

NORTHWATCH

December 17, 2018

Canadian Nuclear Safety Commission
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Sent by email to cnscconsultation.ccsn@canada.ca

Ref. REGDOC-1.2.1

Re. Northwatch Comments on Draft Regulatory Document
REGDOC-1.2.1 “Guidance on Deep Geological Site Characterization”

On October 19, 2017 the Canadian Nuclear Safety Commission (CNSC) invited the public to provide feedback by December 17th on Draft Regulatory Document *REGDOC-1.2.1 Guidance on Deep Geological Site Characterization*.

The notice described *REGDOC-1.2.1, Guidance on Deep Geological Repository Site Characterization* as a document which “sets out guidance for the site characterization stage of the siting process for a deep geological repository facility for radioactive waste, as information gathered for site characterization may be used in subsequent licence applications”, and indicated that the regulatory document would supersede *R-72, Geological Considerations in Siting a Repository for Underground Disposal of High-Level Radioactive Waste*, which was published in September 1987.

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 interest in the development and application of *REGDOC-1.2.1, Guidance on Deep Geological Repository Site Characterization* is related to a long history of northern Ontario being identified as a candidate region for the siting of a deep geological repository for all of Canada’s high level radioactive fuel waste, and current investigations by the Nuclear Waste Management Organization of several locations in northern Ontario as potential sites for a deep geological repository, as described conceptually in the NWMO’s 2005 “Adaptive Phased Management Plan”. The sites are associated with but at various distances from three municipalities who have engaged with the NWMO in the NWMO’s “Learn More” program. Northwatch is also an intervenor in the review process for Ontario Power Generation’s proposed Deep Geological Repository for “low and intermediate level radioactive wastes”, which OPG is proposing be constructed beneath the Bruce Nuclear Generating Station on the shore of Lake Huron and within the area of concern of Northwatch’s membership on the North Shore and in the North Channel of Lake Huron.



We have reviewed the draft *REGDOC-1.2.1, Guidance on Deep Geological Repository Site Characterization* and several of the referenced documents and other related documents. Our review is also based on our own extensive organizational experience with AECL's siting efforts in the 1970s and early 1980s, AECL's concept program in the 1980s and 1990s, the Nuclear Waste Management Organization's programs and activities since 2002, and OPG's efforts related to their proposed DGR beneath the Bruce NGS and their related campaign since 2004.

We have the following general observations with respect to the draft REGDOC:

- The documents is frequently overly general or ambiguous
- The document varies between providing general descriptions of various topics and providing regulatory guidance
- The document lacks sufficient footnotes or references; many statements would benefit from a supporting reference or explanation
- The document conveys a sense, overall, that if a proponent brings forward a proposal for a deep geological repository it will be licensed; it lacks the impartiality or neutrality that would convey that such projects would only be licensed if the proponent had demonstrated performance, i.e. that the repository could effectively isolate radionuclides placed at depth into perpetuity
- The document is inconsistent in its approach, varying from one section to the other; for example, Section 3.2.5 provides a brief introduction and explanation of why geotechnical characterization is important, but most sections do not; while there are some problems with the content of this introductory paragraph, we note it here to illustrate the inconsistency of approach throughout the document

Northwatch Comments

Our comments are provided on a section-by-section basis, addressing sections of the draft REGDOG in the order they occur in the draft document.

Preface

Regulatory document REGDOC-1.2.1, *Guidance on Deep Geological Repository Site Characterization*, self describes in the preface as being a document which “sets out guidance for the site characterization stage of the siting process for a deep geological repository (DGR) facility for radioactive waste, as information gathered for site characterization may be used in subsequent licence applications.

- In several instances the document is ambiguous in its use of terms such as “site characterization stage” and “siting process”; the document should be clear in its terminology, and particularly in its distinctions – if any – between the site search, site evaluation, site investigation, site characterization, and site confirmation, all of which might – or might not – be within the “siting process”; while Canadian proponents have been vague and varied in their use of these terms, the regulator should not be

The draft document states that “This document supersedes R-72, *Geological Considerations in Siting a Repository for Underground Disposal of High-Level Radioactive Waste*, published in September 1987.”

