2023 Technical Peer Review Summary Report

Biosphere – Environmental Media Baseline Program

Municipality of South Bruce

January 08, 2024

Executive Summary

The Nuclear Waste Management Organization (NWMO) has been engaged in a multi-year, community driven process to identify a site where Canada's used nuclear fuel can be safely contained. The site selection process involves nine steps (NWMO 2010), with the process currently at Step 3 (Phase 2). The NWMO is now in its final screening process, and the two remaining siting areas currently being assessed under Step 3, Phase 2, are the Municipality of South Bruce (MSB) and the Township of Ignace and their surrounding areas. The NWMO plans to complete all preliminary assessment work and to select one community/area to host the Adaptive Phased Management (APM) Project (Project) by the end of 2024.

Building on previous work, engagement completed to-date, and MSB's 36 Guiding Principles, the NWMO and MSB are working together to prepare a suite of studies which will be shared broadly with the community. The studies are being undertaken by the NWMO or MSB, with some being joint efforts. The MSB has retained consultants to develop a number of studies and to peer review others developed by the NWMO and their consultants. The information acquired through the studies is expected to aid MSB to make informed decisions about whether the Project is suitable for their community, and if they are willing to consider hosting it and under what circumstances and terms.

The purpose of the Environmental Media Baseline Program (EMBP) is to characterize the biophysical environment and is focused on environmental components that have the potential to be impacted by the Project. The data collected as part of the EMBP would support the development of a conceptual site model (CSM) which would provide a better understanding of the physical geology and hydrogeology, refine the understanding of groundwater to surface water interactions and update the groundwater model to refine the assumptions for the shallow groundwater and subsurface soil and bedrock EMBP components. The collection of data related to EMBP commenced in September 2021.

The specific objectives of the EMBP are as follows:

1. To collect data of high importance to stakeholders and rights-holders, maximizing the use of local and Indigenous Knowledge to ensure the data are appropriate and representative.
2. To collect data that are of high quality and are statistically rigorous.
3. To collect data that will provide adequate information for future modelling and preparation of an Impact Assessment.
4. To maximize opportunities for community involvement in completing the sampling, if desired.
5. To provide an understanding of potential cumulative effects.

This interim technical report summarizes the peer review findings of work plans, technical data reports and environmental media field surveys and sampling events carried out by the NWMO and their consultants that commenced in November 2022. The peer review is intended to aid the community with a good understanding of the scope of work being undertaken to characterize the environmental baseline conditions prior to the development of the Project.

The current peer reviews described in this report are a follow up to the EMBP peer reviews conducted in 2021 on the following draft reports:

– Canada North Environmental Services Limited Partnership (CanNorth) Final Draft Report: Nuclear Waste Management Organization Adaptive Phased Management Project – South Bruce Site, Environmental Media Baseline Program Design, May 2021

The 2021 draft reports outline the framework and design for conducting environmental baseline studies within the South Bruce Study area.

It is the view of the PRT that the EMBP and associated documents produced by the NWMO to date demonstrate the progress to satisfying the development of the CSM. The CSM will generate a better understanding of the physical geology and hydrogeology, refine the understanding of groundwater to surface water interactions, and update the

groundwater model to refine the assumptions for the shallow groundwater and subsurface soil and bedrock EMBP components.

It is the PRT's current understanding that the EMBP will continue with additional data collection related to surface water, hydrology and drinking water. Data collection for air quality, noise and light is expected to begin in 2024, along with tissues sampling.

The PRT will continue to work collaboratively with the NWMO and their consultants to review work plans for the air quality, noise, and light and tissues sampling, as they come available, and will also conduct field observations related to these activities. It is the view of the PRT that the EMBP and the associated documents are technical in nature and demonstrate progress in satisfying Guiding Principle #2 based on the factual data collected to date. It is too early in the program to demonstrate progress in satisfying Guiding Principle #7 as site specific designs for the construction and operation of the DGR have not been developed. As this is a multi-year program, the PRT will review the additional data that will be collected to ensure that the characterization of the environmental baseline is complete to make informed decisions and to assess the changes resulting from or associated with the Project.

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Acronyms

APM	Adaptive Phased Management
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CanNorth	Canada North Environmental Services
CNSC	Canadian Nuclear Safety Commission
CSM	Conceptual Site Model
CWB	Community well-being
DGR	Deep Geological Repository
EMBP	Environmental Media Baseline Program
Geosyntec	Geosyntec Consultants International, Inc
GHD	GHD Limited
IEC	Independent Environmental Consultants
MSB	Municipality of South Bruce
NRSI	Natural Resource Solutions Inc.
NWMO	Nuclear Waste Management Organization
OSAP	Ontario Stream Assessment Protocol
PRT	Peer Review Team
QA/QC	Quality Assurance/Quality Control
SME	Subject Matter Expert
SVCA	Saugeen Valley Conservation Authority
TULLOCH	TULLOCH Environmental, a division of TULLOCH Engineering Inc.
Zajdlik	Zajdlik & Associates Inc
Zoetica	Zoetica Environmental Consulting Services

Scope and limitations

Respectfully submitted by:

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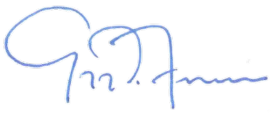
Jennifer Son, P. Eng.
Environment Lead, GHD Leadership Team



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Gregory D. Ferraro, P. Eng.
Project Manager, GHD Leadership Team

1. Introduction

Background

This interim technical summary report documents the technical peer review undertaken of the various Biosphere – Environmental Media Baseline Program (EMBP) reports, work plans and observation of field programs carried out by the Nuclear Waste Management Organization (NWMO) and their consultants. The NWMO has been engaged in a multiyear, community driven process to identify a site where Canada's used nuclear fuel can be safely contained. The site selection process involves nine steps (NWMO 2010), with the process currently at Step 3 (Phase 2). Step 3 is defined by two phases of preliminary assessments for each interested community. Phase 1 involved primarily desktop studies documenting the current socioeconomic conditions in the communities and then considering what might be the possible implications of the Adaptive Phased Management (APM) Project (Project) on community wellbeing (CWB) for each community and the wider area. For interested communities that successfully completed the initial screening in Phase 1, Phase 2 (the current phase) involves additional work to support conducting a preliminary assessment of potential suitability and narrowing the number of communities that have expressed an interest in partnering with the NWMO.

The NWMO is now in its final screening process, and the two remaining siting areas currently being assessed under Step 3, Phase 2, are the Municipality of South Bruce (MSB) and the Township of Ignace and their surrounding areas. The NWMO plans to complete all preliminary assessment work and select one community/area to host the APM Project by the end of 2024 which then marks the beginning of Step 4 of APM implementation[1]. The selection of a final site will trigger the regulatory approvals phase of the APM Project. Federal approval under the Impact Assessment Act and licensing by the Canadian Nuclear Safety Commission (CNSC) under the Nuclear Safety and Control Act will be required. Meeting federal regulatory standards is imperative to achieve approval and withstand intense public and regulatory scrutiny.

Building on previous work, engagement completed to-date, and MSB's 36 Guiding Principles, the NWMO and MSB are working together to prepare a suite of studies which will be shared broadly with the community. The MSB has retained consultants to peer review others developed by the NWMO and their consultants. The information acquired through the studies is expected to aid MSB make informed decisions about whether the APM Project is suitable for their community, and if they are willing to consider hosting it and under what circumstances and terms.

The Environmental Media Baseline Program

The purpose of the EMBP is to characterize the biophysical environment and is focused on the following environmental components that have the potential to be impacted by the Project:

- Tissue samples
- Hydrology
- Surface water parameters
- Air quality, noise and light
- Shallow groundwater quality and drinking water quality
- Surface soil, shallow overburden and bedrock quality

The data collected through the preceding components will support the development of a conceptual site model (CSM). The CSM will generate a better understanding of the physical geology and hydrogeology, refine the understanding of groundwater to surface water interactions, and update the groundwater model to refine the assumptions for the shallow groundwater and subsurface soil and bedrock EMBP components.

1. Nuclear Waste Management Organization, 2020. Moving Towards Partnership - Triennial Report 2017 to 2019.

The specific objectives of the EMBP are as follows:

1. To collect data of high importance to stakeholders and rights-holders, maximizing the use of local and Indigenous Knowledge to ensure the data are appropriate and representative.
2. To collect data that are of high quality and are statistically rigorous.
3. To collect data that will provide adequate information for future modelling and preparation of an Impact Assessment.
4. To maximize opportunities for community involvement in completing the sampling, if desired.
5. To provide an understanding of potential cumulative effects.

The EMBP was initially designed as a 3-year program. The EMBP includes developing various work plans, execution of environmental media field surveys and sampling events and the production of data reports for the individual program components. The collection of data commenced in September 2021 with the second year of the program ending in September 2023. Preparation of the EMBP Year 1 Baseline Report combines the information collected during Year 1 of the program and has been completed.

The EMBP has been carried out by the NWMO's technical team and their consultants which include:

– Canada North Environmental Services (CanNorth)
– Geosyntec Consultants International, Inc. (Geosyntec)
– Independent Environmental Consultants (IEC)
– Zajdlik & Associates Inc. (Zajdlik)
– Saugeen Valley Conservation Authority (SVCA)
– Natural Resource Solutions Inc. (NRSI)
– TULLOCH Environmental, a division of TULLOCH Engineering Inc. (TULLOCH)

Peer Review Team

The Peer Review Team (PRT) for the EMBP related documents and field observation activities include the following Subject Matter Experts (SMEs) from GHD:

– Sarah Andrew, B.A.Sc., P. Eng. – Senior Water Resources Engineer
– Andrew Betts, M.A.Sc., P.Eng. - Senior Water Resources Engineer
– Ian Collins, M.Eng, P.Eng., QP_{RA} – Senior Environmental Risk Assessor/Engineer
– Chris Ellingwood, B.E.S. – Senior Terrestrial and Wetland Biologist
– John Ferguson, MBA, P.Eng. – Senior Air and Noise Engineer
– J-P Fleras, B.A. – Senior Technician (Surface Water, Sediment, Bathymetry, Arborist)
– Leah Jefferson, B.E.S. – Field Lead (Surface Water, Ecology)
– Laura Lawlor, M.Sc., CSE – Senior Aquatic Biologist/Ecologist
– Robyn Leppington, B.Sc. – Senior Aquatic Biologist
– Mike Masschaele, B.E.S, LEL – Senior Noise and Vibration Specialist
– Allan Molenhuis, B.Sc., P.Geo. – Senior Scientist - Hydrogeology
– Brad Trytten, B.Sc., M.S., P.Geo. – Senior Geologist/Hydrogeologist

The SMEs, in combination with the GHD Leadership Team (Greg Ferraro, Jennifer Son and Amy Douglas), make up the PRT.

Peer Review Status

The current peer reviews and their findings described in this report is a follow up to the EMBP peer reviews conducted in 2021 on the following draft reports:

– Canada North Environmental Services Limited Partnership (CanNorth) Final Draft Report: Nuclear Waste Management Organization Adaptive Phased Management Project – South Bruce Site, Environmental Media Baseline Program Design, May 2021

The 2021 draft reports outlined the framework and design for conducting baseline studies related to the environment within the South Bruce Study area.

The PRT commenced work on the current peer review in November 2022 on various EMBP components.

Section 2 of this report elaborates on the Peer Review Protocol process including the steps specifically followed and discussions held with the NWMO and their consultants. As described in **Section 3**, the PRT in conducting the peer review considered the information provided in several relevant ancillary documents prepared by the NWMO. A high level overview of the PRT's current findings/observations are summarized in **Section 4**. This is followed by a description on how the EMBP and associated documents informs the applicable Guiding Principles. Lastly, the conclusions from the current peer review are provided.

2. Peer Review Protocol

2.1 Objectives and Overview of the Peer Review Protocol Process

The technical peer review of the various EMBP reports, work plans and observations of field surveys and sampling events was undertaken in accordance with the Peer Review Protocol established jointly by the MSB and the NWMO. The Peer Review Protocol had the following established objectives:

1. To provide the community of the MSB with an independent review by qualified SMEs
2. To complete a peer review of the NWMO's assessment of potential impacts and proposed benefits of locating the APM Project in MSB in comparison to existing conditions
3. To review how the potential impacts and proposed benefits adhere to the 36 Guiding Principles that will guide the MSB's assessment of willingness to host the APM Project

With these objectives in mind, the Peer Review was conducted in a collaborative manner between the NWMO team and the MSB/GHD team while maintaining independence during the process. **Appendix A** includes the Peer Review Protocol established in June 2021 and **Figure 2.1** below summarizes the process followed.

Figure 2.1 The Peer Review Protocol Process

2.2 Key Activities Associated with the Peer Review of the Environmental Media Baseline Program

With the preceding process in mind, the peer review carried out by the PRT included work plans for field execution, field observations, and technical data reports prepared by the NWMO and its consultants. As part of the peer review process, the PRT reviewed various components of the EMBP to understand the following:

– Are there any significant concerns, issues, and/or omissions in the documentation?
– What are the PRT's initial observations/impressions on the quality of the documentation?
– Are the baseline findings interpreted and presented in a clear and understandable manner?
– Does the documentation reflect the most current information?
– Does the information contribute to developing the CSM

A description of the activities conducted as part of the peer review process of the work plans, field observations and reports are provided below.

Work Plans

– Gain a greater understanding of the field plans and methods for conducting various activities for field data collection as part of the EMBP
– Provide comments on the NWMO's work plans and considering responses received from the NWMO
– Hold on-going discussions as required with the NWMO team providing input where appropriate (e.g., field methodologies, decontamination procedures, sample collection methodologies, etc.)

Field Observations

– Observe field activities for field data collection as part of the EMBP to confirm that the NWMO team are following procedures outlined in the work plans
– Providing observations on the NWMO team's field execution
– Hold on-going discussions as required with the NWMO team providing input where appropriate

Reports

– Review draft reports and revised draft reports prepared by the NWMO team

Peer Review Comments

- Develop a preliminary list of comments including initial impressions, observations, and any potential issues and/or concerns with the work plans, field observations and draft and revised reports based on several documents and information as described in **Section 3**
- Provide the preliminary list of comments on the various documents to the NWMO team for their understanding of the PRT's initial impressions, observations, and any potential issues and/or concerns
- Attend a Working Sessions with the NWMO team to discuss the preliminary list of comments and work through appropriate responses and/or actions in a collaborative manner.
- Submit the formal set of comments on the various documents to the NWMO team for their review and responses
- Review the responses from the NWMO team to the formal set of comments and ensure no significant outstanding issues and/or concerns remain

Peer Review Report

- Prepare the draft 2023 Technical Peer Review Summary Report and submit to MSB for review
- Finalize the draft 2023 Technical Peer Review Summary Report based on any comments received and provide to MSB

3. Key Documentation and Information Reviewed

For the purposes of this interim Technical Summary Report, various work plans, field observations and data reports made available to and were reviewed by the PRT in carrying out the Peer Review Protocol starting in November 2022. **Table 3.1** lists background reports that were reviewed to gain a high level understanding of the Project and support the peer review process and **Table 3.2** lists the key documents and information considered by the PRT in the review of the Biosphere – Environmental Media Baseline Program.

