



**Written submission from the
Canadian Environmental Law
Association and
Dr. M.V. Ramana**

**Mémoire de l'Association
canadienne du droit de
l'environnement et
Dr M.V. Ramana**

In the Matter of

À l'égard de

**Decision on the scope of an environmental
assessment of the proposed Micro Modular
Reactor Project at the Canadian Nuclear
Laboratories Ltd., in Chalk River**

**Décision sur la portée de l'évaluation
environnementale pour le projet de
microréacteur modulaire aux Laboratoires
Nucléaires Canadiens Ltée, à Chalk River**

Hearing in writing based on written
submissions

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**SUBMISSION BY THE CANADIAN ENVIRONMENTAL LAW ASSOCIATION
TO THE CANADIAN NUCLEAR SAFETY COMMISSION ON THE
SCOPE OF FACTORS FOR GLOBAL FIRST POWER'S MICRO MODULAR
REACTOR ENVIRONMENTAL ASSESSMENT**

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1.0 INTRODUCTION

The Canadian Environmental Law Association (CELA) and Dr. M.V. Ramana submit this report in response to the Canadian Nuclear Safety Commission’s (CNSC) Updated Public Notice dated March 24, 2020, inviting comments on the proposed scope of factors to be considered in the environmental assessment of Global First Power’s Micro Modular Reactor Project (herein, “small modular reactor” or “SMR”) at Chalk River.¹

This submission delineates the key issues and boundaries we recommend be considered in the assessment, including the baseline conditions and scoping of alternatives.² Section 1 introduces CELA and Dr. Ramana and provides a brief description of the project; section 2 responds to the Commission’s Record of Proceeding dated April 27, 2020 which denied our joint request for an extension of this EA’s timelines given the extenuating circumstances of COVID-19;³ section 3 sets out our recommended scope of assessment; section 4 summarizes the deficiencies in the CNSC’s Staff scoping report; and section 5 provides greater detail and analysis on the factors which should inform the Commission’s review of Global First Power’s EA.

CELA and Dr. Ramana (herein “CELA”) have reviewed all hearing documents from the CNSC and proponent. As detailed below, we find the Commission Member Document (CMD) prepared by CNSC Staff regarding the scope of an environmental assessment for the Global First Power SMR⁴ (herein “CNSC Staff scoping report”) fails to meet the purposes and provisions of the *Canadian Environmental Assessment Act, 2012* (“CEAA 2012”)⁵ because it fails to describe how the factors to be considered in conducting an EA will be interpreted and applied to this designated project.

Should the Commission adopt the CNSC Staff’s report as currently drafted, CELA submits the Commission’s decision on scope will not be expansive nor tailored enough to the project to meet the purposes of the Act. Furthermore, the proponent, stakeholders and the public at large will not be provided sufficient particulars describing how the factors set out in section 19 of *CEAA 2012* have been evaluated and weighed within the EA process. This will resultantly undermine the

¹ Canadian Nuclear Safety Commission, *Revised Notice of an Opportunity to Submit a Written Intervention on the Scope of an Environmental Assessment*, Ref. 2020-H-102

² In this report, ‘baselines conditions’ are describe the pre-project environment, which is inclusive of the cumulative effects of previous activities and the future environment in the absence of the proposed project while ‘alternatives to’ the project refers to the different ways of meeting the proposed project objectives or problem at hand; B. Noble (2010) “Introduction to Environmental Impact Assessment – A Guide to Principles and Practice,” Don Mills: Oxford University Press [**EIA Principles and Practice**]

³ Rumina Velshi, Determination on: The request to extend the deadline for the submission of requests to intervene in respect of the Commission’s decision on the scope of factors to be considered in the environmental assessment for Global First Power’s Micro Modular Reactor project (ref. CMD 20-H102) (27 April 2020)

⁴ Canadian Nuclear Safety Commission, *Request for a Commission Decision on the Scope of an Environmental Assessment for Global First Power Micro Modular Reactors at Chalk River*, (29 April 2020) CMD 20-H102, e-Doc 6245395 [**CNSC Staff CMD**]

⁵ *Canadian Environmental Assessment Act, 2012*, (SC 2012, c 19, s 52) [**CEAA 2012**]

transparency, traceability and accountability of the Commission's decision, as an EA decision-making authority.

As a result, we recommend the Commission require CNSC Staff to provide a more thorough examination of the factors to be considered in the environmental assessment and restart the scoping stage of the EA upon such a time when more comprehensive draft guidelines are publicly available for comment.

1.1 Interest and Expertise of the Intervenor

By way of this report and pursuant to the CNSC's *Rules of Procedure* ("Rules"), CELA and Dr. Ramana request status to participate as an intervenor in the public hearing respecting the Global First Power environmental assessment. As noted below, we meet the test set out in the *Rules* for intervening on the basis of both: (1) interest in the matter being heard; and (2) expertise or information that may be useful to the CNSC in coming to a decision.⁶

CELA is a non-profit, public interest law organization. CELA is funded by Legal Aid Ontario as a speciality legal clinic to provide equitable access to justice to those otherwise unable to afford representation for environmental injustices. For nearly 50 years, CELA has used legal tools to advance the public interest, through advocacy and law reform, in order to increase environmental protection and safeguard communities across Canada. CELA has been involved in a number of nuclear facility licensing and regulatory matters before the CNSC and, has participated in various administrative and legal proceedings under *CEAA 2012* and its predecessors, *CEAA 1992* and the *Environmental Assessment and Review Process Guidelines Order*.

On the basis of our decades-long experience in assessment matters, CELA has carefully considered the project description provided by the proponent from a public interest perspective. Our recommendations below build on CELA's related concerns about other environmental assessment law matters such as the CNSC's authority to conduct EAs,⁷ and the *Impact Assessment Act* (IAA), as highlighted in recent submissions to Environment Climate Change Canada (ECCC) regarding the revised Projects List⁸ and in briefing notes for the purpose of public legal education.⁹

⁶ *Rules of Procedure*, SOR/2000-211, s. 19(1)(a)(b).

⁷ See for instance Blaise K., McClenaghan T., Lindgren R. (2019) Nuclear Law, Oversight and Regulation: Seeking Public Dialogue and Democratic Transparency in Canada. In: Black-Branch J., Fleck D. (eds) Nuclear Non-Proliferation in International Law - Volume IV. T.M.C. Asser Press, online: <https://cela.ca/nuclear-law-oversight-and-regulation-seeking-public-dialogue-and-democratic-transparency-in-canada/> [Blaise, McClenaghan & Lindgren]

⁸ Canadian Environmental Law Association, "Submissions to the Government of Canada Regarding *Discussion Paper on the Proposed Project List* and *Discussion Paper on Information Requirements and Time Management Regulatory Proposal*," (29 May 2019), online: <https://www.impactassessmentregulations.ca/8866/documents/16609/download>

⁹ Canadian Environmental Law Association, "Briefing Note on Bill C-69: Overview of Canada's New *Impact Assessment Act*," (28 August 2019), online: <https://www.cela.ca/brief-new-impact-assessment-act>

This submission also draws on the expertise of Dr. M.V. Ramana of the University of British Columbia who has expertise and many years of experience in analyzing the safety and environmental impacts of nuclear power related facilities including proposed Small Modular Reactor (SMR) designs.¹⁰

1.2 Project Background

Global First Power is proposing a first-of-a-kind small modular reactor (SMR) at the Chalk River Laboratories (CRL) site in Deep River, Ontario. In addition to the project description pertaining to this federal environmental assessment, the proponent has submitted an application for a licence to prepare a site for a SMR at CRL, on lands owned by Atomic Energy of Canada Limited.¹¹

According to the project description, Global First Power aims to be operational by 2023 for a period of approximately twenty years. According to the Canadian Nuclear Association's (CNA) vision for SMRs in Canada, as stated in its *A Call to Action: A Canadian Roadmap for Small Modular Reactors* ("SMR Roadmap") released in November 2018,¹² this demonstration project at CRL could lead to the commercialization of SMRs by 2026.¹³

1.3 Methods Informing Review

Scoping is among the earliest of phases in the environmental assessment process, generally following the determination by the EA authority that the project is required to undergo an EA (see Figure 1). Generally, at the scoping stage of the EA the authority conducting the EA (such as the Impact Assessment Agency of Canada or formerly, the Canadian Environmental Assessment Agency) discloses its draft guidelines which it intends to rely upon when conducting its review of the proponent's Environmental Impact Statement (EIS). The draft guidelines are then consulted upon and a final version is later released, to serve as a guide to the proponent on the requirements it must fulfil in preparing an EIS.

