Information requirements based on the Revised Environmental Impact Statement (EIS) for the proposed Near Surface Disposal Facility (NSDF) Project

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
CNSC-2-01	FC-02 FC-03	Canadian Nuclear Safety Commission (CNSC)	Change to an environmental component due to radiological contaminants	Sections 5.7, 5.8 and 10.3 (EIS)	**Context:** CNSC staff's original Information Requests (IRs), FC-02 and FC-03, are with respect to seismicity and its effects on the containment and isolation capability of the engineered containment mound (ECM), for the protection of human health and the environment. Seismic activity can affect the structural integrity of the berm, liner and cover systems. It can also result in liquefaction of the underlying sand overburden, resulting in foundation failure and loss of containment. **Rationale:** Section 10.3 of the revised EIS indicates that the ECM and its components were designed to withstand a 10,000 year earthquake, which is selected as the DBE. Furthermore, liquefaction analysis shows that under the DBE, saturated sands may liquefy, and Canadian Nuclear Laboratories (CNL) proposes to remove and replace that liquefiable materials with compacted fill. The Post-Closure Safety Assessment (PostSA, 3rd iteration to Near Surface Disposal Facility Project, 232-509240-ASD-004, 4.1.1) of the proposed NSDF defines an assessment time frame of 10,000 years. The chosen DBE has an annual probability of exceedance of 1/10000, which results in a probability of exceedance of 63% in 10,000 years (1-[1-1/10000]10000). This probability of exceedance is significant. However, in the normal evolution scenario for the PostSA (revised EIS subsections 5.7.6.1.1.2; 5.8.6.1.2.2) it is assumed that the cover and liner gradually degrade and the berm will remain fully functional. The PostSA also states that in the normal evolution scenario:	**Specific Question/ Request for Information:** CNL should either: a) Provide a rationale for choosing a design basis earthquake (DBE) with a significant probability of exceedance for the selected assessment time frame. In providing that rationale, CNL should take into consideration the impact to human health and the environment should a more severe event occur. Effects of a more severe earthquake has been bounded in disruptive event scenarios (e.g., enhanced erosion, damage to berm) or in defense-in-depth scenarios (series of landslides). However, the normal evolution scenario should be revisited, by including liner, cover and berm failure due earthquakes more severe than the DBE. Or b) Define a different DBE with a lower probability of occurrence, and revisit the stability, seismic and liquefaction analyses of the ECM system, and modify its design if the need arises.	N/A	Yes

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					"Within the 10,000 year assessment timeframe, seismic activity is not expected to affect the safety function of the cover, liner and berm".			
CNSC-2-02	**FC-06**	CNSC	Change to an environmental component due to hazardous contaminants	Section 2.1.3, Section 2.5 (EIS)	**Context:** CNSC staff's original IR (FC-06) remains only partially addressed. Section 2.1.3 of the revised EIS indicates that an above ground waste facility with engineering barriers is an improvement on the current state of legacy waste at the sites. However, the nitrate pit, the ACS pit, the thorium pit, the bulk storage, and the waste management areas (WMAs) B to H will not be transferred into the NSDF and will remain sources of contamination. **Rationale:** As requested in the original IR (FC-06), CNL was requested to provide a narrative that clearly describes how the ECM will significantly reduce the environmental risks at the CNL site compared to implementing engineering covers on each WMAs to limit the releases to the environment. In addition, this section of the EIS is silent on whether other alternative means were considered but determined not to be technically and economically feasible, for example, the status quo option. Any alternative means that were considered, but determined not to be technically and economically feasible, should be identified and described, and the rationale as to why they were determined not to be feasible should be documented in this section. Please identify whether any other options were considered, particularly those that may have been suggested by stakeholders and the public, and provide a rationale as to why they were determined not to be feasible.	**Specific Question/ Request for Information:** CNL is requested to provide a narrative that clearly describes how the ECM will substantively reduce the long-term environmental risks to the CNL site and the Ottawa River compared to decommissioning each waste area in situ. CNL is also requested to identify and describe any alternative means that were considered, but determined not to be technically and economically feasible, and the rationale as to why they were determined not to be feasible should be documented in this section.	N/A	No

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CNSC-2-03	FC-27	CNSC	Change to an environmental component due to hazardous contaminants	Section 3.7 (EIS)	**Context:** CNSC staff's original IR (FC-27) was that the 100 year design storm for surface water management, e.g., the stormwater management ponds, is too low since the probability of having at least one exceedance in 50 years is over 40%. CNL's revised EIS remains unchanged on the design storm part. CNSC staff consider CNL's response inadequate**.** **Rationale:** CNL's response to CNSC staff's original IR is as follows: *"The management of surface water runoff from the ECM [engineered containment mound] has both a contact and non-contact component: design of the contact component uses runoff volumes to address waste water treatment plant (WWTP) requirements and uses back-to back 100-year storm events as the design criteria; the non-contact component uses peak flows from the 100-year+ climate change event to address runoff from the ECM cover in down-chute design and runoff volumes from the 100-year event to address storage and pumping requirements within the ECM for those areas not covered (section 3.2 of Surface Water Management Plan [1]). The ditches can convey the 100-year + climate change flow and for most cases they can also convey the probable maximum precipitation design flow (section 7.3.1 of [1]."* The response and revised EIS still do not address CNSC staff's concern on using the 100-year storm as the design storm, for the following reasons: 1. Considering the very high probability (over 40%) of storm events exceeding a 100-year storm over 50 years of operation and an even higher probability	**Specific Question/ Request for Information:** CNSC staff reiterate that the 100-year design storm is too low. CNL is requested to address the concern by selecting a design storm with a higher return period and a corresponding contingency plan to address exceeding storm events. 1. When selecting the proper design storm for the operation and closure phase, CNSC staff expect CNL to take into consideration: (a) The *US NRC NUREG-2175, Guidance for Conducting Technical Analyses for 10 CFR Part 61* which states: *"Because of the risks associated with the flooding and/or release of low-level wastes during the period of vulnerability when wastes may not be covered or protected, the staff concludes that the probable maximum flood (PMF) and the probable maximum precipitation (PMP) provide acceptable bases for the design of flood protection features. Although use of the PMF is clearly acceptable for the operational design of low-level waste facilities, its use is not required. On a case-by-case basis, the staff will review site designs that are based on floods less than a PMF. The acceptability of using such floods must be documented by the applicant. The analyses must conclusively document the integrity of the site, particularly in light of the uncertainties associated with the magnitude and occurrence of rare floods."* (b) The design storm should be selected such that the exceedance probability is reasonably low throughout the operational and closure period. The	N/A	Yes

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					if the closure period is included, the heavier storms may occur often which means that the contingency plan will be triggered frequently to handle excessive water. Moreover, there is no discussion on how to deal with excessive water caused by heavy rains in the contingency plan. 2. For the non-contact water storage and pumping requirements, there is no discussion of potential structure damage to be caused by higher than 100-year storms. CNL does not specify the maximum storm event the facilities such as the stormwater management ponds, can handle before overflow or structure failure would occur. 3. For contact water management, there is no discussion of potential structure damage or release of contaminants into the environment to be caused by higher than 100-year storms. In addition to the concern on low design storm criterion, the calculation of capacity based on one storm event needs more consideration. While the leachate amount is directly related to the storm, it also depends on the filtration rates and pre-existing water content conditions in the waste cells and there is a time delay from the time of the storm and the peak of the leachate rate. A more appropriate method is to calculate the capacity based on hydrological process modeling of the water budget over a long time period, usually by Monto Carlo simulation of precipitation, evaporation, etc. 4. CNL does not discuss quantitatively the sediment issues. CNL does not assess the potential heavy erosion of the cover and berm under extreme storms. The report, *'What-If' Hazard Analysis For The*	exceedance probability, or the probability of an event larger than the design event with a return period of "T" happening at least once during the design period (operation and closure) "L" can be calculated by: P=1-(1-1/T)^L See reference, e.g., http://stream1.cmatc.cn/pub/comet/HydrologyFlooding/flood/comet/hydro/basic/FloodFrequency/print_version/02-statistical_rep.htm For L=80 years: P=1-(1-1/T)^80 T(Years) P(%) 100 63.4 200 39.4 500 18.1 1000 9.5 10000 1.0 2. CNSC staff expect that the contingency plan on flooding should be developed based on the selected design storm to manage excessive water and sediment caused by storms higher than the design storm. The lower the return period of the design storm, the higher demand is needed in the contingency plan.		