Table 3.1 Background Reports Reviewed to Support the Peer Review Process

Document Name/Information	Author/Source/Date	Description/Application
Implementing Adaptive Phased Management 2021 to 2025	NWMO (March 2021)	This report presents the 5-year strategic plan for the NWMO and is a way for the NWMO to show commitment to transparency. The 5-year plan is a living document and each year is updated to reflect progress in the work completed by the NWMO, input from communities and the public, advances in science and technology, insights from Indigenous Knowledge, evolving societal values and changes in public policy.
Final Draft Report: Nuclear Waste Management Organization Adaptive Phased Management Project – South Bruce Site, Environmental Media Baseline Program Design, May 2021	CanNorth, Geosyntec, IEC and Zajdlik (May 2021)	This report outlines the design of the Environmental Media Baseline Program to support the Impact Assessment should the community of South Bruce remain in the process. The report describes the environmental components included in the EMBP, which will include tissue samples, hydrology, surface water parameters, air quality, noise and light, shallow groundwater quality and drinking water quality, and surface soil, shallow overburden and bedrock quality.

Document Name/Information	Author/Source/Date	Description/Application
Deep Geological Repository Conceptual Design Report – Crystalline / Sedimentary Rock (APM-REP-00440-0211-R000)	NWMO (September 2021)	This report describes conceptual designs for a Deep Geological Repository (DGR) facility in either crystalline or sedimentary rock. For costing purposes, it is assumed that the facility will receive 5.5 million used CANDU fuel bundles over a 46-year period. The report describes the required facilities and infrastructure needed to safely receive, package, and emplace the used nuclear fuel in the underground repository. The report further describes how at the end of emplacement activities and following a period of extended monitoring the DGR facility will be decommissioned and closed. All underground rooms, tunnels and the three shafts will be permanently sealed.

Table 3.2 Key Documents and Information Considered in the Peer Review of the Biosphere – Environmental Media Study

Document Name/Information	Author/Source/Date	Description/Application
SVCA Channel Characterization and Bathymetric Surveys – Bathymetric Survey Workplan	NRSI (December 9, 2021)	The Workplan provides work requirements, methods, etc., necessary to complete as part of the NWMO's EMBP. A targeted bathymetric sampling and survey program developed by NRSI within Clam, Silver, Hines, and Robson Lakes as identified by the SVCA.
SVCA Channel Characterization and Bathymetric Surveys – Channel Characterization Survey Workplan	NRSI (September 30, 2022)	The Workplan provides work requirements, methods, etc., necessary to complete characterization surveys within an approximately 30 km reach of the Teeswater River within the SVCA jurisdiction as part of the NWMO's EMBP. A targeted channel characterization survey program developed by NRSI for the approximate 30 km reach of the Teeswater River between Hillcrest Street West and Bruce County Road 20 is presented.
Draft Report: Nuclear Waste Management Organization Adaptive Phased Management Project – South Bruce Site, Biophysical Conceptual Site Model Update and Screening Level Change Assessment	CanNorth, Geosyntec, IEC and Zajdlik (November 9, 2022)	This report examines, at a high level, how the Project may affect the environment, and identifies technologies and systems that are commonly used to manage those changes. The report also provides a description of the existing conditions in the natural environment. The change assessment simply acknowledges when there may be a change to the environment because of the Project, it does not identify whether that change is important or significant. Additionally, this screening level change assessment focuses only on the Project activities and not potential cumulative considerations of other activities in the area.
South Bruce Environmental Media Baseline Program – Year 2 and 3 Surface Water Study Work Plan	SVCA (January 3, 2023)	This Work Plan provides information relevant to completing the surface water, benthic invertebrate, sediment, zooplankton, phytoplankton, periphyton, and environmental DNA (eDNA) components for Year 2 and Year 3 of the EMBP. The report describes how data collection will adhere to the standard operating procedures (SOPs) developed by CanNorth and their collaborators, provided in the Environmental Media Baseline Program Design report (CanNorth, May 2021)

Document Name/Information	Author/Source/Date	Description/Application
2022 Field Scope of Work, Private Well Water Sampling, Borehole Surface Water and Soil Sampling, and EMBP Soil Sampling Work Plan	TULLOCH (June 28, 2023)	The Work Plan provides details on work requirements, methods, etc., on the soil and surface water sampling at two borehole sites approximately 3.5 km northwest of Teeswater, Ontario and surficial soil sampling and private well water quality programs.
Final Draft Report: Nuclear Waste Management Organization Adaptive Phased Management Project – Saugeen Ojibway Nation-South Bruce Area, Environmental Media Baseline Program – Year 1 Baseline Report	CanNorth, Geosyntec, SVCA (September 29, 2023)	This report outlines the collection of data from the SON-South Bruce area under the EMBP that started in September 2021 and was primarily completed by the SVCA. The report describes how during Year 1 of the program, data were collected on surface water quality and surface water flow (hydrology and drinking water program).

4. Peer Review Findings and Resolution

4.1 Comments on the Biosphere – Environmental Media Baseline Program

As previously discussed, the purpose of the EMBP is to characterize the baseline conditions of the biophysical environment and is focused on the environmental components that have the potential to be impacted by the Project. To date the EMBP work has been carried out on individual components as independent programs. The integration of the component work that has been completed into a draft characterization of baseline conditions is yet to be completed.

The PRT has provided the NWMO team in memorandum form, preliminary comments on the Biosphere – EMBP documents received and field activities observed during the November 2022 to October 2023 time period. As described, the preliminary comments were discussed with the NWMO prior to the NWMO providing documented responses. Where possible, the PRT provided final responses once edits were confirmed in the updated documents.

The PRT is of the understanding that a Year 2 Baseline Report will be prepared and provided for peer review. The Year 2 Report is expected to include the data and information generated from Year 2 component work into draft characterization of baseline conditions. In addition, the PRT understands that the NWMO will complete a program review that will be available for review as part of proceeding with Year 3 work.

Overall, the PRT is of the opinion that there should be a higher level of consistency in the detail provided in the workplans and reports. The quality of the component workplans and reports and the level of detail provided has not been consistent between the firms involved in executing the EMBP. The integrated characterization report should address the level of detail required for each component and sub-component to prepare a balanced CSM.

In addition, it would be valuable to understand how the baseline biophysical environment information will be integrated with the results of the biodiversity and geoscience programs currently being carried to build the comprehensive CSM for the DGR site setting.

Table 4.1 summarizes the key Peer Review general findings/observations. **Appendix B** provides the Peer Review memorandums issued during the EMBP up to September 30, 2023.

Table 4.1 Peer Review Memorandums issued throughout the Biosphere – Environmental Media Baseline Program Review

Document Title	Document Type Reviewed	Preliminary PR comments issued to the NWMO	General Findings / Observations
Sediment Sampling Observations (MEM-38)	Field Observations	November 15, 2022	Based on the PRT's field observations, the sediment sampling work plan was being adhered to and the field staff team were qualified for the work and have experience with sampling requirements. As part of the PRT's observations, the PRT noted that analytes (i.e., volatile organic compounds [VOCs], benzene, toluene, ethylbenzene, xylenes [BTEX], etc.) should be preserved in the field immediately after collection to mitigate exposure to oxygen and potential volatilization. The PRT also provided additional recommendations for inclusion into the work plan to maintain sample integrity.
Benthic Sampling Observations (MEM-37)	Field Observations	November 16, 2022	Based on the PRT's field observations, the field staff team were qualified for the work and have experience with sampling requirements. At the time of the field observations, it was the PRT's understanding that the NWMO were in the process of retaining a new provider for taxonomic identification. As such, the PRT recommended that once a taxonomic identification provider is selected, benthic sample processing and taxonomic procedures should be reviewed to ensure they are consistent with the work plan and the data quality objectives set within the work plan. The PRT noted that any changes made in the field regarding sampling protocols should be reflected in updates to the work plan.
South Bruce Conceptual Site Model and Screening Change Assessment (MEM-39)	Report	November 18, 2022	Based on completion of the peer review, the inputs presented in the Draft Report are found to support the working CSM for the biophysical environment that is being used to develop the baseline studies which will be used in the Impact Assessment (IA) if this site continues to the next stage. The Draft Report also supports the screening level change assessment by providing a high-level understanding of the potential implications from the project activities. It is recognized that data gaps remain as outlined in the report and all potential Project derived changes to the biophysical environment and the mitigations/controls for the contaminants of potential concern cannot be identified at the current time. As stated, the change assessment should be advanced if South Bruce is selected as the preferred location and the design of the site specific DGR is prepared. It is noted the Screening Level Change Assessment would benefit by including mitigation measures for the control of radiation as outlined in the NWMO's current Safety Assessment work.
South Bruce Environmental Media Baseline Program – Year 2 and Year 3 Surface Water Study Work Plan Rev. 0.2 – Peer Review Comments (MEM-53)	Work Plan	June 19, 2023	Based on the PRT's review, the Work Plan is comprehensive and provides a high level of detail to ensure methods and procedures can be replicated by different field staff and crews. The Work Plan may benefit from including Quality Assurance/ Quality Control (QA/QC) procedures for the flow monitoring portion of the program. At the time of the initial review of this work plan, the results of the Year 1 EMBP was not available and was difficult to fully review and comment on the approach and sufficiency of the Year 2 and Year 3 Study Work Plan. The PRT will complete additional review on the Year 2 and Year 3 Study Work Plan now that the review of the Year 1 reporting has been completed.

Document Title	Document Type Reviewed	Preliminary PR comments issued to the NWMO	General Findings / Observations
SVCA Channel Characterization and Bathymetric Surveys – Channel Characterization Survey Workplan – Peer Review Comments (MEM-54)	Work Plan	June 19, 2023	Based on the PRT's review, most of the methodology and field procedures for the channel characterization program will rely on and follow the Ontario Stream Assessment Protocol (OSAP). Therefore, the Work Plan does not include high level detail for all sections, however it does reference specific modules within OSAP that will be followed, as well as where and how the program will deviate from OSAP, and which modules will be excluded from the program with supporting rationale. It is recommended that the work plan reference the EMBP Year 2 and Year 3 Surface Water Work Plan for supplemental field and data management methodologies and procedures. Overall, the Work Plan provides sufficient detail to ensure quality data will be collected, assuming all OSAP modules and the EMBP are followed.
SVCA Channel Characterization and Bathymetric Surveys – Bathymetric Survey Workplan (Draft) – Peer Review Comments (MEM-55)	Work Plan	June 19, 2023	Based on the PRT's review, we found the Work Plan provides a sufficient level of detail to ensure quality data is collected to meet the objectives of the bathymetric survey program.
2022 Field Scope of Work, Private Well Water Sampling, Borehole Surface Water and Soil Sampling, and EMBP Soil Sampling – Peer Review Comments (MEM-56)	Work Plan	August 11, 2023	Overall, the PRT found the Work Plan to provide a sufficient level of detail to ensure quality data is collected as described for the three main components of the Work Plan (private well water sampling, borehole soil and surface water sampling, and EMBP soil sampling). The individual work tasks were described in detail, including field methods, equipment, decontamination, and field documentation. The PRT also provided suggestions that may augment the current Work Plan. The PRT was uncertain whether previous sampling following this Work Plan was completed given the dates listed for revision and final issue and was unaware of any sampling that was completed in Fall 2021 or Fall 2022.
Surface Water Sampling Observations (MEM-57)	Field Observations	August 18, 2023	Based on the PRT's field observations, the field staff team were qualified for the work and have experience with sampling. During the PRT's field observations, no duplicate samples were collected during the peer review process. As per the monitoring plan, duplicates are to be collected at a frequency of four per seasonal sampling campaign. No trip blank or field blank was submitted as part of the surface water sampling event, however SVCA did acknowledge that one trip blank and one field blank would be completed for the entire sampling season. As per the comment on the workplan (QA/QC), the PRT requested clarification regarding the collection and submission frequency of field and trip blanks, as this is not considered best practice. The PRT also provided additional recommendations based on our observations.
Private Well Water, Borehole Surface Water and Soil, Environmental Media Baseline Program Soil Sampling Observations (MEM-60)	Field Observations	September 10, 2023	Based on the PRT's field observations, the field staff team were qualified for the work, followed written procedures and all work was completed in general accordance with the work plan. During the field observations, a description of the procedures related to data collection and sample handling was provided. The PRT did not observe the borehole surface water and soil sampling procedures.

Document Title	Document Type Reviewed	Preliminary PR comments issued to the NWMO	General Findings / Observations
Environmental Media Baseline Program – Year 1 Baseline Report – Peer Review Comments (MEM-58)	Baseline Report	September 17, 2023	Based on the PRT's peer review, the results obtained for Year 1 for surface water, hydrology, drinking water, and general site characterization information presented in the Final Draft Report are found to support the overall objective of developing baseline conditions to support the development of the working CSM for the biophysical environment. The PRT provided comments to provide greater detail and clarity to the reader of this report. It is recommended that the Final Report be consistent in providing interpretation of the results, next steps of the program, and how the baseline biophysical environment information will be integrated with the results of the Geoscience Program to prepare an overall CSM for DGR site setting.

4.2 Municipality of South Bruce's Guiding Principles

The Municipality published a Project Visioning report based on community workshops held in December 2019 and January 2020 that identified areas of community concern and opportunities. Based on the Project Visioning report and further public consultation, MSB passed a Council resolution endorsing the 36 Guiding Principles that will guide their assessment of willingness to host the APM Project. In light of their importance to MSB, the principles have been individually linked to each of the studies as appropriate to ensure that they were fully considered or accounted for in completing the work (**Appendix C**).

The work plans for field execution, field observations, and technical data reports prepared by the NWMO, as it relates to the EMBP, informs two of the principles (Guiding Principles #2 and #7) of the 36 Guiding Principles established by MSB. **Table 4.2** lists MSB's Guiding Principles #2 and #7 and how it is considered in the EMBP documents.

Table 4.2 The MSB Guiding Principles associated with the Biosphere – Environmental Media Baseline Program

Principle # and Description	Consideration of the Principle in the EMBP
2. The NWMO must demonstrate to the satisfaction of the Municipality that sufficient measures will be in place to ensure the natural environment will be protected, including the community's precious waters, land and air, throughout the Project's lifespan of construction, operation and into the distant future.	The EMBP scope of work informs Guiding Principle #2 by collecting environmental data to focus on environmental effects and characterize environmental baseline conditions prior to the development of the Project. As a result, the potential effects of the major Projects stages (construction, operations, extended monitoring, decommissioning and post-closure) can be identified, understood and, as required, monitored in the future. The sampling program, to date, has focused on the collection of environmental data from surface water and hydrology, private drinking water well, and soil sampling. It is the PRT's understanding that future work related to atmospheric (air, noise and light) will also be conducted to support the development of the understanding of the baseline conditions to ensure that the natural environment will be protected. As this program is a multi-year program, it is the PRT's understanding that a program review will be completed by the NWMO to make modifications based on analysis of the data already collected and data needs. As a longer-term baseline program, a full program review will be completed after three years to statistically analyze the data for applicability to ensure the program will evolve to meet the future stages and needs of the Project.
7. The NWMO must commit to preparing construction management and operation plans that detail the measures the NWMO will implement to mitigate the impacts of construction and operation of the Project.	As outlined in above, the EMBP should consider Project impact and informs Guiding Principle #7 by identifying the characteristics of the regional environmental setting. The environmental media characteristics will be used to build the comprehensive CSM. The characteristics of environmental media will need to be assessed to confirm the mitigation measures that would be required and will feed into the site-specific detail design for the repository construction and operational mitigations. The environmental media data will also be used to understand the characteristics and sensitivities of environment in the vicinity of the DGR, to mitigate the potential for impacts and integrate with the appropriate management programs.