In formulating our recommendations to the Commission, we compared the CNSC's Staff scoping report (often referred to as draft EIS guidelines) to analogous scoping documents which have previously been open for public comment, as part of other federal EA review processes. As a result, our submission below has been informed by these draft guidelines as well as legal scholarship on the topic of EA law.

¹⁰ Dr. Ramana has published several peer reviewed papers and reports on the topic. For a selection of his work, see: <https://sppga.ubc.ca/profile/m-v-ramana/>

¹¹ Canadian Nuclear Safety Commission, "New reactor facilities – Current licensing activities" (March 20, 2019), online: <http://nuclearsafety.gc.ca/eng/reactors/power-plants/new-reactor-facilities/index.cfm>

¹² Canadian Small Modular Reactor Roadmap Steering Committee (2018) "A Call to Action: A Canadian Roadmap for Small Modular Reactors," Ottawa, Canada, p 9 [SMR Roadmap].

¹³ SMR Roadmap, p 22

Figure 1. Generic Environmental Impact Assessment Process¹⁴

Project description	Description of the proposed action, including its alternatives, and details sufficient for an assessment.
Screening	Determination of whether the action is subject to an EIA under the regulations or guidelines present, and if so what type or level of assessment is required.
Scoping	Delineation of the key issues and the boundaries to be considered in the assessment, including the baseline conditions and scoping of alternatives.
Impact prediction and evaluation	Prediction of environmental impacts and determination of impact significance.
Impact management	Identification of impact management and mitigation strategies and development of environmental management or protection plans.
Review and decision	Technical and public review of EIS and related documents and subsequent recommendation as to whether the proposed action should proceed and under what conditions.
Implementation and follow-up	Implementation of project and associated management measures; continuous data collection to monitor compliance with conditions and regulations; monitoring the effectiveness of impact management measures and the accuracy of impact predictions.

2.0 REPLY TO THE COMMISSION’S DECISION DENYING EXTENSION OF TIMELINES

As a preliminary matter, we wish to respond to the Commission’s denial of our request for an extension of this public comment period. On April 8, 2020, as the COVID-19 pandemic was unfolding, CELA and Dr. Ramana requested the Commission extend the scoping comment period for a minimum of 30-days.¹⁵ We pointed out that the COVID-19 pandemic poses significant barriers to meaningful public engagement.

Our request for an extension of the scoping stage of this EA proceeding was denied by the Commission by way of a written Record of Proceeding on April 27, 2020.¹⁶ Specifically, the Commission ruled that a 30-day extension was neither “appropriate” nor “reasonable” in the

¹⁴ EIA Principles and Practice, p 16

¹⁵ Canadian Environmental Law Association, Letter to Marc Leblanc, Commission Secretary, Canadian Nuclear Safety Commission (8 April 2020), online: <https://cela.ca/letter-requesting-extension-covid-and-smr-environmental-assessment/>

¹⁶ Rumina Velshi, Determination on: The request to extend the deadline for the submission of requests to intervene in respect of the Commission’s decision on the scope of factors to be considered in the environmental assessment for Global First Power’s Micro Modular Reactor project (ref. CMD 20-H102) (27 April 2020)

circumstances.¹⁷ As indicated in the Commission’s decision, Global First Power also indicated that if an extension were granted, it would “introduce undue detriment to the MMR project.”¹⁸

With due respect, CELA and Dr. Ramana submit the Commission’s ruling against a 30-day extension ignores the realities facing many Canadians and dismisses, without adequate reason, the ongoing constraints posed to public participation as a result of COVID-19 and government’s accompanying emergency orders. The COVID-19 pandemic has given rise to sudden and unprecedented changes to the lives of Canadians and the CNSC has a duty to ensure the public’s right to participate is not diminished in the circumstances. For the reasons detailed below, we request the Commission reconsider our request for an extension of this stage of the EA process.

First, it is a fundamental principle of EA law that the public participate in EA decision making.¹⁹ This is reflected in Canadian ministerial guidelines for participation under CEAA 2012 which sets out, “the public should have an opportunity to have a say in decisions that affect their lives through a meaningful public participation process.”²⁰

To facilitate meaningful engagement, the process should be:

- Informative and proactive so that communities with an interest in the project or those who may be affected can engage at the earliest of review stages;
- Equitable to ensure that all represented and unrepresented interests are included in participation²¹; and
- Context-oriented and adapted to the local, social, or political climate relevant at the time of review.²²

By denying the 30-day request for an extension, we submit the Commission has acted contrary to the tenets of the *Act* and the best practices for meaningful public participation. The Commission, as a public interest body, is vested with supporting participants and building capacity within the EA process. As a decision-making authority under *CEAA 2012*, the Commission also has broad discretion to extend and alter environmental assessment timelines.

Further, as a potential use of this project championed by the proponent is its use in off-grid and remote communities, advancing reconciliation requires respect for Indigenous values and

¹⁷ *Ibid*, para 5

¹⁸ *Ibid*, para 4

¹⁹ *EIA Principles and Practice*, p 190

²⁰ *Ministerial Guideline on Assessing the Need for and Level of Public Participation in Screenings under the Canadian Environmental Assessment Act*, s 6; see also Canada, Public Participation Guide, online: <https://www.canada.ca/en/impact-assessment-agency/services/policy-guidance/public-participation-guide.html>

²¹ *Ibid*

²² *Ibid*

traditional knowledge, and their equal, effective, and fair participation in decision-making processes.²³ While the proponent has committed to “building trust, building a relationship, listening to [Indigenous peoples] honestly and understanding each other’s concerns,”²⁴ we note that in 2019, the Anishinabek Chiefs-in-Assembly unanimously endorsed a Grand Council Resolution opposing the construction and operation of Small Modular Reactors in Ontario²⁵ and the Nishnawbe Aski Nation (NAN) passed Resolution 05/57 in 2005, declaring NAN a nuclear waste free zone.²⁶ In order to advance reconciliation and satisfy the duty to consult *prior* to decisions being made which could affect First Nations’ constitutionally protected traditional and treaty rights, requires Indigenous participation and engagement early in the decision-making process.

Secondly, the Commission continues to Act contrary to other provincial and federal regulators and decision makers who have granted timeline suspensions or significantly extended comment periods. In addition to the examples provided in our letter,²⁷ we note that the Impact Assessment Agency of Canada (herein “Agency”) is routinely suspending or extending EA timelines largely due to COVID-19’s impact on the public’s ability to gather information and prepare comments. As Figure 2 below provides, the Commission’s intransigence under *CEAA 2012* is contrary to the flexible approach the Agency is exercising under the *IAA*. Similar to this SMR EA, the projects presented in Figure 2 below are also in the planning phase of the EA process.