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					Near Surface Disposal Facility 232-508770-Ha-001, Revision 0, indicates "No consequence identified" for "Ground subsidence and erosion". The consequences of flooding due to heavy precipitation, snow melt, etc, is "Potential delay in operations. No release to the environment". The low design storm would mean very limited capacities of the stormwater ponds to catch sediments resulting from heavy storms eroding the ECM. In *US NRC NUREG-1200, Standard Review Plan for the Review of a License Application for a Low-Level Radioactive Waste Disposal Facility*, it states that: *"The NRC staff expects erosive processes (fluvial and eolian) to be the most likely of all of the disruptive processes to impact the long-term stability of most disposal facilities. Therefore, the NRC staff recommends licensees develop robust erosion control designs using durable materials, as discussed in section 5.3. Robust erosion control designs are usually developed based on the consideration of low-probability events, such as the PMP and corresponding PMF (NRC, 2002b)."*			
CNSC-2-04	FC-36 FC-38 FC-40 FC-149 FC-150 FC-152 FC-153 FC-154 FC-155 FC-158	CNSC	Indigenous physical and cultural heritage	Section 6 (EIS)	**Context:** CNL states: "*The Indigenous Engagement Report [1] has been revised and is a Technical Supporting Document to the EIS. Section 4 of this report [1] provides further information on Indigenous engagement."* Indigenous Engagement Report, Section 4.5 "Feedback Received" states: *"Indigenous interests are considered any interests that CNL is generally aware of or that have been expressed to CNL during engagement with identified Indigenous communities."*	**Specific Question/ Request for Information:** **For additional context and rationale as well as details regarding each sub-request for information, see Addendum A.** **A. FC-36 + FC-149 + FC-150 + FC-152 + FC-153 + FC-154 + FC-155 + FC-158** Provide a complete description of CNL's engagement with each of the First Nation and Métis groups identified in table 6.2.2-1 regarding potential impacts to Indigenous and/or treaty rights. This information must include what issues, concerns, and/or feedback	N/A	Yes

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					CNL also states: *"A new section 6 has been included in the revised EIS, to consolidate and summarize the major areas of assessment relevant to Indigenous peoples into one single section."* **Rationale:** There is very little detail included in the revised EIS and/or Indigenous Engagement Report (IER) on discussions had and feedback received from each Indigenous community and how this feedback was taken into consideration in the revised documents. As per the requirements/guidance in REGDOC-3.2.2, *Indigenous Engagement*, CNL should demonstrate that through its engagement activities it had discussions with all identified First Nation and Métis groups regarding potential impacts to Indigenous and/or treaty rights, as well as potential impacts as per the requirements of *Canadian Environmental Assessment Act, 2012* (CEAA 2012) and has tracked and addressed any issues / concerns / feedback. This has not been demonstrated in the revised/new sections of the EIS or in the responses to CNSC staff original IRs FC-36, FC-38, FC-40, FC-149, FC-150, FC-152, FC-153, FC-154, FC-155, and FC-158.	were raised by each Indigenous group, as well as how CNL addressed these. • Examples of discussion topics include but are not limited to archeological sites and artifacts (FC-152), traditional use of land and resources (including trapping, hunting, gathering and fishing) (FC-149, FC-153), Pointe-au-Baptême (FC-154), environmental monitoring (FC-158). • Clarify if all the First Nation and Métis groups identified in table 6.2.2-1 were engaged on the topics listed above. • Provide details in the EIS and/or IER on which First Nation and Métis groups provided feedback through engagement to the end of December 2019. Include the additional information in the relevant sections of the EIS and IER. Alternatively, please clarify why the end of March or April 2019 is a cutoff time for information provided. **B. FC-38** Provide additional information on Indigenous engagement regarding valued components (VCs). • Clarify how the Indigenous VCs in table 6.3.2-1 were selected. • Clarify which First Nation and Métis groups provided input or feedback on the selection of Indigenous VCs listed in table 6.3.2-1. **C. FC-40** Provide additional information on the lifestyle survey referred to in section 6.6 of the revised EIS, including the following: • Methodology used to develop the survey to ensure it was representative of First Nation and Métis peoples. • Whether groups were consulted on the development and/or results of the survey; if not, provide a rationale.		

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						D. Assumption statements FC-149 + FC-153 Clarify if assumptions made about Indigenous peoples, and included throughout sections 6.2 and 6.4 of the revised EIS have been validated through engagement activities with First Nation and Métis groups? If not, provide a rationale.		
CNSC-2-05	FC-46	CNSC	Change to an environmental component due to hazardous contaminants	Table 5.2.1-5 (EIS) Table 3 (Atmospheric Environment TSD)	**Context:** CNSC staff's original IR (FC-46) requested that the background data in the main EIS (table 5.2.1-5) align with the background data in the Atmospheric Environment Technical Supporting Document (TSD) (table 3). CNSC staff have reviewed and determined that CNL's response is adequate. The changes have been made in the revised EIS and the Atmospheric Environment TSD. In the previous revision of the EIS (2017), emission data from 2014 was used. In this revision, updated emission data from 2017 and 2018 were used. It is noted that the emission data from 2014 for SO_2, SPM, PM_{10}, Pb and Hg were higher than the 2017 and 2018. What activities account for the differences in the emission data? How was it determined that the lower emission data for 2017 and 2018 is representative of future emissions within the local study area of the Chalk River Laboratories (CRL) site? **Rationale:** Clarification is needed to demonstrate that the emission data for 2017 and 2018 is bounding compared to the higher emission data from 2014.	**Specific Question/ Request for Information:** CNL is requested to justify why the 2017 and 2018 emission data (table 5.2.1-5) is representative (bounding) of future emissions within the local study area of the CRL site. Although the 2017/2018 data are more recent, the emissions are lower than the 2014 emissions which were used in the previous version of the EIS. Further, what sources were removed to account for the lower emissions? Is it reasonable to assume that they would not be present during the construction or operations phases of the proposed project?	N/A	No
CNSC-2-06	New IR	CNSC	Change to an environmental component due to radiological contaminants	Section 2.5 (EIS)	**Context:** As presented in the revised EIS, the design of an ECM above ground surface for the proposed NSDF for the disposal of low-level waste at the CRL site is not sufficiently justified although CNL declares that a	**Specific Question/ Request for Information:** CNL is requested to describe how an ECM above ground surface, deeper excavation and waste conditioning have been considered in the alternative means assessment, proposed design of the project and/or through other	N/A	No

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					comprehensive analysis of alternatives was undertaken for the facility location, type, and design, as well as approach for treatment of wastewater to meet the needs of the NSDF Project. **Rationale:** Near surface disposal facilities are suitable for the disposal of low-level waste as noted by international nuclear industry guidance (IAEA SSG-29). However, an ECM above ground surface will likely experience higher risks through exposure to the potentially detrimental external natural processes and events (e.g., seismic events, erosion, physical instability of the site/mound) affecting the disposal facility, which may degrade the containment and isolation capacity over shorter periods of time. Although the effects of many natural processes and events can be mitigated during operation, passive controls will be relied upon in the post-closure period. An NSDF with an above ground ECM might need more active controls post-closure of the facility, e.g., longer period of monitoring, surveillance, and inspections, than an NSDF without an above ground ECM. The purpose of the project is to develop a disposal facility for the long-term management of 1,000,000 m^3 of low level waste (LLW), produced mainly from past or future operations of Atomic Energy Canada Limited (AECL) and CNL. Table 3.3.1-3 in the revised EIS indicates that 80,338,934 kg organic wastes will be buried directly in the NSDF, which could account for a significant portion of the total waste in volume. Directly burying the organic wastes in the NSDF will have a number of considerations such as the need for more storage capacity of the NSDF,	analyses associated with the project. If not, provide rationale for why these considerations were not assessed.		

