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Written submission from the Nuclear Transparency Project

Mémoire de Nuclear Transparency Project

Bruce Power

Bruce Power

Bruce Power Mid-Term Update of Licensed Activities

Rapport de mi-parcours au sujet des activités autorisées de Bruce Power

Commission Meeting

Réunion de la Commission

September 20 and 21, 2023

Le 20 et 21 septembre 2023



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transparency
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Submitted by email

August 3, 2023

To President Velshi and Members of the Canadian Nuclear Safety Commission,

Re: Comments relating to Bruce Power’s Mid-Term Report on Licensed Activities

We would like to begin by thanking the Commission for this opportunity to provide comments on this mid-term licence update for the Bruce Nuclear Generating Station (BNGS).

These comments have been made possible by CNSC funding through its Participant Funding Program (PFP). These submissions were researched and drafted by NTP founder and coordinator Pippa Feinstein, and have been divided into six parts on the following pages:

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About NTP

The Nuclear Transparency Project (NTP) is a Canadian-registered not-for-profit organization dedicated to supporting open, informed, and equitable public discourse on nuclear technologies. NTP advocates for robust public access to data and other types of information and helps to produce accessible analysis of publicly available information, all with a view to supporting greater transparency in the Canadian nuclear sector.

NTP engages with a multi-disciplinary group of experts to address economic, ecological, and social facets of the Canadian nuclear sector, producing public reports, academic articles, and other publicly accessible resources as well as intervening in regulatory decision-making processes. The organization seeks to support youth and early career scholars, especially those from underrepresented communities and groups in the nuclear field. NTP also recognizes a responsibility to model the transparency and accountability practices for which it advocates. It is committed to interdisciplinary, cross-sectoral, and equitable collaborations and dialogue between regulators, industry, civil society, members of host and potential host communities, as well as academics and professionals from Science, Technology, Engineering, and Mathematics (STEM) fields, the social sciences, and humanities.

About the current opportunity for public interventions

In 2018, a licence renewal application was held for the BNGS. At that time, Bruce Nuclear requested a ten-year licence to operate until 2028, longer than the previous licence terms generally granted to the facility. As the Record of Decision from the Commission Tribunal in 2018 notes, the ten-year licence term was opposed by many civil society organizations, including Greenpeace Canada, Northwatch and the Canadian Environmental Law Association.¹ In response to these concerns, the Commission Tribunal decided to require a mid-term update in five years' time where members of the public could review BNGS operations, follow up on items in their previous interventions, and examine issues of interest relating to the BNGS – the kinds of reviews members of the public and civil society organizations might usually undertake in a relicensing review.

NTP understands these mid-term licence updates are effectively meant to be a compromise between industry and CNSC staff pushes for longer licence terms on the one hand, and the public need to maintain their knowledge about and comment on the oversight of nuclear facilities and their operations on the other hand. As licence lengths have increased for many other nuclear facilities since 2018, these mid-term update Commission meetings will be held increasingly frequently, in some ways creating a new category of public intervention in Canadian nuclear regulation. As such, these submissions have been drafted with these larger regulatory considerations in mind. We first provide our review Bruce Nuclear's public disclosure policies and practices over the

¹ Record of Decision in the matter of Bruce Power Inc., Application to Renew the Power Reactor Operating Licence for Bruce A and B Nuclear Generating Stations, 2018, online: < <https://nuclearsafety.gc.ca/eng/the-commission/pdf/Decision-BrucePower-Relicensing2018-e.pdf>>.

last five years, with a view to how they can promote transparency. We then review and make a series of recommendations concerning the current opportunity to refine the purpose and role of mid-licence Commission meetings, better distinguishing them from other regulatory processes including those for Regulatory Oversight Reports (RORs).

1) Indigenous jurisdiction and the CNSC's regulatory context

NTP recognizes the sovereignty and jurisdiction of the Indigenous Nations on whose land the BNGS sits. We support their interventions in this matter and recognize them as relevant decision-makers when determining allowable activities by nuclear industry in their territories. NTP also recognizes the applicability of Indigenous laws as part of these Nations' governance systems of their homelands on which Bruce Nuclear's facilities operate.

This site does not extinguish Indigenous jurisdiction, nor does it prove the paramountcy of Canadian law and regulation of the site. A formalized process by which Indigenous Peoples' authority and jurisdiction is observed is necessary to determine a just outcome of these matters and should be defined by these rights holders.

NTP also notes that questions about Indigeneity are complex and have been made fraught by generations of Canadian colonial lawmaking that sought to break Indigenous legal, governance, and kinship systems. That being said, we urge the CNSC to consult with Nations on protocols for determining Indigenous identity and rights holders in a way that is consistent with Indigenous law and policies developed by Nations. While this is a difficult task that demands sensitivity, there are examples of it being done ethically and equitably in many jurisdictions.

Comments on Bruce Nuclear's public information and disclosure policies

As NTP has said before, transparency is a crucial precondition for accountability. It is required of regulators and companies in different ways, and for different purposes. In the nuclear sector, transparency is demonstrated by an accessible regulator that ensures its work and the reasoning behind its decisions are clearly communicated to the public. It is also demonstrated by licensees who share information about the real and potential impacts their facilities can have on the environment, human health, the economy, and society more broadly. Regulators have an important role in ensuring licensees provide this information. Regulators are also responsible for ensuring they and the public have the necessary information on which to make informed decisions about what real and potential impacts are reasonable or acceptable, and which are not.