We also note Global First Power’s (GFP) objection to a 30-day extension is contrary to other proponents who have proactively requested timelines be delayed for the same reasons noted by CELA, citing the extenuating circumstances of COVID-19. We are dismayed that GFP has chosen to place greater importance on being thirty days ahead in the planning stage rather than recognize the value of public engagement and its benefits to their reputation and social licence for the project.²⁸

²³ Blaise, K. and Stensil, S-P. (2019) “Small Modular Reactors in Canada: Eroding Public Oversight and Canada’s Transition to Sustainable Development,” In: Black-Branch J., Fleck D. (eds) *Nuclear Non-Proliferation in International Law*, Volume V, p 222 [Blaise & Stensil]

²⁴ Global First Power, “Micro Modular Reactor at Chalk River Community Telephone Town Hall – May 20, 2020,” online: https://2fd19a5b-d4ba-460a-ae87-124539f0ba42.filesusr.com/ugd/8c5308_67c742983eaf4183a139171961f2026a.pdf

²⁵ Anishinabek News, “Anishinabek Chiefs-in-Assembly unanimously oppose small modular reactors on Anishinabek territory” online: <https://anishinabeknews.ca/2019/06/12/anishinabek-chiefs-in-assembly-unanimously-oppose-small-modular-reactors-on-anishinabek-territory/>

²⁶ Nishnawbe Aski Nation, “Nuclear Waste Free Zone” online: <http://www.nan.on.ca/article/nuclear-waste-free-zone-497.asp>

²⁷ Letter excerpt: “*Providing a minimum 30 additional days aligns with COVID-19 actions already being taken by other provincial and federal regulators and decision makers. For instance, courts are introducing “suspension periods” whereby hearings are adjourned and timelines are being allowed to run; tribunals are permitting the late filing of appeals and introducing transition periods, whereby appeals will be accepted following the lifting of emergency orders; and administrative review bodies, like the Impact Assessment Agency of Canada are significantly extending comment periods on matters including discussion papers. In all of these instances, the decision-making body is suspending, deferring or expanding timelines in light of COVID-19.*”

²⁸ Please note - while CELA participated in the Global First Power town hall, the presentation was constrained to one hour and did not provide adequate time to canvas all questions and provide meaningful responses. While a ‘call back’ option was provided for follow-up questions (which CELA relied upon), no response nor call back was received.

Figure 2. Status of current environmental assessments and COVID-related extensions

Project	Timeline Change
Global First Power SMR	<ul style="list-style-type: none"> - Extension of 30 days requested by CELA - Extension <u>not supported</u> by proponent - CNSC denies extension
Gazoduc Project	<ul style="list-style-type: none"> - Extension of up to 90 days requested by province of Quebec citing exceptional circumstances arising from COVID-19 pandemic; other groups also requested extension - Agency grants 90-day extension²⁹
Tilbury Phase 2 LNG Expansion Project	<ul style="list-style-type: none"> - Proponent requests public comment period be suspended in order to recognize the exceptional circumstances arising from the COVID-19 pandemic - Agency grants 30-day extension on March 31³⁰ and grants a second 30-day suspension of the timeline on April 28, 2020³¹
Suncor Base Mine Extension Project	<ul style="list-style-type: none"> - Suspension of 180-day time limit requested by proponent citing “extenuating circumstances arising from the COVID-19 pandemic and its impacts to communities, businesses, and stakeholders” - Agency grants suspension of timeline³²

For these reasons, we once again request the Commission exercise its discretion to extend the timelines within Global First Power’s EA and provide additional time for public comment on the scope of this EA. As a public interest legal organization that advocates for environmental justice, CELA remains concerned that the Commission’s decision has excluded individuals and civil society organizations who would have intervened in this process if not for pressing, COVID-related priorities. Although unprecedented and devastating in so many ways, we reiterate that COVID-19 *should not* diminish the ability of Canadians to engage in matters of high importance.

3.0 RECOMMENDED SCOPE OF ASSESSMENT

As a regulator vested with the authority to conduct environmental assessments per s. 15 of the *CEAA 2012*, CELA urges the CNSC to conduct a fulsome environmental assessment for the Global First Power project.

As we discuss below, all nuclear facilities, including SMRs, can cause adverse environmental impacts, including from severe accidents that could result in widespread and long-lived

²⁹ Online: <https://iaac-aeic.gc.ca/050/evaluations/document/134561>

³⁰ Online: <https://iaac-aeic.gc.ca/050/evaluations/document/134501?culture=en-CA>

³¹ Online: <https://iaac-aeic.gc.ca/050/evaluations/document/134501?culture=en-CA>

³² Online: <https://iaac-aeic.gc.ca/050/evaluations/document/134471?culture=en-CA>

contamination, and the production of radioactive waste. There is thus an intergenerational burden that accompanies the operation and eventual decommissioning of SMRs.

These reactors also pose proliferation risks in part due to the nature of the fuel to be used. Thus, there are also national and international security repercussions that should be considered within the scope of this EA. To our knowledge, there is no other procedure to be undertaken to consider these proliferation risks. If there is some procedure, then, given the serious security implications, that procedure should be undertaken first before proceeding with this environmental assessment.

Further, according to the project description, this project serves as a demonstration project for future SMR use and deployment. This was reiterated in a recent townhall hosted by the proponent where it was noted that the project was a “commercial demonstration to prove whether MMRs are a viable solution for Far North communities or remote mines.”³³

If reactors are located in such remote locations, then the assessment should take into account the far greater challenges of dealing with accidents and undertaking the necessary emergency actions, including evacuation of people. Scoping the assessment of this project too narrowly and failing to consider its intended purposes would risk conducting a deficient assessment of the project’s environmental effects.

Therefore given the spatial extent of the environmental effects accompanying this project which includes both on-site and off-site impacts,³⁴ we recommend the Commission’s scoping decision ensure the project’s effects are considered in light of its proposed applications (i.e. for mine sites and to provide an off-grid power supply) and for use in rural and remote communities throughout Canada.³⁵

4.0 SUMMARY OF DEFICIENCIES IN RESPONSE TO CNSC’S CMD OF FACTORS TO BE CONSIDERED

4.1 Purposes of CEAA 2012

As stated in the CNSC Staff’s scoping report, their recommendation to the Commission is that:

[t]he scope of factors to be considered include the factors mandated in paragraph 191(1)(a) to (h) of CEAA 2012 and that no other factors need to be considered in this EA.

³³ Global First Power Telephone Town Hall, Personal Notes of P. Bailey, Student-at-law- of Canadian Environmental Law Association (20 May 2020)

³⁴ EIA Principles and Practice, p 40

³⁵ SMR Roadmap, p 9

As detailed below, CELA submits this recommendation by CNSC Staff's is too rudimentary to fulfil the purposes of Act and should not be adopted by the Commission in their decision on scoping.³⁶

As a federal authority with designated decision making authority under *CEAA 2012*, the Commission must decide whether “the designated project is not likely to cause significant adverse environmental effects or that the significant adverse environmental effects that it is likely to cause are justified in the circumstances.”³⁷ Therefore, should the Commission adopt the CNSC Staff's recommendation, its decision on scoping would be too deficient to allow it to meet this test under the Act.

The integration of environmental factors into federal decision-making remains a central purpose of federal EA law and this must be reflected in the Commission's decision and reasoning.³⁸ Unfortunately, as drafted, the CNSC Staff's CMD only broadly sets out the factors that are to be considered in an EA, as described in section 19 of the Act. The CNSC Staff's scoping report does not provide substantive direction, adequate detail nor clear elaboration about the actual project-specific issues that will be assessed.