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					heterogeneity of the buried wastes, potential gas generation, (differential) settlements of the buried wastes that could damage the cover system, etc. In the revised EIS, no assessment was conducted on whether waste conditioning, for example, incineration of the organic wastes, could be beneficial to the proposed project. In addition, as shown in figures 5.3.2-2B and 5.3.2-2C of the revised EIS, part of the constructed base liner will be under the groundwater. In the revised EIS, no assessment was conducted on whether excavating deeper into the bedrock to construct the NSDF cells would be more beneficial to the proposed project as this could reduce the footprint of the project and potentially remove the above ground mound.			
CNSC-2-07	New IR	CNSC	Change to an environmental component due to radiological contaminants	Section 7.4 (EIS)	**Context:** The potential conventional occupational hazards that relate to blasting are considered in section 7.4 of the revised EIS. However, in table 7.4.1-1, only the conventional hazard of overblasting is assessed. There is a potential hazard of malfunction of detonators used for blasting, which is not assessed in section 7.4. **Rationale:** Rock blasting will be required to complete site preparation activities for the proposed NSDF Project site (figure 3.2.1-1). Malfunction of detonators will pose risks to worker safety and have potentially adverse environmental effects as explosives in the undetonated boreholes would be left in place.	**Specific Question/ Request for Information:** CNL is requested to consider the malfunction of detonators used for blasting as a potential conventional occupational hazard and assess its impact on workers safety and the environment.	Develop procedures in the Blasting Plan to adequately handle the malfunction of detonators for rock blasting.	No
CNSC-2-08	New IR	CNSC	Change to an environmental component due to	Section 3.4 (EIS)	**Context:** Inconsistent information with respect to the construction of the ECM berm is provided in the revised EIS.	**Specific Question/ Request for Information:** CNL is requested to clarify whether the berm will be constructed directly on bedrock or will	N/A	No

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			radiological contaminants		**Rationale:** On page 3-32, it is stated that all overburden material will be removed in the area beneath the ECM berm, and the berm will be constructed on bedrock. However, figure 3.4.1-1 shows that a soil layer named "silty sand imp" directly underlines the berm.	be underlined with a layer of soil, and correct the inconsistent information in the EIS.		
CNSC-2-09	New IR	CNSC	Change to an environmental component due to radiological contaminants	Section 3.4.1 (EIS)	**Context:** Protection of human health and the environment relies on the multiple barrier system of the ECM, the main components of which are the cover, base liner, berm and the geosphere (revised EIS, section 3.4.1). The structural integrity of the cover, liner and berm for both the operational and post-closure periods has been demonstrated by a series of stability analyses and seismic analyses. The revised EIS uses these analyses to support the assumed life-time and robustness of those components. **Rationale:** Section 3.4.1 of the revised EIS indicates that water will mound in the waste in the post-closure period. However, the stability and seismic analyses assume that the waste will remain dry.	**Specific Question/ Request for Information:** The inconsistency between the revised EIS, the supporting PostSA, and the stability and seismic analyses need to be resolved, since the presence of water mounding in the waste will affect the stability of the different components and subcomponents of the ECM, as well as the liquefaction potential of the sand layers of the liner. CNL should provide complementary stability and seismic analyses to those reported in: 1. Slope stability Analysis, Rev.1, 232-503212-REP-011. 2. Base liner and final cover evaluation and optimization, Rev.1, 232-508600-TN-002. 3. Seismic Analysis, Rev.2, 232-503212-REPT-015. These supplementary analyses should consider the presence of water mounding within the ECM, and its consequence on the liquefaction potential of different sand layers in the base liner, and on the static and seismic stability of the ECM, its components and sub-components.	N/A	Yes
CNSC-2-10	New IR	CNSC	Change to an environmental component due to radiological contaminants	Section 5.3 (EIS)	**Context:** Section 5.3 is incomplete. Geological features as documented in (for example) the Geological Waste Management Facility Integrated Geosynthesis Report (the Geosynthesis Report), which forms part of the reference information used to support the revised EIS, presents information that appears not to have been considered in the	**Specific Question/ Request for Information:** The background information in section 5.3 of the revised EIS should be completed to accurately reflect the information in the supporting references (particularly the Geological Waste Management Facility Integrated Geosynthesis Report, including but not limited to #1 – 3 in Context section).	N/A	No

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					revised EIS, and must be considered. The characteristics of the geosphere underlying the NSDF footprint is part of the existing environment and could impact the predictions about project environmental effects. For instance: 1. In the Geosynthesis Report, figure 2-16a diabase dyke appears to cross in to the (unmarked) NSDF footprint; figure 2-37 also shows a major EW trending magnetic anomaly that appears to cross into the NSDF footprint. 2. The results of the lineament study, depicting surface structures at the proposed NSDF site are not considered or depicted. 3. Figure 2-42 in the Geosynthesis Report depicts fracture zones of "confirmed and probably categories" – why aren't these presented in the EIS? There are fracture zones that transect the proposed footprint of the NDSF. 4. Furthermore, why isn't this information used in the groundwater modelling? The model should be based on realistic and available site information. **Rationale:** Geological information on the site, particularly on the structural geology of the upper bedrock, has not been integrated into the revised EIS. This information (#1 – 3 in "Context" section above) may affect the pathway analysis for the geology and hydrogeology VCs. Surface bedrock structures known to exist in the footprint of the NSDF should be used in the hydrogeological model for the site.	The hydrogeology model should consider the structural data known for the site. Please demonstrate how a fractured bedrock surface will impact the analysis of the geological and hydrogeological VCs. Furthermore, considering the 10,000 year PostSA assessment time frame, the baseline information from the site that is relevant for the NSDF extends to the upper bedrock. The relevant baseline information must be clearly summarized in the EIS, and integrated into the predictive models of the site's future evolution.		

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					The PostSA for the NSDF defines an assessment time frame of 10,000 years. This long time frame needs to be supported by models and information (e.g., #1 – 3 above) including the geological environment. This information (the baseline geological environment) should be accurately represented in the EIS.			
CNSC-2-11	New IR	CNSC	Public and Stakeholder Engagement	Section 4.0 (EIS), Stakeholder Engagement Report	**Context:** CNL has provided a summary of all outreach and engagement that has been conducted in support of the proposed NSDF Project. CNL also provided a summary of feedback heard during engagement sessions, including key themes, and how this feedback was incorporated into the revised EIS. However, there is no formal evaluation as to the outcomes and impacts of the engagement sessions, and how this has influenced CNL engagement activities. There is also no evaluation as to whether engagement activities have been successful in achieving CNL corporate public information program objectives. **Rationale:** Section 2.2.6 of REGDOC-3.2.1, *Public Information and Disclosure* describes the requirement for a program evaluation and improvement process. The evaluation process may include surveys of the surrounding communities to gauge changes in public interest, or satisfaction with the information provided.	**Specific Question/ Request for Information:** CNL is requested to conduct an evaluation on their public engagement activities. The purpose of this assessment is to identify the effectiveness of their engagement activities, confirming that full consultation has occurred with target audiences. The assessment should also demonstrate how CNL has responded to the public's changing need for information as the project has progressed, and demonstrate that they have engaged in a two-way dialogue with target audiences. To the extent practicable, there should be a demonstration that CNL has sought and obtained, where possible, validation from stakeholders that their concerns and issues have been adequately addressed.	N/A	No
CNSC-2-12	New IR	CNSC	Change to an environmental component due to hazardous contaminants	Section 5.8.6.2.2.1 (EIS) Landfill Gas Management Plan	**Context:** The emissions due to the decomposition of waste were assumed to be 252,000 m^3/year. This value is an increase from the assumed value of 39,000 m^3/year that was used in the 2017 version of the EIS. It was noted that the parameters for Lo and k were revised and	**Specific Question/ Request for Information:** CNL is requested to justify the change in the model parameters (Lo and k) in estimating emissions from the decomposition of waste. CNL should provide further clarification in the EIS and supporting materials for how these parameters were determined and confirm that they are adequately conservative.	N/A	No

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					are based on the 2018 version of the Landfill Gas Management Plan. **Rationale:** The information in the Landfill Gas Management Plan provides two references as validation for the site-specific factors derived for this assessment. The value for Lo, in particular, is below the range of Lo factors provided in the listed references. Further clarification should be provided for how the parameters for Lo and k were determined and whether or not they are adequately conservative.			
CNSC-2-13	New IR	CNSC	Change to an environmental component due to hazardous contaminants	Table 4-5 (Atmospheric TSD)	**Context:** Table 4-5 of the Atmospheric Environment TSD indicates that the dust control efficiency was assumed to be 85%. Previously, this value was assumed to be 75%. What is the justification for this change? How was it determined that this dust control efficiency of 85% is sufficiently conservative? Further, a control efficiency of 85% was used to estimate emissions from on-road vehicles (unpaved road dust); however, a control efficiency of 75% was used for estimating fugitive dust from stockpiles. What is the justification for the use of different control efficiencies in the assessment? **Rationale:** For clarity, CNL is requested to justify the changes made in the assumed control efficiency for dust and provide justification why this change is adequately conservative.	**Specific Question/ Request for Information:** CNL is requested to justify the change in the dust control efficiency and comment on how the revised value is sufficiently conservative. CNL should provide further clarification in the EIS and supporting materials to explain why two different control efficiencies were used in the assessment (i.e., 75% for fugitive dust from stockpiles and 85% for on-road vehicles).	N/A	No
CNSC-2-14	New IR	CNSC	Change to an environmental component due to hazardous contaminants	Section 5.2.4.2 (Air Quality TSD)	**Context:** The passive vents are assessed as area sources instead of point sources. This is a change from the 2017 version of the EIS. The area source summary data for the passive vents is absent from section 5.2 of the Air Quality TSD (table 5.3).	**Specific Question/ Request for Information:** CNL is requested to provide the assumptions used in modeling the passive vents as area sources to ensure that they are valid and adequately conservative. Table 5.3 should be revised accordingly.	N/A	No