Bruce Nuclear is required by CNSC REGDOC 3.2.1 to have a public information program for the BNGS. This requirement recognizes the need for members of the public to be informed about the operations and impacts of nuclear facilities in the ecosystems and communities in which they are embedded. This REGDOC is instituted under the Commission's mandate to "disseminate objective scientific, technical and regulatory

information to the public concerning nuclear activities”.² The REGDOC notes an effective public information program has the potential to foster an “atmosphere of openness, transparency, and trust”.³

NTP agrees a fulsome public information program can go far to achieve openness and transparency. However, NTP would argue there are two additional preconditions to support public trust: comprehensive information and data that can demonstrate reasonable operations and impacts of nuclear facilities and licensee responsiveness to expressions of public concern.

These submissions will first note some concerns with the approach taken in REGDOC 3.2.1, and then continue to evaluate Bruce Nuclear’s public information and disclosure policies.

1) Concerns with qualifying language in REGDOC 3.2.1

NTP has concerns with the use of certain qualifying language and phrases employed in REGDOC 3.2.1. First, the regulation states that licensee communication is meant to be “commensurate with the public’s perception of risk” and the “level of public interest in licensed activities”.⁴ Second, the regulation explains that “*where the public has indicated an interest to know*, the program shall include a commitment to and protocol for ongoing, timely communication of information...”.⁵ This language puts an unfair burden on members of the public by requiring some degree of public mobilization in order to receive information. It removes the burden of communications from the regulator and licensee onto an already overburdened public and civil society. While public comment and engagement with licensees concerning their disclosures and other matters of interest should be encouraged and receive timely substantive responses, it is unreasonable to base disclosure breadth and frequency on these interactions alone. For example, CNSC guidance for licensee’s public disclosure protocols states that licensees “should seek to gain an understanding of what information the public wishes to know”.⁶ NTP agrees this can indeed be a helpful consideration for licensees, however, it should be performed in addition to a comprehensive and proactive baseline for disclosures required of nuclear licensees by the CNSC.

Further, NTP suggests that the CNSC consider an approach that recognizes all facilities are responsible for a variety of impacts on local communities and ecosystems and that these should be proactively and comprehensively disclosed to the public – regardless of perceptions of risk. Impacts can be defined broadly to include employment, electricity generation, environmental releases, and public radiological doses. An impact-based approach, rather than a risk-based one, is also more consistent with the public interest as

² Section 9(b) of the NSCA, referenced in REGDOC 3.2.1 “Public and Aboriginal Engagement, Public Information and Disclosure”, http://www.nuclearsafety.gc.ca/pubs_catalogue/uploads/REGDOC-3-2-1-Public-Information-and-Disclosure-eng.pdf, s 1.3, p 1.

³ *Ibid* REGDOC 3.2.1 at Preface, p i.

⁴ *Ibid* at section 2.1, p 2.

⁵ *Ibid*.

⁶ *Ibid* at section 2.3.2.

it places the burden on industry to comprehensively disclose its activities, rather than placing a burden on members of the public to present arguments establishing risks or their perceptions of risk. Licensees generally already have the most relevant technical information in their possession as well as the means to release it.

Recommendation 1: that CNSC consider an impact-based approach to licensee disclosure requirements rather than a risk-based approach.

2) Evaluation of Bruce Nuclear compliance with REGDOC 3.2.1

REGDOC 3.2.1 requires Bruce Nuclear to develop and implement a public information program. A significant part of this program is a public disclosure protocol which must be posted to its website. Each will be discussed in turn.

- Bruce Nuclear's Public Information Program

REGDOC 3.2.1 requires licensees to explain the objectives of their public information program in the context of their overall corporate objectives. The REGDOC also requires licensees to identify target audiences for their information and specify their public information strategy and products (i.e. content). More specifically, public information strategies are required to detail the content to be released, specify methods for distributing the content, and describe how this content is meant to address perceived risks to health, safety and the environment. Finally, the REGDOC requires licensees to outline how they will respond to and record public comments, questions, or concerns posed by target audiences and provide timelines for releasing information. Amendments to the REGDOC in 2018 required Environmental Risk Assessments to be proactively posted to licensees' websites as well as summaries of their Probabilistic Safety Assessments.⁷

Bruce Nuclear does not post its Public Information Program online. Rather, it provides a summary of its Public Disclosure Protocol (assessed later in these submissions). NTP inquired about the program with a Bruce Nuclear representative and was provided with an internal document containing high-level descriptions of aspects of the program.

Generally, it appears as though the Program provides a good overview of its purposes within the context of its corporate objectives. It identifies its target audiences as "community members, Indigenous communities and other interested parties, including local residents, government representatives, charities, service clubs, schools and students".⁸ This is a fairly comprehensive list, though recognition of civil society organizations beyond charities would be welcome as many civil societies including NTP do not have charitable status but are still actively involved in nuclear regulatory processes, engage with nuclear licensees, and have an interest in proactive disclosures.

⁷ *Ibid* at section 2.2.4.

⁸ Bruce Power, Public Disclosure Protocol, October 7, 2019, online: <<https://www.brucepower.com/2019/10/07/bruce-power-public-disclosure-protocol/>>.

Recommendation 2: that Bruce Nuclear amend their target audiences to broaden the term “charities” either by using the term “civil society organizations” instead or else the phrase “charities and non-profit organizations”.

Further, NTP wishes to comment on schools and students as a target audience. The need to educate children about radiation and nuclear technologies, especially in areas where nuclear infrastructure is located, is important. However, it is crucial that this education remain impartial on the question of these technologies’ necessity. Young people should be educated to become science and data-literate, to develop strong critical thinking skills, and the confidence to form their own opinions on nuclear energy, informed by comprehensive public information. Similarly, the CNSC as a regulator must remain technology-agnostic, and fulfil its duty to ensure educational resources or programs offered by licensees honour children’s and the public’s autonomy to make their own decisions on the desirability of nuclear infrastructure.