4.3 Conclusions of the Peer Review

As previously discussed, the purpose of the EMBP is to characterize the baseline conditions of the biophysical environment and is focused on the environmental components that have the potential to be impacted by the Project. The multi-year EMBP and associated documents currently provides the community with a good description of the scope of work undertaken in Year 1 and Year 2 of the program to characterize the environmental baseline conditions prior to the development of the Project. To date, the EMBP work has been carried out on individual components as independent programs. The integration of the component work that has been completed into a draft characterization of baseline conditions is yet to be done.

The work to be carried out in Year 3 of the program is yet to be finalized and communicated. The PRT understands that the NWMO will undertake a program review and provide a Program Review Report to the PRT for peer review. The Program Review will assess the Year 1 and Year 2 EMBP data and potentially make recommendations to adjust the program's design and implementation plans.

It is the PRT's current understanding that the EMBP will continue with additional data collection related to surface water, hydrology, and drinking water. Data collection for air quality, noise, and light is expected to begin in 2024, along with tissues sampling.

The PRT will continue to work collaboratively with the NWMO and their consultants to review work plans for the air quality, noise, and light and tissues sampling, as they come available, and will also conduct field observations related to these activities. It is the view of the PRT that the EMBP and the associated documents are technical in nature and demonstrate progress in satisfying Guiding Principle #2 based on the factual data collected to date. It is too early in the program to demonstrate progress in satisfying Guiding Principle #7 as site specific designs for the construction and operation of the DGR have not been developed. As this is a multi-year program, the PRT will review of the additional data that will be collected to ensure that the characterization of the environmental baseline is complete to make informed decisions and to assess the changes resulting from or associated with the Project.

Should the MSB be selected as the host community, it is the PRT's understanding that the NWMO will carry out further studies once the site-specific conceptual design has been prepared to further assess and describe the potential effects on the environment.

5. References

Nuclear Waste Management Organization (NWMO). 2010. Moving Forward Together: Process for Selecting a Site for Canada's Deep Geological Repository for Used Nuclear Fuel. May 2010.

Appendices

Appendix A

Peer Review Protocol

South Bruce Consultants Peer Review Protocol

Protocol for Peer Review Process

1. The scope of the peer review is variable for each NWMO study (Study). The scope and objective of each Study is variable. The Study may include development of information, data and documents in the form of a:
   - Statement of Work
   - Work plan
   - Baseline conditions
   - Modeling/prediction/forecast of future conditions
   - An assessment of impact/benefits

   Not all NWMO studies will include each of the above listed elements. While a collaborative peer review approach is to be used, it is important to maintain independence during the peer review process.
2. Develop an initial understanding of NWMO inputs to conducting the Study including timing, availability and sources of information.
3. Meet with NWMO and their consultants to
   - compile a list of information/documents that will need to be reviewed as part of the Peer Review
   - compile a list of parties/agencies providing information for use in preparing the Study
   - identify additional information/sources that may be pertinent to the Study
4. Undertake an initial review of the information/documents assembled and developed for the Study
   - Peer review of the SoW will include information and data pertaining to some or all of the following elements:
     i.) Statement of Work (SoW)
     ii.) Work plan
     iii.) Baseline conditions
   - Provide questions/comments to NWMO on the available information/documents and ensure they have been adequately addressed with the community in mind.
5. Conduct peer review of the Study findings as they are developed which may include the following:
   i.) Project design(s)
   ii.) Modeling of future conditions
   iii.) Impact assessment approach
   iv.) Impact assessment findings
   v.) Analysis of reliability
   - If warranted, work with NWMO and their consultants to conduct a site visit
6. Meet with NWMO and their consultants to:
   - Seek clarifications of the information/documents reviewed
   - Ensure a full understanding of the assessment approach and findings
   - Present the preliminary peer review findings (concurrences and concerns)

- Provide questions/comments and peer review findings and ensure they have been adequately addressed with the community in mind.

7. Review NWMO draft reports
   - Complete a detailed review of the draft reports
   - Identify omissions and/or inconsistencies if they occur with SOW and Work Plan
8. Prepare draft Peer Review Report for submission to South Bruce for comments.
   - Include a summary of peer review observations, findings, and comments
9. South Bruce will review with RedBrick for communications to public
10. Finalize and present the Peer Review Report to South Bruce and NWMO
11. Each consultant will need to provide a presentation of the findings of the peer reviews to the CLC.

Table of Contents for Peer Review Report

1. Introduction
   a. State the purpose of the Peer Review Report (Report)
   b. Provide capsule summary of the proposed Project
   c. Identify the NWMO Study that is being peer reviewed
   d. Identify the NWMO Statement of Work for completing the Study (i.e., SOW from EOI or update)
   e. Identity participants involved in conducting the Study
   f. Identify the time period the Study work and Peer Review was carried out
2. Peer Review Objectives and Process
   a. State objectives for conducting the Peer Review which include
      i. To provide the community of SB with independent review by qualified subject matter experts
      ii. To complete a peer review of the NWMO Assessment of potential impacts and proposed benefits in comparison to existing conditions
      iii. To review how the potential impacts and proposed benefits adhere to the 36 principles that will guide the assessment of willingness to host the Project.
   b. Describe the Peer Review Process Undertaken
      i. Describe the Peer Review process that was carried out.
      ii. List activities completed (e.g., site visits, work plan review, data review, report review, meetings, etc.)
3. Documentation and Information Reviewed
   a. List NWMO study specific information reviewed which may include:
      i. Scope of work
      ii. Detailed work plan
      iii. Baseline Conditions
      iv. Assessment Approach
      v. Assessment Findings
   b. List parties/agencies involved in providing information into the study
   c. List all documents/meetings/data/additional information and include a short summary of each

4. Peer Review Findings and Resolution
   a. Baseline Conditions Report (concurrences and concerns and resolution)

b. Impact Assessment (IA) Report
    i. IA approach (concurrences and concerns and resolution)
    ii. IA findings (concurrences and concerns and resolution)
c. Conclusions of peer review
d. Adherence to the 36 principles which are pertinent to the study

5. Summary

Appendix B

Peer Review Comment Memorandums

Technical Memorandum

15 November 2022

To	Dave Rushton/Catherine Simpson, Municipality of South Bruce		
Copy to			
From	J-P Fleras/Jennifer Son	**Tel**	+1 519 884 0510
Subject	Sediment Sampling Observations	**Project No.**	11224152-MEM-38

1. Introduction

Guided by a Nuclear Waste Management Organization (NWMO) staff member, a GHD Limited (GHD) technician joined staff from Saugeen Valley Conservation Authority (SVCA) on November 2, 2022, to observe field data collection protocols for sediment sampling. The workplan for the activities observed was provided to GHD for review prior to the site visit.

2. Sediment Sampling Observations

Field activities were initiated with completion of a tailgate safety meeting for all parties present. Appropriate personal protection equipment (PPE) and safety equipment was present and appeared to be in good working order. Sampling equipment appeared clean and to be in good working order. Staff from SVCA were knowledgeable and experienced and were prepared to answer questions posed by GHD.

SVCA sediment sampling activities were observed by GHD at the Teeswater River 3 (TWR_03) sampling locations:

– SB_SW_TWR_03_R1
– SB_SW_TWR_03_R2
– SB_SW_TWR_03_R3
– SB_SW_TWR_03_R4
– SB_SW_TWR_03_R5

It is noted that the five sampling stations were considered by NWMO and SVCA replicate locations. A surface water sample collected at SB_SW_TWR_03_R1 was also observed by GHD.

– Sediment samples were collected from downstream to upstream; depositional areas were identified along the banks and were chosen by SVCA based on:
    - The presence of sediment,
    - Comparable habitat to exposure sites, and

    - Stations spaced approximately three bank full widths apart (~60 metres)
- Field data was recorded using a digital form. Field staff verbally repeated all measurements to avoid transcription errors. QA/QC procedures for submission of field forms and progress updates were described/demonstrated for GHD.
- At each sampling station, sediment was collected using a petite ponar and care was taken to sample from downstream to upstream at each sampling station. Decanted sample material was removed from the petite ponar using a stainless-steel spoon and placed in pre-labelled Ziploc bags. Woody debris, vegetation, and rock was removed from the sample. Several petite ponar grabs were required at each sampling station to collect the necessary volume of sediment for lab analysis.
- Excess material was discarded once sufficient sediment material had been collected.
- After being placed in a Ziploc bag, sediment was stored in a cooler on ice to be processed further and placed in laboratory jars at the office/warehouse. GHD understands from SVCA that the sediment is jarred at the office/warehouse because access to the riverbanks was unavailable (due to private property) and a suitable workspace to process the material was not present at each location.
- SVCA staff advised that the sample material would be further processed in the office/warehouse where woody/vegetation/rock debris would be removed, and the sample would be homogenized. Following homogenization, the sediment would be placed in laboratory-supplied jars. The sediment was homogenized prior to preserving/containerizing volatile analytes, up to several hours after sample collection in the river.
- The petite ponar was rinsed with river water between petite ponar grabs at each sampling station. As NWMO and SVCA staff considered each sampling station at Teeswater River 3 a replicate, sampling equipment was rinsed three times between sampling locations. Equipment was not decontaminated with a phosphate-free soap or rinsed with deionized water between sampling station replicates.
- Based on discussion with SVCA staff, the sediment samples are relinquished to the laboratory per the workplan schedule.

3. Summary Comments

The following comments are provided based on sediment sampling observations:

- Field staff team members are qualified for the work and have experience with sampling. Field crew members had a good level of confidence and familiarity with the field forms and data collection and sampling procedures in general.
- Field staff were able to identify depositional areas along the river base on the criteria noted above. A GPS was used to document location and confirm distance between sampling stations.
- Samples collected for volatile analytes (i.e., VOCs, BTEX, PHC F1) should be preserved in the field, immediately after sample collection to mitigate exposure to oxygen and potential volatilization. Allowing the sediment to remain in a Ziploc bag for several hours until the sample is processed is not a preferred method when analyzing for presence trace level volatile analytes.
- Samples collected for volatile analytes should be placed in jars/vials prior to homogenization to mitigate volatilization.
- Sampling equipment should be decontaminated with phosphate-free soap and deionized water between stations. The sample stations along the river should be considered as unique sampling stations rather than replicates. Equipment should be decontaminated to avoid cross-contamination between sampling stations at each sampling location.

In summary, SVCA were accommodating to GHD's field observations. While the workplan was being adhered to, the above-mentioned recommendations should be incorporated into the workplan to maintain sample integrity.

Technical Memorandum

16 November 2022

To	Dave Rushton/Catherine Simpson, Municipality of South Bruce		
Copy to			
From	Robyn Leppington/Laura Lawlor/Jennifer Son	**Tel**	+1 519 884 0510
Subject	Benthic Sampling Observations	**Project No.**	11224152-MEM-37

1. Introduction

Guided by a Nuclear Waste Management Organization (NWMO) staff member, a GHD Limited (GHD) ecologist joined staff from Saugeen Valley Conservation Authority (SVCA) on November 3, 2022, to observe field data collection protocols for benthic macroinvertebrate sample collection.

The workplans for the activities observed were provided to the GHD ecologist prior to the site visit. However, it is understood that NWMO, CanNorth, and SVCA updated sampling locations based on pre-field meetings/site visits that they had prior to benthic sampling execution to ensure sampling sites were located within erosional habitats within watercourses that have comparable habitat characteristics (e.g., depth, flow, and substrate composition).

2. Benthic Sampling Observations

Field activities were initiated with completion of a tailgate safety meeting for all parties present. Appropriate personal protection equipment (PPE) and safety equipment was present and appeared to be in good-working order. Sampling equipment appeared clean and to be in good working order. Staff from SVCA were knowledgeable and experienced and were prepared to answer questions posed by GHD.

SVCA benthic sampling activities were observed by GHD at the Teeswater River 3 (TWR_03) sampling locations:

– SB_SW_TWR_03_R1
– SB_SW_TWR_03_R2
– SB_SW_TWR_03_R3
– SB_SW_TWR_03_R4
– SB_SW_TWR_03_R5

It is noted that the five sampling stations were considered by NWMO and SVCA to be replicate locations. GHD's field observations were made only of SVCA executing the erosional benthic sample collection activities.

A flow measurement was also collected at the SB_SW_TWR_03_R1 and SB_SW_TWR_03_R5 replication stations.

It is noted, that based on the benthic standard operating procedure (SOP) for erosional habitats (or river/creek habitats) (Appendix A2 of provided work plan), that at each sampling location (i.e., TWR_03) five (5) replicate stations are to be established 3 to 6 bankfull widths apart, and each replicate station is to consist of three field (3) sub-samples. The SOP and workplan are consistent with the 2012 *Metal Mining Technical Guidance for Environmental Effects Monitoring* by Environment Canada and is an accepted protocol to follow to establish a BACI (Before-After-Impact-Control) sampling program.

Summary of field observations:

- Benthic samples were collected from downstream to upstream at the predetermined replicate station locations established from the previous day's sediment sampling event. SVCA used a GPS to confirm replicate station locations. Replicate stations were approximately three bankfull widths apart (~60 meters).
- Field data was recorded using hard copy forms. Field staff verbally repeated all measurements to avoid transcription errors. QA/QC procedures for submission of field forms and progress updates were described/demonstrated for GHD.
- At each replicate station, three sub-samples were collected with use of a net. Each sub-sample was approximately 10 meters in length and was sampled for a 3-minute sampling period. Once all three sub-samples were collected the sample was transferred to sampling jars.
- SVCA was careful during the transfer process from the net to ensure the entire sample was emptied into the sample jar(s). SCVA also checked seams and folds of the net for any hidden specimens and cleaned and removed any freshly fallen leaves that were not benthic invertebrate habitat. SVCA also ensured the sample volume was spread evenly over two to three jars so that there was sufficient room left in the sample jar(s) for preservative.
- After being placed in a sample jar(s), benthic samples were stored in a cooler and preserved at the office/warehouse. GHD understands from SVCA that the benthic samples are preserved with a 10% formalin solution at the office/warehouse because access to the banks is unavailable and a suitable workspace for this process was not present in the field.
- SVCA staff advised the preserved benthic samples will be stored at room temperature and will be stored in the office/warehouse until the end of the 2022 benthic sampling program, when they will be relinquished to NWMO. NWMO is responsible for coordinating the sample delivery to the laboratory for taxonomic identification. GHD understands taxonomic identification will be done to the lowest practical level.
- NWMO representative advised that they are in the process of retaining a new provider for taxonomic identification for the program.
- When GHD requested, SVCA walked through the procedure for a depositional (or lake) habitat for how the balance of the benthic field data has been collected. SVCA's description was the same as the protocol outlined in the work plan. GHD has not observed lake, wetland or eDNA benthic sampling.
- NWMO and SVCA mentioned that wetlands are planned for sampling in 2023. NWMO noted that when sites are determined, the work plan will be updated with the SOP and field data sheets once they are developed.

3. Summary Comments

The following comments are provided based on benthic sampling observations:

- Staff from both NWMO and SCVA were accommodating to the field review conducted by GHD and willingly answered questions.

- Field staff team members are qualified for the work and have experience with sampling. Field crew members had a good level of confidence and familiarity with the field forms and data collection and sampling procedures in general.
- Field staff were able to identify replicate stations along the river to ensure benthic samples were co-located with sediment sampling. A GPS was used to confirm distance between replicate stations.
- Once a taxonomic identification provider is selected, benthic sample processing and taxonomic procedures should be reviewed to ensure they are consistent with the work plan and the data quality objectives set within the work plan (i.e., taxonomists the follow the QA/QC requirements outlined in the 2012 *Metal Mining Technical Guidance for Environmental Effects Monitoring* document by Environment Canada as specified in the work plan). If benthic samples for the 2022 sampling season were sent to the original taxonomist, the new taxonomist provider should have similar benthic sample process and taxonomic identification procedures to ensure consistency.