- Presumably, the document is intending to convey that this regulatory document would supersede R-72 if and when this REGDOC is finalized
- The document should provide a clearer explanation of the relationship between “R” documents, such as R-72, “P” documents, such as P-290 “Management Radioactive Waste”, the CNSC suite of REGDOCs, regulations, and any related guidelines

Introduction

The draft document states that “A deep geological repository (DGR) is an engineered facility where radioactive waste is emplaced in a deep, stable geological formation (usually several hundred metres or more below the surface) designed to isolate and contain radioactive waste to provide the long-term isolation of nuclear substances from the biosphere [1]. After closure there is no intention to retrieve or transfer the radioactive waste [2].”

- It is of ongoing and great frustration that the CNSC references CSA documents which are not generally available to the public (reference #2, CSA Group, CSA N292.0-14, General principles for the management of radioactive waste and irradiated fuel, Mississauga, 2014)
- Despite its general non-availability, we have reviewed CSA N292.0-14, General principles for the management of radioactive waste and irradiated fuel and outside of the definition section, we found no statement or requirement that “After closure there is no intention to retrieve or transfer the radioactive waste”
- In several sections, including the Introduction section, it is unclear when the document is being very generally descriptive and when it is actually setting out a requirement; the statement “After closure there is no intention to retrieve or transfer the radioactive waste” is a case in point; the CNSC should clarify how this statement fits within the CNSC regulatory requirements and Canadian government policy: is waste to remain retrievable, as in some other jurisdictions, or is the intention to plan on permanent closure?

The draft document states that “Site characterization involves detailed technical site investigations undertaken to increase the state of knowledge about a particular site. Site characterization involves desktop and both regional and site-specific investigations to identify and provide an understanding of particular features and processes. These processes are typically studied in different disciplines (hydrogeology, rock mechanics, geochemistry, etc.) but should be understood in an integrated manner.”

And that “The data gathered in the preliminary stages of the site characterization may be used to support the initial Canadian Nuclear Safety Commission (CNSC) licence application (i.e., licence to prepare site or a combined licence to prepare site and construct) and form part of the safety case.”

- As per earlier comments, in several instances the document is ambiguous in its use of terms such as “site characterization stage” and “siting process”; the document should be clear in its terminology, and particularly in its distinctions – if any – between the site search, site evaluation, site investigation, site characterization, and site confirmation, all of which might – or might not – be within the “siting process”; while Canadian proponents have been vague and varied in their use of these terms, the regulator should not be

- The regulator should clarify if it has any expectations / requirements with respect to site characterization activities and information collected at sequential stages in site investigations

1.2 Scope

The draft document states that “The CNSC uses a comprehensive licensing system that covers the lifecycle of a DGR – from site preparation to construction, operation and decommissioning (closure and post-closure), and finally, release from the CNSC licence. This approach requires a licensing authorization at each phase, although the site preparation and site construction licence may be combined.”

- if, as stated, the CNSC “comprehensive” licensing system is from site preparation forwards, the REGDOC should explicitly set out what the pre-licensing requirements are with respect to siting processes and all stages of site characterization
- in both practical and technical terms, site characterization activities for a potential Deep Geological Repository would begin well before the first stage of licensing (application to prepare the site); the REGDOC should clearly set out requirements for the pre-licensing activities, including requirements for transparency, traceability, documentation, and data accessibility

1.3 Relevant legislation

The draft document states that “The extent of these pre-licensing activities should be discussed with the regulator to avoid initiating activities that require a licence. The purpose for collecting the site-specific data will determine the requirements for data quantity and quality that the site characterization plan should meet.”

- CNSC requirements should be clearly set out so they can be understood and adherence to them evaluated by all parties, not just the licensee or potential licence applicant; accordingly, understanding what is required should not entail (private) discussions between a licence applicant and the regulator
- it is unclear under what circumstances variability in the quality of data would be encouraged or even acceptable

1.4 Early regulatory involvement

The draft document states that “The extent of consultation between the applicant and the regulator should be balanced in order to preserve the independence of the regulator while providing adequate guidance to the applicant. It is recommended that a service agreement be established between the regulator and the applicant.”