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					Rationale: The assumptions used to model the passive vents as area sources were not provided in the revised (2019) EIS. These values should be provided to ensure that they are valid and adequately conservative.			
CNSC-2-15	New IR	CNSC	Socio-Economic conditions	Section 5.10 (EIS)	**Context:** As required under paragraph 5(2)(b) of CEAA 2012, the EIS should provide a description and analysis of how changes to the environment caused by the project could affect health and socioeconomic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, as they pertain to non-Indigenous peoples. That is to say, the EIS should describe the indirect socio-economic effects that occur as a result of a change that the project may cause to the environment. While section 5.10 Socio-Economic Environment of the revised EIS provides specific discussion and analysis, there is no clear linkage in the descriptions of the VCs and effects pathway analysis between the indirect effect and the direct environmental effect. **Rationale:** Please provide clarification and describe, in the "Socio-economic Environment" assessment, the linkages between the indirect socio-economic effects and the project related changes to the environment that result in these indirect effects on socio-economic conditions.	**Specific Question/ Request for Information:** CNL is requested to revise the EIS section accordingly to reflect the paragraph 5(2)(b) of CEAA 2012 requirements in relation to socio-economic conditions.	N/A	No
CNSC-2-16	New IR	CNSC	Socio-Economic conditions	Section 6.5 (EIS	**Context:** As required under paragraph 5(1)(c) of the CEAA 2012, the EIS should describe the effects of any changes the project may cause to the environment, with respect to	**Specific Question/ Request for Information:** CNL is requested to revise the EIS section accordingly to reflect the paragraph 5(1)(c) CEAA 2012 requirements in relation to socio-economic conditions with respect to	N/A	No

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					Indigenous peoples, on health and socioeconomic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance. While Section 6.5 Indigenous Socio-economic Environment of the revised EIS provides specific discussion and analysis, there is no clear linkage in the descriptions of the VCs and effects pathway analysis between the indirect socio-economic effect and the direct environmental effect. **Rationale:** Please provide clarification and describe, in the "Indigenous Socio-economic Environment" assessment, the linkages between the indirect socio-economic effects and the project related changes to the environment that result in these indirect effects on socio-economic conditions with respect to Indigenous peoples. In addition, provide the distinction between those that are related to paragraph 5(1)(c) CEAA 2012 requirements vs. those that were identified as issues and concerns raised by Indigenous groups.	Indigenous peoples. CNL is also requested to clearly delineate between those that are related to paragraph 5(1)(c) CEAA 2012 requirements vs. those that were identified as issues and concerns raised by Indigenous groups. **For additional context and rationale as well as details, see Addendum B.**		
HC-2-01	FC-21 FC-163 FC-168 (HC-3, HC-6, HC-13)	Health Canada (HC)	Indigenous Peoples' health / Socio-economic conditions	Section 5.10.5.2.2 and Table 5.10.10-1 (EIS) 2018 NSDF Project Construction-Related Road Traffic Report 2017 NSDF Traffic Study	**Context:** CNL's 2018 NSDF Project Construction-Related Road Traffic Report includes an assumption that truck traffic will mainly occur during daytime hours, or over a period of 15 hours, 7 days a week and during 8 months of construction (for two years). However, section 5.10.5.2.2 of the revised EIS and CNL's response to FC-168, indicates trucks will run an average of 16 hours per day, and may run for up to 18 hours a day, 6 days a week during 9 months of construction (for two years). A 16 or 18 hour a day construction phase suggests trucks will be	**Specific Question/ Request for Information:** CNL is requested to update the traffic-construction noise assessment to reflect the assumptions in the revised EIS, section 5.10.5.2.2, specifically: 1. truck traffic occurring on average 16 hours a day, 6 days a week, for the construction phase [9 months per year for two years] 2. a breakdown of existing and predicted truck trips per hour for receptors along Plant Road and Highway 17, specifying occurrences during night-time hours (or clarify if nighttime traffic will not occur)	For suggestions of mitigation and follow-up measures, please refer to HC-2-02 regarding the complaints resolution process.	No

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					running during night-time hours (i.e., between the hours of 10pm and 7am) and as the number of days of operations have been reduced from 6 to 7, this means a higher number of trucks will be running over each day. Additionally, in table 5.10.10-1 of the revised EIS, CNL has indicated that trucks will be scheduled to "avoid peak traffic times to the extent possible". Based on the reported maximum vehicle traffic per day in the 2018 NSDF Project Construction-Related Road Traffic Report, the project would require 10 peak hours of vehicle traffic per day to achieve the reported AADT (i.e., annual average daily traffic) of 8,210. If the 10 peak hours of traffic are avoided, this results in the majority of construction traffic occurring at night. Alternately, if the 8,210 vehicles are evenly spread across the currently assumed 22 non-peak hours, this represents an average of 299 vehicles per hour. Furthermore, the 2017 Traffic Study data appears to be based on the peak hours on a single day of monitoring data (May 17th, 2017), which is not an appropriate method of estimating traffic volume. The existing traffic volume on Plant Road may be over-estimated, as evidenced by the supporting photos in the report which all show Plant Road as currently being almost entirely devoid of traffic. **Rationale:** Truck traffic in the evening and overnight may result in higher increases in annoyance than currently predicted, particularly given that existing traffic appears to be comprised of personal vehicles that produce	3. recalculate the %HA (i.e., percent highly annoyed) in the noise assessment for receptors along Plant Road, and with the addition of receptors along Highway 17 (or justify why receptors along Highway 17 have not been included in the noise assessment), to include the updated assumptions and applicable penalties (e.g., inclusion of 10dB night-time adjustment) as per Health Canada's guidance (HC, 2017) and ISO 1996-1:2016, *Acoustics — Description, measurement and assessment of environmental noise*. Note that newer models may provide more accurate predictions than ORNAMENT for receptors located less than 15m from the road (e.g., residential houses along Plant Road). Reference: Health Canada, 2017. *Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise.* Cat.: H129-54/3-2017E-PDF, ISBN: 978-1-100-19258-1, Pub.: 160331.		

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					substantially less noise disturbance than trucks. Additionally, a 5% change in the volume of traffic along Highway 17 (section 5.10.5.2.2) can be noticeable to nearby receptors if these vehicles are different than existing traffic and are using the roadway during times when previously there had been lower or no traffic.			
HC-2-02	FC-169 (HC-14)	HC	Indigenous Peoples' health / Socio-economic conditions	Table 11.0-1 (EIS)	**Context:** In response to FC-169, CNL indicates a Public Information Program has been developed and this program will be used to "notify local communities of the start of NSDF Project construction." A reference to the complaints resolution process has been included in table 11.0-1 of the revised EIS, but the duration (i.e., project phase), breadth of receptors (i.e., those along transportation routes), and method for responding to noise-based concerns has not been clearly defined. **Rationale:** Although an established communication and notification system appears to be in place, a clear complaints resolution process has not been described.	**Specific Question/ Request for Information:** CNL is requested to present a formalized complaint-response plan that describes how complaints will be received (e.g., website, telephone #, etc.), response time, and method(s) for resolution, including additional mitigation measures if required. Health Canada recommends that any complaints resolution process span all project phases, including construction, operations and closure, as noise effects may be present during any of these phases.	CNL may inform all people who may be affected by project-related noise (both Indigenous and non-Indigenous people) in advance of any changes in sound level that may occur (beyond just the start of construction). This type of communication has historically been shown to be effective to address concerns related to noise.	No
ECCC-2-01	FC-52	Environment and Climate Change Canada (ECCC)	Fish and fish habitat	Sections 3.4.1.9.2 and 3.4.2.1 (EIS)	**Context:** In section 3.4.1.9.2 (page 3-47) of the revised EIS, CNL states that the *"interim cover is used so that runoff from these areas of the ECM is non-contact water that will be directed to the temporary non-contact water pond inside the ECM."* It was also noted in section 3.4.2.1 (page 3-54) that "*contact water is collected in temporary contact water ponds or equivalent structures on a lined portion of the cell floor*." It was further explained that these contact water ponds would be moved within the ECM as necessary to support operations.	**Specific Question/ Request for Information:** CNL is requested to describe how, during operations, both temporary contact and non-contact water ponds within the ECM will interact with each other including: 1. How these two structures will be kept independent of each other and the leachate system? 2. How these water structures will avoid contamination from the operations adjacent to them?	N/A	No

