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**Written submission from  
Northwatch**

**Mémoire de  
Northwatch**

In the Matter of

À l'égard de

**Regulatory Oversight Report for Uranium  
and Nuclear Substance Processing Facilities  
in Canada: 2017**

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**Rapport de surveillance réglementaire des  
installations de traitement de l'uranium et des  
substances nucléaires au Canada : 2017**

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Commission Meeting

Réunion de la Commission

**December 13, 2018**

**Le 13 décembre 2018**



# NORTHWATCH

November 13, 2018

Canadian Nuclear Safety Commission  
280 Slater Street, P.O. Box 1046, Station B  
Ottawa, ON K1P 5S9

Ref. CMD 18-M47

Dear President Velshi and Commission Members:

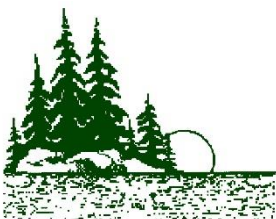
Re. **Northwatch Comments on Regulatory Oversight Report on Uranium Processing and Nuclear Processing Facilities in Canada: 2017**

On June 29, 2018 the Canadian Nuclear Safety Commission issued a notice<sup>i</sup> that a report titled “Regulatory Oversight Report on Uranium Processing and Nuclear Processing Facilities in Canada: 2017” would be presented at a Commission meeting in December 2018. The notice indicated that draft Report would be available for review on the CNSC website, or on request to the Secretariat, after October 12, 2018 and that the deadline for comments on the report would be November 13, 2018.

On October 15<sup>th</sup> a notice was posted on the CNSC web site<sup>ii</sup> that the draft executive summary of the *Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2017* was available for review and a link was included to the executive summary<sup>iii</sup>. The full report was also available online as a document related to the December Commission meeting. Notice of its availability was provided to Northwatch via an email sent by the CNSC on 2018-10-15 at 4:47 PM, but a link to the full report not included in the notice available through the post on the CNSC “news” section; it is not known to Northwatch how broadly the email with the link to the full report was distributed by the CNSC, but it is our general contention that such information should be clearly publicly posted.

## Northwatch’s Interest

Northwatch is a public interest organization concerned with environmental protection and social development in northeastern Ontario. Founded in 1988 to provide a representative regional voice in environmental decision-making and to address regional concerns with respect to energy, waste, mining and forestry related activities and initiatives, we have a long term and consistent interest in the nuclear chain, and its serial effects and potential effects with respect to northeastern Ontario, including issues related to uranium mining, refining, nuclear power generation, and various nuclear waste management initiatives and proposals as they may relate or have the potential to affect the lands, waters and/or people of northern Ontario.



Northwatch's particular interest in the subject report is the discussion of Cameco's uranium refinery in Blind River, which is within the District of Algoma, one of the six districts of northeastern Ontario which is Northwatch's area of geographic focus and where Northwatch's membership largely resides. The stated purpose of the subject report is to summarize the performance of the Cameco facility located within Northwatch's area of interest, and that of other facilities.

Northwatch's issues and concerns relate primarily to the performance of the refinery and the potential related adverse effects on workers and residents and on the natural environment in the vicinity of the refinery, including the North Shore of Lake Huron, the North Channel and – potentially – the islands in the North Channel of Lake Huron. Since the beginning of the Cameco refinery's operations in the 1980s, there has been an accumulation of uranium in the soil and vegetation in the area, which is one indicator of releases as a result of the refinery's operations, and there are ongoing releases to the air, surface water and groundwater.

Northwatch has previously intervened in license reviews for the Blind River facility, most recently in 2011/2012. During licensing exercises, Northwatch noted that there were a number of performance issues which are of concern, particularly with respect to radiation protection, including those related to whole body and skin dose results, and exceedances of action levels. Between the 2006 and 2011 license renewal processes there were changes to operations which could further impair performance, including the transfer of Port Hope wastes to Blind River for incineration and increases to production and operating times were permitted.

Northwatch has also commented on the Regulatory Oversight Reports related to the Blind River uranium refinery in 2016 and 2017. In Northwatch's 2016 submissions on the *Regulatory Oversight Report for Nuclear Processing, Small Research Reactor and Class IB Accelerator Facilities: 2015 The Canadian Nuclear Safety Commission (CNSC)*<sup>iv</sup> issues were identified related to CNSC staff's reliance on the Safety and Control Areas (SCA) rankings as evidence of a nuclear facility's safe operations and their limited inclusion of SCA categories in the RORs, among other concerns. These concerns – and others – persisted throughout Northwatch's review of the *Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2016* and into the review of the subject report, *Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2017*

### ***Northwatch Comments on Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2017***

As was the case when we compared the 2017 *Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2016* to the 2016 *Regulatory Oversight Report for Nuclear Processing, Small Research Reactor and Class IB Accelerator Facilities: 2015*<sup>v</sup> we found the reports to be very similar, even repeating report sections in near entirety. As was the case with the 2016 report, the 2017 report generally provides less information and is less detailed than the 2015 report.