In response to CNSC's Staff scoping report, we recommend the Commission require CNSC Staff to provide greater clarity regarding *how* the factors to be considered in the environmental assessment will be applied. We submit that the CNSC's CMD fails to meet the purposes of the *CEAA 2012* because it fails to adequately detail how the factors to be considered in conducting an EA will be interpreted and applied to this designated project.

³⁶ The purposes of *CEAA 2012* are enumerated as follows:

4 (1) The purposes of this Act are

- (a) to protect the components of the environment that are within the legislative authority of Parliament from significant adverse environmental effects caused by a designated project;
- (b) to ensure that designated projects that require the exercise of a power or performance of a duty or function by a federal authority under any Act of Parliament other than this Act to be carried out, are considered in a careful and precautionary manner to avoid significant adverse environmental effects;
- (c) to promote cooperation and coordinated action between federal and provincial governments with respect to environmental assessments;
- (d) to promote communication and cooperation with aboriginal peoples with respect to environmental assessments;
- (e) to ensure that opportunities are provided for meaningful public participation during an environmental assessment;
- (f) to ensure that an environmental assessment is completed in a timely manner;
- (g) to ensure that projects, as defined in [section 66](#), that are to be carried out on federal lands, or those that are outside Canada and that are to be carried out or financially supported by a federal authority, are considered in a careful and precautionary manner to avoid significant adverse environmental effects;
- (h) to encourage federal authorities to take actions that promote sustainable development in order to achieve or maintain a healthy environment and a healthy economy; and
- (i) to encourage the study of the cumulative effects of physical activities in a region and the consideration of those study results in environmental assessments

³⁷ *CEAA 2012*, s 7

³⁸ B. Hobby, “Canadian Environmental Assessment Act: an Annotated Guide” (2019-) Toronto: Thomson Reuters

At a minimum, the CNSC's CMD should have identified with much greater specificity the requirements the proponent is to address in their EIS in order to meet all prescribed factors set out in *CEAA 2012*. It should also specify the nature, scope and extent of information required in meeting these considerations.

If the EIS guidelines are issued by the Commission as proposed by CNSC Staff, there will not be sufficient particulars to the proponent, stakeholders and the public at large detailing how the factors set out in section 19 of the Act have been evaluated and weighed within the EA process. It will also undermine the transparency, traceability and accountability of the CNSC's decision-making as a decision-making authority.³⁹ **We reiterate that the scoping stage of the EA should be restarted upon such a time when a comprehensive set of draft guidelines is publicly available for comment.**

4.2 Environmental Effects

In addition to not fulfilling the purposes of the Act, the CNSC Staff scoping report altogether lacks any consideration of subsection 5(1) of *CEAA 2012*, which describes the environmental effects that must be considered in an EA.⁴⁰ Relatedly, as the federal authority reviewing this EA, it is also necessary per subsection 5(2) to consider directly linked or incidental effects of the project and their impact on health and socio-economic conditions, and physical and cultural heritage.

Relatedly, the document does not set out the valued components (VCs) to be examined. Typically, when deciding upon scope, the draft guidelines identify the VCs relevant to section 5

³⁹ Blaise, McClenaghan & Lindgren, p 255

⁴⁰ The following environmental effects are enumerated in *CEAA 2012*:

Environmental effects

5 (1) For the purposes of this Act, the environmental effects that are to be taken into account in relation to an act or thing, a physical activity, a designated project or a project are

(a) a change that may be caused to the following components of the environment that are within the legislative authority of Parliament:

- (i) fish and fish habitat as defined in subsection 2(1) of the Fisheries Act,
- (ii) aquatic species as defined in subsection 2(1) of the Species at Risk Act,
- (iii) migratory birds as defined in subsection 2(1) of the Migratory Birds Convention Act, 1994, and
- (iv) any other component of the environment that is set out in Schedule 2;

(b) a change that may be caused to the environment that would occur

- (i) on federal lands,
- (ii) in a province other than the one in which the act or thing is done or where the physical activity, the designated project or the project is being carried out, or
- (iii) outside Canada; and

(c) with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on

- (i) health and socio-economic conditions,
- (ii) physical and cultural heritage,
- (iii) the current use of lands and resources for traditional purposes, or
- (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

of the *CEAA 2012* and can refer to environmental, biophysical, human or socio-economic features that may be impacted by a project.⁴¹

While recognizing it is the responsibility of the proponent to provide sufficient information and analysis on potential effects to the environment resulting from the prescribed project, it is the CNSC – as the authority for EA – that must ensure that the proponent is asked for all of the necessary information so that a thorough evaluation of all potential environmental impacts can be undertaken.

5.0 DETAILED COMMENTS ON SCOPE OF FACTORS

In the section which follows, we provide detailed comments on the factors to be taken into account when conducting an EA. We also provide guidance on the interpretation and application of these provisions. Section 19 of the Act enumerates the factors to be considered when conducting an EA. Accordingly:

19 (1) The environmental assessment of a designated project must take into account the following factors:

- (a) the environmental effects of the designated project, including the environmental effects of malfunctions or accidents that may occur in connection with the designated project and any cumulative environmental effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out;
- (b) the significance of the effects referred to in paragraph (a);
- (c) comments from the public — or, with respect to a designated project that requires that a certificate be issued in accordance with an order made under section 54 of the National Energy Board Act, any interested party — that are received in accordance with this Act;
- (d) mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the designated project;
- (e) the requirements of the follow-up program in respect of the designated project;
- (f) the purpose of the designated project;
- (g) alternative means of carrying out the designated project that are technically and economically feasible and the environmental effects of any such alternative means;
- (h) any change to the designated project that may be caused by the environment;
- (i) the results of any relevant study conducted by a committee established under section 73 or 74; and

⁴¹ See Canada, “Practitioners Glossary for the Environmental Assessment of Designated Projects Under the Canadian Environmental assessment Act, 2012,” online: <https://iaac-aeic.gc.ca/default.asp?lang=En&n=E7F0FC59-1&offset=3&toc=hide>

(j) any other matter relevant to the environmental assessment that the responsible authority, or — if the environmental assessment is referred to a review panel — the Minister, requires to be taken into account.

As detailed by CELA below, we recommend that each of the section 19 factors be considered within all of the following phases of the SMR lifecycle:⁴²

- Fuel fabrication and transport of materials
- Site preparation and construction
- Operation
- Decommissioning and abandonment
- Transport and storage of waste

5.1 The environmental effects of the designated project, including the environmental effects of malfunctions or accidents and cumulative environmental effects (s.19(1)(a))

5.1.1 Environmental Effects

As there is no discussion of environmental effects included in the CNSC Staff's report on scope, we ask that the following explanatory note be adopted by the Commission in its decision to provide guidance to the proponent:

Environmental effects occur as interactions between actions (the carrying out of the project or decisions made by the federal government in relation to the project) and receptors in the environment, and subsequently between components of the environment (e.g. change in water quality that may affect fish; a more complicated example might be the spreading of radioactive dust into the environment that may result in contamination of plants, which in turn may affect animals who feed on the plants, and that in turn could, because of bioaccumulation, result in significant radiation doses to human beings who might eat these animals).

Under CEAA 2012, an examination of environmental effects that result from changes to the environment as a result of the project being carried out or as a result of the federal government exercising any power, duty or function that would allow the project to be carried out must be considered in the EIS.