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					Rationale: It is important to understand whether there are both contact and non-contact water ponds within the ECM. Non-contact water will be routed to the stormwater management ponds, whereas, contact water will be routed to the Wastewater Treatment Plant (WTP). Potential effects on different receiving environments will be dependent upon where the effluent is routed.			
ECCC-2-02	FC-52	ECCC	Fish and fish habitat	Sections 3.4.4.5.1 and 5.3.1.5.2.2 (EIS)	**Context:** In terms of surface water management, two routes will be used: • Route 1 – the Surface Management Pond 1 and the exfiltration gallery is proposed to discharge to the East Swamp wetland, which flows into Perch Lake. Surface Water Management Pond 1 is designed for 80% Total Suspended Solids (TSS) removal. • Route 2 - Both Surface Water Management Ponds 2 and 3 will discharge to the Perch Lake Swamp wetland complex, which flows into Perch Lake. Surface Water Management Pond 2 and 3 are currently designed to only provide 76% and 60% TSS removal respectively. CNL states, "*the wetland also has a sediment trapping function that will provide additional treatment to ultimately enhance level of treatment for adjacent streams (e.g. East Swamp Stream and Perch Creek)*" (page 3-71). It should be noted, that due to the presence of fish, the Perch Lake Swamp wetland complex should not be used as part of the surface water treatment system to remove additional TSS. **Rationale:**	**Specific Question/ Request for Information:** Given that Perch Lake Swamp wetland complex should not be used as part of the surface water treatment system to remove TSS, CNL is requested to provide the additional mitigation measures that will be taken to prevent adverse effects from effluent being released.	N/A	Yes

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					CNL is considering applying sandstone mixture instead of road salt on the NSDF Project site. This mixture could increase the amount of TSS entering the surface water management ponds. Any surface runoff from the project site (with potential blasting residues) will be directed to the surface water management ponds. However, blasting activities and the removal of waste rock during the construction phase could increase dust deposition and could increase trace metals that may be attached to TSS. When effluent is discharged to the exfiltration gallery or directly to Perch Lake, it may carry these residues which could have an adverse impact on the receiving environments.			
ECCC-2-03	FC-52	ECCC	Fish and fish habitat	Section 5.3.1.5.2.2 (EIS)	**Context:** During the construction phase of the project, CNL states that approximately 170,000 m^3 of blasted rock is anticipated in order to excavate the project site. However, there is no discussion on whether these rocks have been assessed for acid rock drainage and metal leaching potential or where the rock will be stockpiled. Should the blast rocks remain at the CRL site, what is the long-term impact on water quality? **Rationale:** The blast rock can also have potential impacts through its long-term weathering and as dust/blast debris. It is important to understand whether the blast rock has the potential to generate acid rock drainage as it could have adverse effects on water quality.	**Specific Question/ Request for Information:** CNL is requested to provide information that demonstrates the acid rock drainage and metal leaching potential of the proposed blast rock and describe any proposed mitigation to manage potential leaching.	N/A	No
ECCC-2-04	FC-52	ECCC	Fish and fish habitat	Section 5.4.2.5.2.1 (EIS)	**Context:** On page 5-249 (section 5.4.1.5.2.2 of the revised EIS), CNL first states that "*the major flow system for all three surface water management ponds, will outlet to adjacent wetland and will be dispersed by level spreaders that will provide an even flow*	**Specific Question/ Request for Information:** CNL is requested to clarify the proposed location for each of the three surface water management pond discharge locations and spreaders in relation to nearby wetlands and describe how the effluent will enter into the wetlands.	N/A	No

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					distribution to the wetlands with an approximately wide dispersal pattern". However, this paragraph then states that the "*current three surface water management ponds outlet locations are limited by the site boundary (greater than 5 m required) so that there is no discharge from the spreader directly to the wetlands*". The two statements seem contradictory. **Rationale:** It is important to understand whether the surface water management ponds will be discharging to the wetlands and at what rate as this may result in water quality effects in nearby streams.			
ECCC-2-05	FC-68	ECCC	Fish and fish habitat	Table 3.4.2-1 (EIS) Section 4.1 (Leachate and Wastewater Characterization Report)	**Context:** In the last paragraph of section 4.1 of the Leachate and Wastewater Characterization Report (page 11), CNL states: "*For an assumed 15,000 m^2 maximum cell surface area, this equates to 1,800 m^3 of water, or about a 16% increase in the annual volume shown in the second to last column of Table 2.*" This 16% increase does not appear to be reflected in table 2. It is unclear as to how it affects the accumulated volume of effluent going to the WTP. **Rationale:** CNL should account for all wastewater that will be treated by the WTP. This could have impact on the design of the WTP, its ability to treat the effluent, and the quality of the effluent to be discharged into the receiving environment.	**Specific Question/ Request for Information:** CNL is requested to clarify the base drainage volumes directed towards the WTP versus the combined base drainage with the 16% increase. CNL is also requested to revise table 2 accordingly and provide further information that accounts for all wastewater that will be treated by the WTP.	N/A	No
ECCC-2-06	FC-68	ECCC	Fish and fish habitat	Section 3.4.2.6 (EIS)	**Context:** CNL has indicated that the treated effluent (from the WTP) will be discharged to the exfiltration gallery or Perch Lake depending on specific site conditions. However, there is	**Specific Question/ Request for Information:** CNL is requested to develop criteria and a schedule that will be used to determine when the effluent from the WTP will be discharged to	N/A	Yes

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					no discussion on when the effluent will be discharged to either of the two locations. These discharge points are in separate receiving environments. **Rationale:** There is a lack of clarity with respect to when CNL anticipates releasing effluent through either of the two pathways (i.e., is this driven by site conditions, seasonality, or other factors). CNL should account for all wastewater that will be treated by the WTP. This could have an impact on the design of the WTP, its ability to treat the effluent, and the quality of the effluent to be discharged into the receiving environment. ECCC is also concerned that during a major storm event, the combined effluent discharge from the Stormwater Management Pond 1 (including effluent from its spillway) and the exfiltration gallery might result in a flood event in the East Swamp Wetland (ESW). If such an occurrence should take place, there is a potential that water could enter the four WMAs adjacent to the ESW and result in untreated effluent reaching the ESW.	the exfiltration gallery and when it will be discharged directly to Perch Lake. In the event that an extreme weather event is discharged from both the Stormwater Management Pond 1 and the exfiltration gallery (with its normal treated effluent): 1. What is the possibility of flooding the adjacent WMAs? 2. If flooding occurs (#1 above), what is the impact on the ESW and ultimately Perch Lake?		
ECCC-2-07	FC-81	ECCC	Fish and fish habitat	Section 5.5.4.2.2 (EIS) Characterization of Fish Collected from Perch Lake 2018 July 26 to 2018 August 09 Ichthyofauna Survey data for Perch Lake, Toussaint Lake, Main Stream and East Swamp Stream	**Context:** In response to ECCC's original IR (FC-81), CNL has committed to conducting additional fish surveys in the Perch Lake basin to provide an updated analysis of the fish population in the basin. The request was also for CNL to justify its original conclusion that "*there is no evidence to suggest that current Chalk River Laboratories operations are negatively affecting the aquatic environment*". The revised EIS (section 5.5.4) does describe the results of new fish surveys conducted at Perch Lake watershed. The document also presented additional data from surveys in	**Specific Question/ Request for Information:** CNL is requested to provide any additional information regarding the physical condition of the fish caught during the surveys conducted in 2017 and 2018. Any data available should be updated into the baseline study to help characterize the fish health and any possible effects from chronic exposure to radiological and non-radiological contaminants in the Perch Lake basin. In addition, CNL is requested that when routine fish sampling and reporting (either compliance monitoring or as post-EA decision monitoring) is carried out, that the frequency or prevalence	N/A	No