We noted some small but potentially significant changes between the Regulatory Oversight Report issued last year compared to the report issues last month (the October 2018 draft report) including:

- The report authors substitute the term “refinery” with the more generic term “facility” in identifying the subject of the report sections dealing with Cameco’s uranium refinery in Blind River; we question how that is helpful, and are concerned that in the longer term – particularly given Cameco’s stated intent to create a waste “mound” for decommissioning wastes from their Port Hope facilities in the Blind River area – this shift to a more generic term could be for purposes of opaqueness
- The 2018 version of the report removes the reference to Missisauga First Nation as the closest community (located approximately one kilometre from the refinery) in the opening paragraphs of the sections dealing with Cameco’s uranium refinery in Blind River
- The report removes the “Port Hope Conversion Facility” before the first instance of using “PHCF”; perhaps that is because it is earlier in the document, but the authors should consider that some readers will be concerned with only certain sections, such as regional residents, and it may be helpful to them to not have to search earlier sections of the report to understand an acronym

In addition, Northwatch identified several larger concerns:

- The 2017 report provides inadequate information about the transportation events that are very generally described; additional detail should be provided, including the mode of transportation, the shipper and the source of the materials being transported, and the nature and cause of the damage to the shipping containers; the information provided does not allow the Commission or the interested public to evaluate the degree to which these repeated transportation incidents may have common root causes or are stand-alone incidents, or to evaluate the effectiveness of the current regulatory framework in light of these repeated incidents
- The regulatory oversight documents continue to be plagued by a lack of referencing and overly general statements; an example in the 2017 report is the statement “For each event, Cameco completed an investigation and established corrective actions”; presumably there were reports to the Commission during Commission meetings – these reports should be referenced and hyperlinked to place them in the context of the ROR and to provide additional – and potentially adequate – background to the ROR
- The document is inconsistent in whether it provides dose rates as simply mSv or as mSV per hour or per year; perhaps the report authors expect readers to extrapolate from the context, but the document would be better served by clearly stating the time frame in each use of “mSv” dose rates
- The ROR indicates that *“In 2017, there was one exceedance of the BRR facility’s action level for whole-body dose reported to the CNSC. Cameco’s investigation revealed that the reported exposure was **non-personal** in nature. Cameco pursued a change to the official dose of record in the National Dose Registry for the employee as per the CNSC-established process. The dose change request was reviewed by CNSC staff and approved in December*

2017”; it is completely unclear from the report and from review of other available information what is meant by an exposure that is “non-personal” in nature; we would encourage Commission members to question this during their December meeting and to require a full explanation be included in the final version of the report

- The report indicates that four of the five environmental objectives set by Cameco for 2017 were completed, but provides inadequate information about these objectives; in particular, there is no information included in the report on any of Cameco’s waste generation of waste management activities, including those which were related to the identified objectives (i.e. addressing legacy waste on site)
- The report indicates that four of the five environmental objectives set by Cameco for 2017 were completed, but provides no information on why the fifth objective – to assess an alternate location for the incinerator sampling point - was cancelled, other than to say that “Cameco determined the original sampling point was appropriate and did not require relocation based on current operations”. This is unconvincing, given there was presumably a purpose in identifying this assessment of potential alternate locations for the incinerator sampling point as an objective; more information should be provided.
- As has been expressed in previous submissions by Northwatch, statements such as “the IEMP results indicate that the public and the environment in the vicinity of surrounding the BRR site are protected and safe” is overly definitive; the CNSC may reasonably make a statement to the effect of “based on the very limited sampling undertaken the CNSC has concluded that the environmental releases appear to be within regulatory limits’, but it cannot reasonably claim that the IEMP demonstrates that there are “No adverse consequences to human and environmental receptors”; perhaps the disclaimer of these consequences not being “expected” satisfies CNSC, but it does not satisfy a public interest test

Northwatch expressed appreciation in our 2017 comments for the additional information provided about discussions between Mississauga First Nation and the CNSC in last year’s report. We note with disappointment that this year’s report repeats the same information about the meetings between the CNSC and Mississauga First Nation held in 2016, but provides only very general statements about followup actions. Northwatch could not make a determination from the information provides as to whether the CNSC has continued to meet with the Mississauga First Nation, and Northwatch’s request that future reports include verification of the activities alluded to by CNSC staff in the previous year’s report as well as a statement conveying their level of satisfaction with their role and with CNSC efforts by the Mississauga First Nation.

In particular, the subject report indicates:

*A sampling plan meeting both the IEMP objectives and the MFN objectives was subsequently developed and executed in October 2017. The IEMP results were shared with MFN and indicated that the community is protected from the operations of the facility. Another IEMP campaign was completed in October 2018 at the BRR facility similar to previous years, involved ongoing communications and support from the MFN. The results from the campaign will be made available to the public once the samples have been analysed by CNSC’s laboratory.*

This is a potentially positive and significant development, and may have resulted in improvements to the CNSC IEMP program, potentially resolving concerns previously expressed by Northwatch. However, based on the information provided in the ROR, it is difficult to determine the degree to which MFN's objectives were met.