⁴² Per section 19(1)(a) of *CEAA 2012* undertakings which are related to the project are within the scope of the Act and similarly, as was included in the Terms of Reference for the Review of the Darlington Nuclear Power Plant project, ancillary projects were also within the scope of the undertaking, see online: http://www.cnscc.gc.ca/eng/pdfs/jrp_agreement_darlington_e.pdf

In scoping the potential changes to the environment that may occur, the proponent should consider any potential changes in the physical environment such as changes to air quality, water quality and quantity, and physical disturbance of land that could reasonably be expected to occur.

5.1.2 Promotion of Sustainable Development

The purposes of the Act, set out in section 4, further inform the interpretation of “environmental effects”. Accordingly, federal authorities per subsection 4(1)(h) are to “take actions that promote sustainable development in order to achieve or maintain a healthy environment and a healthy economy.”

As previous sustainability-based assessments of nuclear energy have identified, the use of nuclear power for power generation poses unique risks associated with severe accidents and weapons proliferation.⁴³ Applying an intergenerational equity lens also reveals risk to future generations, because of nuclear power generation’s legacy of radioactive waste that remains hazardous to human health for hundreds of thousands of years.⁴⁴

Considerations of sustainability are of high priority within the project’s assessment because of the interrelated socio-economic and biophysical implications of the proposed SMR and it is crucial, to ensure a sound EA process, that they be considered from the outset of decision-making.⁴⁵ Furthermore, because the CNSC’s regulatory mandate and its governing statute, the *Nuclear Safety and Control Act*, does not require that a project’s contribution to sustainability or its socio-economic effects be assessed, it is crucial that a thorough sustainability assessment be conducted at this stage of decision making under the authority of *CEAA 2012*.

In meeting the sustainability purpose of the Act, we therefore ask the following requirements for the proponent be adopted by the Commission in its decision.⁴⁶

- **Intergenerational equity**

Assess options and favour actions that are most likely to preserve or enhance the opportunities and capabilities of future generations to live sustainably.

⁴³ Gibson et al, “An Analysis of the Ontario Power Authority’s Consideration of Environmental Sustainability in Electricity System Planning” (2008)

⁴⁴ *Ibid*

⁴⁵ Blaise & Stensil, *supra* note 23; Noble B F (2010) Introduction to Environmental Impact Assessment: A Guide to Principles and Practice (2nd Ed), Oxford, Don Mills, p 5; World Commission on Environment and Development 1987, paras 59 – 60

⁴⁶ *As based on Gibson’s sustainability assessment criteria*; Gibson, R.B. (2012). In full retreat: The Canadian government’s new EA law undoes decades of progress. Impact Assessment and Project Appraisal, 30(3), 179-188; Gibson, R.B. (2017). (Ed.). Sustainability Assessment: Applications and Opportunities. London, New York: Routledge

- **Intragenerational equity**

Conduct assessments in ways that reduce dangerous gaps in sufficiency and opportunity (and health, security, social recognition, political influence, etc.) between the rich and the poor.

- **Polluter-pays principle⁴⁷**

Review the proposal in light of the polluter-pays principle, which is an economic rule of cost allocation requiring that the entity which creates a pollutant be responsible for external costs arising from its effects. This should be expressly applied in consideration of the proponent's long-term management of radioactive waste.

5.1.3 *Cumulative Effects*

An assessment of cumulative effects generally entails assessing changes to the environment, caused by actions in combination with other past, present or future actions. Accordingly, these actions may be linear, amplifying or exponential in effect.⁴⁸ By assessing a project's cumulative effects, the synergistic effects of the project can be reviewed.⁴⁹

Section 19(1)(a) requires that cumulative effects be taken into account however, the CNSC's CMD fails to explain how cumulative effects will be assessed within this project. Consideration of cumulative effects is reiterated as a purpose of the Act per section 4(1)(i) and therefore, critical to this review.

In order to determine the "cumulative environmental effects that are likely to result from the designated project in combination with other physical activities that have been or will be carried out" as required in the list of section 19 factors, we recommend that the Commission's EA scoping decision include the following statement:

The EIS will include descriptions of the construction, operation, decommissioning and abandonment associated with the proposed project. This will include descriptions of the activities to be carried out during each phase, the location of each activity, the quantities of the expected material inputs and outputs and an indication of the activity's magnitude and scale.

⁴⁷ The polluter-pays principle is another fundamental principle of sustainable development which places the onus on the party responsible for causing harm for the cost of its management, and prevention of adverse impacts towards humans and the environment; online: https://cela.ca/wp-content/uploads/2019/07/1257-Submission-from-CELA-and-Greenpeace-Comments-on-Federal-Sustainable-Development-Strategy_April2_2019.pdf

⁴⁸ EIA Principles and Practice, p 261

⁴⁹ *Ibid*, p 199

Although a complete list of project activities should be provided, the emphasis will be on activities with the greatest potential to have environmental effects. Sufficient information must be included to predict environmental effects and address concerns identified by the public and Indigenous groups. Activities must also be highlighted that involve periods of increased environmental disturbance or the release of materials into the environment.

The EIS will include a summary of the changes that have been made to the project since originally proposed, including the benefits of these changes to the environment, Indigenous groups, and the public.

We recommend that in providing this information regarding cumulative effects, the following additional details be provided:

- **Fuel fabrication**
 - Composition and process used for the fabrication of fuel
 - Source, location, operational history and environmental monitoring program of fuel fabricating facility
- **Transportation of materials**
 - Sources and location
 - Accompanying tracking and oversight measures
- **Site preparation and construction**
 - Site clearing, excavation and relocation of existing buildings or materials on site
 - Establishment of freshwater diversions (location, methods and timing)
 - Water management including dewatering or deposition activities (location, methods and timing)
 - Equipment requirements (type, quantity and installation)
 - Administrative buildings, garages, other ancillary facilities
 - Characterization of the workforce, including the number and transportation of employees, and work schedules
 - Storage and management of hazardous materials, fuels and residues
- **Operation and Maintenance**
 - Storage, handling and on-site transport of materials
 - Contribution to atmospheric emissions, including emissions profile (type, rate, and source)
 - Water management on the project site including storm water, process water, wastewater, water recycling and effluent treatment (quantity, quality, treatment requirements, withdrawal and release point(s))

- Characterization of the workforce, including the number and transportation of employees, and work schedules
 - Maintenance of nuclear reactor and associated systems
 - Timeframe of maintenance including procedures for verification and qualification of systems and testing
 - Maintenance procedures during planned and unplanned shutdowns or outages
 - Verification, sampling, and testing procedures during operation
 - Management of hazardous substances and hazardous waste and activities related to environmental protection and radiation protection programs
- **Decommissioning and abandonment**
 - Any progressive reclamation and monitoring planned
 - Preliminary outline of a decommissioning and reclamation/closure plan for any components associated with the project, including timing
 - Water and effluent management;
 - Ownership, transfer and control of the different project components
 - Responsibility for monitoring and maintaining the integrity of the remaining structures and for permanent structures, a conceptual discussion on how decommissioning and abandonment could occur
 - Programs and planning required to achieve a safe state of closure prior to decommissioning
- **Transport and storage of waste**
 - Description of the different radioactive waste streams, specifically spent fuel and its composition
 - Assessment of magnitude of waste generated and characterization in comparison to existing radioactive waste streams, such as from CANDU reactors
 - Agreements with the Nuclear Waste Management Organization (NWMO) relating to waste management approach
 - Statement of authority which allows NWMO to accept additional and new types of nuclear fuel waste pursuant to the *Nuclear Fuel Management Act*
 - Description of the polluter pays principle and its application to the long-term management of radioactive waste

5.1.4 *Accidents and Malfunctions*

Section 19(1)(a) of the Act also requires that “effects of malfunctions or accidents that may occur in connection with the designated project” be considered.