In summary, SVCA were accommodating to GHD's field observations. If there were changes made in the field regarding the workplan, the workplan should be updated. GHD requests the opportunity to observe wetland habitat benthic sample collection in 2023.

Memorandum

18 November 2022 – updated 10 August, 2023

To	Dave Rushton/Steven Travale, Municipality of South Bruce		
Copy to	Michelle Nearing/Katie Langdon, NWMO		
From	Greg Ferraro and Jennifer Son/AD/mma	**Tel**	+1 519 884 0510
Subject	South Bruce Conceptual Site Model and Screening Change Assessment – Subject Matter Expert Comments	**Project no.**	11224152-MEM-39

1. Introduction

This memo provides the Municipality of South Bruce (South Bruce) peer review team's (PRT's) comments on the Biophysical Conceptual Site Model (CSM) and Screening Change Assessment Draft Report (Draft Report) prepared by Canada North Environmental Services (CanNorth), Geosyntec Consultants International, Inc. (Geosyntec), Independent Environmental Consultants (IEC) and Zajdlik & Associates Inc. (Zajdlik; November 2022; revised April 2023) for your consideration and internal circulation as per the South Bruce Nuclear Exploration Project joint study review flow process. In addition, the memo will be submitted to the Nuclear Waste Management Organization (NWMO) and their consultants (CanNorth, Geosyntec, IEC, and Zajdlik) by GHD Limited (GHD) as per the peer review protocol process.

2. Peer review approach

The peer review of the Draft Report was carried out by GHD (Subject Matter Experts [SMEs] and GHD Lead Consultant). The peer review process was completed in alignment with the peer review protocol that was developed to support a collaborative approach between NWMO and South Bruce while maintaining independence during the process. In accordance with the peer review protocol process, the PRT reviewed the Draft Report having the following questions in mind:

– Are there any significant concerns, issues, and/or omissions with the Draft Report?
– What are our initial observations/impressions on the Draft Report?
– Does the Draft Report reflect the most current information available?

3. Peer review comments

As stated above, the comment disposition table (**Table 1**) lists our initial comments on the Draft Report. NWMO and their consultants provided responses to these comments and addressed each comment where appropriate as part of finalizing the report. Based on completion of the peer review, the inputs presented in the Draft Report

are found to support the working CSM for the biophysical environment that is being used to develop the baseline studies which will be used in the Impact Assessment (IA) if this site continues to the next stage. The Draft Report also supports the screening level change assessment by providing a high-level understanding of the potential implications to environmental receptors from the project activities.

It is recognized that data gaps remain as outlined in the report and all potential Project derived changes to the biophysical environment and the mitigations/controls for the contaminates of potential concern cannot be identified at the current time. As stated, the change assessment should be advanced if South Bruce is selected as the preferred location and the design of the site specific Deep Geological Repository (DGR) is prepared. It is noted the Screening Level Change Assessment would benefit by including mitigation measures for the control of radiation as outlined in the NWMO's current Safety Assessment work.

Table 1 Comment Disposition Table

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
1	General	Leadership (GF)	The definition of the spatial boundaries are fairly vague.	The discussion of spatial boundaries was revised. They are still somewhat vague but are appropriate for this level of document. It is expected that clearer definitions of LSA and RSAs will be provided in subsequent documents.	Comment satisfactorily addressed.
2	General	Leadership (GF)	Discussion of predicting potential releases rather than indicating the project design will be prepared to minimize any risk of potential releases.	It is unclear to us what is meant by this comment, so no changes have been made.	The report seems to take the view that that releases will occur that can affect wildlife and humans(i.e., Section 4.0) and changes to the environment beyond the Project footprint are expected. Current report does state interactions table provides a high level description of the design features and/or mitigation measures that will limit or block these potential interactions This occurs to some extent in Section 5.
3	Exec. Summ. Introduction (pg. ii)	Leadership (GF)	The peer review team thought the focus of this document was to identify potential Project effects to existing conditions, not to address community concerns.	The purpose of the document was restated. It was to identify Potential effects with the intent to provide this information to the community.	Comment satisfactorily addressed.
4	Exec. Summ. Introduction (pg. iv)	HydroG (AM/BT)	Description of the environment and non-living things needs to include bedrock.	Revised.	Comment satisfactorily addressed.
5	Exec. Summ. Conceptual Site Model (pg. v, para. 2)	Leadership (GF)	There is a better descriptor of Land Use in the socio-economic Land Use (S15) Study Report, Section 3. Should define the spatial boundaries for the area of interest (AOI).	Thank-you for pointing us to this document. We reviewed it but found that it focussed more on land use planning and regulations. Some information was added to the Change Assessment, but large scale changes to the land use section to account for this report were not made.	Noted, comment was made concerning description of existing land uses surrounding the Project site.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
6	Exec. Summ. Conceptual Site Model (pg. v, para 4)	Leadership (GF)	What does “the area” mean? What does “the region” mean?	We have removed details around LSA and RSA to avoid confusion. The precise definition of the region and area is not applicable at this point in the process.	Comment satisfactorily addressed.
7	Exec. Summ. Conceptual Site Model (pg. vi, para. 7)	Leadership (GF)	What is “the South Bruce region”?	We have revised the text to remove South Bruce region.	Comment satisfactorily addressed.
8	Exec. Summ. Conceptual Site Model (pg. vi)	HydroG (AM/BT)	The description of glaciofluvial deposits being used as a drinking water resource should be expanded upon. Many of the supply wells in the area are completed in shallow bedrock. This paragraph implies the wells are overburden.	The commented discussion has been revised for clarity.	Comment satisfactorily addressed.
9	Exec. Summ. Protect and Enhance the Natural Environment and Table 4-2	Aquatics (LL)	Consider including ‘Noise’ in the Fish/fish habitat image under ‘Protect and enhance the natural environment’, and carry through in Section 4-2.	Revised.	Comment satisfactorily addressed.
10	Exec. Summ. Community Concerns: Drinking Water (pg. vii, para. 3)	Leadership (GF)	Does a groundwater model currently exist?	This is under development.	Noted.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
11	Exec. Summ. Community Concerns: Protect the rivers and Greenock Swamp Wetland Complex (pg. ix, para. 2)	Aquatics (LL)	Under second paragraph of 'Protect the rivers and Greenock Swamp Complex Wetland' inclusion that drawdown can also occur when grading is changed or surface water is diverted.	Revised.	Comment satisfactorily addressed.
12	Exec. Summ. Community Concerns: Protect the rivers and Greenock Swamp Wetland Complex (pg. ix, para. 4)	Leadership (GF)	A project specific monitoring program will be designed and implemented prior to…? Maybe indicate that a monitoring program will be designed with a full understanding of the receiving environment per the baseline work.	Text was revised to discuss the monitoring program.	Comment satisfactorily addressed.
13	Exec. Summ. Air Noise and Light (pg. x, para. 3)	Leadership (GF)	Address noise controls for heavy equipment, blasting, and construction hours. What about vibration impacts to immediate adjacent neighbours?	Text has been revised for clarity.	Comment satisfactorily addressed.
14	Exec. Summ. Rock Pile (pg. xi, para. 2)	Leadership (GF)	"Testing will be done to estimate how much of the metals/minerals could be released…" through surface water run-off?	Text has been revised for clarity.	Comment satisfactorily addressed.
15	Exec. Summ. Rock Pile (pg. xi, para. 2)	Leadership (GF)	"…appropriate guidelines…" the term "applicable regulations" has been used previously when discussing monitoring programs.	Text has been revised for clarity.	Note that "Appropriate guidelines" is still being used in the Executive Summary.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
16	Figure 3-5	HydroG (AM/BT)	General comment, is the LSA based on drainage areas to the various streams/rivers and/or topographic and hydrologic divides? If so, is this described? It appears that way on the west, but not so on the east. Perhaps the SSA, LSA, RSA need to be fully defined up front.	Text has been revised to remove LSA (and SSA and RSA) references. The area of interest is what is shown on the figures and this was developed by NWMO to reflect an area to focus the early studies in and is based in part on the watershed boundary.	Comment satisfactorily addressed. GHD notes figures have been renumbered.
17	Figure 3-6 (pg. 27)	HydroG (AM/BT)	General comments on the cross-section: the figure labels are difficult to read. Might consider reorganizing the figure to enlarge the text labels. Perhaps replace the cross-section with a stratigraphic column drawn to scale for unit thicknesses, and perhaps add if the water is potable, non-potable, brine, etc. May want to include a more detailed description on the sources of data used to create Figure 3-6. Labels for the Lucas, Amherstburg, and Bois Blanc Formations would be good additions.	This figure will be revised in the next version of the report and these comments will be addressed in the revised figure.	Comment satisfactorily addressed, assuming figure is revised appropriately.
18	Section 3.1.2 (para. 4)	HydroG (AM/BT)	Range of depths and yields is fine, but perhaps a median or mean would provide additional details, especially if the min or max values are vastly different than the median and/or mean values.	Noted.	Noted, but not addressed.
19	Section 3.1.2 (para. 5, last sentence)	HydroG (AM/BT)	“There are also five monitoring wells identified in the WWIS (MECP 2020)”. It’s unclear which five monitoring wells you’re referring to. Are these in addition to the 9 wells?	Text has been modified to clarify,	Comment satisfactorily addressed.
20	Section 3.1.2 (para. 6)	HydroG (AM/BT)	What are the depths/depths below top of bedrock of the supply wells in two supply wells located in Teeswater and Mildmay? Please add.	Text has been modified to reflect screened and cased intervals of the wells.	Comment satisfactorily addressed.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
21	Section 3.1.2 (para. 8)	HydroG (AM/BT)	The report notes that the groundwater flow from east to west is similar to surface water flow trending west-northwest. I think this is meant to be similar in that both flow towards Lake Huron. It's a little unclear.	Text has been clarified.	Comment satisfactorily addressed.
22	Section 3.1.2 (para. 9)	HydroG (AM/BT)	You've introduced the Sherman Falls and Kirkfield Formations. It would be good to see them on cross-section or stratigraphic column (if possible).	Figure will be updated in next version of report.	Comment satisfactorily addressed., assuming figure is revised appropriately.
23	Section 3.1.2 (pg. 29)	HydroG (AM/BT)	The discussion of regional groundwater flow followed by lowest hydraulic conductivity layers followed by porosity and anisotropy/chemistry seems disjointed and out of order. Perhaps a better description of the geology/stratigraphy, followed by a description of the potable water units, the non-potable/brine water units, and the description of the aquitards/aquicludes separating the potable water units from the deep non-potable water units would make more sense.	Text has been revised.	Comment partially addressed. Suggested revision to better incorporate stratigraphy and hydrostratigraphy, which will define potable water aquifers, aquitard and aquiclude layers, and the deep brine aquifer was not included. Describing these items in this style leads to the description of the probable lack of hydraulic connection between the deep brine aquifer and the shallow potable water aquifer. This is a key concept regarding protecting the potable water aquifer.
24	Section 3.1.3 Soil	HydroG (AM/BT)	I am unclear why Paleozoic bedrock is grouped with soil. Soil is typically considered the upper less than 1 m of the overburden. The overburden is the relatively unweathered deposits overlying bedrock. I suggest splitting the soil, overburden, and bedrock apart in the discussions.	Section name has been revised to include overburden and bedrock.	Comment satisfactorily addressed.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
25	Section 3.1.3 Soil	HydroG (AM/BT)	The Amherstburg Formation is oil-bearing in some areas. If the statement "not oil-bearing in the AOI) refers to the lack of found/developed oil deposits, that does not preclude the presence of naturally occurring hydrocarbons in the bedrock.	Text has been revised for clarity.	The terminology of "oil-bearing bioclastic limestone (although not found to date to be oil-bearing in the AOI) does not clarify the description. This implies that the Amherstburg is always oil-bearing, except where not seen to be oil-bearing in the AOI. Oil-bearing and found/developed oil deposits are very different scenarios.
26	Section 3.1.3 Soil	HydroG (AM/BT)	Why is LSA-soil and RSA-soil defined at the very end of the section? Out of place. See previous comment about defining these up front.	This was removed.	Comment satisfactorily addressed.
27	Section 3.1.5	Species at Risk (LL)	It is unusual that monarch butterfly (*Danaus plexippus*), an Ontario special concern species, is not listed in the SAR NHIC records for the area. Consider revisiting the source.	This was removed and reference to the Biodiversity study included to minimize the potential for inconsistent information.	Comment satisfactorily addressed.
28	Section 3.1.5.1, Figure 3-7	Species at Risk (LL)	By including only the globally-ranked SAR in a figure, it introduces a biased perspective that other SAR (e.g. provincial SAR) are not located in or around the AOI, which is not the case based on the preceding section. For clarity of the reader, consider modifying Figure 3.7 to include the provincial information or remove the figure entirely.	This was removed and reference to the Biodiversity study included to minimize the potential for inconsistent information.	Comment satisfactorily addressed.
29	Section 3.1.5.2	Env Effects (Rad) (IC)	Please confirm if the mentioned Human Health and Ecological Risk Assessment (HHERA) work will evaluate potential human and ecological health risks due to all COPCs, including radionuclides as well as chemicals.	Yes the risk assessment would include all relevant COPC (radionuclides, metals, etc.)	Comment satisfactorily addressed.
30	Section 3.2 Land Use	HydroG (AM/BT)	General comment – should Land Use be up front before defining stratigraphy and detailed biodiversity? Also, consider elevating COPCs to a separate section or subsection rather than after land use.	Thanks for the suggestion, this is a valid point, but due to the mapping the document had a better flow without moving the section, so no change was made. COPC is in a separate section.	Comment satisfactorily addressed.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
31	Section 3.3	Leadership (GF)	Description of list of contaminants of potential concern is confusing and unclear with respect to sources of contaminants from existing land uses versus project design.	The selection of COPC includes factors such as general environmental characterization (e.g., water hardness), releases from the Project, cumulative effects and community concerns. The text was simplified for this report, a more detailed explanation of the selection of COPC is provided as part of the EMBD.	Comment partially addressed. Further detailed description of potential to be present and for release beyond Project footprint would be beneficial to communicate level of risk/concern. Reader must refer to section 5 to see how a certain COPC may be controlled, if addressed.
32	Section 4.0 and 5.0	HydroG (AM/BT)	There is little discussion on the long-term, post-closure (scale of 100's of years) risks to groundwater and soil quality (this would also apply to surface water and ecology). The assumption is that the monitoring will be completed up to 70 years; however, this seems insufficient given the need for isolation up to several hundred years for intermediate radioactive wastes. Is the intent to cover these risks and mitigation measures in the preliminary decommissioning plan?	This is for NWMO to address.	Noted. However, a mention describing long-term monitoring would provide context for this CSM.
33	Section 4.0	Surface Water (SA)	In Table 4-1, is meteorology (i.e., precipitation, air temperature, etc.) included under the "air" component under "atmospheric environment". Monitoring of meteorology will be applicable to other components, such as surface water, during all phases of the project.	Meteorology has been added to the table (including acknowledgement that it would be applicable to other components).	Comment satisfactorily addressed.
34	Table 4-1	Aquatics (LL)	Clarify if wetlands will also be evaluated as a component of Wildlife Habitat in addition to Surface Water.	Yes this will include wetlands, this was clarified in the table.	Comment satisfactorily addressed.
35	Section 4.7	Aquatics (LL)	Consider including that if the Project cannot avoid disturbing aquatic habitat, the Project activities have the potential to result in the loss of physical or quality available aquatic habitat.	Noted. Text has been updated to reflect the suggested edit.	Comment satisfactorily addressed.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
36	Table 4-2 Altered Site Drainage	HydroG (AM/BT)	Stormwater management ponds may result in changes to Soil if you consider the construction of the ponds.	Soil has been added to this item in Table 4-2.	Comment satisfactorily addressed.
37	Table 4-2 – Altered Site Drainage and Surface Facilities sections	Aquatics (LL)	Consider including 'Fish and Fish Habitat' as a study component that stormwater management ponds and surface water quality will interact with.	Revised.	Comment satisfactorily addressed.
38	Table 4-2	Water Quality (AB)	Has any consideration been given to the potential impacts from winter maintenance (i.e., use of road salts)?	Good suggestion, this was added as a line item to the vehicle traffic table.	Comment satisfactorily addressed.
39	Table 4-2	Water Quality (AB)	The use of stormwater ponds has the potential to increase the water temperature which could have an impact on cold water habitat.	Text has been revised to reflect temperature.	Comment satisfactorily addressed.
40	Figure 5-1	Aquatics and Species at Risk (LL)	Consider changing the label of 'No Regulatory Considerations' to reflect the land development zones without excluding SAR regulatory considerations.	Figure has been removed to avoid inconsistencies with Zoetica report and figures.	Comment satisfactorily addressed.
41	Section 5.1 (pg. 73)	Species at Risk (LL)	Consider revising the environmentally sensitive periods noted to reflect the local recommendations to remain compliant with the Migratory Bird Convention Act (i.e., bird nesting extends beyond mid-May through mid-July).	Text has been revised to be less specific to avoid inconsistencies with Zoetica report.	Comment satisfactorily addressed.
42	Section 5.5	Water Quality (AB)	Consideration for temperature mitigation from SWMP should be discussed.	Text has been revised to reflect temperature.	Comment satisfactorily addressed.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
43	Section 5.6	HydroG (AM/BT)	Concrete batch plant and other aggregate needs – can dolostone of the ERMA be segregated for aggregate re-use? Although ARD is discussed, the more likely scenario is relatively high concentrations of natural salts leaching from the ERMA.	Consideration of the beneficial reuse of the ERMA is being discussed.	Comment satisfactorily addressed. However, we note that the section still only describes acidic drainage and metal leaching. Natural salts are also a concern given the natural brines existing at depth, and the impact of natural salts from excavated bedrock shales and shaley dolostones such as has occurred in the Niagara Region.
44	Section 5.8	HydroG (AM/BT)	Mitigation measures should speak to treatment of water taken from each zone or refer to Section 5.9.	This section was revised to be more general, more information is required.	Comment satisfactorily addressed.
45	Section 6.1	Surface Water (SA)	In Table 6-1, under “Data Requirement – Environmental Baseline Data”, should add surface water “quantity” under the “notes/details” section.	Noted. Text has been updated to reflect suggested edit.	Comment satisfactorily addressed.
46	Table 6-1, Page 90	Aquatics and Species at Risk (LL)	Consider including biological information in the ‘Environmental Baseline Data’ line item (wildlife, fish and their habitats).	Noted. Text has been updated to reflect suggested edit with additional breakout of Environmental Media Baseline and Biodiversity Baseline data requirements.	Comment satisfactorily addressed.