Some additional information is available on the CNSC web page related to the CNSC IEMP Program:

*The 2017 sampling campaign also included sites on Mississauga First Nation (MFN) land. Samples of air, soil and water at seven sites were selected based on prior discussions between CNSC staff and MFN. The results for the samples obtained on MFN land were below applicable guidelines. The results are also similar to what was found from the 2013 and 2014 sampling campaigns as well as the results for the other sampling sites outside the BRR site perimeter for 2017.*

Based on the downloaded data set, it appears that there while some sampling sites were added in 2017 – presumably in order to meet MFN objectives – it also appears that there are numerous sampling locations for which data was collected in 2013 and 2014 but not in 2017; no explanation of this is provided.

### Reporting Gaps

There are two significant reporting gaps in the 2017 draft report, the first being waste management and the second being decommissioning planning.

There are only two references to wastes or waste management in the draft report:

- In Section 3.1 the report states that “Cameco provides a safety report on their website, along with waste management information and quarterly compliance reports”<sup>vi</sup> but it does not provide an analysis or evaluation of that waste management related information or any summary of waste volumes or practices;
- In Section 3.3, the report includes a reference to a completed objective related to the reduction of legacy waste on site, but as previously noted in these comments provides no information about the objective or related activities or the current status of legacy waste on the site

The report provides no information about decommissioning plans for the Blind River refinery. It does include brief discussions of decommissioning planning for two other facilities, but none for the Blind River refinery (with the exception of listing the Blind River refinery in Appendix D, which lists the amount of financial guarantee in place per facility).

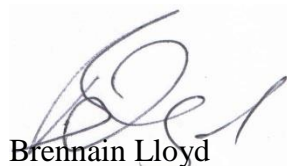
In addition to the comments provided above specific to this year's report, there are numerous items of concern identified in Northwatch's 2017 submission on the previous year's regulatory oversight report which remain unresolved. The relevant sections of our 2017 submission are attached as Appendix A, particularly for the information of new Commission members; the items



of key concern can be summarized as follows:

- air emissions are reported on an annual basis, in contrast to the BRR licence which requires air releases to have a weekly, and sometimes daily, averaging period; the annual averaging does not track whether there were weeks when radiological release limits were exceeded; information should be provided on a more detailed basis, including any period of inoperability and greater frequency averages
- Northwatch requested that the CNSC confirm whether this annual safety meeting is public and if so, to provide updates when available, on location and date for the next meeting and requested copies of the documents related to environmental protection that were reviewed at the most recent annual safety meeting.
- There is no information provided on waste management, so the CNSC assignment of “satisfactory” performance for this SCA is unsupported
- According to BRR’s 2016 Annual Compliance Report, their Preliminary Decommissioning Report was “updated and reissued in 2016”<sup>vii</sup>; neither the 2016 or 2017 RORs provide any information in this regard
- in reviewing the 2016 report Northwatch noted that – unlike in every other previous year – neither Cameco’s Annual Information Form or Annual Report report on production levels for the Blind River refinery, although they do continue to report on production levels for the Port Hope Conversion facility and fuel manufacturing facility; in the absence of any production information, it is more difficult to assess emissions rates and whether these are increasing or decreasing on a per unit basis
- The soil sample results are aggregated, making comparison with actual monitoring results from previous years impossible. Further, given that some sampling locations have been eliminated (as of last year’s report), a comparison of averages, minimums and /or maximums are no longer valid, particularly absent of specific information about which sampling locations have been eliminated; the 2017 draft report showed only annual averages of Uranium concentration in soil, but showed an increase of 6.25% from 2016 to 2017; while these are averaged annual values and so of only limited value in understanding site conditions, they are helpful in evaluating the statement that “*Essentially, uranium soil concentrations do not appear to increase in the area surrounding the facility. This confirms that current BRR operations have no effects on soil quality.*” In brief, the statement has no basis.

All of which is respectfully submitted.



Brennan Lloyd  
Northwatch Project Coordinator



## ENDNOTES

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<sup>i</sup> <https://www.nuclearsafety.gc.ca/eng/the-commission/pdf/NoticeMeetingPFP-ROR-2017-UPNPF-e.pdf>

<sup>ii</sup> <http://nuclearsafety.gc.ca/eng/resources/news-room/latest-news/index.cfm>

<sup>iii</sup> <http://nuclearsafety.gc.ca/eng/resources/publications/reports/regulatory-oversight-reports/uranium-and-nuclear-substance-processing-facilities.cfm>

<sup>iv</sup> <https://nuclearsafety.gc.ca/eng/resources/publications/reports/2015-regulatory-oversight-report-for-nuclear-processing-small-research-reactor-and-classB-accelerator-facilities/index.cfm>

<sup>v</sup> <https://nuclearsafety.gc.ca/eng/resources/publications/reports/2015-regulatory-oversight-report-for-nuclear-processing-small-research-reactor-and-classB-accelerator-facilities/index.cfm>

<sup>vi</sup> Page 27

<sup>vii</sup> BRR Annual Compliance Report, *supra* note 27, p 15

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## **Appendix 1**

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# **Reviewing the CNSC's Oversight of the 'Environmental Protection' and 'Waste Management' Safety Control Areas**