There are several reasons to be concerned about the possibility of accidents at a High Temperature Gas Cooled Reactor (HTGR) of the kind that GFP is proposing. *First*, there are severe accident scenarios in HTGRs, including the incursion of water or air into the core, that could result in the release of radioactive materials from the reactor and adversely affect the environment.

Second, there is a history of poor performance and persistent problems from HTGRs that have been constructed and operated so far. In the case of specifically prismatic block HTGRs, the same kind that is being proposed by GFP, the Dragon reactor in the United Kingdom, and the Peach Bottom and Fort St. Vrain reactors in the United States, there were leaks, corrosion, and fuel failures. This history suggests that one cannot take project proponents' expectations of good performance at face value and accidents are a real possibility. GFP's project description from last year has not addressed these issues.⁵⁰

Therefore, in regards to the "effects of accidents or malfunctions" of the project, we recommend the following explanatory note be adopted:

The proponent will conduct an analysis of the hazards related to accidents and malfunctions across all phases of the project. The analysis of each worst case hazard scenario will include a description of the changes to the receiving environment and the resulting effects to the identified VCs, and present preliminary emergency response measures and capacities. This analysis should be provided regardless of the likelihood of the hazard occurring.

Taking into account the lifespan of all different project components and temporal phases, the proponent will identify all potential accidents and malfunctions related to the project, including an explanation of how those events were identified, potential consequences (including the environmental effects as defined in section 5 of *CEAA 2012*), the worst case scenarios considered, and the effects of these scenarios.

This assessment will include an identification of the magnitude of an accident and/or malfunction, including the quantity, mechanism, rate, form and characteristics of the contaminants and other materials that can conceivably be released into the environment during the accident and malfunction events and would potentially result in an adverse environmental effect as defined in section 5 of *CEAA 2012*.

The EIS will describe the preventative measures and design safeguards that have been established to protect against such occurrences and the contingency and emergency

⁵⁰ M.V. Ramana, "Submission to the Canadian Nuclear Safety Commission Regarding the Project Description for Global First Power's Micro Modular Reactor" (14 September 2019)

response procedures that would be put in place if such events do occur. Environmental sensitivity mapping, including likely pathways, will identify areas sensitive to accident and malfunction scenarios that are located adjacent to project activities, such as streams and wetland areas frequented by fish and/or migratory birds.

We recommend that in providing this information, the following details be provided:

- **Performance and Risk**
 - Define and describe fuel to be used including comparisons among options; level of enrichment and where it will be procured from, given that Canada does not enrich uranium
 - Provide a baseline and historical review of other HTGRs' that have been constructed and operated (including the pebble bed type in Germany and the two prismatic types in the United Kingdom and the United States), including failures and unplanned events
 - Study of ingress of air or water or salts used for heat transfer into the reactor core and the potential radioactive releases that might result
- **Accident Scenarios**
 - Assessment based on worst case, unmitigated, accident scenario assuming that emergency actions cannot be counted upon in remote communities
 - Comparison of accident scenarios and radionuclide release based on contained and uncontained accident scenarios
- **Safeguards**
 - Details about how operator would go about mapping radiation doses to nearby populations, the environment and atmosphere, in near-real time conditions should an accident occur
 - Detail containment system including what type of overpressures it is capable of withstanding in the event of an accident
 - Detail monitoring system in place for tracking of radionuclides in the environment (including graphite particles that might be contaminated with fission products)
- **Proliferation risk**
 - Review international obligations and proliferation risks posed by the SMR, including the incompatibility between the use of enriched fuel with enrichment levels well above what is used in CANDU reactors and light water reactors, and the Canadian government's advocacy for stopping the production of fissile materials, including enriched uranium, in other countries such as Iran

- Demonstrate that international non-proliferation treaty commitments have been fully considered and align with the public interest of all Canadians
- Assess proliferation and security risks posed throughout lifecycle of SMR (i.e., operation, transport of spent fuel and storage of waste) and across the range of nuclear sites where SMRs are identified to be deployed (i.e. rural, remote and off-grid communities)
- Identify mechanisms for oversight and inspection including in remote locations where site accessibility is challenging for CNSC and IAEA inspectors
- Identify tracking mechanisms for measuring plutonium in spent fuel⁵¹

5.1.5 *The Significance of the Effects*

In order to understand the environmental effects of a project, it is necessary that an initial assessment of the current environmental conditions be undertaken. This is particularly true for a site such as Chalk River that has had a history of nuclear activity, including accidents. Baseline information should be presented in order to identify how the project could affect the VCs and include an analysis of those effects.

At a minimum, the EIS should describe the following environmental components:

- **Atmospheric environment**
 - A baseline survey of ambient air quality in the project areas and in the airshed that might conceivably be affected by the project with monthly measurements (averages and standard deviations over at least three full years) of the concentrations of at least the following contaminants in concentration units comparable to guidelines (Bq/m³ or µg/m³): radionuclides including Strontium-90, Zirconium-95, and Cesium-137
 - Potential concentrations of at least the following contaminants in concentration units comparable to guidelines (i.e. Bq/m³ or µg/m³) and radionuclides including Strontium-90, Zirconium-95, and Cesium-137
 - Identify and quantify existing greenhouse gas emissions (including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), perfluorocarbons (PFCs), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF₆) and nitrogen trifluoride (NF₃)) by individual pollutant measured as kilotonnes of CO₂ equivalent per year in the project study areas

⁵¹ As noted by C. Rouse, K. Blaise and T. McClenaghan in “Renewables – Not Small Modular Nuclear Reactors are the Solution to Climate Change (4 December 2019), online: <https://cela.ca/renewables-not-small-modular-nuclear-reactors-are-the-solution-to-climate-change/>, the touted benefit of SMRs for use in remote and rural regions would also mean increased transport of radioactive substances on roads and railways across the country. This poses unique proliferation risks since the waste from enriched fuels can produce quantities of plutonium that could be attractive for diversion to malicious purposes; see online: <https://cela.ca/renewables-not-small-modular-nuclear-reactors-are-the-solution-to-climate-change/>

- Direct and indirect sources of air emissions
- Current provincial/territorial/federal limits for greenhouse gas emission targets
- **Geology and geochemistry**
 - The geomorphology, topography and geotechnical characteristics of areas proposed for construction of major project components
 - Geological hazards that exist in the areas planned for the project facilities and infrastructure including history of seismic activity in the area and slope erosion and the potential for ground and rock instability, and subsidence during and following project activities
- **Topography and soil**
 - Baseline mapping and description of landforms and soils (including soil chemistry), within the local and regional project areas
 - Baseline survey of the concentrations in soil of at least the following contaminants in concentration units comparable to guidelines (i.e. Bq/m³ or µg/m³): radionuclides including Strontium-90, Zirconium-95 and Cesium-137
- **Riparian, wetland and terrestrial environments**
 - Characterization of soils in the excavation area, in terrestrial and riparian environments, with a description of their past use
 - Characterization of the shoreline, banks, current and future flood risk areas, and wetlands (marshes, swamps, bogs and fens, etc.), including the location and extent of wetlands likely to be affected by project activities according to their size, type (class and form), the description of their ecological function (ecological, hydrological, wildlife, socioeconomic, etc.) and species composition
 - Plant and animal species (abundance, distribution and diversity) and their habitats, with a focus on species at risk or with special status that are of social, economic, cultural or scientific significance, as well as invasive alien species and species used for traditional purposes by Indigenous groups
- **Groundwater and surface water**
 - Hydrogeology, including;
 - hydrogeological context (e.g., hydrostratigraphy with aquifers and aquitards, major faults, etc.), including the delineation of key stratigraphic and hydrogeologic boundaries
 - physical properties of the hydrogeological units (e.g. hydraulic conductivity, transmissivity, saturated thickness, storativity, porosity, specific yield)
 - groundwater flow patterns and rates;