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
				Environmental Risk Assessment of Chalk River Laboratories Report (2019)	2017 and 2018 (both in the EIS and in baseline studies). Within these documents the diversity and abundance of the fish species caught by various methods is reported in addition to fish tissue data from the 2018 study. The conclusion presented in the disposition table states that "*there have been no significant changes to fish community structures that could be attributed to CRL operations*". However, fish community structure is not the only indicator of effects on fish communities. Though the fish community structure may not be indicating an adverse effect, section 4.5.2.4 of the Environmental Risk Assessment of Chalk River Laboratories Report (2019) showed that there were some Risk Quotients greater than 1 for fish in Perch Lake under existing conditions. Additional information should be provided to help determine the effects of chronic exposure to radiological and non-radiological contaminants in the Perch Lake basin. **Rationale:** There are a number of metrics/methods that can be used to evaluate the effect of stressors on fish. These include meristics analysis, population aging and reproductive condition as well as gross observations of physical condition such as the presence of disease (tumours/lesions etc.). It is assumed that when the individual specimens were measured and weighed, there would have been opportunities to examine their physical condition. Information that helps quantify the above indicators may further assist in understanding the impacts of both radiological and non-radiological contaminants in the Perch Lake watershed.	of diseases should be assessed. This assessment should determine whether there are any possible effects from the chronic exposure of radiological and non-radiological contaminants that could be attributed to the contaminants flowing into the Perch Lake basin.		
ECCC-2-08	FC-87	ECCC	Linked to regulatory permits / authorizations	Figure 1.0-1 and Figure 5.5.3-1 (EIS)	**Context:** Not all of the existing 18 WMAs and adjacent areas have been evaluated with respect to	**Specific Question/ Request for Information:** CNL is requested to evaluate all of the existing WMAs and adjacent areas with respect to use	N/A	Yes

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					their use by migratory birds and species at risk. However, it is known that the substrate within these WMA sites will be relocated to the NSDF. The excavation of these sites may have impacts on wildlife including migratory birds and species at risk listed on the *Species At Risk Act* (SARA). This disposition is relevant to themes common to the EIS, such as: presence/absence of terrestrial species at risk, potential environmental effects of the project, and proposed mitigation. Therefore, CNL should include all relevant information on these topics in this IR response in the EIS. When existing documents such as published reports, baseline data or survey results are referenced, please: • Specify which portion of the information or data in the document applies to the NSDF Project. • Explain how it applies, and any assumptions, limitations or differences. • Distinguish factual evidence from inference. • Note any limitations on inferences or conclusions that can be made. **Rationale:** Figure 5.6.4-15 "Bat Habitat Availability and Distribution in the RSA – Base Case" and figure 5.6.4-17 "Blanding's Turtle Habitat Availability and Distribution in the RSA – Base Case" both clearly show that the WMA sites overlay with known species at risk habitat. It is also likely other species at risk and migratory birds are utilizing the property within each of the WMAs as habitat (or other uses). The removal of the substrate will result in an impact(s) (i.e., habitat loss) to these species. There is also the possibility of	by migratory birds and species at risk. This analysis should include relevant mapping for each site and the proposed mitigation measures, and be reflected in the EIS accordingly.		

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					these animals accessing the site during the excavation and transfer process potentially resulting in direct mortality. These interactions should be considered, assessed and mitigated.			
ECCC-2-09	FC-109	ECCC	Linked to regulatory permits / authorizations	Table 5.6.5-1 (EIS)	**Context:** Within table 5.6.5-1 (page 5-473) of the revised EIS under the column "Management Practices and Mitigation Actions" it notes measures to address the loss of Critical Habitat, specifically: *"Critical Blanding's turtle habitat will be assessed annually to ensure no significant loss at CRL and to determine compensation measures initiated at CRL or elsewhere".* It should be noted that if a SARA permit is required it may necessitate further mitigation measures due to the impacts to the loss of critical habitat for Blanding's turtles. **Rationale:** A SARA permit may be required for the project and may include the need for additional compensation measures (on or off site) to meet the preconditions under section 73(3)b) of SARA: *"all feasible measures will be taken to minimize the impact of the activity on the species or its critical habitat or the residences of its individuals".* ECCC is currently reviewing the impacts from the project to the identified (but not yet protected) critical habitat as detailed in the final Blanding's Turtle Recovery Strategy and will be determining whether a SARA permit may be needed.	**Specific Question/ Request for Information:** CNL is requested to investigate acquiring and/or protecting suitable habitat for Blanding's turtles at the CRL site or elsewhere in case a SARA permit is required and habitat compensation becomes necessary.	N/A	Yes
ECCC-2-10	FC-112	ECCC	Fish and fish habitat	Table 5.5.5-1 (EIS)	**Context:** Within table 5.5.5-1 (page 5-338) of the revised EIS under the column "The Management Practices and Mitigation Actions" it notes timing restrictions on in-	**Specific Question/ Request for Information:** CNL is requested to update table 5.5.5-1 and the project timing to include restrictions on in-water work that include turtles.	In-water work should not occur between September 15 and April 15 to avoid impacts on hibernating turtles.	No

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					water work that are specific to aquatic species (i.e., fish) but does not consider the impacts on overwintering turtles: *"Work will be completed within the timing window of July 16 to March 14 to avoid spawning and egg/larval developmental periods for spring spawning fish species (DFO 2013; MNR 2013); the construction duration is anticipated to be short term (i.e., <30 days)"* Due to the presence of Blanding's turtles within the project site, all in-water activities must also examine the potential effect pathways on in-water works for this species. **Rationale:** Turtles tend to hibernate over the fall through to spring seasons and the proposed construction of the discharge pipe could directly impact them. Perch Lake and the adjacent wetlands provide suitable overwintering (hibernating) habitat for turtles. Turtles are highly immobile during the overwintering period, therefore it is possible that if turtles are within the construction area they could be killed as a result of excavation.			
ECCC-2-11	New IR	ECCC	Fish and fish habitat	Figure 1.0-1, Section 5.4.2.4.2, Figure 5.7.4-8, Figure 5.7.4.9 (EIS)	**Context:** Throughout the revised EIS, CNL mentions that LLW from the 18 WMAs will be excavated, sorted, in some cases packaged, moved and then stored in the ECM. However, there is no discussion on whether there will be dewatering activities (and/or the proposed mitigation measures) for each of these WMAs when the LLW is excavated. The only discussion could be found related to this concern was on page 5-266 where it states: "*The Perch Creek and Perch Lake Watershed represents the LSA for this project because most of the drainage from the SSA*	**Specific Question/ Request for Information:** CNL is requested to provide: 1. Confirmation of whether dewatering activities from the WMAs will be required, and if required, whether the dewatered effluent will be treated by the WTP. 2. The volume of effluent to be dewatered and what contaminants, if any, and their concentrations are contained in the effluent from each of the 18 WMA sites (including mapping). 3. An update on the design of the WTP and the predicted discharge quality of the effluent based on information collected in 1) and 2) above, if necessary.	N/A	No

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					will be directed to the Perch Creek and Perch Lake Watershed. Additionally, this watershed contains many of the site's operating waste management areas; in particular, the waste management areas of the earliest vintage in the evolution in waste storage practices at CRL, including the Liquid Dispersal Areas. Because of its history, this basin is the most historically affected region of the CRL site." However, this discussion only applies to 4 of the 18 WMAs. **Rationale:** It is important to understand whether there will be dewatering activities from all of the WMAs and whether this effluent will be treated by the WTP. This could have impacts on the design of the WTP, its ability to treat the effluent, and the quality of the effluent to be discharged into the receiving environment.			
QC-2-01	FC-206 (QC-8e)	Ministère de l'Environnement et de la Lutte contre les changements climatiques (MELCC)	Change to an environmental component due to radiological contaminants	Section 3.4.2.5.1 (EIS)	**Context:** CNL does not fully address the question raised in the original IR (QC-8e). The MELCC requested that CNL describe the existing treatment methods to reduce tritium activity in wastewater. **Rationale:** The revised EIS in section 3.4.2.5.1 states that tritium has an adjusted release limit relative to other radiological contaminants. While the release limit for other radiological contaminants is set relative to values derived from Health Canada's Drinking Water Guidelines, the release limit for tritium is set so that the value of the Guidelines is met not at the effluent, but at the discharge point of Perch Creek in the Ottawa River. CNL does not justify this difference, other than mentioning that there is a lack of treatment technology for tritium in water. The technologies used to remove tritium in heavy	**Specific Question/ Request for Information:** 1. CNL is requested to justify why no treatment method is used to reduce the activity of tritium in wastewater. 2. In order to ensure the sustainability of the water treatment installation in relation to the achievement of treatment targets, CNL is requested to explain how it will be able to adjust the wastewater treatment process in the event of more stringent discharge standards for the life of the facility, particularly for tritium present in water.	N/A	No