Memorandum

July 19, 2023 – updated August 18, 2023

To	Dave Rushton/Steven Travale, Municipality of South Bruce		
Copy to	Michelle Nearing/Katie Langdon, NWMO		
From	Sarah Andrew, Andrew Betts, Laura Lawlor, Jennifer Son and Greg Ferraro/AD/mma	**Tel**	+1 519 884 0510
Subject	South Bruce Environmental Media Baseline Program – Year 2 and Year 3 Surface Water Study Work Plan Rev. 0.2 – Peer Review Comments	**Project no.**	11224152-MEM-53

1. Introduction

This memo provides the Municipality of South Bruce (South Bruce) peer review team's (PRT's) comments on the *South Bruce Environmental Media Baseline Program – Year 2 and Year 3 Surface Water Study Work Plan (Rev. 0.2)* prepared by Saugeen Valley Conservation Authority (SVCA; January 3, 2023) herein referred to as the Work Plan. The comments are provided for South Bruce's consideration and internal circulation as per the South Bruce Nuclear Exploration Project joint study review flow process. This memo will also be submitted to the Nuclear Waste Management Organization (NWMO) and their consultants (SVCA) by GHD Limited (GHD) for consideration in implementing the Work Plan as per the peer review protocol process.

2. Peer review approach

The PRT's review of the Work Plan was carried out by GHD (Subject Matter Experts [SME] and Lead Consultant). The peer review process was completed in alignment with the peer review protocol that was developed to support a collaborative approach between NWMO and South Bruce while maintaining independence during the process.

The PRT reviewed the Work Plan having the following questions in mind:

– Are there any significant concerns, issues, and/or omissions with the Work Plan?
– What are our initial observations/impressions on the Work Plan?
– Does the Work Plan reflect the most current information available?

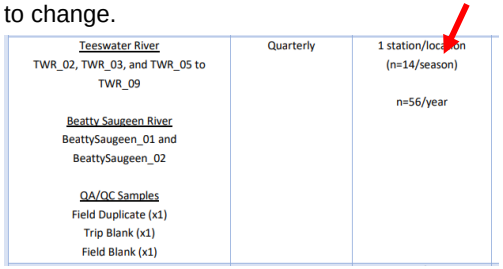
3. Peer review comments

The comment disposition table (**Table 1**) lists the PRT's combined comments on the Work Plan. The expectation established in the peer review protocol is that NWMO and their consultants will provide responses to **Table 1** comments following its receipt which may lead to amendments or additions to the Work Plan.

Overall, the Work Plan is comprehensive and provides a high level of detail to ensure methods and procedures can be replicated by different field staff and crews. The Work Plan may benefit from including QA/QC procedures for the flow monitoring portion of the program. Without opportunity to complete a detailed review of the Year 1 Study results, it is difficult to fully review and comment on the approach and sufficiency of the Year 2 and Year 3 Study Work Plan. Additional peer review comments on the Year 2 and Year 3 Study Work Plan may become evident upon review of the Year 1 reporting.

Table 1 Peer Review Comments - South Bruce Environmental Media Baseline Program – Year 2 and Year 3 Surface Water Study Work Plan (Rev. 0.2)

Comment number	Report section reference	Comments from Peer Review	How and Where Comments are Addressed (NWMO/SVCA to Address)	Peer Review Initial Feedback to NWMO/SVCA Comments (GHD to complete after previous column completed by NWMO/SVCA)
1	3.1.1	Under required equipment for benthic sampling, consider including clamps and using wooden stakes and/or tent pegs for establishing flow monitoring cross-sections as it provides a flat surface to secure the measuring tape using clamps.	SVCA uses galvanized nails and/or tent pegs to secure cross section measuring tape. Galvanized nails and tent pegs can be added to the equipment list.	Comment satisfactorily addressed.
2	3.1.1	Under required general equipment, consider including a hammer for tent peg/wooden stake installation in banks.	See above.	Comment satisfactorily addressed.
3	3.1.1	Under required general equipment, consider including portable charges bas backup and associated cables for tablet use.	SVCA has a charger and cables that plug into the vehicle as a backup. Tablet charging cables can be added to the equipment list.	Comment satisfactorily addressed.
4	3.1.1	Under required equipment for decontamination, consider including garbage bags to dispose of single use supplies (i.e., nitrile gloves, used filters, etc.).	Garbage bags can be added to the equipment list.	Comment satisfactorily addressed.
5	3.1.1	Under required equipment, the alternate eDNA filter type is missing. Please confirm if only cellulose nitrate filters will be used for these samples.	Yes, only cellulose nitrate filters are used.	Comment satisfactorily addressed.
6	3.1.1.	Under required equipment, identification of sample vessels and associated preservatives are provided inconsistently between sample types.	The following sample vessels and preservatives will be added to the equipment lists: Surface water sampling – Sample bottles containing preservatives provided by the analytical lab (bottles are pre-charged by the analytical lab) Sediment sampling – Glass sampling jars provided by the analytical lab Zooplankton sampling – Sample bottles provided by the analytical lab	Comment satisfactorily addressed.

Comment number	Report section reference	Comments from Peer Review	How and Where Comments are Addressed (NWMO/SVCA to Address)	Peer Review Initial Feedback to NWMO/SVCA Comments (GHD to complete after previous column completed by NWMO/SVCA)
			Phytoplankton sampling – Sample bottles provided by the analytical lab Periphyton sampling – Sample bottles provided by the analytical lab	
7	3.1.2	Confirm number of wetland locations to be sampled, sentence mentions 15 but has 16 crossed out next to it.	There are 15 wetland sites. The "16" will be removed from section 3.1.2 text of document.	Comment satisfactorily addressed.
8	3.1.2, Table 3	Please direct the reviewers to the Year 1 data results that support determination of the identified reference lakes and wetlands.	Add superscript flag to the Table 1 header. At the bottom of the table, with the other superscript descriptions, insert following description: Data from Year 1 of the EMBP program will be used to support determination of reference sites.	Comment satisfactorily addressed assuming response action will be applied to Table 3.
9	3.1.2 Table 3	Under Surface Water (grouping in the second row), does n=12 instead of 14 per season? The table indicates the following on a quarterly frequency: TWR_02 – n=1 TWR_03 – n=1 TWR_05 to TWR_09 – n=5 BeattySaugeen_01 – n=1 BeattySaugeen_02 – n=1 Field Duplicate (x1) - n=1 Trip Blank (x1) - n=1 Field Blank (x1) - n=1 Total n=12/season and n=48/year	N=12 is correct. In Table 3 of section 3.2.1 the workplan will be corrected to n=12/season and n=48/year. See chart below for reference about what line to change.  Additionally, please change typo in Table 3 of section 3.2.1 where text in row 4 reads "Saugeen_01 and Saugeen_02" the text should be changed to read "Saugeen_01 and Saugeen_03".	Comment satisfactorily addressed.

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10	3.1.2, Table 3	Consider providing more detail regarding replicates in this table for clarity and ease of cross-referencing with the text sections. As it reads in Table 3 there are no benthic duplicate samples to be collected, but Section 3.4.2.1, Item 6 makes reference to duplicate samples.	Table 3 is accurate. The text in section 3.4.2.1, bullet 6.a) will be changed from "At TWR_04 and BeattySaugeen_03, a second replicate will be collected at each station, as well as one duplicate per location, and preserved in 95% ethanol for eDNA Sanger sequence analysis." so that it reads "At TWR_04 and BeattySaugeen_03, a replicate will be collected at each station for taxonomic identification and enumeration analysis. Samples for taxonomic identification will be preserved using 10% buffered formalin immediately after collection. At TWR_04 and BeattySaugeen_03 a second sample will be collected at one of the replicates. This second sample will be preserved using 95% ethanol for eDNA analysis."	Comment satisfactorily addressed.
11	3.3.2	Consider including calibration standard lot numbers and expiry dates during each calibration for QA/QC purposes.	Standard lot number and expiry date will be added to the YSI Calibration Worksheet.	Comment satisfactorily addressed.
12	3.4	Under general information to record at each site, consider including the following: A. Equipment control/serial numbers for QA/QC purposes should equipment become faulty or erroneous data observed. B. Along with sample ID, consider including the number of bottles filled in the sample set, what parameters were field filtered (if any), and associated in-situ water quality measurements. C. Consider specifying for site photographs, sample location, looking upstream and looking downstream.	A. Workplan will be updated to include equipment identifier in Limnology meter field on page 4 of Survey123 form. e.g., input will be in a format such as YSI ProDSS Serial No 12345	Comment partially addressed. Need clarification of whether field filtering for metals is optional, the procedure for field filtering (where and when), and what criteria is used to determine to field filter or not. Also need to include depth of sample and manual estimate of velocity of the current within river section at time of sampling. See comment 31.

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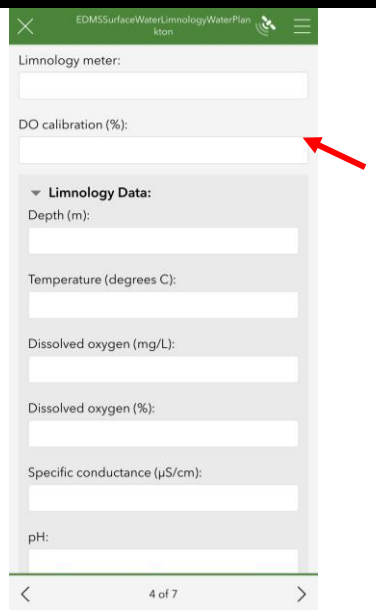
		D. General comments and observations, consider including specific sample observations (i.e., visual characteristics for clarity and colour, odour, and presence of any visible particulates). E. General comments and observations, consider if a thermocline is observed with the temperature measurements, include in observations.	 B. Sample ID is already on the section 3.4 list. Number of bottles is captured in the retained lab chain of custody documentation for each sample set. In-situ water quality measurements are captured on the Survey123 forms – see section 3.4.1 line 3. Field filtered parameters are consistent at each site (dissolved metals and chlorophyll A). For clarity, the last sentence in section 3.4 will be updated to refer the reader to Appendix A for refence to the field forms and more details on specific data to be recorded. To section 3.4.1 please add a bullet after bullet 11. This new bullet should read "Once sample water is collected, the dissolved metals and chlorophyll a samples shall be field filtered:	

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			- An individually packaged, clean chlorophyll a filter provided by the laboratory will be placed on top of the porous stopper of a clean vacuum flask. The sample water will then be poured into the vacuum flask, and suction applied so that the total volume of sample water (200-250 mL) goes through the filter into the base of the vacuum flask. The filter paper will then be removed from the vacuum flask by nitrile-gloved staff using clean tweezers. The filter will be placed onto a strip of clean aluminum foil, and the foil will be folded to form an envelope around the filter. The filer and foil will then be placed in the lab-provided clean vial. Staff will write the volume of water filtered on the outside of the vial using permanent marker and will also record the volume in the comments section of the lab chain of custody form. If sample turbidity or other factors prevent staff from field filtering a volume of sample water greater than 200 mL, then 250 mL of un-filtered sample water will be sent to the lab in the lab-provided sample bottle, and a note indicating that lab filtering of Chlorophyll a will be recorded on the chain of custody form for that sample. - An individually packaged clean syringe provided by the laboratory will be filled with sample water by gloved staff. A single-use clean filter provided by the laboratory will be inserted onto the tip of the syringe by gloved staff. The plunger of the syringe will then be depressed to force water out of the syringe, through the filter, and into pre-labeled dissolved metals bottled, which are provided by the analytical lab, and pre-charged with preservatives."	

