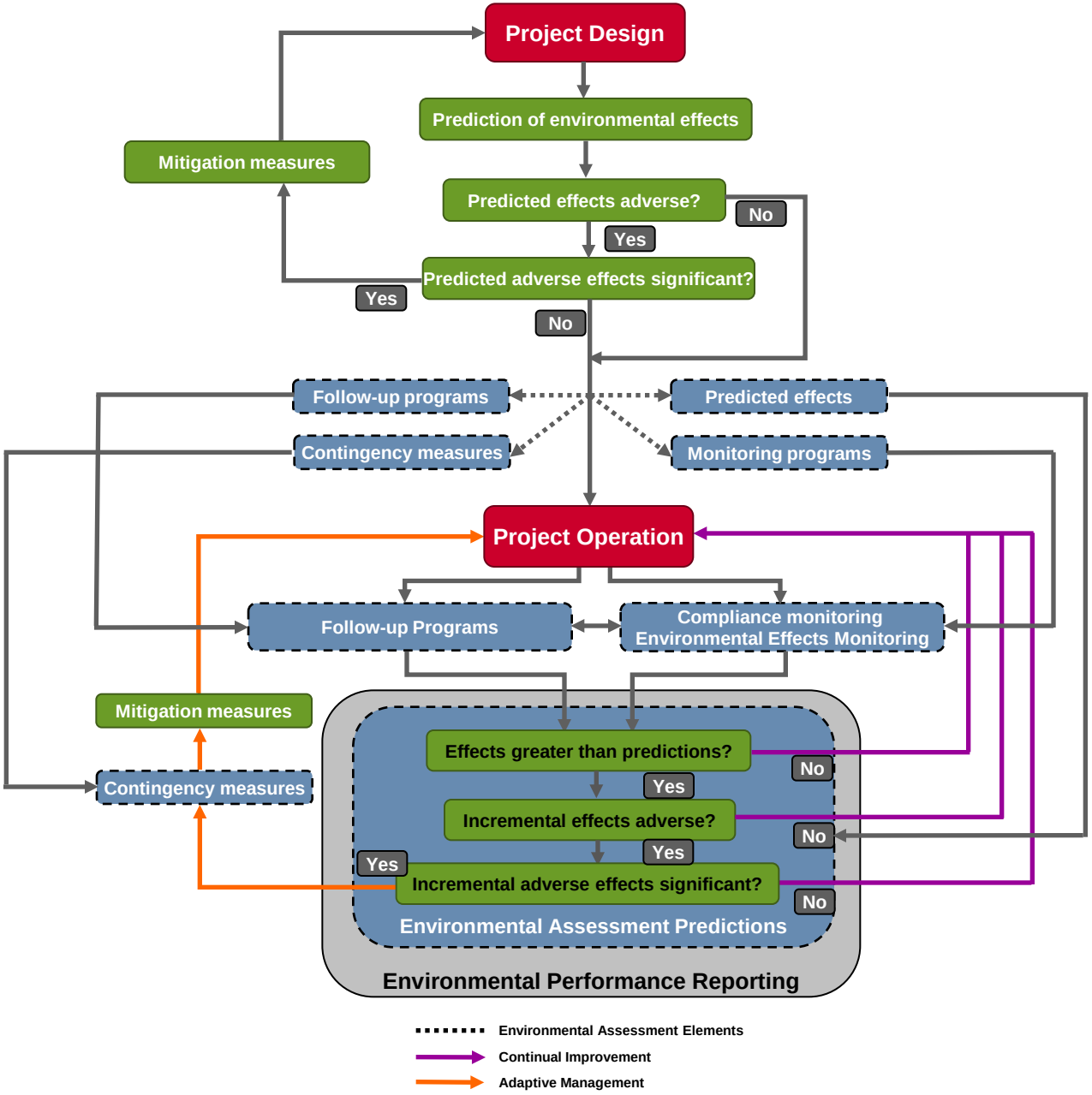


Figure 2.2-1 AREVA's Environmental Protection and Management Framework

2.2.2 Continual Improvement and Adaptive Management

The bottom half of Figure 2.2-1 illustrates how each of the elements developed during the EA process are integrated into the construction, operation and decommissioning of the facility. During facility development and operation, compliance monitoring maintains operational performance standards. Environmental Effects Monitoring programs, completed in the receiving environment, provide the information necessary to determine operational effects, their geographical extent, and magnitude. The monitoring program incorporates endpoints that represent key ecosystem features which are effective at identifying unanticipated effects.

These monitoring systems provide the opportunity to examine actual effects, refine model predictions and compare these results to the effects anticipated in the EA. The evaluation is iterative through time, which allows the identification, tracking and comparison of actual effects to the predicted effects anticipated at the time of the EA. The data and tracking of actual effects provides the necessary feedback, impetus, and information to the operation to identify and implement opportunities for continual improvement in systems performance. Results which indicate unforeseen or incremental effects beyond those predicted in the EA provide a basis to determine if a trend would, over time, lead to significant adverse effects. If so, the monitoring information also provides data upon which to develop adaptive management plans, and to facilitate detailed design of alternative mitigation or contingency measures to mitigate the significance of the incremental adverse effects.

Follow-up programs are tailored to verify the accuracy of EA predictions and to determine the effectiveness of mitigation practices. The information generated by the follow-up program is used to refine and verify the assumptions of the assessment methodology and thereby validate the predicted effects and reduce uncertainty in predictions. The feedback from the follow-up program also provides the basis for continual improvement in both the facility operation and the monitoring and follow-up programs. Unforeseen or incremental effects beyond those predicted, which indicate the future development of significantly adverse effects, provide the information necessary to implement contingency practices to mitigate the development of these effects.

AREVA's environmental protection and management framework allows the outcomes of the facility design, mitigation and environmental assessment processes to be integrated into facility construction, operation and decommissioning. The results of monitoring and follow-up programs are incorporated into evaluation processes, which facilitates the identification of continual improvement initiatives and adaptive management requirements, when necessary. This framework is consistent with the IQ concept of Pilimmaksarniq/Ayoikyumikatakhimanik; *skills must be improved and maintained through experience and practice* (IQ-Nunavut 2008).