Recommendation 3: that CNSC staff ensure communications to students and schools concern the science of nuclear energy generation rather than arguments relating to its necessity or desirability

Finally, NTP recommends that summaries of additional provisions of the Program be posted to the Bruce Nuclear website, in particular: how often the program is reviewed and amended and how Bruce Nuclear will record and respond to public inquiries it receives through the contact information it provides on the webpage for its Public Disclosure Protocol.

Recommendation 4: that Bruce Nuclear include on its webpage how often its public information is revised and how public inquiries will be responded to and recorded.

- Bruce Nuclear’s Public Disclosure Protocol

Public Disclosure Protocols are an important part of a licensee’s public information program. REGDOC 3.2.1 recommends these disclosure protocols include the type of information or reports to be made public, the criteria for determining when information or reports are published, and the medium for disclosure. The REGDOC also suggests several types of information licensees should consider disclosing, including: operational developments such as labour disputes or changes in facility designs or operations; events with off-site effects; fires and natural events such as floods, earthquakes or lightning; serious industrial or vehicle accidents; planned or unplanned disruptions in facility operations; routine and non-routine releases of contaminants into the environment; unplanned events including those surpassing regulatory limits; and environmental monitoring reports.⁹

The summary of Bruce Nuclear’s Public Disclosure Protocol on its website includes a fairly comprehensive list of scenarios in which disclosures would be made including: expansion or changes to facility design or operations; unplanned events exceeding

⁹ *Ibid* s. 2.3.2.

regulatory limits or causing offsite effects or which could result in public or media interest or concern; annually posting and communicating the Radiological Environmental Monitoring Program (REMP) detailing emissions and spills; and general communications to local residents, elected officials, and First Nations and Métis communities.¹⁰ NTP recommends that this list of disclosures also include a commitment by Bruce Nuclear to disclose machine readable disaggregated data and monitoring locations (discussed in more detail later in these submissions).

Recommendation 5: that Bruce Nuclear include a commitment to publicly disclose machine-readable disaggregated data and monitoring locations in its Public Disclosure Protocol.

NTP also recommends that Bruce Nuclear include a description of the criteria it uses for determining when information or reports are published online, as suggested by REGDOC 3.2.1.

Recommendation 6: that Bruce Nuclear disclose the criteria it uses for determining when information or reports are published online.

Finally, NTP notes that Bruce Nuclear has a consistent social media presence, posting regularly to several different platforms. While already likely a practice, NTP recommends that Bruce Nuclear explicitly commit in its Public Disclosure Protocol to notifying members of the public via social media whenever an event report is posted to its website.

Recommendation 7: that Bruce Nuclear explicitly commit in its Public Disclosure Protocol to notify members of the public via social media whenever an event report is posted to its website.

Bruce Nuclear had posted its Protocol as a PDF document in a link at the end of the webpage detailing its disclosure protocol, however, the link has been temporarily disabled as the company ensures its compliance with the *Accessibility for Ontarians with Disabilities Act*. Representatives of Bruce Nuclear assured NTP the PDF contains the same information that is posted to the webpage. NTP agrees ensuring compliance with this legislation is important and can hopefully be done expeditiously for this and any other posted documents for public reference on Bruce Nuclear's website.

Comments on Bruce Nuclear's disclosure practices

While the discussion above related to Bruce Nuclear's programs and policies, this section reviews the company's practices. There appear to be five primary mechanisms by which Bruce Nuclear discloses information about its operations to the public:

¹⁰ Bruce Power, Public Disclosure Protocol, October 7, 2019, online: <https://www.brucepower.com/2019/10/07/bruce-power-public-disclosure-protocol/>.

- 1) Annual Environmental Protection Reports which provide annual averages of releases to the environment as well as expected doses to the public and workers;
- 2) Environmental Risk Assessments (ERAs) which are conducted every five years and meant to provide a comprehensive “snap shot” of ecological conditions in and around the BNGS site;
- 3) Relatively new online interactive applications (“apps”) disclosing environmental monitoring data;
- 4) National Pollutant Registry Inventory data posted in machine-readable formats to the Open Government Portal; and the
- 5) Independent Environmental Monitoring Program.

NTP will provide comments for each in turn.

1) Environmental Protection Reports

Annual Environmental Protection Reports (EPRs) from 2018 – 2022 are posted on Bruce Nuclear’s website. NTP has reviewed these reports and is still in the process of compiling questions for Bruce Nuclear in order to better understand their contents. However, we have noticed several trends in these reports, and our findings inform a series of recommendations that follow.

Due to its size and the scale of BNGS activities, Bruce Nuclear is required to monitor several contaminant pathways. For the majority of these pathways, the EPRs report annual averaged concentrations, usually distinguished by contaminant substance or type. This is the case for: onsite waterbodies (including ponds, streams); ambient lake water and water in local municipal water supply locations; radiological liquid effluent releases; beach sand; releases to air from stacks of radiological and non-radiological contaminants as well as halocarbons; precipitation; greenhouse gas emissions; soil; all fish species; agricultural products; and public radiological doses. Reporting annual averages means that for all these pathways, the public cannot get a sense of seasonal variation, nor could anyone know of any spikes or particularly elevated values measured over the course of that year.