- Discussions between any potential licence application and the regulator should be documented in detail and the records of such exchanges – in person, by telephone, in writing or through informal contacts such as at meetings or conferences – should be included in a public registry established for the purpose of bringing transparency to interactions between the CNSC and its licensees and potential license applicants (while not a full design match, the federal government’s registry of lobbyists provides a generalized model of such a registry)

- To preserve and enhance both its practice of independence and the public perception of the independence of the CNSC, the CSNC must limit its interactions with potential licensees so those which can be undertaken within a system of openness and transparency

The draft document states that “The CNSC may choose to observe activities or request information. Prior to a formal application being submitted, CNSC staff may also request data, results and materials from the site characterization activities in order, for example, for the CNSC to conduct independent research.”

- To preserve and enhance both its practice of independence and the public perception of the independence of the CNSC, the CSNC must limit its interactions with potential licences so those which can be undertaken within a system of openness and transparency
- Northwatch would encourage the CNSC to request data, results and materials from the site characterization activities and would support the CNSC conducting independent research and evaluation, but only within a system of openness and transparency, with the data, results and materials from the site characterization activities becoming part of the public record; this record should be public throughout the site investigations – i.e. from earliest stages of site identification and investigation – and not reserved and them made available as a data dump during a formal public review process (which frequently occur only at the very end of a long period of site investigation)

2. Overview of Siting Process

The draft document states that “The objective of the siting process, which includes site characterization, should be to select a site that, along with a proper design and engineered barriers, has properties that provide adequate containment and isolation of radionuclides and hazardous substances from the accessible environment for the desired period of time, usually the assessment timeframe [4].”

- The REGDOC – and CNSC more generally – should be more quantitative in its discussion of DGR requirements; for example, we find no record of clarity from the CNSC on the following:
 - What is a “proper design” or the criteria by which such a judgement would be made?
 - What is “adequate” containment?
 - What is the “desired period of time”?
 - What is the “assessment timeframe”?

The draft document states that “The data gathered in the preliminary stages of the siting process may form part of the initial licence application and part of the safety case. Information gathered at this stage may be used as baseline information to support the demonstration of safety throughout the lifecycle of the DGR facility.”

- the data and results site from all stages of site characterization activities should be part of the public record; this record should be public throughout the site investigations – i.e. from earliest stages of site identification and investigation – and not reserved and them made available as a data dump during a formal public review process (which frequently occur only at the very end of a long period of site investigation)

The draft document states that “Following confirmation of the site and the initial phases of licensing, characterization activities are normally expected to continue into the site preparation, construction and operational phases. The characterization activities continue through these phases in order to contribute further to an adequate baseline for future monitoring, as well as to help confirm assumptions made in earlier safety cases and reduce any residual uncertainties in the safety case [4]. Those characterization activities that continue until closure of the DGR are usually defined in a geoscience verification program. The safety case and associated safety assessment should identify uncertainties and assess the robustness of the facility so that the geoscience verification program can be developed and a research program designed and executed to address these uncertainties throughout the lifecycle of the DGR.”

- There are a number of problematic ambiguities with the paragraph above, including:
- It suggests an assumption on the part of the REGDOC authors that site confirmation is inevitable, i.e. that there can be no inappropriate sites, i.e. there are no candidate sites, just sites
- It is unclear as to the timing of license issuance relative to the sequence of site characterization activities
- In neither this or other sections of the draft REGDOC are there any clear guidelines, standards, or even expectations set out as to what would qualify a site as a potential location for a DGR

2.3 Site characterization stage

The draft document states that “Preliminary safety assessments should be completed at this time to test the site’s suitability to host a DGR facility, as well as to guide further characterization and confirmation activities. These safety assessments may also form part of a comparative analysis of the remaining site (if applicable), which would lead to the next stage of site confirmation, in which detailed, extensive work would be focused on one site.”

- What are the methods and requirements for the preliminary safety assessments to be undertaken? If these requirements are not to be set out in this REGDOC, at minimum the REGDOC should include clear references to where these methods and requirements are set out
- What is the criteria for testing the site’s suitability?
- Does the REGDOC either assume or require a comparison of sites?
- At which stage and for what reasons in the sequence of site investigation / characterization activities would a proponent shortlist from several to a few to a single site?
- What are the requirements of the comparative analysis of candidate or potential sites?