- a discussion of the hydrogeologic, hydrologic, geomorphic, climatic and anthropogenic controls on groundwater flow
 - temporal changes in groundwater flow (e.g. seasonal and long term changes in water levels)
 - a delineation and characterization of groundwater - surface water interactions including temperature and the locations of groundwater discharge to surface water and surface water recharge to groundwater.
- **Fish and fish habitat for potentially affected surface waters:**
- A characterization of fish populations on the basis of species and life stage, abundance, distribution, and movements, including information on the surveys carried out and the source of data available (e.g. location of sampling stations, catch methods, date of catches, species, catch-per-unit effort)
 - A description of primary and secondary productivity of aquatic resources (e.g. benthic communities, feeder species, aquatic plants) in terms of abundance and distribution in affected water bodies with a characterisation of season variability
 - A list of any fish or invertebrate species at risk that are known to be present
 - A description of the habitat by homogeneous section, including the length of the section, width of the channel from the high water mark (bankful width), water depths, type of substrate (sediments), aquatic and riparian vegetation, habitat types and functions, cover components, and photos
 - A description of natural obstacles (e.g. falls, beaver dams) or existing structures (e.g. water crossings) that hinder the free passage of fish
 - Maps, at a suitable scale, indicating the surface area of potential or confirmed fish habitat for spawning, rearing, nursery, feeding, overwintering, migration routes, etc. Where appropriate, this information should be linked to water depths (bathymetry) to identify the extent of a water body's littoral zone; and
 - The description and location of suitable habitats for fish species at risk that appear on federal and provincial lists and that are found or are likely to be found in the study area.
- **Species at Risk**
- A list of all potential or known Species at Risk Act listed species (fauna and flora) that may be affected by the project, using existing data and literature as well as surveys to provide current field data
 - A list of all species designated by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as extirpated, endangered, threatened or of special concern, using existing data and literature as well as surveys to provide current field data

- Any published studies that describe the regional importance, abundance and distribution of species at risk. The existing data must be supplemented by surveys, as appropriate, to provide current field data; and information on residences, seasonal movements, movement corridors, habitat requirements, key habitat areas, identified critical habitat and/or recovery habitat (where applicable) and general life history of species at risk that may occur in the project area, or be affected by the project.

5.2 *Mitigation measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the designated project (s. 19(1)(d))*

5.2.1 *Follow Up Programs*

There is no statement nor discussion in the CNSC's CMD explaining how this provision of the Act, which requires consideration of mitigation measures, is intended to be applied by the proponent in their EIS.

The significance of this omission derives from the need to examine the environmental and other impacts of design choices made in the project. For example, nuclear power plants include a containment dome that is intended to, as the name indicates, contain a large fraction of the radioactive materials that might be released during an accident. Depending on the design details, a containment dome could withstand a greater or less energy release and resulting overpressure during the accident before allowing some of the radioactive materials to escape. There are other such mitigation measures, such as filtered containment vents.

All measures including, but not limited to, a containment dome of varying strength as well as different nuclear fuel designs (thicker coatings in the TRISO fuel, for example), should be considered and the costs and benefits should be evaluated.

We therefore ask that the following be adopted in the Commission's scoping decision:

Every EA conducted under *CEAA 2012* will consider any and all measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project. Under *CEAA 2012*, mitigation measures includes measures to eliminate, reduce or control the adverse environmental effects of a designated project, as well as restitution for damage to the environment through replacement, restoration, compensation or other means. Measures will be specific, achievable, measurable and verifiable, and described in a manner that avoids ambiguity in intent or commitment, interpretation and implementation. Mitigation measures may be

considered for inclusion as conditions in the EA decision statement and/or in other compliance and enforcement mechanisms provided by other authorities' permitting or licensing processes.

As a first step, the proponent is encouraged to use an approach based on the avoidance and reduction of the effects at the source. Such an approach may include the modification of the design of the project or relocation of project components. Should the design be maintained as it is, the proponent would have to explain why further refinements of the design to increase the level of safety and mitigate the consequences of accidents were not implemented.

The EIS will describe the standard mitigation practices, policies and commitments that constitute technically and economically feasible mitigation measures and that will be applied as part of standard practice regardless of location. The proponent will describe criteria used to estimate the technical and economic feasibility of potential mitigation measures and provide rationale as to why certain mitigation measures were rejected. The EIS will then describe the project's environmental protection plan and its environmental management system, through which the proponent will deliver this plan. The plan will provide an overall perspective on how potentially adverse effects would be minimized and managed over time. The EIS will further discuss the mechanisms the proponent would use to require its contractors and sub-contractors to comply with these commitments and policies and with auditing and enforcement programs.

The EIS will then describe mitigation measures that are specific to each environmental effect identified, including any effects directly linked or necessarily incidental to any federal decisions. Mitigation measures will be written as specific commitments that clearly describe how the proponent intends to implement them and the environmental outcome the mitigation measure is designed to address.

The EIS will identify and describe mitigation measures to avoid, or lessen potential adverse effects on species and/or critical habitat listed under the Species at Risk Act. These measures will be consistent with any applicable recovery strategy and action plans.

The EIS will also identify and describe mitigation measures to avoid or lessen adverse effects on listed COSEWIC species, and species harvested by Indigenous groups.

The EIS will specify the actions, works, minimal disturbance footprint techniques, best available technology, best management practices, corrective measures or additions planned during the project's various phases to eliminate or reduce the significance of adverse effects. The EIS will also present an assessment of the effectiveness of the

proposed technically and economically feasible mitigation measures. The reasons for determining if the mitigation measure reduces the significance of an adverse effect will be made explicit. The proponent is also encouraged to identify mitigation measures for effects that are adverse although not significant.

The EIS will indicate what other technically and economically feasible mitigation measures were considered and explain why they were rejected. Trade-offs between cost savings and effectiveness of the various forms of mitigation measures will be justified. The EIS will identify who is responsible for the implementation of these measures and the system of accountability.

Where mitigation measures are proposed to be implemented for which there is little experience or for which there is some question as to their effectiveness, the potential risks and effects to the environment should those measures not be effective will be clearly and concisely described. In addition, the EIS will identify the extent to which technological innovations will help mitigate environmental effects. Where possible, it will provide detailed information on the nature of these measures, their implementation, management and the requirements of the follow-up program.

The EIS will document specific suggestions raised by each Indigenous group for mitigating the effects of changes to the environment on Indigenous peoples (section 5(1)(c) of CEAA 2012). For those mitigation measures intended to address effects of changes to the environment on Indigenous peoples, the proponent must discuss the residual effects with the Indigenous groups prior to submitting the EIS.

Adaptive management is not considered as a mitigation measure, but if the follow-up program indicates that corrective action is required; the proposed approach for managing the action (including resources) should be identified.

We also recommend the Commission adopt the following explanation regarding follow-up programs:

A follow-up program is designed to verify the accuracy of the effects assessment and to determine the effectiveness of the measures implemented to mitigate the adverse effects of the project. Where there is uncertainty about effects outcomes, the proponent will show evidence of detailed follow-up and monitoring programs to identify change, and identify adaptive management measures that will be applied.