As time progresses, uncertainties are reduced through demonstration of the physical performance of the facility, its mitigative features, and confirmation and update of the predictions supporting the environmental assessment and licensing approvals. The focus shifts from the precautionary

approach initially required in the face of uncertainties to continual improvement and refinement. Optimization of operational performance, monitoring programs and follow-up programs is achieved through continual improvement based on experience.

The framework also outlines the mechanisms by which these processes and initiatives are reported and communicated to stakeholders. This communication is achieved through the publication of Environmental Performance Reports which are issued on a minimum five year basis throughout the lifecycle of the Project. This provides a suitable means for ensuring that monitoring and follow-up programs are appropriately focused.

3 Regulatory Information

Various approachs can be taken to advance a proposed project through the environmental assessment and licensing process. AREVA's approach is to advance the project through EA and licensing sequentially, rather than concurrently. We view this as an opportunity to adopt an iterative approach to incorporate public and regulatory feedback into each phase of the Project design. AREVA recognizes that DEIS reviewers require a clear commitment to mitigation and a framework for management in order to confidently determine that the Project is not likely to result in significant adverse effects. Furthermore, licensing actions will ensure that the Project proceeds as reviewed and approved in the Final Environmental Impact Statement (FEIS). The mechanism to capture this information is provided by AREVA's Integrated Management System (IMS). The IMS will incorporate the environmental performance features of each Project component and Project activity, and will be provided as part of the detailed licensing, permitting and/or authorization application to ensure that the designs and mitigations meet or exceed those outlined in the FEIS.

3.1 General Information

For the Kiggavik Project to proceed, it must achieve a positive environmental assessment (EA) decision and the accompanying Project Certificate, issued by the NIRB. The EA decision requires sufficient information to determine whether the proposed project will cause significant adverse environmental effects after mitigation measures are employed.

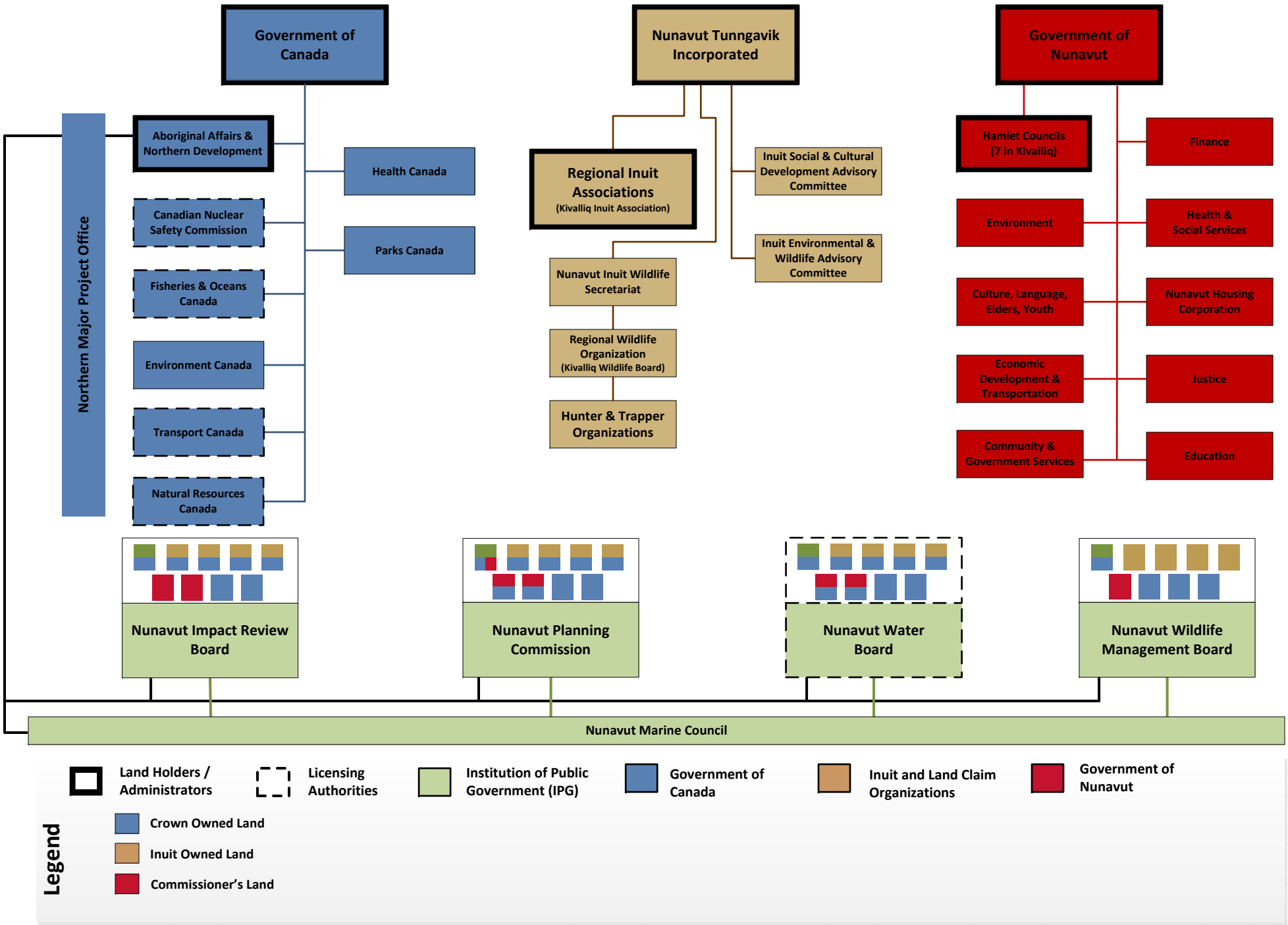
The Following Inuit and Land Claim Organizations, territorial and federal agencies in addition to other interveners, are participating in, or are associated with the NIRB-led review of the Kiggavik Project EIS:

- Inuit and Land Claim Organizations
  - Nunavut Tunngavik Incorporated (NTI)
  - Kivalliq Inuit Association (Regional Inuit Association)
  - Kivalliq Wildlife Board (Regional Wildlife Organization)
  - Baker Lake Hunter and Trapper Organization (HTO)
- Government of Canada
  - Aboriginal Affairs and Northern Development Canada (AANDC)
  - Canadian Nuclear Safety Commission (CNSC)
  - Environment Canada (EC)
  - Fisheries and Oceans Canada (DFO)
  - Health Canada (HC)
  - Natural Resources Canada (NRCan)
  - Northern Projects Management Office