*Northwatch's Comments on the CNSC's Regulatory  
Oversight Report for Uranium and Nuclear Substance  
Processing Facilities in Canada: 2016*

***Submitted by:***

Brennain Lloyd, Project Coordinator, Northwatch

Kerrie Blaise, Counsel, Canadian Environmental Law Association

November 20, 2017

**Excerpt Related to Blind River Uranium Refinery**

## A. URANIUM PROCESSING FACILITIES

### Overview

The uranium processing facility licenses reviewed in the ROR were those of Cameco's Blind River Refinery ("BRR"), the Port Hope Conversion Facility ("PHCF") and Fuel Manufacturing Inc ("CFM"), and BWXT Nuclear Energy Canada Inc.'s facility. All of these licensees received a 'satisfactory' compliance rating in the areas of environmental protection and waste management.

### 1. Cameco: Blind River Refinery

#### Environmental Protection

##### Atmospheric Emissions

The ROR states that Cameco's atmospheric emissions for the 2016 licensing year "continued to be effectively controlled".<sup>26</sup> Supporting this statement in the ROR is Table 3-2 *Blind River Refinery – Air Emissions Monitoring Results*, which reports the annual average of air emission monitoring results. Northwatch has a number of comments regarding this section.

First, Table 3-2 averages air emissions on an annual basis. This in contrast to the BRR licence which requires air releases to have a weekly, and sometimes daily, averaging period. Because of this discrepancy in averaging period, the chart in the ROR does not track whether there were weeks when radiological release limits were exceeded.

Northwatch submits it would be more effective if the air emission chart illustrated the number of times the licence limit was breached. A hypothetical example is illustrated below:

Air Release Source	Substance	Licence Limit	Averaging Period	Length of Inoperability (weeks)	Instances in which Limit Exceeded (weeks)	Compliance Rating (%)
Incinerator Stack	Uranium	0.01	Weekly	26	4	85%

As included in this chart, an approach which also factors in total operating time increases the rigour of the data. The annual averages used in the ROR remove data outliers and do not show the number of weeks a release limit may have been exceeded.

<sup>26</sup> *Ibid*

Furthermore, it is unclear if the ROR's dataset excludes weeks in which the 'air release source' was inoperable. According to BRR's 2016 Annual Compliance Report, "the incinerator did not operate in the second or third quarter of 2016 to allow for repairs to the continuous emissions monitoring system and as a result of the extended summer shutdown."<sup>27</sup> Therefore, if the data provided in the CNSC's report does not account for the outage, many weeks of zero emissions could potentially be averaged with the other data. Using the hypothetical chart above, if the inoperable weeks were not removed from the equation, the licensee would have a falsely increased compliance rating of 92%. Northwatch requests the CNSC to explain to what extent outages were accounted for in the calculation of atmospheric emission averages.

Secondly, based on the historical data included in the ROR's Table 3-2, it is evident that the licensee, on an annual average basis, has not surpassed allowable emission limits. For instance, 0.00005kg/h of uranium was emitted via ventilation stack, despite a licence limit of 0.1 kg/h. Similarly, 0.00001 kg/h of uranium was emitted from the absorber stack, even though the licence limit was 0.1kg/h. Therefore, Northwatch asks if the CNSC has discussed amending the licence release limit so as to better reflect the CNSC's licensing principle of "As Low As Reasonably Achievable" (ALARA). Northwatch seeks the CNSC's opinion on this issue and whether the licence release limit remains much higher to account for 'one off' or 'occasional' releases at a higher rate.

### Environmental Management System

The ROR notes that " Cameco holds an annual safety meeting in which environmental protection issues are discussed and documented." The ROR continues that based on this meeting, CNSC staff review the annual safety meeting documents to verify licensee compliance and note outstanding issues requiring follow-up. First, Northwatch requests the CNSC confirm whether this annual safety meeting is public and if so, to provide updates when available, on location and date for the next meeting. Secondly, as the ROR does not provide further details on this event, Northwatch requests copies of the documents related to environmental protection that were reviewed at the most recent annual safety meeting.

### Waste Management

The BRR received a satisfactory rating on the waste management SCA. The ROR does not include discussion of the licensee's waste management licence condition. Therefore, it is not possible for Northwatch to gauge the extent to which the licence condition has been met, breached, or even surpassed. The comments which follow are based on Northwatch's review of the proponent's annual compliance report and licensing application (dated April 15, 2011), alongside their current operating licence and LCH.

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<sup>27</sup> Cameco: Blind River Refinery, "2016 Annual Compliance Monitoring & Operational Performance Report" (27 March 2017) [BRR Annual Compliance Report]



### Waste Management Oversight and Compliance Verification

Northwatch requests that the CNSC explain how it determined the licensee's rating to be satisfactory, and what inspections, documents and compliance reports informed this decision. Northwatch recommends that the waste management SCA be included in next year's ROR. Northwatch also requests that any future chapter on waste management report the extent to which the uranium contaminated materials generated on site have been reprocessed, recycled and re-used or otherwise stored or disposed of on or off site, and indicate the amounts retained on-site and their respective storage condition.