Recommendation 8: that Bruce Nuclear release disaggregated data with annual Environmental Protection Reports

It is likely that Bruce Nuclear already manages and analyses its raw monitoring data in machine-readable formats in order to produce the more digested trends it highlights in its reports. As such, NTP requests that when disclosing raw data to the public, Bruce Nuclear provide it in the machine-readable formats it uses. This would facilitate members of the public who may wish to perform their own analysis or visualizations of the data, and also likely require little processing time and effort by Bruce Nuclear staff.

Recommendation 9: that Bruce Nuclear release disaggregated data in machine readable formats along with its EPRs

Of all the pathways and areas in which monitoring is performed, only very few specific monitoring locations are provided. These locations, marked on maps, are primarily given for: dose results for representative persons; areas covered in the Conventional Ecological Risk Assessment; and areas where background radioactivity measurements were taken. For releases to air, stacks are not clearly shown in any diagrams. The same is true for effluent outfalls and groundwater monitoring wells. Further, any existence of thermal or contamination plumes in and around the BNGS is difficult to get an accurate picture of from the information provided in the EPRs alone.

Ideally, monitoring locations would be given as geographic coordinates for ease of public reference. However, if monitoring locations are clearly indicated on detailed site maps that can be cross-referenced with Google Maps or other mapping software, this would be a very helpful interim measure.

Recommendation 10: that Bruce Nuclear release detailed monitoring locations along with any raw data released (preferably as geographical coordinates, if available)

Recommendation 11: that Bruce Nuclear provide diagrams of groundwater flow as well as the currents and flow directions of monitored surface water

NTP submits that CNSC staff and Bruce Nuclear might consider reviewing the units used to report contamination in the environment. While human doses are expressed in millisieverts, ecological releases tend to be expressed either in annual loadings of mass/volume (e.g. kg) or else as concentrations in Becquerels. However, these units cannot give a clear picture of the effects of exposures to aquatic and terrestrial biota.

Recommendation 12: that Bruce Nuclear and CNCS staff consider releasing radiological data with Sievert or Gray units so that the public may better assess the significance of reported values for ecological and human receptors

Finally, measurements that only provide mass or concentration are not as useful as measurements that can provide both. This more comprehensive reporting would allow the public to more accurately understand the scale of releases from the BNGS.

Recommendation 13: that Bruce Nuclear provide mass and concentration values for measured released contaminants

NTP hopes that these recommendations would not be too onerous as most of this information should already be present in Bruce Nuclear's own records.

2) Environmental Risk Assessments

The last ERA was prepared in 2022 and the next will be performed and released in 2027. ERAs provide the most detailed ecological descriptions of the Bruce Nuclear site. They canvas species and dose receptors more extensively than other reports, and they canvas more contaminants of potential concern than other reports as well. The result from

disclosed data in an ERA is a better “snap shot” of ecological conditions in and around the Bruce site than is possible anywhere other than an Environmental Assessment.

The 2022 ERA generally contained better maps of sampling locations – especially in the case of monitoring for PAHs, zinc, selenium, and lead, though all locations were shown in diagrams in the PDF report (as opposed to being provided as geographic coordinates of linked to separate GIS maps).¹¹ Consistent with our recommendations above, we would recommend the disclosure of raw machine-readable data with geographic coordinates for monitoring locations. This would allow for ERA data to be used alongside other sources of data such as that included in annual EPRs.

Recommendation 14: that Bruce Nuclear consider providing raw machine-readable monitoring data and geographic coordinates for monitoring locations featured in its ERAs so that data can be analyzed alongside the data available in annual EPRs.

3) Online interactive applications disclosing environmental monitoring data

This is an exciting time for Canadian nuclear data where more environmental data is being shared with the public than any time in the past. Certain licensees (especially those responsible for nuclear generating stations) including Ontario Power Generation (OPG) and Bruce Nuclear, are making more environmental data available to members of the public in new ways.

In the 2022 ERA, Bruce Nuclear provides links to several online applications (“apps”) that share environmental data with members of the public in interactive ways. NTP has reviewed these apps and provided analysis for each below.

One app provides thermal discharge data where members of the public can select years and months from a filter to see temperatures in lake water off the shores of the BNGS.¹² This app is meant to provide a glimpse into thermal pollution from the BNGS’s once-through cooling system, and its impact to local fish species. The app contains several pages where rationales for its monitoring methodology is given. The app is user-friendly, and the visuals (including pictures of fish being monitored as well as the heat map showing the dispersal of elevated temperatures in lake currents) assist with its information communication. More rationale for how it selected its study area may have been helpful.

Another app provides environmental monitoring data for soil, sediment, groundwater, and surface water on and around the Bruce Nuclear site. Filters allow users to select the contaminants, parameters, locations, years, and benchmarks they are most interested in. Maps provide monitoring locations, while monitoring data is provided in tables above the maps. The interface is more complex than the app for thermal pollution, but the data

¹¹ Bruce Power 2022 Environmental Qualitative Risk Assessment, June 2022, online: <<https://www.brucepower.com/wp-content/uploads/2022/10/BP-REP-03443.pdf>>, Figures 20, 21, 22 on pp 173, 175, 176.

¹² See: https://wsp-shinyapps.shinyapps.io/ERA_temperature/

tables and additional filters for this app are helpful features given the high volume of data available on this app.

At the same time, it was unclear at times, how spatial boundaries were determined for some of the ecological receptors as some included monitoring locations across the whole Bruce site, while others only provided locations for a portion of the site. Further, some years are missing from datasets without any corresponding explanation for this absence. For both apps, it is crucial for the boundaries and limitations of their datasets to be clearly communicated. All data is scoped in order to be manageable, however how this scoping is done should be transparent and defensible.