We further recommend the following considerations inform the development of the follow-up program:

- Whether the project will impact the physical environment, environmentally sensitive areas/VCs, or protected areas or areas under consideration for protection
- The nature of Indigenous and public concerns raised about the project
- Suggestions from Indigenous groups regarding the design of and involvement in the follow-up programs and monitoring programs
- Incorporation of Indigenous knowledge, where available
- The accuracy of predictions
- Whether there is a question about the effectiveness of mitigation measures or the proponent proposes to use new or unproven techniques and technology;
- The nature of cumulative environmental effects
- The nature, scale and complexity of the program
- A description of proposed engagement with Indigenous groups in the planning and implementation of follow-up and monitoring
- Identify, with supporting rationale, how long post closure water will need to be managed and monitored
- Whether there was limited scientific knowledge about the effects in the EA.

Furthermore, the following components should be obligatory to the follow-up program:

- Objectives of the follow-up program and the VCs targeted by the program;
- List of parameters requiring follow-up
- Number of follow-up studies planned as well as their main characteristics (list of the parameters to be measured, planned implementation timetable, frequency, duration, etc.)
- Measures to be taken in the event EA predictions are not met or the mitigation measures are not effective
- Mechanism to disseminate follow-up results among the concerned populations
- Accessibility and sharing of data for the general population
- Proponent's commitment to include the participation of Indigenous groups and stakeholders on the affected territory and include Indigenous knowledge, during the development and implementation of the program
- Proponent's commitment to involve local and regional organizations and Indigenous groups in the design, implementation and evaluation of the follow-up results as well as any updates, including a communication mechanism between these organizations and the proponent.

5.2.2 *Monitoring Programs*

Monitoring programs are a systematic means of collecting data and observations to track and evaluate changes across a range of considerations, including environment, economic, and social variables and are usually associated with projects where there is uncertainty in the effects or the potential for significant adverse outcomes.⁵²

Therefore we ask the Commission to adopt the following explanation regarding the goals and purposes of monitoring programs:

The goal of a monitoring program is to ensure that proper measures and controls are in place in order to decrease the potential for environmental degradation during all phases of project development, and to provide clearly defined action plans and emergency response procedures to account for human and environmental health and safety.

The Agency will consider the proponent's identified follow-up measures to form the basis of enforceable conditions of an EA decision statement, should the Project be allowed to proceed.

Specifically, the EIS should provide an outline of the monitoring program which should include the following elements:

- Identification of the interventions that pose risks to one or more of the environmental and/or VCs and the measures and means planned to protect the environment
- Identification of regulatory instruments that include a monitoring program requirement for the VCs
- Description of the characteristics of the monitoring program where foreseeable (e.g., location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, human and financial resources required)
- Description of the proponent's intervention mechanisms in the event of the observation of non-compliance with the legal and environmental requirements or with the obligations imposed on contractors by the environmental provisions of their contracts
- Guidelines for preparing monitoring reports (number, content, frequency, format) that will be sent to the authorities and Indigenous groups concerned
- Plans for engagement with Indigenous groups in monitoring

5.3 *The purpose of the designated project (s. 19(1)(f))*

There is no statement in the CNSC's CMD describing the purpose of the designated project, which is an important factor to be detailed per section 19(1)(f) of the Act. In the case of the

⁵² EIA Principles and Practice p, 263

proposed project, the purpose is likely to be the generation of electricity, although the project proponent admitted during the 20 May 2020 telephone town hall that it is possible that the turbine might not be installed at the site if the electricity is deemed to be unnecessary in the Ottawa Valley.

Thus, we recommend the following text be adopted by the Commission in their scoping decision:

The EIS will describe the purpose of the project by providing the rationale for the project, explaining the background, the problems or opportunities that the project is intended to satisfy and the stated objectives from the perspective of the proponent. If the objectives of the project are related to broader private or public sector policies, plans or programs, this information will also be included.

The EIS will also describe the predicted environmental, economic and social benefits of the project. This information will be considered in assessing the justifiability⁵³ of any significant adverse residual environmental effects as defined in section 5 of CEAA 2012, if such effects are identified.

5.4 *Alternative means of carrying out the designated project that are technically and economically feasible and the environmental effects of any such alternative means (s. 19(1)(g))*

There is no statement in the CNSC's CMD setting out what is meant in addressing the 'alternative means' factor of the Act per section 19(1)(g). Typically, alternative means refers to the different ways of carrying out the proposed project, for instance alternative locations, timing of activities, and designs.⁵⁴

We therefore ask the Commission to adopt the following in their scoping decision:

The EIS will identify and consider the environmental effects of alternative means of carrying out the project that are technically and economically feasible. The proponent will complete the assessment of alternative means in accordance with the Agency's Operational Policy Statement entitled "Addressing "Purpose of" and "Alternative Means" under the Canadian Environmental Assessment Act, 2012".

The EIS will also provide a systematic comparison of reasonable alternative sites and locations for the demonstration project. This serves to demonstrate whether the project is located in the safest or most environmentally appropriate site.

⁵³ See subsection 52(2) of CEAA 2012

⁵⁴ EIA Principles and Practice, p 260

In conducting an alternative means analysis, we recommend proponent address, at a minimum, the following project components:

- Alternative fuel compositions, including different levels of uranium enrichment
- Alternative fuel designs, including pebble bed designs
- Alternative coolant liquids, including water and steam cycle instead of molten salt

5.5 *Any change to the designated project that may be caused by the environment (s. 19(1)(h))*

We recommend the Commission adopt the following description of ‘predicted changes to the environment’ in their scoping decision to help guide the proponent’s EIS:

The EA will include a consideration of the predicted changes to the environment as a result of the project being carried out or as a result of any powers, duties or functions that are to be exercised by the federal government in relation to the project. These predicted changes to the environment are to be considered in relation to each phase of the project (construction, operation, decommissioning, and abandonment) and are to be described in terms of the magnitude, geographic extent, duration and frequency, and whether the environmental changes are reversible or irreversible.

As changes to various parts of the physical environment, listed below, may be inter-related as part of an ecosystem, the EIS will explain and describe the connections between the changes described.

5.6 *Any other matter relevant to the environmental assessment (s. 19(1)(j))*

Section 19(1)(j) of *CEAA 2012* allows the Commission, as the responsible authority for EA decision making, to specify other factors to consider in the EA. Therefore, we request the Commission require the proponent to demonstrate the alleged ‘need for’ this novel nuclear technology.⁵⁵

In so doing, we recommend the proponent be required to systematically compare the project to the environmental impacts and benefits of the ‘alternatives to’ this technology (i.e. renewables) that could also supply energy in the intended market (i.e. remote, off-grid communities and to resource extraction projects such as mines).⁵⁶

⁵⁵ Formerly found in s.16(1)(e) of *CEAA 1992*

⁵⁶ Blaise & Stensil, p 212

6.0 CONCLUSION

For the foregoing reasons provided in this intervention, CELA and Dr. Ramana request the CNSC acting as a federal authority for this EA:

- (1) Grant CELA and Dr. Ramana the status of intervenor;
- (2) Extend the timelines within Global First Power's EA and extend the current public comment period;
- (3) Ensure the scope of the environmental effects accompanying this project includes both on-site and off-site impacts, and that the project's effects are considered in light of its proposed applications (i.e. for mine sites and to provide an off-grid power supply) and for use in rural and remote communities throughout Canada;
- (4) Adopt our recommendations, including explanatory notes and specific baseline studies set out above, in order to meet the required list of factors to be considered in an EA as enumerated in section 19 of *CEAA 2012*.

We look forward to further engagement on this project and ask to be notified of any future steps in the environmental assessment process.

Respectfully submitted this 1st day of June, 2020.



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