    - Parks Canada (PC)
    - Transport Canada (TC)
- Workers' Safety & Compensation Commission (WSCC)
- Government of Nunavut (GN)
    - Hamlet Councils (7 in Kivalliq)
    - Department of Community and Government Services
    - Department of Culture, Language, Elders and Youth
    - Department of Economic Development and Transportation
    - Department of Education
    - Department of Environment
    - Department of Executive and Intergovernmental Affairs
    - Department of FinanceDepartment of Health and Social Services
    - Department of Justice
    - Nunavut Arctic College, Nunavut Housing Corporation, and the Nunavut Research Institute (Crown Corporations)

3.2 Institutions of Public Government

There are six Institutions of Public Government (IPGs) established in the *Nunavut Land Claims Agreement (NLCA)*: the Nunavut Impact Review Board (NIRB), the Nunavut Planning Commission (NPC), the Nunavut Surface Rights Tribunal (NSRT), the Nunavut Water Board (NWB), the Nunavut Wildlife Management Board (NWMB), and the Nunavut Marine Council (NMC). Each of the six IPGs has a relationship with the Government of Canada (GC), Nunavut Tunngavik Incorporated (NTI), and the Government of Nunavut (GN). Figure 3.2-1 illustrates the composition of the NIRB, NPC, NWB, and NWMB. Each of these IPG Boards consists of nine members nominated or appointed by GC, NTI, and GN.


Government of Canada
Nunavut Tunngavik Incorporated
Government of Nunavut
Northern Major Project Office
Aboriginal Affairs & Northern Development
Health Canada
Canadian Nuclear Safety Commission
Parks Canada
Fisheries & Oceans Canada
Environment Canada
Transport Canada
Natural Resources Canada
Regional Inuit Associations
(Kivalliq Inuit Association)
Inuit Social & Cultural Development Advisory Committee
Inuit Environmental & Wildlife Advisory Committee
Nunavut Inuit Wildlife Secretariat
Regional Wildlife Organization
(Kivalliq Wildlife Board)
Hunter & Trapper Organizations
Hamlet Councils (7 in Kivalliq)
Finance
Environment
Health & Social Services
Culture, Language, Elders, Youth
Nunavut Housing Corporation
Economic Development & Transportation
Justice
Community & Government Services
Education
Nunavut Impact Review Board
Nunavut Planning Commission
Nunavut Water Board
Nunavut Wildlife Management Board
Nunavut Marine Council
Legend
Land Holders / Administrators
Licensing Authorities
Institution of Public Government (IPG)
Government of Canada
Inuit and Land Claim Organizations
Government of Nunavut
Crown Owned Land
Inuit Owned Land
Commissioner's Land

For example, the NIRB Board diagram contains

- two full blue squares to represent two Board members appointed by the GC
- two full red squares to represent two Board members appointed by the GN
- four squares half blue and half brown to represent four Board members nominated by NTI and appointed by GC
- one square half blue and half green to represent the Board Chair that is nominated by the other IPG Board members and approved by GC

The first square for each IPG in the figure represents the Board chair. Squares are multiple colours when one organization nominates and another organization then approves the appointment.

The Nunavut Marine Council is comprised of membership from the existing Boards for the NIRB, NPC, NWB, and NWMB. All five IPGs in the figure and the NSRT report to the federal department of Aboriginal Affairs and Northern Development.

IPGs, GC departments, Inuit Organizations under NTI, and GN departments do not have assigned project development responsibilities according to these four broad categories (i.e. IPG, GC, NTI, GN), rather environmental assessment responsibilities, licensing actions and approvals, and land administration is achieved by sub-organizations across all four categories.

Environmental Assessment: The review process is led by the NIRB with broad participation from responsible authorities including technical experts from GC and GN departments, Inuit Organizations, and sometimes other IPGs in addition to the public. The NIRB makes the recommendation for project advancement for a NLCA Article 12 Part 5 review to the Minister of AANDC, who makes the determination.

Licensing: Responsible licening bodies are denoted in the figure as having a dotted line. These organizations include the NWB, the CNSC, DFO, EC, TC, and NRCan. Table 3.2-1 lists these licensing approvals.

Compensation and other Agreements: Projects located partially or wholly on Inuit-Owned Land require water (NLCA Article 20) and wildlife (NLCA Article 6) compensation agreements and an Inuit Impact Benefit Agreement (NLCA Article 26) with the Regional Inuit Association, for Kiggavik this is the Kivalliq Inuit Association.

Land Administration: Land in Nunavut is owned by GC, NTI, and GN with land administration by AANDC, the Regional Inuit Associations, or Hamlet Councils, respectively. Land holders and administrators are denoted in Figure 3.2-1 with thick black lines.

Table 3.2-1 Summary of Major Licences, Permits and Approvals

Agency	Licence, Permit or Agreement
Nunavut Water Board	• Type A Licence
Canadian Nuclear Safety Commission	• Licence to Prepare and Construct • Licence to Operate • Licence to Decommission • Licence to Abandon
Kivalliq Inuit Association	• Water and Wildlife Compensation Agreement • Land Use Licence • Surface Lease • Inuit Impact Benefit Agreement
Aboriginal Affairs and Northern Development Canada	• Class A Land Use Permit • Surface Lease
Fisheries and Oceans Canada	• Fisheries Authorization
Transport Canada	• Navigable Water Permit

3.3 Coordination

A solid understanding of this organization is required to capitalize on efficiencies, collaboration, and capacity building as appropriate through project reviews, monitoring, and decommissioning for institutional control, should a system for institutional control be developed in the territory of Nunavut.

The NLCA 12.7.5 specifically outlines that: *Any monitoring program established for a project under Section 12.7.1 shall be designed so as to avoid duplication of duties and to facilitate coordination of monitoring activities, and may, in addition to any other relevant matters, provide for the variables to be monitored and the program specifications*.

In the spirit this provision of the NLCA, It is valuable to view monitoring responsibilities on a continuum from environmental assessment to project-specific monitoring in support of licensing and the ways in which project-specific monitoring can support regional cumulative effects monitoring.