Recommendation 15: that Bruce data apps clearly define the scope (and any limitations or boundaries) of their data

As more licensees develop similar apps, it will be important for the CNSC to ensure this area does not become a regulatory gap. CNSC staff should work with the public to develop best practices and standardize licensee's use of online applications to disclose environmental data. This could be achieved in several ways, and NTP defers to CNSC staff on this matter, whether it becomes a new REGDOC, an amendment or addition to REGDOC 3.2.1, or a new working paper/policy. Functionally, however, NTP recommends that this new policy prioritize transparency in data communications.

Recommendation 16: that CNSC staff consult with members of the public, civil society organizations, and Indigenous Nations, communities and organizations about how to regulate new online apps developed by licensees to communicate environmental data

4) National Pollutant Release Inventory data on the Open Government portal

The data reported to the NPRI portal is also included in Bruce Nuclear's annual EPRs. This data is reported as annual loadings and concentrations, for which the recommendations in relating to EPR data above would apply. However, since last appearing before the Commission Tribunal, where we spoke about the limits of NPRI data, NTP has put together comments and recommendations for ways to expand data reporting through the Open Government portal. We have attached those comments as an appendix to this submission for consideration by the Commission Tribunal, CSC staff, and Bruce Nuclear.

5) Independent Environmental Monitoring Program data

Bruce Nuclear and CNSC staff reference the IEMP in both their CMDs. NTP again seeks to underscore that the IEMP is a very particular and narrow type of environmental monitoring that cannot establish or characterize a nuclear facility's environmental impact. Its results are primarily meant for the communities that choose the monitoring locations as monitoring locations are based on areas of identified community interest rather than publicly-available regulatory or scientific criteria. IEMP monitoring frequencies are also limited, occurring once every few years. As such, the IEMP is unable to measure seasonal

or other trends or any spikes in contaminant values. Rather, IEMP results provide particular “data snap shots” of a given area at the particular time testing is conducted.

Areas for further disclosure in the future

Since obtaining a *Fisheries Act* permit for the once-through cooling water system at the BNGS, Bruce Nuclear has been required to conduct more impingement and entrainment data. NTP requests that the results of these monitoring activities be provided with the public.

Recommendation 17: that Bruce Nuclear consider publicly disclosing further (preferably raw and machine-readable) data relating to impingement and entrainment monitoring results as they are collected.

NTP is still conducting its review of Bruce Nuclear’s financial data posted to its website. However, we are interested in the description of “green bonds”, including exactly how proceeds are allocated according to Bruce’s Green Financing Framework. NTP would be interested to learn more about this new activity.

Recommendation 18: that Bruce Nuclear consider publicly disclosing more information relating to its “green bonds”, including exactly how proceeds are allocated according to Bruce’s Green Financing Framework

Bruce Nuclear has also recently announced a Carbon Offset Accelerator Fund to support “Nature based projects that will lead to measurable environmental impacts”.¹³ The majority of its funding is going to a New Acre Project in partnership with ALUS. A search of ALUS projects online found claims of measurable ecological impacts through projects that seek to remediate waterways and plant pollinator species on agricultural lands, however no data was available showing exactly what these measurable outcomes are. As these projects progress, NTP recommends clearer and more specific communications about measurable outcomes: what they are, how they are measured, and their significance in relation to BNGS routine activities.

Recommendation 19: that Bruce Nuclear provide more information on the progress of its Carbon Offset Accelerator Fund as it continues, including any data relating its outcomes and predicted success.

NTP concerns over intervention timeframes

While NTP is grateful for the participant funding and CNSC support provided to prepare this intervention, our analysis would have benefitted from more time. Additional months would have allowed us to have more back and forth with Bruce Nuclear and CNSC staff

¹³ Bruce mid-term report at p 28.

as required. At the moment, we are still preparing detailed questions for Bruce Nuclear, and have to undertake to report on their responses and any outcomes from a meeting with them at the upcoming ROR meeting for nuclear generating facilities.

We received CNCS staff and Bruce Power's CMDs on June 8th, leaving two months to prepare for this meeting. Ultimately, CNSC staff's CMD made many references to past RORs for generating stations as sources of information relating to BNGS operations over the last five years.

However, it is important to distinguish between RORs and mid-term licence update meetings. While RORs offer the public with an opportunity to review the operations of multiple facilities in a given category against each other, relicensing hearings and mid-term licence update meetings provide rarer opportunities for members of the public to learn about specific facilities in greater detail. As a result, NTP submits that six months to a year for the preparation of these types of interventions would be more appropriate. The year would include notices for Participant Funding Program applications and funding determinations, and at least 6 months should be left for intervenors to assess CMDs, acquire and analyze additional information, and engage with licensees and CNS staff over information requests and other queries. Allocating this extended period of time every 5 years or so should sound reasonable, and would help to better distinguish ROR comment opportunities from facility-specific reviews.

Recommendation 20: that future mid-term licence update meetings provide six months to a year for intervention processes.

APPENDIX A

NTP submissions to the CNSC-ECCC-ENGO NPRI working Group



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transparency
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Website: www.nucleartransparency.ca
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Submitted via email

March 2, 2023

To the National Pollutant Release Inventory – Canadian Nuclear Safety Commission Joint Technical Task Force on Radionuclide Data Linkages,

Re: Comments relating to National Pollutant Release Inventory nuclear data's accessibility, usability, and comprehensiveness

Thank you for the opportunity to submit feedback on the recent addition of radionuclide release data to the federal Open Government Portal. This document is divided into four sections: the first provides some information about our organization; the second provides some context for our feedback, explaining how we use data in our work; the third outlines recommendations for additional features that could make current radionuclide data more user-friendly and informative; the final portion of these comments contain recommendations for additional areas of information, communications, and data we hope could be added to the portal in time.