2.4 Site confirmation stage

The draft document states that “Site confirmation generally consists of detailed, extensive field and laboratory studies at the selected site. It is at this stage that evaluation of whether sinking a shaft or construction of an underground research facility (URF) may be necessary to obtain more information.”

- This section is overly vague and provides little to no actual direction with respect to these activities and their carrying out. For example:

- Is the descriptor of this activity “generally” consisting of certain activities meaning this is generally the case internationally, generally the case in domestic experience to date, or “generally” in some other context or sense?
- Given that the section is very general, where and how will the CNSC provide actual direction or set out requirements for the site confirmation stage?
- Does the site characterization program (Section 3) include all the stages set out in Sections 2.1 to 2.4, or is the characterization program separate and different from these stages and if so, how so? And if not, how specifically do they relate to each other?
- What would be the basis for a decision for “sinking a shaft” versus “construction of an underground research facility”? What would the Commission or CNSC staff’s role be in that decision point?
- What are the CSNC license requirements for “sinking a shaft” versus “construction of an underground research facility”?

The draft document states that “A final safety assessment should be prepared based on all of the data gathered during prior siting stages and in combination with geological and hydrogeological information, and information about other barriers such as the engineered barrier system, canister design and radioactive waste characteristics. This information may be used to develop the safety case that will be submitted in the initial licence application (i.e., licence to prepare site or combined licence to prepare site and construct).”

- The REGDOC should clearly set out linkages to other regulatory, policy and licensing guidance related to development, operation and closure / decommissioning of a Deep Geologic Repository; it may not be appropriate to include the methods and criteria for a “final safety assessment” in a REGDOC about site characterization, but the linkages need to be in place, and these methods and criteria need to be available prior to finalizing this REGDOC, as there are clear linkages and interdependencies; for example
- if the above statement by the REGDOC authors that “A final safety assessment should be prepared based on all of the data gathered during prior siting stages and in combination with geological and hydrogeological information, and information about other barriers such as the engineered barrier system, canister design and radioactive waste characteristics” is valid, the specifics about the “geological and hydrogeological information” that will be required for the safety assessment must be known prior to development of the site characterization program and carrying out the site characterization activities

3. Site Characterization Program

The draft document states that “As part of the siting process, the licence applicant should prepare and implement a program for site characterization for the proposed site for a DGR facility. The program should provide information sufficient to support a general understanding of the site in its current state and how it is expected to evolve over extended time frames associated with the safety case [6]. The site characterization program should establish baseline conditions for the site and environment in its present condition; support the understanding of the normal evolution; identify any events and processes associated with the site that might disturb the normal evolution

of the DGR system; and support the understanding of the effect on safety of any features, events and processes associated with the DGR system [6].”

- The REGDOC should clearly set out its definition of site characterization program and its definition of siting stages and of the siting process, and discuss interrelationships between these three aspects

The draft document states that “Data collected during site characterization will form the basis of descriptive site models and geological, hydrogeological, geochemical and geomechanical frameworks that will be relied on to evaluate long-term safety. The data will provide baseline data for detecting potential short- and long-term environmental impacts at various stages and for tracking throughout the CNSC’s licensing lifecycle for a DGR. Data needs include relevant regional- and site-scale information.”

- This REGDOC includes numerous terms which are undefined and which have linkages to DGR licensing aspects (such as the site models, and geomechanical frameworks) which Northwatch expects will be the subject of other REGDOCs but which require at least contextual descriptions and clear definitions in this document
- Data needs should be more explicitly identified than the broad statement that they must include “relevant regional- and site-scale information”; what is the criteria for determining relevance? What will be the basis for the regulator’s determination that more information is needed, or that sufficient information has been provided?
- the data and results site from all stages of site characterization activities should be part of the public record; this record should be public throughout the site investigations

The draft document states that “Baseline data include the biosphere and geosphere, and support an understanding of current conditions at the site, its geological history, and its likely future evolution over the safety case time frame. These data provide the initial information for safety assessments at the conceptual stage and during initial facility design. They will serve as the basis for the first iteration of the full safety case and any initial geoscience verification program at the site once it has been selected. As well as in the event that development (at any phase) is licensed to proceed.”