### Reporting on Waste Reduction Strategies

The LCH for BRR reads that the waste management program for Cameco BRR "should include waste minimization" (emphasis added). Northwatch submits that waste minimization should not be discretionary and instead, be a requirement of licensing. As we recognize it is not the purpose of the ROR to amend licence conditions, we submit that the ROR, in its reporting of licensee compliance and CNSC oversight, comment on the extent to which this recommended licence condition has been advanced.

Waste minimization is an acute issue and as noted by the licensee "waste materials ... are stored on site until appropriate disposal options are available."<sup>28</sup> The disposal options, alluded to in the licensee's most recent licence application are not named. It is likely, however, that these options include one of the many waste repositories undergoing review. In an effort to reduce waste inventory, the licensee describes in its 2011 licence application that it successfully decontaminated over 100,000 empty steel uranium concentrate drums. This event appears to serve as an ongoing marker of success, as it is repeated in the licensee's 2016 annual compliance report. It is unclear if any other waste reduction strategies were pursued in 2016.

Based on our review of this waste management information, our request to the CNSC is two parted: first, we ask that the CNSC require the licensee to report the actions it took in 2016 to reduce waste outputs and existing waste inventory; and second, for the CNSC to comment on the extent to which the licensee's waste management strategy is based on waste disposal options which currently do not exist.

### Preliminary Decommissioning Plan

Section 12.2 of BRR's licence requires it "maintain a preliminary decommissioning plan (PDP) for decommissioning the facility. This PDP shall be reviewed every five years or when requested by the Commission, or a person authorized by the Commission." According to BRR's 2016 Annual Compliance Report, their PDP was "updated and reissued in 2016."<sup>29</sup> Northwatch requests the CNSC to disclose the updates made by the licensee in order to facilitate our review of the licensee's licensing condition.

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<sup>28</sup> Cameco, "2012 Licence Renewal Application for the Blind River Refinery" (15 April 2011), p 21

<sup>29</sup> BRR Annual Compliance Report, *supra* note 27, p 15

## C. REVIEW OF THE BLIND RIVER REFINERY

These comments are provided in addition to those included in Section A.1 of this report, which considers the manner in which the Regulatory Oversight Report evaluated the safety control areas of Environmental Protection and Waste Management at the Blind River Refinery, as it did for all eight facilities reported on in the Canadian Nuclear Safety Commission's (CNSC) *Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2016* (ROR).<sup>57</sup>

This section of the report are provided as followup to Northwatch's review of CNSC's *Regulatory Oversight Report for Nuclear Processing, Small Research Reactor and Class IB Accelerator Facilities: 2015*.

As part of this review, we compared the section on the Blind River refinery as found in the 2015 and the 2016 reports. Three key observations emerged from that comparison:

- The reports are extremely similar, even repeating report sections in near entirety
- With the exception of the section that described the several transportation accidents (which were absent from the 2015 report) the 2016 report is generally less detailed and includes less information
- Northwatch appreciates the additional information provided about discussions between Mississaugi First Nation and the CNSC and the development of a monitoring role for Mississaugi First Nation; of additional interest would be in the inclusion in future reports of a verification of these activities and a statement conveying their level of satisfaction by the Mississaugi First Nation

### *Mid-Term Performance Report*

We are particularly disappointed in the quality and level of detail in the regulatory oversight report series given the CNSC staff response to our request for the mid-term performance report, in which they indicated that the section on the Blind River refinery in 2014 Regulatory Oversight Report was the mid-term performance report. In response to our September 2017 request for the mid-term performance reports we were told that "the Mid-Term Performance Report for Blind River is in the 2015 Regulatory Oversight Report (ROR)".<sup>58</sup>

One of Northwatch's concerns with extending the licence length from two years to five years in 2007 was the length of time between between detailed reporting and between occasions for the interested public to provide comment on a licensee's operating performance. This concern was at least partly satisfied by the provision of mid-term performance reports, such as the 2009 mid-term performance report on the Blind River refinery.<sup>59</sup>

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<sup>57</sup> CNSC, *Regulatory Oversight Report for Uranium and Nuclear Substance Processing Facilities in Canada: 2016*, CMD 17-M45 (13 October 2017) [ROR]

<sup>58</sup> Email subject line: RE: Document Request: Mid-Term Performance Report and Preliminary Decommissioning Plan for Cameco's Uranium Refinery, dated September 13, 2017

<sup>59</sup> CMD 09-M55 and CMD 09-M55.1

Those reports did, by our assessment, provide additional information to that included in the Regulatory Oversight Reports. For example, in the 2009 reports, the CNSC CMD described the uranium-contaminated by-products, their disposition, the wastes stream burned in the BRR incinerator, the storage of radioactively contaminated non-combustible wastes on-site, the storage and decontamination of scrap metals and their disposition, and the CNSC staff inspection against Cameco Blind River's Waste Management Plan. The Cameco CMD also very briefly described their management program for the two by-products including some volume estimates, management for recycling of uranium-contaminated metals, and their incineration. While neither of the 2009 CMDs were very detailed, they did at least contain more detail than the 2015 or 2016 RORs.