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					water from nuclear reactors could perhaps be adapted to the treatment of wastewater. For example, research by Ontario Hydro (Sood, SK, Woodall et al., 1997) has identified a new, more compact and affordable technology for the decontamination of heavy water from CANDU-6 reactors.			
QC-2-02	FC-208 (QC-10b)	MELCC	Change to an environmental component due to radiological contaminants	Table 3.3.1-2 (EIS)	**Context:** Decreased performance of the technical characteristics of the ECM. **Rationale:** In their response to the original IR (QC10b), CNL states that: *"At the end of the modeled institutional monitoring period of 300 years, the radioactivity concentration in the waste is similar to the natural background concentrations."* However, table 3.3.1-2 of the revised EIS shows that several of the radionuclides that would be stored in the NSDF site have a half-life significantly longer than the planned institutional control period.	**Specific Question/ Request for Information:** CNL is requested to justify the assertion in the response to QC10b by providing the values of natural background concentrations used to reach this conclusion.	N/A	No
QC-2-03	FC-214 (QC-18a)	MELCC	Change to an environmental component due to radiological contaminants	Section 5.4.2 (EIS)	**Context:** Considering that only low level waste would be buried, why does CNL specify that *"only traces [of isotopes of uranium and radium] will be present in the treated effluent"*? **Rationale:** What are the volumes of stored materials of which these "traces" will come from the treated effluent? CNL should also discuss the activity, toxicity and longevity of these isotopes in relation to the fact that they may possibly exceed the impacts of low level waste.	**Specific Question/ Request for Information:** CNL is requested to explain the source of the "traces" of isotopes of uranium and radium which will be present in the treated effluent: 1. What is the volume of stored materials of which these isotopes will come from? 2. What is the activity, toxicity and longevity of these isotopes? 3. What are the potential impacts of these isotopes?	N/A	No
QC-2-04	FC-215 (QC-19)	MELCC	Change to an environmental component due to radiological contaminants	Section 5.7.6.3 (EIS)	**Context:** CNL's response to the original IR (QC-19) indicates that the predicted concentrations of radionuclides in surface water for the operational and post-closure phases are summarized in section 5.7.6.3 of the revised	**Specific Question/ Request for Information** 1. CNL is requested to compare the concentrations estimated at the mouth of Perch Creek, in the Ottawa River, with the criteria applicable in Quebec for water quality, since the expanded study area	N/A	No

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
					EIS. In addition, the concentrations predicted in Perch Creek are much lower than the concentrations without effect. **Rationale:** No comparison was made with the water quality criteria applicable in Quebec.	includes part of the Quebec province. These criteria are available on the following website: http://www.environnement.gouv.qc.ca/eau/criteres_eau/index.asp 2. An ecological risk assessment was carried out for sediments in the Ottawa River by Bond and his collaborators in 2015. However, it is not clear whether this risk assessment also takes into account the exposure of aquatic organisms to radionuclides in surface waters. CNL should validate and confirm whether the risk assessment includes exposure of aquatic organisms to radionuclides in surface water. Otherwise, CNL is requested to justify this exclusion. 3. CNL is requested to present the results of the long-term sediment verification program for the affected area. 4. The total radiotoxic risk, in µGy/h, for aquatic organisms likely to be exposed to radioactive PPCs must be compared with the criterion applicable in Quebec, since part of the Ottawa River is located there. Quebec has retained a maximum increase of 10µGy/hr compared to ambient levels. This criterion is already exceeded for crustaceans and bivalve mollusks, due to historical contamination. Therefore, care should be taken not to add additional contamination and to take the necessary mitigation measures for this purpose.		

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
QC-2-05	FC-225 (QC-15)	MELCC	Change to an environmental component due to radiological contaminants	Section 5.7.6.3 (EIS)	**Context:** The original IR (QC-15) was partially addressed in responses provided by CNL to IRs QC-19 and QC-29. **Rationale:** CNL should determine whether certain beaches on the Ottawa River are areas of sediment accumulation under the influence of the waters of Perch Creek. If so, these beaches should be added to the initial characterization of the environment.	**Specific Question/ Request for Information:** CNL is requested to determine whether certain beaches on the Ottawa River are areas of sediment accumulation under the influence of the waters of Perch Creek.	N/A	No
QC-2-06	New IR	MELCC	Fish and fish habitat	N/A	**Context:** Development of a marsh on the periphery of the NSDF site. **Rationale:** During the presentation made by CNL to the MELCC on December 4, 2019, it was mentioned that the creation of a marsh built on the periphery of the site was considered, specifically to manage issues related to precipitation. This project does not appear in the documents provided.	**Specific Question/ Request for Information:** CNL is requested to present and describe this marshland development project on the periphery of the NSDF site.	N/A	No
QC-2-07	New IR	MELCC	Change to an environmental component due to radiological contaminants	Figure 5.2.1-1 (EIS)	**Context and Rationale:** Figure 5.2.1-1 of the revised EIS illustrates that the dispersion of atmospheric contamination affects the territory of the province of Quebec.	**Specific Question/ Request for Information:** 1. CNL should add to table 5.2.10-4 Quebec's standards and criteria for atmospheric quality. 2. CNL should justify why the extended study area of the dispersion of atmospheric contamination is not centered on NSDF, which will be the generator of atmospheric dispersions.	N/A	No
QC-2-08	New IR	MELCC	Climate change	Section 10.4 (EIS)	**Context and Rationale:** The MELCC questions the taking into account of projections linked to climate change, including extreme events anticipated on the 0-100 and 0-1000 year scales.	**Specific Question/ Request for Information:** 1. CNL is requested to show the links between the regime of the tributary waters of the watershed and the integrity of the proposed NSDF, using the climate models consulted. The latter should make it possible to identify the vulnerabilities of the waterways and dams upstream of the Chalk River site.	N/A	No

Reference #	Link to IR#1 (original IR package)	Agency	Project effects link	Reference to EIS, appendices, or supporting documentation (if applicable)	Context and rationale	Information requirement	Suggestions for mitigation and follow-up measures (as applicable)	Requires technical discussion
						2. CNL is requested to demonstrate that the risk factors associated with precipitation peaks in the 1-100 year and 1-1000 year cycle have been examined and taken into account. **3.** It is known that out of the ordinary events (hundred and millennial floods) have occurred recently on Lake Superior. Also in Gatineau, two floods over a hundred years have been observed in three years. CNL should adjust the assessment to this reality in order to better reflect future climatic conditions. CNL must also present and discuss the adjusted results.		

Addendum A – CNSC-2-04

A. FC-36 + FC-149 + FC-150 + FC-152 + FC-153 + FC-154 + FC-155 + FC-158

These sections only provide high-level information. Section 6.2.4 only provides information regarding Algonquins of Ontario (AOO) and Métis Nation of Ontario (MNO). Table 6.2.5-1 provides a list of topics of interest for MNO and Algonquin Anishinabeg Nation Tribal Council (AANTC), no concerns/issues are provided. There is also no information on how CNL addressed feedback and whether any feedback from Indigenous groups was incorporated in the EIS and/or IER and if so, where. Also to note that while AANTC is included in this table, there is little mention of AANTC in the rest of the EIS and/or IER (assessment, land use, Indigenous interests) etc.