- This REGDOC includes numerous terms which are undefined and which have linkages to DGR licensing aspects (such as the safety case, safety assessments, and/or the geoscience verification program) which Northwatch expects will be the subject of other REGDOCs but which require at least contextual descriptions and clear definitions in this document
- If other REGDOCs are going to be developed related to aspects of repository design, development and performance other than site characterization a timeline for their development and a schematic for their interlinkages should be presented in this REGDOC (and in each of the REGDOCs related to DGRs)
- This REGDOC should set out criteria and methods for development of the safety case and the geoscientific verification program; while the details of the safety case and the geoscientific verification program maybe be finalized in a project-specific context – with public and peer review – the regulatory framework requires the establishment of program direction for the development and evaluation of these two important license and project assessment components

The draft document states that “The order of the criteria described herein does not imply priority of one element of characterization over another; relative relevance of specific criteria will in

some cases be site specific. Specific criteria provided for the collection of baseline data may not be exhaustive and may constitute recommendations. Alternative approaches and innovative techniques that address additional elements of site characterization are also valid.”

- It is unclear if the “criteria described herein” is referring to the very general descriptions included in later subsections of Section 3, but given that there are no actual criteria presented anywhere (else) in the document, we surmise that might be the intent, to which we would comment: the “criteria described herein” are overly general and do not provide sufficient direction for either the development of a site characterization program (by a potential licensee) or its evaluation (by CNSC, the public, and others).

The draft document states that “In this document, the pre-closure period of a DGR encompasses site preparation, construction, operation and decommissioning. The post-closure or long-term period is the period that follows the closure of a DGR facility, with a time frame of tens of thousands of years or more [3].”

- It is very unclear why this undated referenced document “IAEA, Draft TECDOC, Managing integration of pre-closure activities and post-closure safety in the Safety Case for Geological Disposal” was selected as the reference for this particular very general statement

3.1 Site characteristics I: geological environment

In the interest of brevity, for the remainder of Section 3 and for following sections this commentary will provided comments by subsection without repeating the text within this document; readers are encouraged to refer to the relevant section of REGDOC-1.2.1 while considering these comments.

Section 3.1

- The document should provide a description of or reference to a document with descriptions of “containment and isolation characteristics”
- The document should provide a discussion of how those “containment and isolation characteristics” are measured or estimated, the extent of the physical investigations related to these characteristics, the manner in which these characteristic are quantified, and the consequence of the abundance or scarcity of these characteristics in terms of the geological formation serving as a barrier to radionuclides
- The document should describe the relationship between the extent of the suitable host rock at depth and repository performance; the document should clearly state how or why “size requirements” are established, or why they are not established, as part of the regulatory framework
- The regulatory document should identify which site characteristics would allow the development of a robust safety case and which site characteristics would disallow the development of a robust safety case
- The document should quantify the meaning of “low” in the context of potential for human intrusion, and should expand on its very general statements with respect to this risk set
- The document should clearly set out how the “extensive geological information (that) would be gathered to verify the initial safety case and to update the safety case iteratively” will be managed within an information system that is transparent and

traceable and which makes data publicly available in a timely manner throughout the siting process and various stages of site characterization

- Throughout the subsections in Section 3.1, the document should discuss how an understanding of these aspects of a site may be different in an undisturbed site versus a disturbed site, i.e. how site disturbance may alter the observations
- Throughout the subsections in Section 3.1, the document should describe the basis for a licensee's selection of data, the methods of data analysis and how conclusions of data analysis are to be traceable,
- Throughout the subsections in Section 3.1, the document should discuss how uncertainties are to be clearly documented in the analysis of data and drawing of any conclusions based on data collected
- The direction in Section 3.1.4 to collect data for the site and region lacks clarity; future drafts should state that two data sets will be collected, one local and one regional
- The document should define "regional" and "local" in the context of Section 3.1.4
- The REGDOC should include a requirement for comparative regions and comparative (local) sites