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			Bullet numbers will be amended to reflect the insertion of this new bullet point. C. NWMO will investigate the feasibility of this recommendation. As it will require updates to the digital form, we will need to better understand the implications of updating Survey123, the geodatabase and our environmental data management system. D. This information is captured on the Survey123 field forms. For clarity, the last sentence in section 3.4 will be updated to refer the reader to Appendix A for refence to the field forms and more details on specific data to be recorded. E. Thermocline presence/absence information is captured through the in-situ physiochemical readings.	
13	3.4.1	Under the surface water list of procedures #2, consider including observations of the substrate (if visible) at sample locations (i.e., rock, gravel, soft/hard sediment).	NWMO will investigate the feasibility of this recommendation. As it will require updates to the digital form, we will need to better understand the implications of updating Survey123, the geodatabase and our environmental data management system	Noted, confirm if this is possible. At minimum, this information could be manually recorded on paper forms or in a general observations portion of a digital form.
14	3.4.1	Under the surface water list of procedures #2, consider including ice thickness measurement at sample locations during the winter event, if applicable.	Section 3.4.1, bullet 2. The text will be changed from: "Record detailed notes on sampling location, station depth, weather, date, time, station code, equipment, and other relevant information (e.g., changes to land use) on the datasheet." So that it reads: "Record detailed notes on sampling location, station depth, weather, date, time, station code, equipment, and other relevant information (e.g., changes to land use, ice and snow depth, etc.) on the datasheet.	Comment satisfactorily addressed.

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15	3.4.1	Under the surface water list of procedures #3, consider taking a photo of the YSI screen for QA/QC purposes to avoid transcription or communication errors.	NWMO will investigate the feasibility of this recommendation. As it will require updates to the digital form, we will need to better understand the implications of updating Survey123, the geodatabase and our environmental data management system.	Noted, confirm if this is possible to upload the photo directly into Survey123. At minimum, a photo (separate from Survey123) should be taken.
16	3.4.1	Under Item 6, consider including that, following proper decontamination, the Van Dorn is rinsed with in-situ water prior to collecting each sample.	A new bullet will be inserted into section 3.4.1 after bullet 3. The new bullet should read "prior to collecting the water samples, the clean VanDorn or sampling vessel is triple rinsed with water from the sampling site. Care is taken that rinse water is discarded away from the sampling site." Bullet numbers will be adjusted to reflect the insertion of this new bullet.	Comment satisfactorily addressed.
17	3.4.1	Under the surface water list of procedures #6b, consider specifying that sequencing of sample locations also be approached from downstream to upstream if more than one station is sampled per day within the same watercourse.	Section 3.4.1 bullet 6 b will be updated from "If sampling a river, the sampling location will be approached from downstream to avoid sedimentation." So that it reads "Sampling sequencing on a single day shall be conducted in an order that will prevent potential contamination from staff disturbing upstream sites from influencing all samples collected. If sampling a river, the sampling location will be approached from downstream to avoid potential sample contamination from staff disturbing the site."	Comment satisfactorily addressed.
18	3.4.1	Under the surface water list of procedures #12, will sample sets be one per cooler? If not, recommend sample bottles within a set be placed in a larger bag to keep them together in the cooler.	Yes, 1 sample set per cooler.	Comment satisfactorily addressed.

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19	3.4.2.1	Item 6 states that a duplicate sample will be collected at each of TWR_04 and BeattySaugeen_03, however it is unclear if this is a duplicate invertebrate sample for identification and enumeration by traditional laboratory methods or only as an eDNA Sanger sequence analysis. If not to be analyzed by traditional laboratory methods, this is not a duplicate and the absence of true invertebrate duplicates is a gap in the work plan.	Language in workplan is not clear. This should be addressed with the changes proposed to address comment # 10. Note that: 1. Sampling 5 stations at a location is greater effort than used for CABIN or OBBN or OSAP. 2. Collecting a "duplicate" would not be a true duplicate representation due to micro variations in habitat. 3. Contrasting the 5 stations should be validate taxonomic information or help identify outliers in an individual replicate. 4. In South Bruce, taxonomic ID's can also be compared to the long-term data records for benthic from SVCA to flag any organisms (at a high-level resolution) that have not been documented in this watershed before.	Recommend that the word 'sample' be used in reference to the benthic sampling vs replicate or duplicate as they have different inferred meanings depending on which sampled media is being assessed. Otherwise, the technical component is satisfactorily addressed.

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20	3.4.2.1	Our understanding of the text in Items 15 - 16 is that 3 grabs of D-net will be compiled into a single sample for analysis. Please confirm this means that 3 complied sub-samples will be collected from each of 5 replicates per station identified (e.g., 15 3-minute collection events at TWR_03 per sampling year).	Sub-sample here refers to the 2nd and 3rd kicking periods. To ensure no bias, all of material from all 3 kicks was included in the sample. Clarified with study designers prior to field season. Ex. 5 replicate stations at TWR_03, situated in comparable habitats. 3 timed kicks at each replicate station, all composited to create TWR_03_R1 sample. Plus extra timed kick for eDNA sampling at one of the five replicate stations. So, when finished at TWR_03, there were: 15 timed kicks for taxonomist + 5 timed kicks for eDNA Formalin preserved (taxonomist) TWR_03_R1 TWR_03_R2 TWR_03_R3 TWR_03_R4 TWR_03_R5 Ethanol preserved (eDNA) TWR_03_R1 TWR_03_R2 TWR_03_R3 TWR_03_R4 TWR_03_R5	Understood that (per the example), 5 formalin preserved samples, each comprising sediment composited from 3 kicking periods, will be analyzed per station (e.g., TWR_03). eDNA samples are additional. Consider revising the language in the report to provide this clarity around number of samples submitted per station.

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21	3.4.2.2	Under the stream gauge list of procedures #1, what was the basis for selecting 6 panels per cross-section? OSAP outlines recommended number of panels depending on stream width, has this been considered?	For velocity measurements at flow stations, SOP/design = equally spaced panels. OSAP S4 says channel width >3 m = min 10 panels. GeoProcess recommended min 20 panels. Since 20 is higher resolution, that's what we did. For velocity measurements at benthic stations, OSAP S2 applies, which does not include any direction to collect discharge or velocity information. Direction from CanNorth, to measure 6 panels complies with CABIN (Canadian aquatic biomonitoring network) protocols.	For velocity measurements at flow stations, the collection of a minimum of 20 panels is satisfactory to meet the objectives of the program. For velocity measurements at benthic stations, it is understood that OSAP methodology for velocity measurements is not being followed but rather CABIN. If the flow data collected via this method is sufficient for data analysis, then this methodology is acceptable. If not, it is recommended to follow OSAP S4 or the GeoProcess recommendation to be consistent with flow monitoring procedures as part of the overall program.
22	3.4.2.2	Under the stream gauge list of procedures #3, recommend using clamps with rubber tips to secure the measuring tape to the tent pegs or wooden stakes to keep it taut and in place.	SVCA uses galvanized nails and/or tent pegs to secure cross section measuring tape. Galvanized nails and tent pegs can be added to the equipment list.	Comment satisfactorily addressed.
23	3.4.2.2	Under the stream gauge list of procedures #14, does the OTT MP Pro prompt the user if there is a large deviation between the velocities of neighbouring panels (i.e., indicating if an additional panel(s) should be considered)?	No, but the OTT MF Pro does prompt if >5% of flow is within one panel. If this prompt occurs, SVCA staff would re-evaluate, and increase the number of panels to increase data resolution.	Comment satisfactorily addressed.
24	3.4.2.2	Under the stream gauge list of procedures #19, what is the velocity capture period for the OTT MF Pro? If the capture period is customizable, recommend a 30 second interval.	Yes, the OTT MF Pro capture period is customizable, we have been and will continue to use a 30 second capture period.	Comment satisfactorily addressed.
25	3.4.4	Recommend clarifying that zooplankton data and samples should be collected before water quality samples to reduce disturbance through the water column; same applies to any locations with co-located surface water or sediment samples.	A note will be added to section 3.4.4 after bullet 13 reading: "Zooplankton data and samples will be collected before other co-located sample matrices to reduce disturbance through the water column."	Comment satisfactorily addressed.

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26	3.4.5	Comment on Report Section 3.4.4 applies to the phytoplankton section as well.	A note will be added to section 3.4.5 after bullet 12 reading: "Phytoplankton data and samples will be collected before other co-located sample matrices to reduce disturbance through the water column. Should Phytoplankton and Zooplankton sampling be co-located, then each matrix will be collected from opposite sides of the transportation vessel to minimize disturbances to portions of the water column from which both sample matrices are collected."	Comment satisfactorily addressed.
27	3.4.7	Please clarify what is meant by ‘unknown’ samples.	Section 3.4.7 is mostly copied direct from Zoetica eDNA SOP, this is pulled directly from Zoetica’s SOP section 6.4, which refers to any sample that is not a duplicate, field negative, or field positive sample as "unknown". Note that the Zoetica SOP defines a field positive as a sample collection at a location where the target species is/are known to be present. If positive controls show up negative in the results, then there are likely error(s) in the field and/or laboratory methods. Positive controls also help increase confidence in the use of eDNA methods for detecting species and biodiversity monitoring, compared to traditional surveys. Section 3.4.7 "unknown samples" in bullets 16 & 26 will be updated to "unknown sample (samples from the source waterbody)".	Comment satisfactorily addressed.

Comment number	Report section reference	Comments from Peer Review	How and Where Comments are Addressed (NWMO/SVCA to Address)	Peer Review Initial Feedback to NWMO/SVCA Comments (GHD to complete after previous column completed by NWMO/SVCA)
28	3.5	One trip blank per seasonal sampling campaign is quite low and won't reflect the variability of daily sampling. Please provide the rationale for a single trip blank per season.	A trip blank sample is where a sample of laboratory water is transported to and from the site unopened using the same containers as the samples. The purpose is to test for cross-contamination during sampling transport and storage. The results of the trip blank are not intended to reflect the variability of daily sampling. Thus, unlike duplicate control samples which have a recommended frequency of 1 per 10 samples, the recommended frequency for a trip blank sample is once per batch (CCME 2016). Reference: Canadian Council of Ministers of the Environment. 2016. Guidance manual for environmental site characterization in support of environmental and human health risk assessment. Volume 1 guidance manual. PN1551.	Agreed; the comment regarding 'daily sampling' was in reference to the sample batch of each day and was based on the assumption that samples would be submitted to ALS after a daily sampling campaign and not only once at the end of the season for all samples from that season. Please clarify what is meant by a 'batch' of samples and that each submission to the lab will have one trip blank included.
29	3.5	Under general QA/QC requirements for the sampling program, consider including taking photographs of equipment display screens if possible to QA/QC data entry (determine if data transcription error occurred if suspect data is observed).	NWMO will investigate the feasibility of this recommendation. As it will require updates to the digital form, we will need to better understand the implications of updating Survey123, the geodatabase and our environmental data management system.	Noted, confirm if this is possible to upload the photo directly into Survey123. At minimum, a photo (separate from Survey123) should be taken.
30	3.5	Under general QA/QC requirements for the sampling program, consider including extra field filters as well as extra sample bottles.	We always carry a spare cooler with an unused clean spare of all bottles/ preservatives. It just isn't included in our work plan as it is good field practice but not actually part of sampling.	Comment satisfactorily addressed.
31	3.4.2.2 and 4	After step 24 for stream gauging, does the OTT MP Pro output an internally calculated total flow value for the section? If so, will this be manually recorded as well as internally saved for QA/QC purposes? Also, as part of the data management plan, will any flow values undergo QA/QC through manual calculations checks?	It does auto-calculate and value is recorded on paper data sheet. OTT also generates an exportable csv. File of all area/velocity measurements, which we graph in excel to assess as part of our QA/QC.	Comment satisfactorily addressed.

Comment number	Report section reference	Comments from Peer Review	How and Where Comments are Addressed (NWMO/SVCA to Address)	Peer Review Initial Feedback to NWMO/SVCA Comments (GHD to complete after previous column completed by NWMO/SVCA)
32	A3 – Depositional Habitats SOP	Equipment required is limited to 95% ethanol which is previously stated as the preservative for eDNA samples only. Please clarify if both traditional laboratory analysis methods will be conducted on benthic invertebrate samples from depositional habitats, or eDNA only?	SOP from CanNorth was to use ethanol for both taxonomy and eDNA samples, but the negotiated taxonomist expressed preference that taxonomy samples be preserved in 10% buffered formalin. Ethanol preserves the integrity of DNA while formalin denatures DNA. Formalin is a more effective fixative for preserving biological samples. Formalin will be added to the equipment list.	Comment satisfactorily addressed.
33	A5 – Phytoplankton and Zooplankton SOP	Please clarify the mesh size to be used for zooplankton sample collection. Further, are there field data sheets to review for these media?	See SOP A5 - 64 microns The planktons field data sheet is paired with surface water – see field data sheet attached in Appendix A1.	Comment satisfactorily addressed.

Memorandum

July 19, 2023 – updated August 18, 2023

To	Dave Rushton/Steven Travale, Municipality of South Bruce		
Copy to	Michelle Nearing/Katie Langdon, NWMO		
From	Sarah Andrew, Andrew Betts, Jennifer Son and Greg Ferraro/AD/mma	**Tel**	+1 519 884 0510
Subject	SVCA Channel Characterization and Bathymetric Surveys – Channel Characterization Survey Workplan – Peer Review Comments	**Project no.**	11224152-MEM-54

1. Introduction

This memo provides the Municipality of South Bruce (South Bruce) peer review team's (PRT's) comments on the *SVCA Channel Characterization and Bathymetric Surveys – Channel Characterization Survey Workplan* prepared by Natural Resource Solutions Inc. (NRSI; September 30, 2022) herein referred to as the Work Plan. The PRT's comments are provided for South Bruce's consideration and internal circulation as per the South Bruce Nuclear Exploration Project joint study review flow process. This memo will also be submitted to the Nuclear Waste Management Organization (NWMO) and their consultants (NRSI) by GHD Limited (GHD) for consideration in implementing the Work Plan as per the peer review protocol process.

2. Peer review approach

The PRT's review of the Work Plan was carried out by GHD (Subject Matter Expert [SME] and Lead Consultant). The peer review process was completed in alignment with the peer review protocol that was developed to support a collaborative approach between NWMO and South Bruce while maintaining independence during the process.

The PRT reviewed the Work Plan having the following questions in mind:

– Are there any significant concerns, issues, and/or omissions with the Work Plan?
– What are our initial observations/impressions on the Work Plan?
– Does the Work Plan reflect the most current information available?

3. Peer review comments

The comment disposition table (**Table 1)** lists the PRT's combined comments on the Work Plan. The expectation established in the peer review protocol is that NWMO and their consultants will provide responses to **Table 1** comments following its receipt which may lead to amendments or additions to the Work Plan.

Most of the methodology and field procedures for the channel characterization program will rely on and follow the Ontario Stream Assessment Protocol (OSAP). Therefore, the work plan does not include high level detail for all sections, however it does reference specific modules within OSAP that will be followed, as well as where and how the program will deviate from OSAP, and which modules will be excluded from the program with supporting rational. It is recommended that the work plan reference the EMBP Year 2 and Year 3 Surface Water Work Plan for supplemental field and data management methodologies and procedures. Overall, the work plan provides sufficient detail to ensure quality data will be collected, assuming all OSAP modules and the EMBP are followed.