Given that we are now at mid-point in a ten year license issued to the Blind River refinery on February 28, 2012, we had expected a substantive and detailed mid-term performance report, commensurate in increased detail with the increased license term. Further, the ROR does indicate that Cameco submitted an Environmental Risk Assessment for the Blind River refinery in late 2016, but provided not even a summary of the ERA. Nor did they include the ERA in the references for the ROR, or make the ERA available through public notice or posting on the CNSC web site; Cameco has similarly failed to make this report available, including only a very brief statement that an environmental risk assessment had been undertaken and that "the assessment found there was no undue risk or impact to the environment or to human health as a result of refinery operations".<sup>60</sup>

An updated environmental risk assessment would have been an appropriate lens through which to view operating performance mid-term in the ten year license. We disagree with CNSC and Cameco decisions to not make the ERA available and to retroactively inform Northwatch that the 2015 ROR was to be substituted for a mid-term performance report.

### *Production Levels Relative to Dose and Discharge*

The Regulatory Oversight Report indicates that contractors at the Blind River refinery may be identified as Nuclear Energy Workers "if the nature of their work activities and time spent onsite presents a reasonable probability of them receiving an occupational dose greater than 1 mSv". We find this description to be overly vague, and does not make clear how these designations are actually determined. This is particularly a concern if the shift in employee-to-contractor ratio that took place between 2015 to 2016 may be the indicator of a trend towards more contractors and fewer employers: we note that the ratio has shifted from 142 employees and 13 contractors in 2015 to 138 Cameco employees and 16 contractors in 2016.

The 2016 report stated that "Average and maximum effective doses at BRR show a decreasing trend, likely due to the decrease in UO<sub>3</sub> production over these years". This has been similarly stated in previous reports, including in 2015, which noted that production levels had significantly reduced from previous years. What is different in reviewing the 2016 report is that – unlike in every other previous year – neither Cameco's

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<sup>60</sup> 2016 Annual Compliance Monitoring & Operational Performance Report, Blind River Refinery, Page 47

Annual Information Form or Annual Report report on production levels for the Blind River refinery, although they do continue to report on production levels for the Port Hope Conversion facility and fuel manufacturing facility.

	2011	2012	2013	2014	2015	2016	Regulatory limit	Source
Production (tonnes)	13.5	13.1	14.2	8.9	8.4	-	24	Cameco Annual Information Forms
Average effective does (mSv)	2.7	3.7	3.3	3.3	1.7	1.5	50 mSv	Figure 3-3
Maximum effective dose (mSv)	12.6	12	12.1	8.2	7.4	6.1	50 mSv	Figure 3-3 (2015)
Average extremity dose (mSv)	10.2	11.4	14.1	5.4	1.5	1.2	n/a	Appendix E
Maximum individual extremity dose (mSv)	49	47.6	35.1	48.2	15.3	10.6	500 mSv/year	Appendix E
Average skin dose (mSv)	5.5	6	6.8	5.4	4	3.3	n/a	Appendix E
Maximum individual skin Dose (mSv)	48.8	39.2	41.4	41.2	28.1	26	500 mSv/year	Appendix E
Public Dose	0.006	0.012	0.012	0.005	0.005	0.005	1 mSv/year	Table 2-2, Public

The excluding of production levels for the Blind River refinery is a matter of some frustration, and one with no reasonable explanation. As in previous years, we would find it helpful to consider levels of worker exposure and levels of releases to the environment in relations to production levels. For the 2016 report, this is not possible. At best, given the absence of actual information on production levels for the Blind River refinery, we could speculate on the production levels at Blind River relative to the production levels at Port Hope, as there has in the past appeared to be a co-relation.

Source: Cameco Annual Information Forms	2011	2012	2013	2014	2015	2016
Blind River production	13.5	13.1	14.2	8.9	8.4	-
Port Hope production	14.7	14.2	14.9	11.6	9.7	8.4

This is, however, only speculative, with several areas of uncertainty, including whether the Springfield production volumes are included in all six years of reported production from the conversion and fuel fabrication facilities, or only in the volumes for 2011 – 2013, those being the years when Springfield's inclusion is noted in Cameco's Annual Information Forms.

Were we to assume that there was a commensurate level of reduction in production at Cameco's Blind River refinery, i.e. of approximately fifteen percent, we would look to the emissions level for releases to air and water for a commensurate reduction in discharges of harmful substances. We would not find it. While there was a slight decrease in the release of Nitrogen Oxides to air and of uranium and nitrates to water, there were no other decreases in the release of harmful substances to air and there were increases in the release of radium to water. In addition, the highest annual average concentration (amongst the sampling stations) of uranium in ambient air measured also increased.

### *Uranium concentrations in soil*

The presentation of soil sampling results in the 2016 ROR was very similar to that of 2015. Again, there were statements that soil monitoring results remained consistent with concentrations detected in previous years, and again there were unsupported claims that the "current BRR operations do not contribute to accumulation of uranium in surrounding soil" and that "no adverse consequences to relevant human and environmental receptors are expected". The soil sample results are aggregated, making comparison with actual monitoring results from previous years impossible. Further, given that some sampling locations have been eliminated, a comparison of averages, minimums and /or maximums are no longer valid, particularly absent of specific information about which sampling locations have been eliminated.