Section 3.2

- The document does not adequately describe the requirements for data collection and analysis related to climate, and particularly related to climate change and related phenomena of extreme weather events, rising temperatures, changed hydrological regimes, etc.
- The document is overly imprecise in its terminology; for example, it repeatedly refers to "precipitation and snow"
- Section 3.2.2. used different terminology than previous sections when describing the same or similar concepts; for example, it uses the descriptor "area of interest" whereas previous sections used the descriptors "local" and "regional"; if there is a purpose in using a different descriptor, its relationship to early similar (but different) descriptors should be made clear
- The document should clearly set out the basis for evaluation of the information to be collected, including that identified for collection and evaluation in Section 3.2.3
- Section 3.2.4, when taken literally, suggests that one of topographical mapping, aerial photograph interpretation, soil sampling to assess soil deposition and transportation processes is sufficient to characterize the geomorphology of a site; we do not believe this to be the case and in fact doubt that this was the REGDOC authors' intention, but is an example of the ambiguities through that document that require correction
- The document is confused as to whether Section 3.2.5 is focussed on geotechnical characterization of a candidate site, or identifying issues with the management of overburden and waste rock during DGR development; in general, it appears to be intended to address the former, but discussion moves into the latter subject, and the latter subject is not addressed elsewhere

Section 4 Human Activities and Land Use

- This section lacks sufficient depth and breadth; for example:
 - A definition of "economically valuable" resources is lacking
 - The section lacks a temporal boundary or recognition of the temporal extremes of a DGR project

- The section omits activities such as fracking which can cause changes at both a local and regional scale
- It does not address uncertainties related to a changing climate
- It does not directly identify the risk of human intrusion

Section 5 Data Acquisition and Verification Activities

- We strongly support the provision that “The licence applicant would demonstrate in their licence application that the results of site characterization activities are accurate, complete, reproducible, traceable and verifiable.”
- In addition, the data and information, the evaluation of that data and information, and conclusions arrived at based on that data / information and subsequent evaluation are transparent and are made available for peer and public review
- In addition, exchanges of information, evaluation, advice or direction from the CNSC to the licence application should be available for peer and public review
- The statement in section 5.1 that “Topics covered under management system governance documentation are expected to include the generic and specific requirements for site characterization processes and practices” lacks sufficient strength and clarity
- The statement in section 5.2 that “Wherever possible, data should be collected, presented, stored and archived in a suitably standardized controlled fashion” is of concern; what is the purpose of the qualifier “wherever possible”? This statement should be directive, and should state that “Data will be collected, presented, stored and archived in a ~~suitably~~ standardized controlled fashion”; additional direction should address methods to avoid the loss of data over time due to changes in storage methods, and provisions for public access and full transparency, during all states of pre-development and development and during operations and post-operation (should a DGR be established); information needs to remain available for those DGRs which are proposed but not approved or not developed and/or put into operation for other reasons
- Data management systems must include means by which reviewers and researchers accessing the data over time can understand how the methods and conclusions were traceable and replicable, and must remain accessible to the public, peer reviewers, and other researchers over time
- The possible intentions of the statement that “the process of data evaluation and establishing site-related parameters involves technical and engineering analyses and judgments, which requires extensive experience and knowledge” in that they suggest a possible approach which is DIFFERENT from one which is transparent, traceable, and verifiable.
- The notion that “parameters and analyses may not lend themselves to direct verifications through inspections and tests, or by other techniques that can be precisely identified and controlled” is equally troubling, for the same reasons
- The supposition that “evaluations should be reviewed and verified by independent individuals or groups (e.g., peer review) that are separate from those who initially did the work” should be standard practice, and should not be suggested only in the case of this troubling notion that evaluations which are subjective and unverifiable would form part of the decision-making process
- In addition to being “separate from those who initially did the work”, independent /peer reviews must be organizationally separate; in addition, there should not be a single peer review group, and the peer review pool should have sufficient resources and capacity to undertake detailed and diligent reviews