Table 1 Peer Review Comments - SVCA Channel Characterization and Bathymetric Surveys – Channel Characterization Survey Workplan

Comment number	Report section reference	Comments from Peer Review	How and Where Comments are Addressed (NWMO/NRSI to Address)	Peer Review Initial Feedback to NWMO/NRSI Comments (GHD to complete after previous column completed by NWMO/NRSI)
1	1.0	Is there a figure to accompany the report showing the approximate 30 km reach boundaries? If not, recommend including a figure.	Figures were used during field planning discussions but were not appended to workplan. Since this work requires gap filling, a figure will be included in the updated workplan prior to field work initiation.	Comment satisfactorily addressed.
2	1.1	Confirm survey timelines, report refers to completion in 2022.	Drone survey – May 4 and 5, 2022 Nine transects completed – October 3-7, 2022 10th transect – November 4, 2022. Note: As a result of property access restrictions and consultation with the study designers using the information gathered at the nine stations, a tenth survey reach was relocated upstream of the original project boundary to provide more representative coverage of the Teeswater River area. However, the channel characterization survey was found to have data collection gaps and additional field work is being planned for this Fall, aiming for a September start. The channel characterization results will therefore be released as part of the Year 2 baseline report.	Comment satisfactorily addressed.
3	2.1 and throughout	Consider consistency of the program name throughout the report. Section 2.1 calls it a "sampling" program, assuming this should be referred to as "channel characterization" program. Throughout the report, the term "sample/sampling" is used interchangeably for "survey/surveying", consider using a consistent term for clarity.	Since this work requires gap filling, a figure will be included in the updated workplan prior to field work initiation.	Noted, assume reference to "figure" in the response will be to confirm wording consistency throughout the updated workplan.
4	2.1 and 3.2.1	What is the field crew size? Is there a minimum of 2 for working in and around water? The EMBP specifies a minimum field crew of 2 for the surface water program. Recommend stipulating in Work Program	Yes, minimum of 2 people at all times as per the subcontractor's health and safety plan.	Comment satisfactorily addressed.

Comment number	Report section reference	Comments from Peer Review	How and Where Comments are Addressed (NWMO/NRSI to Address)	Peer Review Initial Feedback to NWMO/NRSI Comments (GHD to complete after previous column completed by NWMO/NRSI)
5	2.2	Confirm data will be collected on physical forms (i.e., written) and then digitized prior to upload to Survey 123? How will the forms be digitized?	This was not written into the work plan as there was uncertainty around NWMO's Environmental Data Management System development timelines. Survey123 forms are now published, data collected to date on paper forms is digitized, and outstanding data collection will be collected directly into Survey123.	Comment satisfactorily addressed.
6	3.1.1	Recommend that this section be updated to include the flow velocity meter and as this equipment is mentioned in following sections but should also be included in this section.	OTT MF Pro flow velocity meter will be added to section 3.1.1 equipment list of the workplan prior to gap filling field work initiation.	Comment satisfactorily addressed.
7	3.1.1	Consider including a survey rod in addition to the meter stick as a backup method of collecting data if required. Random confirmation measurements should be taken.	Random confirmation measurement will be taken using the meter stick. This will be added to the workplan prior to gap filling field work initiation.	Comment satisfactorily addressed.
8	3.1.1	Consider including portable chargers and associated cables as backup for the data collection tablet.	SVCA has a charger and cables that plug into the vehicle as a backup. Tablet charging cables can be added to the equipment list of the workplan prior to gap filling field work initiation.	Comment satisfactorily addressed.
9	3.1.1	Consider including a waterproof field book or waterproof paper as a backup.	Waterproof paper is standard for our field forms, and blank spares are also brought along into the field. Survey 123 forms are now live, so this data collection occurs on a tablet.	Comment satisfactorily addressed.
10	3.3.1 Paragraph 7	Will data points be tied back to a geodetic benchmark(s)? Will photos be taken at each transect (section, looking upstream, looking downstream)?	No, measurements locally relative from what I understand. Photos are taken at each transect.	Confirm if all survey data is tied back to the same surveyed benchmark for QA/QC to confirm vertical position.
11	3.3.1 Paragraph 7	Sentence starting with "At each observation point…", the parameter of "water depth" is included twice, recommend removing one. For water velocity, will the stream gauge procedures in the EMBP be followed? If so, consider referencing the EMBP.	Delete 2nd "water depth" from workplan prior to gap filling field work initiation. Velocity measurements as per OSAP (Stanfield,2017). Clarity will be added into workplan prior to gap filling field work initiation.	Comment satisfactorily addressed.

Comment number	Report section reference	Comments from Peer Review	How and Where Comments are Addressed (NWMO/NRSI to Address)	Peer Review Initial Feedback to NWMO/NRSI Comments (GHD to complete after previous column completed by NWMO/NRSI)
12	3.3.1	Consider referencing Section 3.4.2.2 – Stream Gauging of the EMBP Year 2 and Year 3 Surface Water Work Plan for details on collecting flow measurements and setting up cross-sections.	Surface Water workplan is separate from Channel Characterization. Velocity measurements were as per OSAP (Stanfield,2017). Clarity will be added into workplan prior to gap filling field work initiation.	Comment satisfactorily addressed.
13	3.3.2	What is the anticipated timeframe for the field portion of the channel characterization program? Do the dates in this section need to be revised?	Refer to timeline in response to Comment 2. Due to unforeseeable delays, this module of the EMBP is currently scheduled to be completed for December 2023.	Comment satisfactorily addressed.

Memorandum

July 19, 2023

To	Dave Rushton/Steven Travale, Municipality of South Bruce		
Copy to			
From	Sarah Andrews, Andrew Betts, Jennifer Son and Greg Ferraro/AD/mma	**Tel**	+1 519 884 0510
Subject	SVCA Channel Characterization and Bathymetric Surveys – Bathymetric Survey Workplan (Draft) – Peer Review Comments	**Project no.**	11224152-MEM-55

1. Introduction

This memo provides the Municipality of South Bruce (South Bruce) peer review team's (PRT's) comments on the *SVCA Channel Characterization and Bathymetric Surveys – Bathymetric Survey Workplan (Draft)* prepared by Natural Resource Solutions Inc. (NRSI; December 9, 2021) herein referred to as the Work Plan. The PRTs comments are provided for South Bruce's consideration and internal circulation as per the South Bruce Nuclear Exploration Project joint study review flow process. This memo will also be submitted to the Nuclear Waste Management Organization (NWMO) and their consultants (NRSI) by GHD Limited (GHD) for consideration in implementing the Work Plan as per the peer review protocol process.

2. Peer review approach

The PRT's review of the Work Plan was carried out by GHD (Subject Matter Expert [SME] and Lead Consultant). The peer review process was completed in alignment with the peer review protocol that was developed to support a collaborative approach between NWMO and South Bruce while maintaining independence during the process.

The PRT reviewed the Work Plan having the following questions in mind:

– Are there any significant concerns, issues, and/or omissions with the Work Plan?
– What are our initial observations/impressions on the Work Plan?
– Does the Work Plan reflect the most current information available?

3. Peer review comments

The comment disposition table (**Table 1**) lists the PRT's combined comments on the Work Plan. The expectation established in the peer review protocol is that NWMO and their consultants will provide responses to **Table 1** comments following its receipt which may lead to amendments or additions to the Work Plan.

Overall, the PRT found the work plan provides a sufficient level of detail to ensure quality data is collected to meet the objectives of the bathymetric survey program. The PRT recommends an alternate survey procedure be prepared and included in the Work Plan in the event excessive vegetation is encountered along the river channel during the surveys or if equipment issues arise.

Table 1 Peer Review Comments - SVCA Channel Characterization and Bathymetric Surveys – Bathymetric Survey Workplan (Draft)

Comment number	Report section reference	Comments from Peer Review	How and Where Comments are Addressed (NWMO/NRSI to Address)	Peer Review Initial Feedback to NWMO/NRSI Comments (GHD to complete after previous column completed by NWMO/NRSI)
1	1.0, 1.2.2, 2.1 and throughout	The first paragraph last sentence of Section 1.0 refers to the work plan as a "bathymetric sampling and survey program". No sediment samples are being collected, correct? If so, recommend removing reference to "sampling" throughout the work plan.		
2	1.0	Is there a figure to accompany the work plan to show the location of the lakes included in the bathymetric program? If not, recommend including one.		
3	1.1	Confirm survey timelines, report refers to completion in 2022.		
4	2.1	What is the field crew size? Is there a minimum of 2 for working in and around water?		
5	3.1.1	Consider including survey rod and meter stick as backups. Also consider including a waterproof field book as a backup.		
6	3.3.1	What is the alternate survey procedure if excessive underwater vegetation is encountered during the survey?		
7	3.3.1	For manual measurements, how will depths be determined, specifically if soft sediments are encountered (i.e., top of sediment versus hard bottom)?		
8	Overall	There are some repeated words and/or phrases within the sections, may wish to consider removing duplicates.		

Memorandum

August 11, 2023

To	Dave Rushton/Steven Travale, Municipality of South Bruce		
Copy to	Michelle Nearing/Katie Langdon, NWMO		
From	Brad Trytten, Allan Molenhuis, Jennifer Son and Greg Ferraro/AD/mma	**Tel**	+1 519 884 0510
Subject	2022 Field Scope of Work, Private Well Water Sampling, Borehole Surface Water and Soil Sampling, and EMBP Soil Sampling – Peer Review Comments	**Project no.**	11224152-MEM-56

1. Introduction

This memo provides the Municipality of South Bruce (South Bruce) peer review team's (PRT's) comments on the 2022 Field Scope of Work, Private Well Water Sampling, Borehole Surface Water and Soil Sampling, and Environmental Baseline Monitoring Program (EMBP) Soil Sampling prepared by TULLOCH Environmental, a division of TULLOCH Engineering Inc. (TULLOCH, June 28, 2023) herein referred to as the Work Plan. The PRTs comments are provided for South Bruce's consideration and internal circulation as per the South Bruce Nuclear Exploration Project joint study review flow process. This memo will also be submitted to the Nuclear Waste Management Organization (NWMO) and their consultants (TULLOCH) by GHD Limited (GHD) for consideration in implementing the Work Plan as per the peer review protocol process.

2. Peer review approach

The PRT's review of the Work Plan was carried out by GHD (Subject Matter Experts [SMEs] and Lead Consultant). The peer review process was completed in alignment with the peer review protocol that was developed to support a collaborative approach between NWMO and South Bruce while maintaining independence during the process.

The PRT reviewed the Work Plan having the following questions in mind:

– Are there any significant concerns, issues, and/or omissions with the Work Plan?
– What are our initial observations/impressions on the Work Plan?
– Does the Work Plan reflect the most current information available?

3. Peer review comments

The PRT's combined comments on the Work Plan are provided below. The expectation established in the peer review protocol is that NWMO and their consultants will provide responses to these comments following its receipt which may lead to amendments or additions to the Work Plan.

Overall, the PRT found the Work Plan to provide a sufficient level of detail to ensure quality data is collected as described for the three main components of the Work Plan (private well water sampling, borehole soil and surface water sampling, and EMBP soil sampling). The individual work tasks were described in detail, including field methods, equipment, decontamination, and field documentation. Although not a component of the Work Plan, measuring/estimating surface water flow rates at the surface water sampling stations is a common practice during surface water sampling, and the PRT suggests that the surface water flow rates be included as a measurement parameter. Surface water flow rates tie into the understanding of water quality as it relates to potential stagnation of the surface water under very low flow conditions, or entrainment of materials in the surface water under conditions of higher flow.

NWMO/TULLOCH Response:

The PRT is uncertain whether previous sampling following this Work Plan has been completed. The Work plan is dated June 28, 2023. The first draft (Version A) was dated October 11, 2022, according to the document tracking page, with revisions dated October 31, 2022, and November 9, 2022. The final document was issued to NWMO on November 11, 2022. Then the June 28, 2023, version includes “changes to the program”.

Section 2 Scope of Work indicates the Current Scope of Work was created in October 2022. It also indicates the fall 2022 sampling program will focus on sites sampled in fall 2021. The PRT is unaware of any sampling completed in fall 2021 or fall 2022. Given that the document was revised “including changes to program”, the document is unclear related to sampling timing (e.g., fall 2022 and/or fall 2023).

NWMO/TULLOCH Response:

Specific Comments Related to Analyte Lists

Rationale for sampling locations were limited and rationale for analyte lists was not presented. In particular, the analyte list for the borehole soil sampling and the EMBP soil sampling were quite different. The PRT recognizes that the objectives of the borehole soil sampling and EMBP soil sampling are different. The soil analyte list for borehole soil sampling lists each analyte, while the EMBP soil analyte list includes only parameter groups (e.g., metals, VOCs, PAHs, SVOCs, PHCs) and some single analytes. A full analyte list for EMBP soils samples would be preferred.

Borehole surface water sampling and private well water sampling have different analyte lists. The PRT recognizes that the objectives for the borehole surface water sampling and the private well water sampling are different. However, in a general sense, parameter groups should include the same list of parameters (except as required by regulatory criteria or other rationale). The PRT notes that the borehole surface water analyte list includes many general chemistry parameters excluded from the private well analyte list (e.g., TSS, TDS, ion balance, hardness, ammonia as N, TOC, colour, turbidity, Langelier Index) many of which would be commonly included in a water supply analyte list.

The VOC analyte list for borehole surface water sampling includes 45 parameters while the VOC analyte list for private well water sampling includes only 16 parameters. The exclusion of common VOC parameters with common analytical detections in groundwater (e.g., acetone, MTBE, MEK, MIBK, TCE, PCE, etc.) from the private well VOC analyte list is a potential cause for concern.

The rationale for including acid based neutral extractables (e.g., chlorophenols, methylphenols, dichlorophenols, trichlorophenols, tetrachlorophenols) is not stated. At this time, the PRT has no reason to believe that these analytes would be found in private well water.

The private well water quality analyte list includes herbicides (AMPA, glyphosate) and pesticides (diquat, diuron). The PRT notes that diquat is an herbicide typically applied to mature crops for easier harvesting. The PRT also notes that diuron is an herbicide. The PRT notes that the analyte list for phenoxy acid herbicides and organochlorine and organophosphorus pesticides commonly contains approximately 75 analytes. These analytes include many that have been phased out of use (e.g., DDT, DDE, DDD and metabolites, chlordane, etc.). The analyte list also includes many commonly used herbicides and pesticides commonly still in use on corn, soybeans, and cereal crops in Ontario. The PRT is unaware of any rationale to exclude commonly used herbicides and pesticides from an analyte list for private well water sampling.

NWMO/TULLOCH Response:

Memorandum

08 January 2024

To	Dave Rushton/Steven Travale, Municipality of South Bruce		
Copy to	Michelle Nearing/Katie Langdon, NWMO		
From	Leah Jefferson, Sarah Andrew, Andrew Betts, Jennifer Son and Greg Ferraro/AD/mma	**Tel**	+1 519 884 0510
Subject	Surface Water Sampling Observations	**Project No.**	11224152-MEM-57

1. Introduction

Guided by Nuclear Waste Management Organization (NWMO) staff members, a GHD Limited (GHD) technician joined staff from Saugeen Valley Conservation Authority (SVCA) on August 9, 2023, to observe field data collection protocols for surface water sampling. The workplan (South Bruce Environmental Media Baseline Program Year Two and Year Three Surface Water Study Work Plan – Sections 3.4, 3.5 and 3.6) for the activities observed was provided to GHD for review prior to the site visit.

2. Surface Water Sampling Observations

SVCA surface water sampling activities were observed by GHD at the Teeswater River 6 (SB_SW_TWR_06) sampling location on August 9, 2023.

Field activities were initiated with completion of a tailgate safety meeting for all parties present. SVCA staff identified that they had informed their colleague of their arrival at the field site and were commencing work. Appropriate personal protection equipment (PPE) and safety equipment was present and appeared to be in good working order. A first aid kit and fire extinguisher were confirmed to be available within SVCA's vehicle.