Environmental Assessment, Licensing, and Operational Monitoring

The NIRB has project-specific monitoring responsibilities under NLCA Article 12 Part 7 to measure relevant project effects and the accuracy of environmental assessment predictions. Terms and conditions contained in a project certificate and subsequent Part 7 monitoring must be sufficient to ensure ecosystem integrity with a focus primarily on projects effects while not prescribing detailed, suggested mitigation. Monitoring mitigation rather than effects relies heavily on the predicted effectiveness of proposed mitigation and may not achieve the intent of protecting ecosystem integrity. Systems of adaptive management and continual improvement are outlined in Section 2.2.2

of this document and these are the systems in place to inform changes in mitigation to achieve predicted and accepted environmental effects.

Project-Specific to Regional Cumulative Effects Monitoring

Recent collaborative initiatives have emerged to develop regional aquatic cumulative effects framework under the auspices of the Nunavut General Monitoring Plan. This collaborative framework looks to integrate IQ, land use, and project baseline information in support of identifying appropriate baseline data, study designs and indicators to meet the needs of regulatory agencies, stakeholders and the public. We are supportive of this initiative and see the need for similar collaborative initiatives in the terrestrial and socio-economic disciplines, which also align well with the objectives of the NGMP.

Memorandums of Understanding

A number of mechanisms are also currently in place to facilitate meeting the provisions of NLCA 12.7.5. A variety to memorandums of understanding (MOU's) have been signed between various organizations with responsibilities related to project development. These MOU's facilitate the EA review process to any subsequent licencing and permitting activities to facilitate efficiency of regulatory oversight, monitoring and reporting.

A memorandum of understanding (MOU) has been agreed to by groups reporting to the Northern Major Project Office, in an effort to reduce overlapping requirements and duplication. Federal departments and agencies with regulatory responsibilities in the three territories have signed a Memorandum of Understanding Defining Terms and Scope of Cooperation between Federal Departments, including the CNSC, Agencies and the Northern Projects Management Office for Coordination of Northern Projects (the "MOU"). The MOU outlines the manner in which federal departments and agencies work cooperatively to promote timely, predictable, transparent and accountable processes for carrying out their activities and obligations in relation to the environmental assessment and regulatory system in the territories. The Northern Project Agreement for the Kiggavik Project was finalized in 2014. The purpose of this Agreement is to clearly articulate the roles, responsibilities, and commitments of each of the federal departments or agencies signatory to the Agreement (the "Parties") in relation to the environmental review, regulatory permitting, and Crown consultation and accommodation for the Project.

In addition to the above, the CNSC also has memorandums of understanding with the following federal departments:

- Department of Fisheries and Oceans signed in 2013
- Transportation Canada signed in 2012
- Environment Canada signed in 2012
- Health Canada signed in 2012

The various MOUs and the CNSC's broad regulatory oversight (which encompasses health, safety and environmental protection) allow optimization of processes to avoid duplication of effort and permits cooperation on environmental protection initiatives.

Monitoring programs in Nunavut are evolving and AREVA is committed to continuing discussion to identify synergies with other project specifi and regional monitoring programs and agencies to maximize the efficiency, compatibility and comparability, and effectiveness of data collection and interpretation to support sustainable development in Nunavut. As outlined above the Nunavut General Monitoring Plan (NGMP), an Aboriginal Affairs and Northern Development Canada-led program that aims to support, facilitate and coordinate the collection, analysis, management and dissemination of information regarding the long-term state and health of the environment in Nunavut. AREVA will continue to work with the Government of Nunavut, Aboriginal Affairs and Northern Development Canada, the NGMP and other stakeholders to contribute and support the objectives of the NGMP.

3.4 Canadian Nuclear Safety Commission

The Kiggavik Project is unique to Nunavut as it is the first proposed uranium mine and mill in the territory and the first project in the territory regulated by the Canadian Nuclear Safety Commission (CNSC). In Canada, the CNSC oversees all uses of nuclear energy and materials in order to protect the health, safety and security of Canadians and the environment and to implement Canada's international commitments on the peaceful use of nuclear energy.

The NIRB is the lead during the EA process in Nunavut, and the CNSC act as technical advisors during the EA process. The CNSC Commission does not have a decision-making role in the EA; however, it retains decision-making power on licensing matters under the NSCA.

3.4.1 History/Background

The CNSC was established in May 2000, under the Nuclear Safety and Control Act (NSCA) which replaced its predecessor organization, the Atomic Energy Control Board. The CNSC reports to Parliament through the Minister of Natural Resources. The CNSC is headquartered in Ottawa with regional offices located in areas with nuclear activities requiring oversight/regulation.

3.4.2 Organizational Structure

The CNSC is composed of the Commission Tribunal members, and the Commission President, the Commission Secretariat, Legal Services and the CNSC Staff, which includes the regulatory operations branch, the technical support branch, the corporate services branch and the regulatory affairs branch. The Commission is supported by more than 800 scientific, technical and professional

staff. These staff members review applications for licences according to regulatory requirements, make licencing recommendations to the Commission, and enforce compliance with the NSCA, regulations and any licence conditions imposed by the Commission. The Commission is an independent administrative tribunal. Decisions are made transparently and according to clear rules of procedure.

The CNSC has a cost-recovery fee regulation, in which regulatory activities are cost-recovered from licensees through an equitable approach; therefore the Canadian public does not incur the regulatory costs of the nuclear industry.

3.5 CNSC Regulatory Framework

The CNSC's regulatory framework consists of Federal laws that govern the regulation of Canada's nuclear industry, and regulations, licenses and documents that the CNSC uses to regulate the nuclear industry. Published regulatory documents are considered to be dynamic documents, subject to regular review and update. Figure 3.5-1 depicts the elements of the CNSC regulatory document framework.