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UNPROTECTED/NON PROTÉGÉ

**Table F-3: Soil monitoring results, 2012-2016**

Parameter	2012	2013	2014	2015	2016	CCME Guidelines*
Minimum uranium concentration (µg/g)	0.1	0.1	0.1	0.1	0.2	23
Average uranium concentration (µg/g) (within 1000 m, 0-5 cm depth)	3.3	4.3	2.7	3.8	1.5	
Maximum uranium concentration (µg/g)	12.1	16.4	7.2	9.7	2.9	

\*Canadian Council of Ministers on the Environment (CCME) Soil Quality Guidelines for the Protection of Environmental and Human Health (for residential/parkland land use).

Table 28 and Figure 16 in Cameco's 2016 Compliance Report for the Blind River refinery similarly shows only aggregated results disassociated with actual sample locations. The report also confirms that soil monitoring locations were lost due to construction of a berm outside the refinery perimeter fence line, and that three new soil sampling locations were established in 2016.<sup>61</sup>

That noted, it is of interest that the minimum uranium concentration was higher than it had been for several preceding years.

Prior to the loss of sampling locations, it was possible to make some general observations. For example, the 2006 to 2010 annual averages showed that values varied a great deal, and not in a manner that shows an overall trend (although Northwatch's review in 2011 found that there were upward trends with specific sample stations). However, the values for 2006 to 2010 (8.4, 8.7, 5.4, 3.0 and 4.0 respectively) were significantly different – and lower – than the values for 2011 to 2015 (18.0, 12.1, 16.4, 7.2 and 9.7). While the lowest maximum concentrations from 2011 to 2015 were generally similar to the highest maximum concentrations from 2006 to 2010, the increase from 4.0 in 2010 to 18.0 in 2011 is noteworthy. The information has not been made available to continue to the comparison to include 2016 monitoring results.

While these are averaged annual values and so of only limited value in understanding site conditions, they are helpful in evaluating the statement that *“Essentially, uranium soil concentrations do not appear to increase in the area surrounding the facility. This confirms that current BRR operations have no effects on soil quality.”* In brief, the statement has no basis.

<sup>61</sup> 2016 Annual Compliance Monitoring & Operational Performance Report, Blind River Refinery, Page 56

As noted in Northwatch’s comments on the previous year’s ROR, Northwatch was astounded by the statement in the Cameco monitoring report that as a result of the construction of a berm “*some historic Cameco soil sampling locations in the vicinity of the fence line were compromised. This means a few new sampling locations will need to be selected in 2016. The locations selected will preferably be in open areas, not under tree canopies, and in areas where the soil has been undisturbed by human activity.*”

As previously noted, this shows what we consider to be a reckless disregard for the long term monitoring program. We note that Cameco does not indicate which sampling locations were lost, only saying that they were in the vicinity of the fence line. We further note that three of the four sampling locations with the highest concentration of uranium in the soil in the Ministry of the Environment’s 2007 report (Sites 1, 2 and 4) were also in the vicinity of the fence line, and the two sites that showed the highest concentration of uranium in the soil in the sampling done for Northwatch by the Elliot Lake Field Station in late 2011 (Sites 2 and 4) were also in the vicinity of the fence line. Those two sampling sites had shown increases of 149% and 96% concentrations between 2007 and 2011.

In December 2013 the Ontario Ministry of the Environment released a Technical Memorandum titled “*Soil and Tree Foliage Survey in the Vicinity of Cameco’s Blind River Refinery, Blind River, Ontario (2012)*” which set out the results of the Ministry’s 2012 soil and vegetation monitoring at the Blind River refinery.

The MOE report in 2007 stated:

*Despite the fact that Sites 2 and 4 are within forested areas and exhibit variable year-to-year concentrations, there are strong indications that uranium concentrations have increased during the operating period of the Cameco facility. These sites are located at the fence line surrounding Cameco’s process area. At Site 3, which is more distant, uranium concentrations have remained constant over time.*

*It is a challenge to ensure that long-term soil monitoring plots are not disturbed or otherwise compromised.*

*Soil and Tree Foliage Survey in the Vicinity of Cameco’s Blind River Refinery, Blind River, Ontario (2012)” 2012 Report, MOE*