We also ask that you consider extending membership in this working group to our organization. We would appreciate continuing to learn from and to contribute to your ongoing efforts relating to the release of nuclear data by Canadian government agencies. We have been thinking about data use and disclosure in the nuclear sector for some time. Through our work we will continue to delve deeper into the nuclear-related datasets currently available through the portal and consult with Canadian Nuclear Safety Commission (CNSC) staff and nuclear licensees to gain further insights and experience with the data and disclosure processes. We hope to be able to share what we learn with this working group in service of supporting transparency in the nuclear sector.

About NTP

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information and helps to produce accessible analysis of publicly available information, all with a view to supporting greater transparency in the Canadian nuclear sector.

NTP is comprised of a multi-disciplinary group of experts working to examine the economic, ecological, and social facets and impacts of the Canadian nuclear sector. The organization produces public reports, academic articles, and other publicly accessible resources. It also regularly intervenes in nuclear regulatory decision-making processes. The organization seeks to support youth and early career scholars, especially those from underrepresented communities in their respective disciplines. NTP also recognizes a responsibility to model the transparency and accountability practices for which it advocates. We are committed to interdisciplinary, cross-sectoral, and equitable collaborations and dialogue between regulators, industry, civil society, members of host and potential host communities, as well as academics and professionals from Science, Technology, Engineering and Mathematics (STEM) fields, the social sciences, and humanities. NTP is also committed to observing Indigenous laws and jurisdictions that govern the lands, waters, and nuclear facilities with which we engage.

NTP's use of environmental data

Public access to data is a crucial part of ensuring an informed public and inclusive public discourse on nuclear technologies and their regulation. When we advocate for greater data disclosure, we do so with the understanding that access to data can help people understand how nuclear infrastructures interact with the economic, social, and environmental systems in which they are embedded. We understand that these interactions are dynamic and ongoing. The more detailed the data, the better our understandings of these interactions.

We rely on a variety of data to do our work, whether preparing interventions in regulatory proceedings or producing a variety of educational resources. This includes data related to nuclear financing, demographic data about the nuclear sector's workforce, and data about geographic locations of nuclear facilities. However, to date, the data on which we have relied the most has related to environmental monitoring – and this is also the most widely-available type of nuclear data. Different nuclear licensees have different degrees of public disclosure and a few produce publicly-accessible machine readable data relating to environmental effects of their facilities. Though the radionuclide release datasets for nuclear facilities on the portal (both for annual loadings of radionuclides and non-radiological contaminants) currently constitutes the most significant source of publicly-available environmental nuclear data.

At the same time, while NTP focuses on access to specific types of data, we recognize this is not the only (or best) way to understand impacts of nuclear infrastructures. We recognize different ways of knowing, including anecdotal or experiential knowledge in communities. We also recognize the rigour and depth of Indigenous knowledges (whether Indigenous Science, Traditional Knowledge, Traditional Ecological Knowledge, or other forms and terms for it) about the lands and waters in which nuclear infrastructures are located. NTP seeks to support and observe the protocols that govern this knowledge and

its sharing, and we do not advocate for or presume access to it. All data we use is generated by licensees and specific to their monitoring of their facilities. All the comments in this document are limited to that data, and always subject to Indigenous knowledge, law, jurisdiction, and governance.

We are currently working on some visualizations of trends in the data for radionuclide releases from Canadian-regulated nuclear facilities on the portal. Our preliminary analysis was conducted by Alan Rial, M. Eng. a data analysis professional and NTP contributor. His analysis and script (with explanatory comments) has been made publicly available and can be accessed at the following link: https://nucleartransparency.ca/wp-content/uploads/2023/02/Radionuclide_Release_Analysis-1.html. It should be noted that Mr. Rial and other NTP contributors are still in the process of clarifying and better understanding several data points with CNSC staff and licensees before we publish reports or other public resources based on this preliminary work. Through this ongoing work, we have become familiar with the portal's radionuclide datasets for nuclear generating and processing facilities, CNL facilities, and uranium mines and mills. Our comments below are based on our experiences with these datasets to date.

Recommendations to make current disclosures of data on the Open Government Portal more user friendly

1) Explanations of uploaded radionuclide data

In our work, we often focus on the differences in types of data and what they can tell us based on what they measure. For someone accessing the radionuclide data on the portal for the first time, it may not be clear that the values provided are annual loadings or that these single values are often comprised of multiple (air and liquid effluent) discharge points in a given nuclear facility. It might also not be known how reported contaminants are determined, for example whether there are additional types of pollution present at these nuclear sites that are not included in the datasets due to NPRI or CNSC reporting scopes and thresholds (such as thermal pollution from generating station's once-through cooling systems, or the use of road salts in the winter). Further, as reported annual loadings, this data cannot speak to concentrations of contaminants in releases nor can it show seasonal variations in emissions. Being transparent about the limits of datasets can make them more accessible and user-friendly.

This description would not need to be long, a paragraph or two might suffice. Further, the same paragraph could accompany all datasets, possibly in the "notes" txt file that already accompanies all categories of radionuclide data. However, if such an explanation of the data is deemed to be beyond the bounds of this task force, and indeed beyond the capacity or scope of activities the Environment and Climate Change Canada (ECCC) and the CNSC envision for themselves, this may indicate a potential communication gap that can be filled by civil society organizations, at least in the short-term. NTP defers to Indigenous Nations and communities on the roles they identify for themselves in such communications, here and more generally.