- Northwatch agrees that reviews should be carried out at the different stages of the siting process in accordance with the work instructions and procedures; these reviews should be open and transparent, and include opportunities for public and peer review and engagement with both development and application of the review method, and with review and reflection on the review results
- It is unclear in Section 5.3 (Sampling and testing procedures) whether this section of the REGDOC encompasses shaft sinking and/or establishment of an underground research laboratory
- The document should clarify: under what circumstances would a borehole not require sealing as part of abandonment, and/or under what circumstances would a borehole established as part of site characterization not be “abandoned”?
- Section 5.3 should clearly state that the information collected and stored as part of the borehole quality assurance and quality control program will be available for public and peer review and access
- The use of the term “perturbed” is somewhat confusing; initially, given the context, we assumed it to be used in the same manner as “disturbed” is frequently used to discuss geological rock formations and the impact of excavation on those formations, but are also aware that the term perturbed is more generally used to refer to soil conditions, as in:

Perturbation (from Latin: *perturbare* "to confuse, disorder, disturb", from *per-* "through" + *turbare* "disturb, confuse," from *turba* "turmoil, crowd") is a set of pedology (soil study) and sedimentary geology processes relating to changes in the nature of water-borne alluvial sediments and in situ soil deposits over time.

For clarification, we referred to *REGDOC-3.6, Glossary of CNSC Terminology*, but found that neither the term “perturbed” or “disturbed are included in that glossary

6. Facilities for Verification and Characteristic Activities

- Section 6 is largely occupied with providing a very general description of underground research facilities and their function in site characterization and “demonstrating feasibility” of a DGR; as in other instances throughout the document (such as the last sentence of the previous section) the tone of the document is one that wholly assumes that the conclusion of site characterization activities will be approval of the site for construction and operation of a deep geological repository; we would strongly encourage a more impartial tone to regulatory documents, and an approach that describes how these activities contribute to an understanding of the site, versus how they demonstrate the site’s acceptability (because the research may or may not “demonstrate feasibility”)
- The final paragraph of text for this draft regulatory document raises concerns similar to those noted earlier: that the pre-application process may lack independence and impartiality:

It is important for the licence applicant to discuss its plans with the CNSC early for verification of site characteristics, such as an underground research facility or similar facility, to clarify the regulatory approval process and to identify those site characterization activities. These consultations are also necessary to identify those site characterization activities that may not require a CNSC licence to prepare site and/or licence to construct.

- CNSC requirements should be clearly set out so they can be understood and adherence to them evaluated by all parties, not just the licensee or potential licence applicant;
- Discussions between any potential licence application and the regulator should be documented in detail and the records of such exchanges – in person, by telephone, in writing or through informal contacts such as at meetings or conferences – should be included in a public registry established for the purpose of bringing transparency to interactions between the CNSC and its licensees and potential license applicants (while not a full design match, the federal government’s registry of lobbyists provides a generalized model of such a registry)
- To preserve and enhance both its practice of independence and the public perception of the independence of the CNSC, the CSNC must limit its interactions with potential licensees so those which can be undertaken within a system of openness and transparency

Conclusion

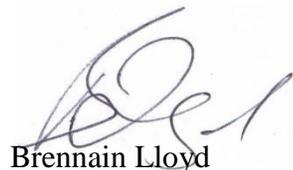
The review notice described draft REGDOC-1.2.1 as one which supercedes R-72. Without any endorsement of the substance of R-72, upon comparison we would note that R-72 does succeed, at least structurally, in three areas where the draft REGDOC fails:

- It sets out what the elements of a successful long term management system for high level nuclear fuel waste would be, and
- It sets out the fundamental requirements that must be considered in evaluating a proposal
- It sets out actual criteria against which a potential deep geological repository will be judged

While we are not arguing in defence of R-72 and would readily acknowledge that this regulatory document requires review and revision, the 1987 document does serve to illustrate some of the gaps in its proposed replacement. Notably, REGDOC-1.2.1 fails in that it provides no direction or means by which applications, concepts or proposals are to be measured and deemed to be successful or “approvable”. As already stated, there is a disturbing and recurring message that approval is the only possible outcome, and this is coupled with the absence of any actual criteria to assess applications.

We request that Northwatch and other commenters on draft REGDOC 1.2.1 be provided with a full dispositioning of their comments.

Thank you for your consideration.



Brennain Lloyd
Northwatch Project Coordinator