- Table 6.2.4 1 includes several meetings entitled "Environmental Stewardship Council Meeting" and a meeting entitled "Meeting with Clare Cattrysse and CNSC". Please provide more information and rationale on how these meetings are related to engagement with Indigenous communities on the proposed NSDF project.
- In Section 4.5 of the IER, "Feedback Received" includes a definition of "Indigenous interest." Please define "generally aware". What due diligence was used to ensure CNL was aware of all potential Indigenous interests in the project area to ensure fulsome and accurate information was provided through the assessments on impacts to Indigenous interests? (To note this information is also included in Section 6.2 of the EIS)
- Provide details in the EIS and/or IER on which First Nation and Métis groups provided feedback through "formal and informal consultation activities", what the feedback was and how it was addressed by CNL.
- In section 6, where CNL describes the potential interactions of the NSDF Project with trapping, hunting, gathering and fishing activities, it does not provide information or validation that CNL has attempted to or gathered any details regarding traditional land use activities in close proximity to the CRL property directly from all identified First Nation and Métis groups. While it incorporated information received from the MNO TKLUS, it still uses assumptions in the text regarding land use by Métis citizens. It also does not provide any information on engagement activities with the seven (7) Williams Treaties First Nations and/or AANTC and/or its member First Nations.
- (FC-150) CNSC staff noted in the previous IR that it "will be important for CNL to clarify in the final EIS if there is any active hunting or trapping in the adjacent PE025 and PE002 trap lines, as well as on adjacent private (patent) lands, specifically if they are being used by any of the identified Aboriginal groups." Section 6.4.4.1.2.1 only provides information regarding AOO and MNO. Table 6.2.2-1 identifies First Nation and Métis groups with potential interest in the project that are not included in the information provided in Section 6.4.4.1.1. Please clarify if all the First Nation and Métis groups identified in Table 6.2.2-1 were engaged on this topic. If so, please provide the details on this engagement, including what issues, concerns, and/or feedback raised by each Indigenous group, as well as how CNL addressed these. If not, please provide a rationale.
- (FC 155) The information provided in the response on the engagement with Curve Lake First Nation cannot be located in the EIS and/IER. Provide a rationale as to why Section 6.4.1 only refers to Métis and Algonquin peoples. Please ensure the information provided on the engagement with Curve Lake First Nation is included in the EIS and/or IER.
- A number of First Nation and Métis groups, including the AOO, Kitigan Zibi Anishinabeg Nation and the AANTC, have expressed an interest in being engaged in on-going monitoring activities for the NSDF Project and CRL site in general, especially as it relates to their traditional land use activities (e.g., fishing). The response and EIS and/IER only provide high-level information and no reference to which First Nation and Métis groups were involved in the discussions.
- Section 6.4.6 states, "A couple of the Indigenous communities have indicated that they think their citizens have negative perceptions associated with harvesting near the CRL site which results in not using an area (KnowHistory2019)." The source quoted is the MNO IK study, this will only indicate concerns of Métis Nation citizens, despite the sentence stating, "a couple of the Indigenous communities…" Please clarify which communities this sentence refers to.
- Provide more information in the EIS and/or IER on discussions had with and feedback provided by interested First Nation and Métis groups on environmental monitoring activities specific to the NSDF Project and the CRL site more generally is included in the final EIS.

B. FC-38

Section 6.3 Valued Components, identifies the AOO and MNO, however, does not include information in relation to engagement and feedback on valued components with the other First Nation and Métis groups identified with potential interest in the project as per list identified in Table 6.2.2-1, such as the 7 Williams Treaties First Nations and/or the Algonquin Anishinabeg Tribal Council and/or its member First Nations.

- Please clarify if all First Nation and Métis groups identified in Table 6.2.2-1 were engaged on this topic. If so, please provide the details on this engagement, including what issues, concerns, and/or feedback raised by each Indigenous group, as well as how CNL addressed these. If not, please provide a rationale.

- In addition to the MNO TKLUS study, what other methods of obtaining feedback and from which First Nation and Métis groups, influenced the identification of the "Indigenous VCS" that are capture in Table 6.3.2-1?
- Please explain why this VC section does not include information in relation to engagement and feedback on valued components with all of the First Nation and Métis groups identified with potential interest in the project, including the 7 Williams Treaties First Nations and/or the Algonquin Anishinabeg Nation Tribal Council and/or its member First Nations. While the section does mention the Algonquins of Ontario and the Métis Nation of Ontario, it does not provide detailed information on engagement and feedback on valued components with these groups.
- Please clarify if the final list of NSDF VCs included in Table 6.3.2-1 were shared with the First Nation and Métis groups identified with potential interest in the project and what feedback was provided. If so? How was the feedback addressed by CNL? If not, please provide a rationale.
- Please clarify which First Nation and Métis groups have conducted TKLUS, or plan to complete a TKLUS, and how that influenced (or potentially will influence) the identification of the "Indigenous VCS" that are captured in Table 6.3.2-1 and to support the NDSF project as stated by CNL in Section 6.3.

C. FC-40

It appears the survey did not take into account the lifestyles of First Nation and Métis peoples, as they did not engage with the First Nation or Métis groups within the area. This survey also assumes that First Nation and Métis peoples only obtain "local foods" from farmers market, local farms and/or grown on their own property. This does not take into consideration harvesting of traditional foods (hunting/fishing/gathering).

CNL should ensure that First Nations and Métis populations are adequately represented in the Human Health Risk Assessment and that dose estimates reflect their consumption rate.

- Please provide more detail on the methodology used to develop this survey. If First Nation and Métis lifestyles were to be a focus of the survey and conclusions, how did the methodology ensure that First Nation and Métis peoples would be accurately reflected?
- Please provided more detail on the results of the lifestyle survey. Include information such as how many people identified as First Nations? How many people identified as Métis? How many people overall participated in the survey? What questions were used to ensure that First Nation and Métis lifestyles would be reflected accurately in the survey results?
- Please clarify if the survey results and conclusions were shared with First Nation and Métis groups with interest in the project, as identified in Table 6.2.2-1. If so, what feedback was provided and how was it addressed by CNL? If not, please provide a rationale.
- Please clarify if First Nation and Métis groups with interest in the project, as identified in Table 6.2.2-1 were consulted on the development of the survey. If not, please provide a rationale.
- Please provide a rationale as to why First Nation and Métis groups with interest in project were not surveyed.
- Please clarify why the *Life Style Surveys: Preliminary Local Food Fraction Findings*, only Indicates First Nation and Non-First Nation participant categories? How are Métis participants included in the results?
- Please clarify which First Nation and Métis groups provided input or feedback on the draft EIS to refine the human health risk assessment to ensure conservative representation. Please provide details on which First Nation and Métis groups provided feedback, what feedback provided and how it influenced the hunter/recreational receptor within the Post-closure Safety Assessment.

D. Assumption statements FC-149 + FC-153

Section 6.4.4.1 – includes information that appears to be from existing reports/agreement/websites and does not indicate if and how the information was validated directly with the communities/groups through engagement activities and feedback. In Section 6.4.4.1 the use of "it is likely", "there could be", "it seems reasonable" etc. is common. Very few source documents/resources are identified for these statements.

- Please provide details in the EIS and/or IER on whether the information included in the paragraphs where "it is likely", "there could be", "it seems reasonable" etc. is used was provided to First Nations and Métis groups for validation and/or feedback? If so, which groups and what feedback was provided? If not, please provide a rationale as to why it was not shared with groups and how these assumptions were validated.

Addendum B – CNSC-2-15

Indigenous Socio-Economic Environment

- Page 6-44 states, *"information and areas of interest raised by Indigenous communities during engagement that influenced the scope of the Indigenous socio-economic assessment are summarized in Table 6.5-1. A full record of engagement activities is available in Section 6.2. Other general areas of interest and questions raised during the Indigenous engagement that pertain to the Indigenous socio-economics assessment (if any) are documented in* ***Appendix 4.0-22 Formal Indigenous Feedback."*** CNSC staff have not been able to locate "Appendix 4.0-22 Formal Indigenous Feedback". This is also the only reference to this appendix in the revised EIS, there isn't another reference found throughout Section 6. CNL is requested to provide the reference.
- Table 6.5-1 only identifies one area of interest, *"Indigenous communities have expressed an interest in the employment and contracting opportunities associated with NSDF or CNL more generally"*. CNL is requested to explain how this relates to the paragraph 5(1)(b) requirements of CEAA 2012?
- Page 6-45 states, *"the assessment endpoint of Indigenous governance challenges pertains to the incremental change that the NSDF Project would have* ***on the organizations that manage Indigenous communities****."* CNL is requested to clarify what is meant by "the organizations that manage Indigenous communities".
- Page 6-48 states, *"CNL identifies all the Indigenous communities and organizations it is engaging within Table 6.5-4 (Section 6.5.4.1) but only provides detailed information on physical Indigenous communities within 100 km of the NSDF Project site. There are several reasons for this. First, there are a number of AOO and MNO communities within 100 km of the site but except for Pikwakanagan these are not physical communities (that is communities such as First Nations Reserves that are governed by Indigenous peoples and with physical infrastructure managed by such organizations). They therefore have different socio-economic characteristics (i.e., the population is dispersed over a wider area) and they are not reliant on the same set of infrastructure or decision-making processes, which can be key socio-economic considerations. Second, Statistics Canada Census information can be found for the Algonquins of Pikwakanagan First Nation Reserve (and other populated reserves) but is not available at an organizational level for other AOO or MNO communities. Third, information on all the Indigenous communities and organizations is provided in Section 3 of the IER. Fourth, First Nation Reserves beyond 100 km were not considered to be potentially affected from a socio-economic perspective except as potential economic beneficiaries. For these reasons, the RSA for Indigenous socio-economic was defined as 100 km."* CNL is requested to provide clarification on these statements and validation of this methodology. Was this section on socio-economic effects discussed with all identified Indigenous groups with potential interest in the project?