2) Contextualizing radionuclide data with maps of stacks and effluent discharge outfalls

Related to the point above, providing maps of facilities and the actual locations of their stacks and liquid effluent outfalls could further help members of the public understand what the data is communicating. For example, the numbers of liquid effluent discharge points and their relative proximity to waterbodies may be of interest to members of the public. Facilities have these maps already, though most do not proactively share them with the public on their websites or in regulatory submissions. The CNSC could obtain these facility maps (if they don't have them already) for inclusion on the open data portal. Such maps could be included in the links with map/GIS-based representations of facilities on the portal.

3) Accessible 'errata' notes to accompany datasets

We accessed the radionuclide release datasets two separate times in order to complete our preliminary analysis this past autumn: once in April 2022 and again in July 2022 once 2021 data values were uploaded to the online files. When comparing the April and July datasets, however, we noticed several discrepancies between data values in both datasets for years 2020 and earlier (i.e. discrepancies that could not be explained by the addition of 2021 values). These discrepancies related to changes in reported values, as well as additional values added where there were none before. When we inquired with CNSC staff about these discrepancies, we were told they were likely due to human error during manual data entry that was corrected after the fact. No notices of these discrepancies or amendments accompanied the datasets. This poses a challenge for public use where multiple versions of datasets may still float around having been shared in groups, or else outdated versions of datasets may be relied on in public materials without knowing they have since been corrected.

We would recommend the addition of charts titled 'errata' (or 'corrections' or 'amendments') accompanying all datasets listing what changes have been made to them since their original posting, and listing the dates on which these changes were made. These charts could be their own file or else included in the 'notes' txt file that already accompanies the datasets. Such a chart would help the public understand how often datasets are revised (and thus know how frequently to check them if using them regularly). Inclusion of this information as footnotes in the data excel spreadsheets might also be an option to alert data users of which values have changed and when. However, this might be more labour intensive than a separately compiled chart and relying on footnotes in this manner might render the datasets unwieldy in the longer-term.

4) Automatization to avoid human error

It may be advisable for the CNSC to require machine readable data from licensees to avoid the need to manually input data for public access. Initial testing laboratories could also be encouraged to report monitoring results in machine readable formats, to assist with analysis by licensees. This way, licensees would only have to forward the datasets

to regulators who could directly upload to the open government portal. A single pipeline of machine-readable data could ultimately render the data more trustworthy and traceable and better avoid human error.

5) Standardized terms and measurements

Certain terms and the thresholds they represent could be standardized across datasets so they can be more easily compared across facility-types. For example, current datasets for nuclear generating facilities use “limit of detection” (LD) with a footnote that “<LD=0”; while data for uranium mines notes ‘detection limit” (DL). Nuclear processing data notes values of 0.00+E00; whereas values of 0 are noted in Canadian Nuclear Laboratories (CNL) facilities’ datasets. Datasets with LDs or DLs tend not to also report values of 0. We are still in the process of confirming with CNSC staff whether all these values indicate the same environmental release conditions, or whether there is a difference between certain limits of detection and confirmed values of 0. For these cases, a proactive description of LDs, DLs, and 0 would help public use of these datasets. Further, using the same terms across datasets to indicate the same conditions or measurements would similarly assist with the usability of this data.

If limits of detection are greater than zero, and are dependent on the substance being measured, a footnote with the actual detection limit value would also be helpful and contribute to more conservative analyses of provided data.

Finally, proactive explanations of the use of different units of measurement for certain contaminants would also help users better understand the data. For example, most radionuclides and types of measured radiation are provided using Becquerel (Bq) units while uranium loadings are more often expressed in kilograms (kg). Each unit of measurement relays a different characterization of the substance: activity level of a radionuclide in the case of Bq and mass in the case of kgs. An explanation of the rationale behind these use of these different units would support greater transparency, including whether this corresponds to a regulatory reporting requirements in a licence for example, or an established scientific convention in the field.

6) Estimated public dose could be reported in its own column

Currently, estimated public dose (EPD) is reported in the column otherwise meant for stack emissions. Footnotes (in a separate column) for these EPD values note they are calculated with reference to both stack emissions and direct discharges. While this does not necessarily pose a barrier for data analysts, having a separate (third) column for EPD could make it easier for those less familiar with raw data to understand how EPDs are distinct from both stack emissions and direct discharges. Footnotes could still accompany EPD values explaining how they are calculated from both stack emissions and direct discharges.

7) Cross-referencing radiological and non-radiological data for nuclear facilities on the open government portal

At the moment, NPRI data for non-radiological contaminants at nuclear facilities is searchable by facility or licensee. However, if searching for a licensee or nuclear facility on the NPRI portal, the radionuclide data for the facility does not automatically appear in the search. The open government portal could contribute to a more fulsome understanding of nuclear facilities ecological impacts by better integrating (and ensuring searchability of) radionuclide and non-radionuclide releases from the same facilities.

8) Greater transparency around reporting non-routine releases

There are instances in the Canadian Nuclear Laboratories (CNL) datasets in which non-routine releases are disclosed in addition to routine annual releases. This is true for significant and non-routine direct discharges of uranium and radium-226 from the 'Port Hope Project' in 2017 and 2018. This disclosure is appreciated and important in these instances. At the same time, the inclusion of this data for non-routine disclosures raises larger methodological questions about what kinds of non-routine releases would merit inclusion as separate line items in these datasets. Is there a specific threshold? If so, from where does this threshold originate and what is its scientific basis or rationale? More transparency on this issue would assist with public understandings of the data provided.