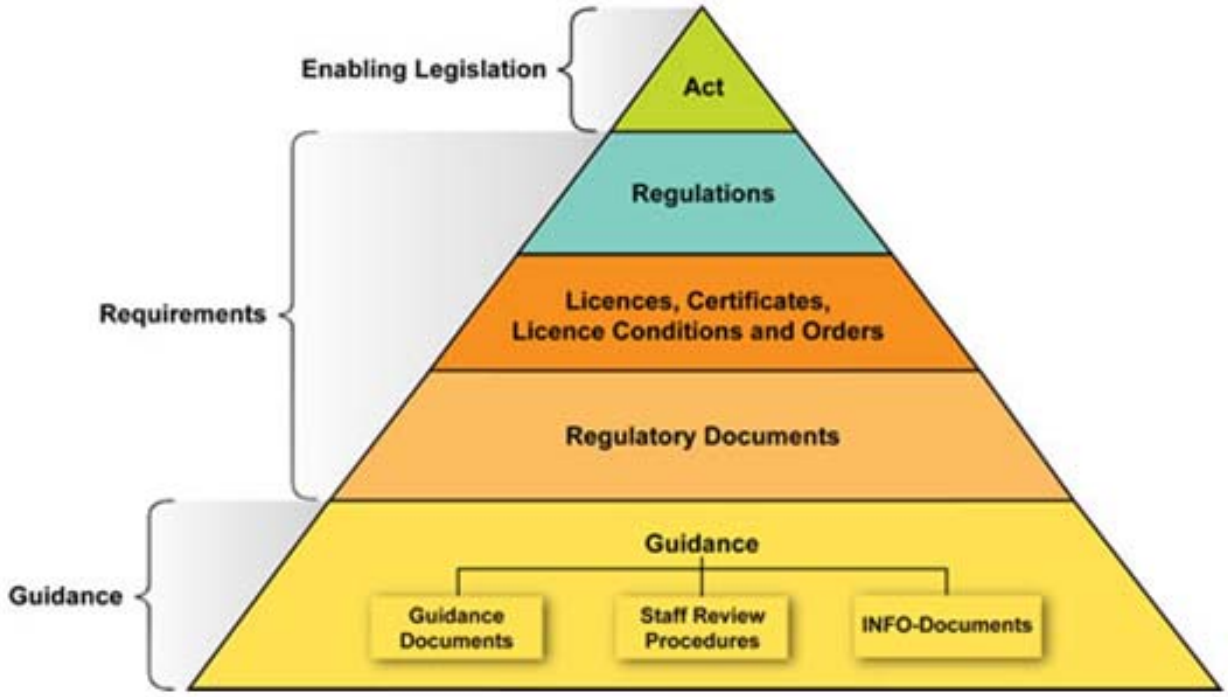


Figure 3.5-1 Elements of the CNSC Regulatory Framework

The CNSC operates within the NSCA. Under the authority of the NSCA, and with the approval of the Governor in Council, the Commission can make regulations for matters related to its mandate. There are several Regulations, created under the NSCA, that apply to the proposed Kiggavik Project:

- Uranium Mines and Mills Regulations
- Administrative Monetary Penalties and Regulations
- Radiation Protection Regulations
- Nuclear Substances and Radiation Devices Regulations
- Packaging and Transport of Nuclear Substances Regulations
- Nuclear Security Regulations
- Nuclear Non-proliferation Import and Export Control Regulations
- Canadian Nuclear Safety Commission Cost Recovery Fees Regulations
- Canadian Nuclear Safety Commission By-laws

The CNSC's regulatory documents provide details on requirements set out in the NSCA. Regulatory documents generally present both requirements and guidance in a single document and distinguish between both through the use of mandatory (e.g., shall, must) and non-mandatory (e.g., should, may) language.

Domestic standards, in particular those produced by the Canadian Standards Association (CSA) Group, are also an important component of the CNSC regulatory framework. Standards support the regulatory requirements established through the NSCA, its regulations and licences by setting out the necessary elements for acceptable design and performance at a regulated facility or a regulated activity. Under the CSA nuclear standards program, standards are periodically reviewed and amended to meet regulatory expectations.

Regulations, regulatory documents, standards and guides are amoungst the tools used by the CNSC to evaluate whether licensees are qualified to carry out licensed activities. Other internal forms of guidance can include other documents and applicable reports, CNSC publications, Staff Review Procedures, and CNSC inspection procedures.

3.5.1 Compliance Verification and Enforcement

Under the NSCA and its associated regulations, various levels of regulatory action can be taken by the CNSC to correct non-compliance by a licensee. Assuring compliance with legislation, regulations and licensing requirements is one of the CNSC's core business processes. Regular inspections and evaluations verify that licensees are complying with laws, regulations and licence conditions. The CNSC verifies compliance through site inspections, and the review of operational activities and licensee documentation. The CNSC requires licensees to report routine performance data, unusual occurrences, and conduct investigations of unplanned events. The CNSC uses a graduated approach to enforcement to encourage compliance, and deter non-compliance, ranging from formal and informal notification to the licensee to prosecution in accordance with federal or provincial legislation.

3.5.2 CNSC Licencing Process

As stated above, in addition to licences from organizations such as the NWB, development of new uranium mine and mill in Canada requires a licence from the CNSC. Once the environmental assessment is approved, the CNSC determines whether the proponent is qualified and can conduct, operate, and decommission the mine in a manner that meets the requirements of the NSCA. This is determined based on supporting documentation and the investigation and recommendations of the CNSC staff. The licensee must develop comprehensive licensing documents, integrated management systems, robust monitoring programs and if necessary, follow-up programs that help demonstrate that the applicant is qualified to operate the proposed project (Figure 3.5-2).

The CNSC licensing process for a uranium mine consists of licences for the individual phases of the project as follows:

- Licence to Prepare the Site;
- Licence to Construct the Site;
- Licence to Operate; and
- Licence to Decommission.

Within each licensing phase, the final detailed engineering of each component and activity involves revisiting the environmental aspects and mitigation measures outlined in the environmental assessment, and identifying any additional mitigation measures based on information collected during the previous phase of the project. This evaluation is incorporated as part of the licensing application which is provided to the regulatory agencies who are responsible for issuing licenses /permits for each phase of the project.

Once the license application is submitted, CNSC staff will review (and solicit input from the MOU cooperative) and prepare recommendations on the application for consideration by the Commission Tribunal. This occurs through a CNSC hearing(s) process. Interested parties and members of the public (termed intervenors) can comment on projects at Public Commission Hearings, which are webcast live and often held in facility host communities to make them more accessible to local residents. Intervenor funding to participate in the commission hearing process is available to interested parties via the *CNSC's Participant Funding Program*. Guidance on the roles and responsibilities of intervenors is detailed in *CNSC GD-379 Guide for Applicants and Intervenors Writing CNSC Commission Member Documents*. The Commission Tribunal weighs the information presented at the Commission hearing (s) and makes the final decision on whether to issue a license.