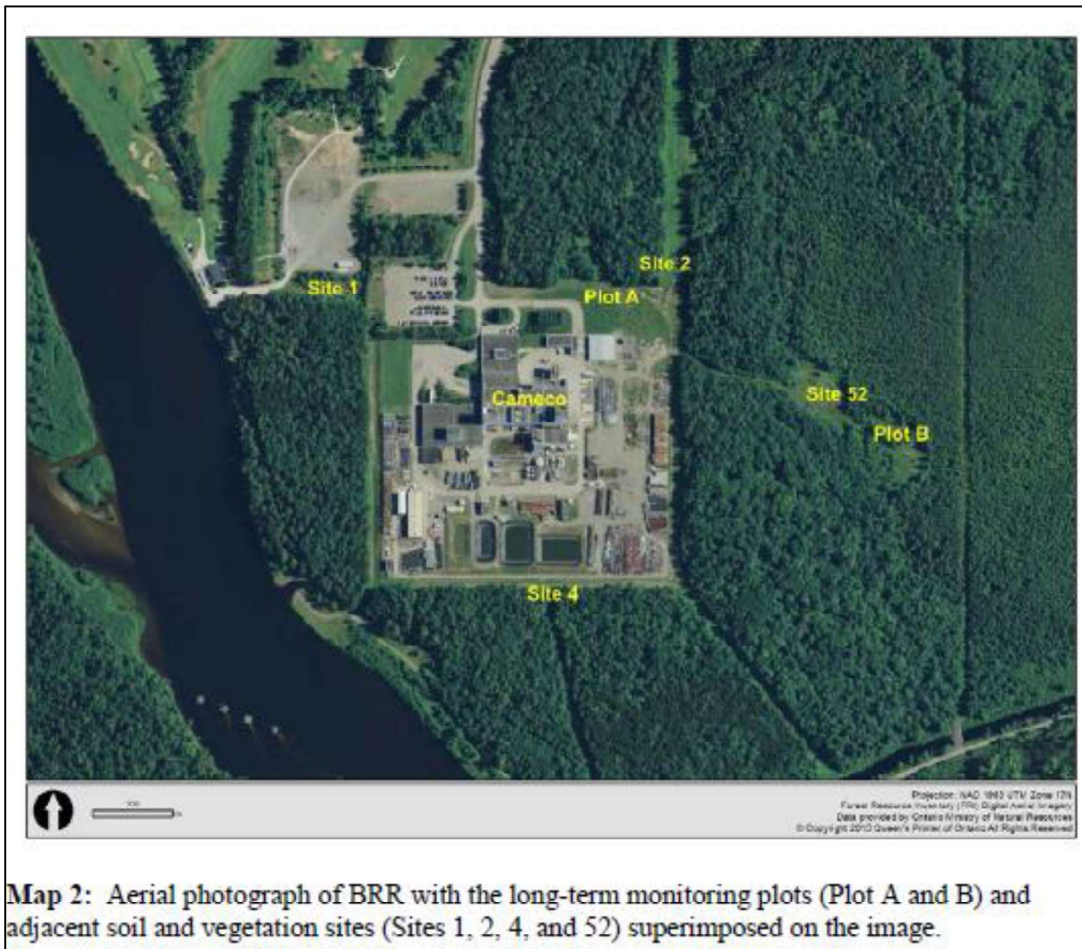
As with the Ministry’s 2007 report and Northwatch’s 2011 report, in the Ministry of the Environment’s 2012 report a small number of the sampling sites showed increased concentrations; others remained relatively constant and a few showed decreases.

The MOE 2012 report indicated that the highest soil uranium concentrations in 2012 were reported at sites within 500 m of BRR (Sites 4, 2, 1, 52, and 8), consistent with MOE soil uranium data since 2000. As in the Northwatch 2011 report, Sites 2 and 4 results show the highest concentration of uranium, and MOE noted that in 2012 soil uranium concentrations were much higher at Site 2 than in previous years.

We note that Site 4 was one of two sites showing the highest concentration of uranium in the soil, and it is located immediately south of the perimeter fence. Site 1 was one of five sites showing the highest concentrations and it is located west of perimeter fence. Cameco indicated in their 2016 Compliance report that “As a result of a third-party review of Cameco soil monitoring locations, in conjunction with construction of a berm outside the refinery perimeter fence line, three new soil sampling locations were



established in 2016” and states that two of the three new sites are located south and south-west of the perimeter fence.



### *Transportation*

The Regulatory Oversight Report indicates that the Blind River refinery “experienced five events that were reported to CNSC staff in 2016” and that four of the five reports were related to transport. The report indicates that “three of the transport events were minor traffic accidents where there was no personal injury or damage to the packages being transported” but provides no detail, and provides on very limited description of the fourth transport-related event, that being the accident near Swift Current, Saskatchewan in January 2016.

Interestingly, the details which are provided are almost entirely different from those provided in the brief report available on the CNSC website,<sup>62</sup> although neither report is inconsistent with the known facts

<sup>62</sup> <http://nuclearsafety.gc.ca/eng/acts-and-regulations/event-reports-for-major-nuclear-facilities/event-reporting/transport-intransit-events.cfm?pedisable=true>

pertaining to the incident. Excluded from the ROR is any information about the two other traffic accidents included on the CNSC website (a traffic accident near Massey in April and another in West Nipissing in December 2016). Of these, only the Massey and West Nipissing accidents are reported on the Cameco website's incident reporting,<sup>63</sup> and no details or descriptions are provided in the Regulatory Oversight Report, or on the CNSC or Cameco's on-line incident reporting.

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<sup>63</sup> <https://www.cameco.com/businesses/fuel-services/refining-blind-river/environment-safety>