9) Adding regulatory limits to release values for context

If Derived Release Limits (DRLs) and Action Levels (ALs) for radionuclides were included in the datasets, this could provide helpful regulatory context for reported data values. At the same time, we acknowledge there might be limits to the applicability of certain regulatory limits if they are expressed as concentrations rather than loadings.

10) Transparency of dataset categories

NTP has voiced concerns about CNL facilities constituting their own category of radionuclide data on the portal. The CNL data is the only dataset for nuclear facilities defined by their operator rather than their function. There are currently datasets for uranium mines and mills, nuclear fuel processing facilities, and nuclear energy generating facilities – each facility type occupies a distinct position in the nuclear fuel chain. By the same logic, there should be a dataset for nuclear waste facilities and decommissioning projects. This final dataset would likely contain most of the CNL facilities as well as some managed by Ontario Power Generation. A dataset for *nuclear waste*, rather than *CNL*, would be also be of more use to members of the public interested in gaining a comprehensive understanding of the full range of nuclear facility types regulated by Canadian agencies.

Recommendations for additional data disclosure

11) Including disaggregated environmental monitoring data

Many facilities collect environmental samples quarterly, monthly, weekly, and even daily from a variety of stacks, outfalls, ambient air and water, and other pathways from nuclear facilities. As noted on page two above, this more detailed data will provide the public with a better understanding of the ongoing and dynamic interactions between facilities and the ecosystems of which they become a part. Understanding how precipitation might affect emissions and their dispersal, understanding seasonal variation in environmental impacts from summer to winter, seeing how frequent unplanned releases are and whether they relate to certain weather conditions, all this and more requires more detailed data than the current annual loadings available on the portal.

Uploading this disaggregated data in time would support people to make informed decisions about their proximity to these facilities (including recreational activities, food or medicine gathering, and other practices). Proactive disclosure of this more detailed disaggregated data can also support those who choose to intervene in regulatory proceedings (including but not limited to meetings or hearings before the CNSC).

12) Including data relating to additional contaminant pathways

Related to the above point, increasing the scope of uploaded nuclear data to additional pathways will be beneficial to many. In addition to currently disclosed data relating to annual loadings of radionuclides released into the environment from stacks and direct discharges, nuclear facilities also monitor contaminants in groundwater and stormwater. Most facilities also monitor ambient air and surface water in the vicinity of their facilities. Monitoring of local produce, milk and eggs, and off-site well water is also often undertaken. Uploading all this data to the portal should be included in ECCCs, the CNSC's, and this working group's plans and goals. Automating data reporting will be an important aspect of this greater disclosure.

13) Contextualizing Independent Environmental Monitoring Program data

NTP has expressed concerns about public communications of the Independent Environmental Monitoring Program (IEMP) by the CNSC. These communications explain the IEMP as a mechanism to earn public trust. They also describe it as a "complementary program" to other environmental monitoring efforts by nuclear licensees of their own facilities. NTP wishes to underscore that the IEMP is a very particular and narrow type of environmental monitoring that cannot establish or characterize a nuclear facility's environmental impact. Further its results are meant for, and have the most meaning for, the communities that choose the monitoring locations. This is because monitoring locations are based on identified community interest rather than publicly-available regulatory or scientific criteria. IEMP monitoring frequencies are too limited for the IEMP to be able to measure seasonal or other trends or any spikes in contaminant values. Rather, IEMP results can only provide particular "data snapshots" of a given area at the particular time testing is conducted.

The CNSC should more clearly explain that these community-specific interests in a given location are not disclosed along with the collected data, thus further qualifying and more

accurately communicating the scope of this data. As far as we are aware all locations are chosen by Indigenous communities, and thus we do not advocate for the disclosure of these community interests themselves. We have, however, asked the CNSC to invite additional members of the public to contact the Commission if they would like to request a particular area of interest be included in future IEMP sampling.

14) Disclosures and protocols that observe and respect Indigenous data sovereignty

Related to the above, the governance frameworks that guide the public release of data should fully incorporate Indigenous data sovereignty principles, if they do not already do so. Data protocols should be designed by (or with) Indigenous Peoples, ensuring protection and support for their inherent rights and diverse interests. There are several models and resources for this including the OCAP model (First Nations' "ownership, control, access, and possession") as developed by the First Nations Information Governance Committee (<https://fnigc.ca/>). There are also the international CARE Principles for Indigenous data governance which require that data be "findable, accessible, interoperable, reusable, for the collective benefit, authority to control, responsibility, and ethics" of Indigenous Peoples (<https://www.gida-global.org/care>).

15) Greater clarity of nuclear data disclosure scope and the work of this task force

Thank you for your presentations at the meeting we were able to attend on Nov. 15, 2022. We used that meeting to gauge the scope for this working group's efforts which informed the comments above. However, if the scope is broader than our assumptions, we would support inclusion of the following types of information on the portal in time as well:

- transportation routes for nuclear materials (including uranium, processed nuclear fuels, potentially radioactive equipment, and nuclear wastes)
- economic data: financial disclosures required for financial guarantees and decommissioning funds, as well as funding reports by public organizations or agencies responsible for managing aspects of nuclear substance operations or waste management (e.g. OPG and the Nuclear Waste Management Organization, NWMO)
- sociological data: employment demographics in the nuclear sector, demographics of nuclear host communities
- CNSC licenses and Licence Conditions Handbooks. Currently they are not being posted to the CNSC website with CNSC staff citing official languages translation issues. The portal might be a way these documents can still be proactively shared with the public.

Thank you again for the opportunity to submit these comments for your consideration. We hope to be able to continue these conversations with this working group.