At the time of licensing, AREVA will need to demonstrate that they meet the requirements set out in the CNSC's regulatory framework if a licence is to be issued. Once a license is obtained, the CNSC will continue to assure that activities are conducted safely and licensing conditions are upheld as per Section 3.3.1 Compliance Verification and Enforcement.

3.5.3 Licencing Documents

The hierarchy of licensing documents required in support of a CNSC facility licence is outlined in Figure 3.5-2. The CNSC issues the CNSC licence and Licence Conditions Handbook. The licensee is responsible for producing the Mining Facility Licensing Manual (MFLM), the Preliminary Decommissioning Plan and Financial Assurance (PDP), and the Facility Description Manual (FDM). The components of the licensing documentation are described below.

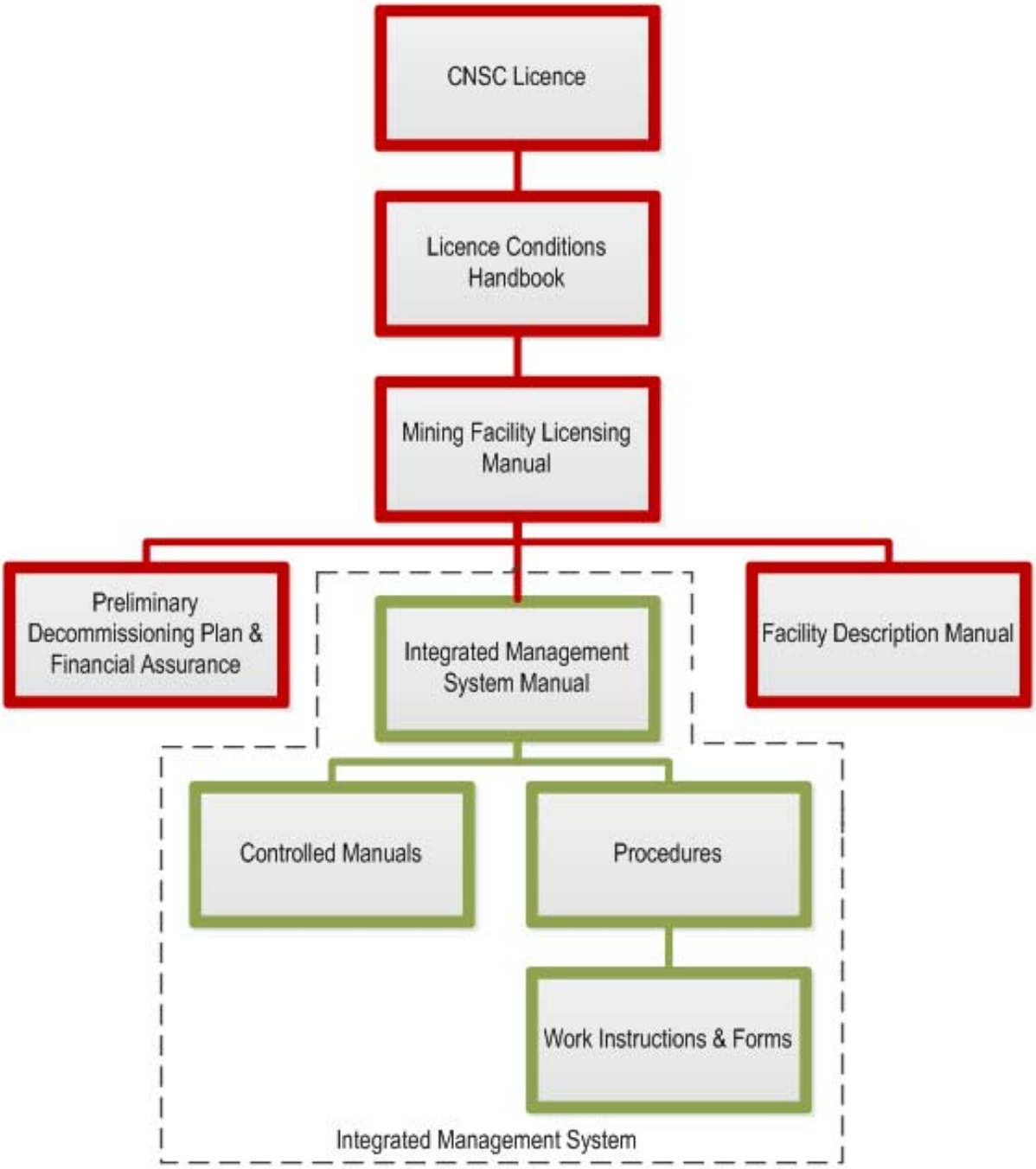


Figure 3.5-2 Licensing Document Heirarchy

The CNSC licence outlines what activities the proponent is authorized to complete along with licence conditions.

The *Licence Conditions Handbook (*LCH*)* identifies criteria that will be used by the CNSC staff to assess licencee compliance with the licence conditions. It also establishes provisions for delegation of authority and conflict resolution.

The *Mining Facility Licensing Manual* (MFLM) is the top-level document that is referenced in the LCH of a Uranium Mine Operating Licence. It provides an overview of the facility and activities of the operation. The MFLM is supported by documents that describe, in more detail, the facilities, operation, and future decommissioning of the Project.

The *Facility Description Manual (*FDM*)* provides a concise description of the mine, mill and waste management systems and components of the Project. The manual contains engineering drawings and refers to any previous licensing submissions concerning the facilities.

The *Preliminary Decommissioning Plan and Financial Assurance (*PDP*)* describes the future conceptual or preliminary decommissioning plans for the Project and provides an outline of associated costs. This is the basis of a financial assurance in the form of letters of credit provided to land holders.

The *Integrated Management System (*IMS*) Manual* contains the description of programs to protect workers, the public and the environment. The IMS provides the organization and processes that are used to manage operations of the site, and refers to procedures and controlled manuals.

Environmental monitoring, management and mitigation plans are further defined and transition into *controlled manuals, procedures and work instructions*.

Additional elemental details of the IMS are described in Section 4.

4 AREVA's Integrated Management System (IMS)

As outlined previously, an IMS plays a key role in the hierarchical documentation required to support a CNSC facility licence. AREVAs IMS encompasses, environmental, health, safety, and quality management. The IMS brings together, in a planned and integrated manner, the processes necessary to satisfy the requirements to achieve business success and sustainability. The IMS is established to meet the needs of the Project, the regulatory agencies, ISO 14001 Environmental Management System standard and OHSAS 18001 Occupational Health and Safety Management System standard.

The outcome of the implementation of the IMS includes the identification of the required operational controls to mitigate all significant environmental aspects including: mitigation plans, environmental monitoring programs, environmental protection plans, work procedures, environmental codes of practice and preliminary decommissioning/abandonment and restoration plans. The IMS ensures that all aspects of the Project, and any potential environmental interactions, are identified and adressed appropriately.

As noted, once implemented, the IMS is not static. The system continually evolves and adjusts to the components and activities of the Project. The IMS incorporates mechanisms that will continually improve and enhance environmental performance. The following sub-sections discuss these mechanisms.

4.1 Environmental Aspects

The IMS requires the environmental aspects (interactions) of each component and activity related to the Project to be identified. The aspects identified are compiled into a registry. The information reviewed for aspect identification includes:

- legal and other requirements including interactions, risks, proposed mitigations and proponent commitments outlined as part of the EA process;
- the final detailed engineering of each project component and all associated activities; and
- facility design documents.

For each component and activity, the potential environmental impact of each environmental aspect is considered with regards to:

- emissions to air;
- releases to water;
- releases to land;
- use of raw materials and natural resources;
- use of energy;
- energy emitted;
- waste and by-products;
- physical attributes;
- transportation impact; and
- community impact.

4.2 Legal and Other Requirements

During the initial IMS implementation, all applicable legal, policy and internal requirements relating to the health, safety and environmental aspects are identified. To maintain and improve the system, internal working groups are established and collaborate to aid in monitoring the development and revision of regulatory requirements and corporate commitments to ensure the IMS remains compliant. In addition, EA requirements are evaluated and any necessary procedural or operational changes are implemented to adapt and ensure that environmental effects remain within those assessed for the Project.

4.2.1 Reporting

AREVA commits to assessing and accurately reporting on our performace to all stakeholders. Reporting will be completed in compliance with territorial and federal government requirements and in cooperation with Nunavut residents and their representative organizations. AREVA commits to transparent and efficient communication with stakeholders at all times. Reporting may include but is not limited to:

- internal reporting within AREVA;
- reporting to satisy territorial licences/ permits and/or authorizations;
- quarterly reports submitted in compliance with CNSC licence conditions and *Metals Mining Effluent Regulations* (MMER);
- annual reports submitted in compliance CNSC licence conditions and *Metals Mining Effluent Regulations (MMER*);
- environmental performance reporting, which are issued throughout the operational and decommissioning periods on a minimum five-year basis; and

- community consultation (e.g. Community Liaison Committee meetings, open houses, site visits, social media etc).

4.3 Risk Management

The IMS risk management process provides a comprehensive and consistent approach to risk prevention, and is applicable to all phases of the Project from exploration, site preparation, construction and operation to decommissioning and abandonment.

The health, safety and environmental aspects related to a project component or activity are identified and assessed. The significance of each impact identified is estimated by performing a risk analysis using a risk matrix. Each health, safety and environmental aspect is evaluated taking into consideration the severity, duration and scale of risk, and is cross-referenced to what is presented in the FEIS. Each aspect is evaluated to determine legal and other requirements which may be associated with it. Where applicable, compliance requirements associated with the aspect are identified. Mitigation measures are established to ensure that processes that were initially identified to have significant consequences are managed to an acceptable residual risk, and that the necessary controls are implemented. Any required actions and active and passive facility design features that eliminate or mitigate the impacts are identified during this process and validated with those identified in the FEIS. Any new requirements that may have originated since the issuance of the Project Certificate are captured as part this process.

4.4 Operational Control

Operational controls are instituted to avoid undesired deviation from the original intent, and to ensure predictability of results, ensuring sustainable environmental performance.

The Environmental Code of Practice (ECOP) is a key component of the IMS which addresses operational controls for project components and activities that could have an impact on the environment. The ECOP governs the appropriate and timely response to conditions ranging from a deviation from normal operating conditions through a loss of operational control.

During detailed project planning, proposed components and activities are evaluated to ensure mitigation measures are in place to eliminate or minimize environmental interactions. These are integrated directly into IMS work procedures. These procedures manage identified risks by implementing and maintaining operational controls, ensuring mitigation measures are in place and perform as predicted.

Changes to processes, systems, structures or components are managed through the change control process. Planned changes must be monitored and managed so as not to introduce a new and

unacceptable risk. The intent is to monitor physical changes, procedural or procurement changes and then apply change control as necessitated by the nature of the change. The change control process ensures changes consider safety, health, environmental protection and legal and other requirements.

4.4.1 Non-conformance and Corrective and Preventative Action

A non-conformance is a deficiency or deviation from desired result, standard or requirement. Non-conformances are identified through inspections, audits and deviations from operational controls such as the ECOP, monitoring and mitigation plans or work procedures and the associated regulatory and compliance requirements.

Corrective action processes ensure that appropriate steps and actions are described, implemented and verified to ensure that the causes of non-conformance are corrected. Preventive actions ensure that the re-occurrences of similar non-conformances are prevented. The corrective and preventative action plans result in a reduction or elimination of risk and improve overall environmental performance.

4.4.2 Management Review

Various levels of management regularly review the IMS along with the environmental performance, the impacts of proposed projects and any developments in legal and other requirements to evaluate effectiveness and continued suitability of the IMS. Management makes recommendations as they relate to environmental policy, processes and environmental objectives. This process is a mechanism that allows for a thorough review of the IMS, consistent with AREVA's commitment to continual improvement.

4.4.3 Use of Experience and Continual Improvement

Self-assessment is integrated into processes including auditing, inspections and incident investigation and reporting. The data accumulated through these various methods is utilized to provide feedback and promote continual improvement of the IMS. This is consistent with the IQ concept of Pilimmaksarniq/Ayoikyumikatakhimanik: skills must be improved and maintained through experience and practice.

Audits are used to inform management of actual and potential risks, verify conformance to IMS requirements, verify compliance with legal and other requirements and identify areas for improvement. AREVA coordinates third party assessments of the IMS with the focus of regulatory and certification compliance. These audits ensure the legal and other requirements identified for the

activities and components of the IMS are satisfied and that the components of the environmental management and occupational health and safety management systems are in place.

Accidents and incidents are tracked and recorded to create a database of relevant information upon which statistical trend analysis is conducted. The goal is to increase awareness, and to focus on incident prevention and environmental protection.

Learning from an external organization or entity's experiences is of proven benefit. Processes including Incident statistics from other companies are used to assess internal performance and identify potential risks or continual improvement opportunities.

5 Project Phases and the Evolution of the IMS

As outlined previously, AREVA will be required to obtain a variety of permits and licences, including a NWB Type "A" licence. CNSC licences will be obtained at the following project phases:

- Licence to Prepare the Site;
- Licence to Construct the Site;
- Licence to Operate; and
- Licence to Decommission.

The IMS requirements vary in proportion to the level of detail required for effective decision making at the different phases of the Project. As AREVA progresses through the licensing, permitting and/or authorization process, regulators and stakeholders will have the opportunity to assess the adequacy of the IMS to meet or exceed the management, mitigation and monitoring plans outlined in the FEIS and ensure any new requirements are addressed.

Guidance on the structure and function of the IMS and its programs at uranium mines and mills has been provided in the form of regulatory standards and guidance documents from the CNSC, and nuclear program standards developed by the Canadian Standards Association (CSA). The following standards apply to, and support the maintenance of the IMS through the phases of the Project:

- CSA Standard N286-12 *Management System Requirements for Nuclear Facilities*.
- CNSC Regulatory Document REGDOC-2.9.1 *Environmental Protection: Environmental Protection, Policies, Programs and Procedures*
- CSA Standard N288.6-12 *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills* (includes human health risk assessment).
- CSA Standard N288.4-10 *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*.
- CSA standard N288.5-11 *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills.*
- CSA Standard N294-09 *Decommissioning of Facilities Containing Nuclear Substances*.

Consistent with the iterative IMS process discussed in Section 4, these standards incorporate mechanisms for review and revision of the IMS. These include:

- Prior to applying for a licence to begin a new stage in the lifecycle of the nuclear facility or licensed activity;
- Following a change to the facility, operations or environment that would substantially alter the predictions made in the environmental assessment process;

- Following any changes in the commitments made to a regulatory agency; and
- Following any changes made to pertinent regulations, licences or permits governing the operation or activities.

These mechanisms ensure that as components and activities are altered or halted, the environmental implications of these changes are considered, that mitigation measures for any significant environmental interactions are instituted; thus ensuring potential environmental effects are managed appropriately.

5.1 Licence Applications

For the preparation, construction, operation, and decommissioning phases of the project, the federal Canadian Nuclear Safety Commission (CNSC), has strict requirements and controls at strategic regulatory hold points as per Sections 5, 6, 7 and 8 of the *Uranium Mines and Mills Regulations* (UMMR).

At each phase of the Project, the UMMR requires that AREVA obtain a licence by submitting information relating to the proposed work taking place, and the programs in place to identify, assess and mitigate environmental risks to validate the project efficacy and operational controls. The application information requirements include:

- mining/milling methods and programs
- environmental baseline characteristics
- characterization of environmental risks
  - environmental risk assessments done to meet the requirements of CSA Standard *N288.6-12 Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills.*. This standard includes both environmental and human health risk assessment.
- environmental monitoring programs
  - developed to meet the requirements of CSA Standard N288.4-10 *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*.
- effluent monitoring programs
  - developed to meet the requirements of CSA standard N288.5-11 *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills.*
- environmental code of practice
- preliminary decommissioning plan (PDP)
  - developed to meet the requirements of CSA Standard N294-09 *Decommissioning of Facilities Containing Nuclear Substances.*

All of the above program and plan information will be integrated into the IMS, which will be structured to meet the requirements of CSA Standard *N286-12 Management System Requirements for Nuclear*

Facilities. The IMS manual as well as the licensing documents, discussed in Section 3.3.3, are included in the licence application package.

Additional federal and territorial licence, permit and authorization applications will be submitted to satisfy the applicable requirements and will include the detailed design of each component and activity; including mitigation measures and monitoring requirements to ensure the expectations meet or exceed those outlined in the FEIS.

Upon initial CNSC licensing of the Kiggavik Project, the following monitoring mitigation and management plans (provided in the following Tier 3 Technical Appendices) requested in the NIRB guidelines will be incorporated into the IMS submitted as part of the application package.

- Technical Appendix 2C: Explosives Management Plan
- Technical Appendix 2H: Ore Storage Management Plan
- Technical Appendix 2I: Water Management Plan
- Technical Appendix 2J: Marine Transportation
- Technical Appendix 2M: Road Management plan
- Technical Appendix 2N: Borrow Pits and Quarry Management Plan
- Technical Appendix 2P: Occupational Health and Safety Plan
- Technical Appendix 2Q: Radiation Protection Plan
- Technical Appendix 2R: Preliminary Decommissioning Plan
- Technical Appendix 2S: Waste Management Plan
- Technical Appendix 2U: Hazardous Materials Management Plan
- Technical Appendix 4C: Air Quality Monitoring Plan
- Technical Appendix 4F: Noise Abatement Plan
- Technical Appendix 5F: Mine Rock Characterization and Management
- Technical Appendix 5J: Tailings Characterization and Management
- Technical Appendix 5L: Conceptual Fisheries Offsetting Plan
- Technical Appendix 5M: Aquatic Effects Monitoring Plan
- Technical Appendix 5O: Sediment and Erosion Control Plan
- Technical Appendix 6D: Wildlife Mitigation and Monitoring Plan
- Technical Appendix 9D: Archaeological Mitigation Plan
- Technical Appendix 10B: Spill Contingency and Landfarm Management Plan

As AREVA progresses through the licensing and permitting process, regulators and stakeholders will have the opportunity to assess the efficacy of mitigation and monitoring programs and the IMS as a whole.

6 References

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