Sampling equipment (stainless steel bucket) was thoroughly cleaned with phosphate free soap and deionized water in the field prior to sampling. Nitrile gloves were donned by the sampling crew throughout the duration of cleaning and sampling. The Van Dorn sampler was confirmed to have been cleaned at SVCA's Sulphur Springs Conservation Area prior to the site visit. Prior to sampling, the Van Dorn and stainless-steel bucket was triple rinsed using river water collected from the upstream side of the bridge and disposed of on the downstream side of the bridge. The equipment used to collect in--situ water quality measurements (YSI ProDSS) was calibrated the morning of sampling using National Institute of Standards and Technology (NIST) certified calibration standards and all readings were recorded in a calibration log maintained by SVCA. All sampling equipment appeared to be in good working order. Staff from SVCA were knowledgeable and experienced and were prepared to answer questions posed by GHD.

A total of 36 surface water sample bottles were collected from the bridge on the upstream side of the bridge at Teeswater River 6 (SB_SW_TWR_06) during the peer review session on August 9, 2023. Sample bottles were sorted into site specific coolers as the SVCA staff had multiple sites to complete on the same day. Coolers were inspected prior to the field visit to ensure the correct number of bottles were present and no breakage or

preservative leakage had occurred. Sample bottles were pre-labelled by ALS Laboratory and SVCA staff added the date and sample time to each bottle using a permanent marker prior to collecting the sample.

- Field data and photographs were recorded using a digital form created on Survey123. Field staff verbally repeated all measurements to avoid transcription errors. Parameter units were repeated and confirmed for in-situ surface water quality readings. Quality Assurance/Quality Control (QA/QC) procedures for submission of field forms and progress updates were described/demonstrated for GHD.
- Water was collected using a Van Dorn sampler and a stainless-steel bucket tied off to the bridge to prevent equipment loss. The sample water was collected from the upstream side of the bridge by lowering the equipment to approximately half of the water column depth and without disturbing the substrate. No water depth was collected from the bridge; therefore, the water sample was estimated to be collected at approximately the middle of the water column.
- Water was then decanted into sample bottles and filled to the appropriate level depending on the sample analyte (i.e., shoulder of bottle, neck of bottle, no headspace). For bottles with no headspace requirements, the field crew confirmed no air bubble was present when turned upside down.
- To avoid any trace metals contamination, the Van Dorn sampler was used for all metal samples, as well as the bulk sample water to be used for the chlorophyll-a filtration sample and the dissolved metals samples.
- Excess surface water was collected in amber glass jars to be transported back to the SVCA resource center where SVCA staff will complete the field filtration for the dissolved metals sample bottles as well as the chlorophyll-a sample. SVCA staff thoroughly described the filtration process but did not demonstrate in the field to minimize the risk of contamination and avoid lab equipment breakage.
- Upon completion of on-site sampling, all sample bottles were counted and stored in a cooler on ice to be further processed at the SVCA resource center.
- For dissolved metals it was noted that the same syringe will be used for each sample bottle from the same site location, but filters will be switched out between each sample bottle. Four sample bottles will be filled at the resource center for dissolved metals for each sampling location.
- For Chlorophyll-a sampling a minimum of 200 millilitre (mL) (250 mL preferred) of sample water will be filtered through a vacuum flask. The filter paper will be carefully wrapped in tin foil and labelled with a sample ID and the sample volume.
- A separate Chain of Custody (COC) form was placed in each cooler before being put in the SVCA van and shifting the remaining empty coolers toward the back of the van.
- Upon returning to the SVCA resource center, the field crew will field filter the remaining dissolved metals bottles and Chlorophyll-a sample, double count sample bottles in each cooler, replace ice, complete COC forms and seal the coolers.
- Upon completion of sampling at SB_SW_TWR_06 the sampling equipment (Van Dorn sampler and stainless-steel bucket) was cleaned using phosphate-free soap and deionized water.
- Based on discussion with SVCA staff, the surface water samples are relinquished to the laboratory at the end of each monitoring day prior to the 7:00 pm lab drop-off cut-off time. A private courier option is currently being explored as a more efficient mode of delivery to allow the sampling team more time in the field to conduct sampling activities.

3. Summary Comments

The following comments are provided based on surface water sampling observations:

- Field staff team members are qualified for the work and have experience with sampling. The field leader had a good level of confidence and familiarity with the field forms and data collection and sampling procedures in general.

- Field staff were able to identify the surface water sampling location. An Ontario Stream Assessment Protocol (OSAP) Site Feature form was used to document the sampling location and confirm sampling stations for repeatability purposes.
- No duplicate sample was collected during the peer review process. As per the monitoring plan, duplicates are to be collected at a frequency of four per seasonal sampling campaign. No trip blank or field blank was submitted as part of the surface water sampling event, however SVCA did acknowledge that one trip blank and one field blank would be completed for the entire sampling season. As per our comment on the workplan we still need clarification regarding the collection and submission frequency of field and trip blanks, as this is not considered best practice.
- No quantitative water depth or benchmark was recorded at SB_SW_TWR_06. GHD recommends that a benchmark measurement from the bridge to water surface be incorporated into the surface water monitoring. Alternatively, a qualitative observation of depth of measurement/sample water collection could be noted using the graduated markings on the YSI ProDSS.
- Accidental overfilling causing over dilution of preservative occurred during a sample collected for Total Organic Carbon (TOC). This was quickly identified by the field leader and corrected by putting an X across the sample label with permanent marker and setting aside. The sample was re-filled to the appropriate fill line using a TOC bottle from the spare sample bottle set that the SVCA crew had brought with them for potential issues/bottle breakage. The overfilled sample bottle was kept separate from the SB_SW_TWR_06 sample set and was to be properly disposed of at the SVCA resource center or ALS laboratory.
- GHD recommends field filtration for dissolved metals (four sample bottles) be completed in the field at the time of sample collection as opposed to back at the SVCA resource center at the end of the sampling day. It is standard practice to field filter as soon as possible to provide the most reliable results. Filtering hours after sample collection could result in a low-biased value for dissolved metals as there is potential for metals to attach to any solids within the sample volume or the sample jar (amber glass).
- If field filtering is not a possibility, it is recommended that SVCA order blank transfer bottles specifically for dissolved metals field filtration from ALS laboratory (plastic). Sample bottles should be disposed of once used and not cleaned and reused to avoid potential contamination.
- GHD recommends adding greater clarity to the sampling work plan regarding field filtering practices (i.e., timing of filtration, location, and methodology).

In summary, SVCA were accommodating to GHD's field observations. Overall, the workplan was being adhered to and was being completed in an efficient manner.

Memorandum

08 January 2024

To	Dave Rushton/Steven Travale, Municipality of South Bruce		
Copy to	Michelle Nearing/Katie Langdon, NWMO		
From	Brad Trytten, Allan Molenhuis, Jennifer Son and Greg Ferraro/AD/mma	**Tel**	+1 519 884 0510
Subject	Private Well Water, Borehole Surface Water and Soil, Environmental Media Baseline Program Soil Sampling Observations	**Project No.**	11224152-MEM-60

1. Introduction

Guided by Nuclear Waste Management Organization (NWMO) staff member (Katie Langdon), a GHD Limited (GHD) technician joined staff from Tulloch Engineering on August 17, 2023, and on August 31, 2023, to observe field data collection protocols for the Environmental Media Baseline Program (EMBP) soil sampling and private well sampling, respectively. The work plan (*NWMO South Bruce Environmental Services - 2022 Field Scope of Work - Private Well Water Sampling, Borehole Surface Water and Soil Sampling, and EMBP Soil Sampling*) for the activities observed was provided to GHD for review prior to the site visit.

2. Private Well Water Sampling Observations

Field activities were initiated by completing a tailgate safety meeting for all parties present and coordinating which private wells were to be sampled during the day. Appropriate personal protection equipment (PPE) and safety equipment was present and appeared to be in good working order. A first aid kit and fire extinguisher were confirmed to be available within Tulloch Engineering's field vehicle.

The water quality checker (YSI Multiparameter water quality meter) was thoroughly cleaned and calibrated prior to mobilizing to the first private well location. GHD did not observe the calibration; however, Tulloch staff described the procedure and the meter appeared to be in good working order.

GHD observed a total of three private well water samples during the peer review session on August 31, 2023.

Sample bottles provided by the analytical laboratory (ALS Environmental (ALS)) were sorted into samples sets prior to GHD arrival at the site. Each cooler was inspected prior to the field visit to ensure the correct number of bottles were present and no breakage or preservative leakage had occurred. Sample bottles were pre-labelled by the analytical laboratory, Tulloch Engineering added the date, sample time, and IDs to each bottle using a permanent marker prior to collecting samples.

The private well sampling process followed the work plan prepared by Tulloch Engineering entitled "*NMWO South Bruce Environmental Services South Bruce, ON – 2022 Field Scope of Work – Private Well Water Sampling, Borehole Surface Water and Soil Sampling, and EMBP Soil Sampling*" (Tulloch, June 28, 2023).

Specifically, the following main steps were completed:

– When required, NWMO and/or Tulloch Engineering staff alerted the resident and met with the resident prior to sampling the well.
– Field data and photographs were recorded using a digital form created on Survey123.
    - Tulloch Engineering collected UTM coordinates, described well condition, type, and access. Tulloch Engineering also took photos throughout the sampling process. Photos included sampling setup, the private well (if location was known), and purging.
– Each private well was purged for approximately 15 minutes via a garden hose that discharged away from the residence. Purge water was directed towards a series of 20L buckets which allowed for flow rate estimates and measuring field parameters. Tulloch Engineering completed flow rate estimates during the initial 5 minutes of purging and collected field readings at the start of purging and after 5, 10, and 15 minutes of purging. Samples were collected directly from the tap using the laboratory supplied bottle sets. Bottles were immediately packaged back into their respective coolers which contained ice for cooling.
– Each of the buckets and YSI water quality checker were thoroughly rinsed after sampling at each private water well. Rinsing was completed using the private well water.
– A duplicate sample was collected from the second private well sampled. Tulloch Engineering collected the duplicate sample by filling the original sample bottle followed by the corresponding duplicate bottle.

During the field visit, Tulloch Engineering described the procedures for accessing each resident, data collection, well purging, and sampling handling. All questions were answered and GHD has no concerns regarding the private water well sampling.

3. Borehole Surface Water and Soil Sampling Observations

As borehole surface water and soil sampling were added to the EBMP after sampling was completed, GHD field staff did not observe this sampling.

4. EMBP Soil Sampling Observations

There are two components to the EMBP Soil Sampling Program, the field sample collection for laboratory sample analysis and the follow-up nutrient concentration screening completed using a test kit.

Nutrient Concentration Screening

Nutrient concentration screening was performed at the NWMO field office in Teeswater. The nutrient concentrations were determined using a LaMotte Soil Testing Outfit for determining concentrations of agricultural nutrients in soils. The process was set up to follow a step-by-step methodology according to the field test kit instructions. The procedure was set up to limit the potential for errors, including two separate work stations away from other areas of the field office, and the completion of the work by the same two trained Tulloch staff. In addition, single-use materials were used where possible, and timers were used with note taking for parameters requiring specific amounts of time in solution with a reagent. All steps were laid out to be performed in a rigorous manner.

Specifically, the following main steps were completed:

– A soil sample was collected in the field in a zip-closure bag, a field data sheet was filled out for each soil sample, and retained with that sample
– A portion of the soil sample for nutrient concentration analysis was placed on a drying sheet (disposable paper plate) and covered with paper towel to prevent contact with other media

– The soil sample was left to dry overnight to enable sample sifting
– The sample was sifted using a household window screen in a 6-inch square wooden box onto a second disposable paper plate
– The sifting screen was cleaned between samples
– All work was completed on single-use disposable placemats (11x17 printer paper)
– Samples were extracted using a Universal Extraction Solution
– The samples were then analyzed using parameter specific reagents and standardized colorimetric charts to determine pH and approximate concentration values for nitrate, ammonia, phosphorus, in units of pounds per acre
– Single-use pipettes, filter papers, and disposable gloves were also used during analysis
– All fluids generated during analysis and remaining soils were containerized in separate buckets and treated as hazardous waste.
– Following completion of the analysis of all samples for that day's analysis, all laboratory containers, brushes, etc., were cleaned with a dirty water and soap rinse with scrubbing if required, clean lab water rinse, and a final lab water spray rinse and allowed to air dry in racks

During the GHD field visit, the steps for the sample handling and analysis were described and questions answered. The GHD observer was allowed to review the colorimetric determinations and discuss the colour comparisons.

Field Soil Sample Collection

Field activities were initiated with completion of a tailgate safety meeting for all parties present. Tulloch staff led the tailgate safety meeting, which included various potential hazards associated with the field program, identification of communication protocols with the second field sampling team, and emergency procedures, including location of the hospital. Tulloch also identified the area of sample collection, and the previous contact with the property owner providing permission for sample collection, and any identified potential issues such a crops to be minimally disturbed. Appropriate personal protection equipment (PPE) and safety equipment was present and appeared to be in good working order. A first aid kit and fire extinguisher were confirmed to be available within Tulloch's vehicle.

Prior to mobilizing to the Site, Tulloch personnel sorted through sets of pre-labelled sample bottles and selected appropriate sample numbers for the field sampling including one duplicate sample.

Tulloch led the NWMO and GHD personnel to the sampling site. Once at the site, an area of pasture, vehicles were parked off the main track in the pasture grasses, and equipment loaded. A brief discussion was held between GHD and Tulloch regarding the potential for parked vehicles to initiate fires in very dry grass/grain stubble due to the heat of the exhaust system. At this location and in the general climate and field conditions encountered during the sampling period, vehicles causing grass fires was not to be expected, and the vegetation under vehicles was visually inspected for signs of potential ignition.

At the field sampling location (R060401), the following steps were carried out:

– A central location was determined in the previously identified area of interest to be at least 30 metres from any probable change in soil type as visually observed based on types of vegetation, hillslope angles, etc.
– A small hole was excavated with a stainless-steel shovel to approximately 15 centimetres below ground surface
– A soil sample from approximately 10 to 15 centimetres below ground surface was collected
– Approximately equal volumes of soil were collected from 7 additional locations spaced at approximately 20 metres from the central location, and at approximate equal radial spacing
– The central location was used for the collection of a soil sample for VOCs analysis using dedicated sealed VOC soil samplers, and for moisture content using a soil moisture probe

- The soils from all 8 samples were mixed for filling pre-labelled sample bottles for analysis of F1 to F4 hydrocarbons, PHCs, SVOCs, dioxins and furans, total metals, TOC, TIC, TKN, OC pesticides, PCBs, Tier 1 and Tier 2 radionuclides, REEs, pH, EC, SAR, chloride, cyanide, sulphate, grain size
- The soil was described using surficial soil/agricultural soil descriptions, as a sandy loam, with a colour based on the Munsell colour charts of 7.5 YR 5/3. A very small amount of soil was partially field dried and crushed to look at sand versus silt content to aid in the soil description
- Following completion of the sampling, the excavated soil blocks were returned to the ground leaving minimal disturbance of the sample site
- All tools and equipment were field washed and rinsed, and a rinsate blank was collected periodically
- All field documents were uploaded to a web server
- Soil samples collected for laboratory analysis were dropped at the ALS laboratory nightly

The Tulloch field sample team performed the soil sampling in accordance with the work plan, and in general accordance with standard soil sampling procedures as established in various guidance documents.

5. Summary Comments

During each field visit, Tulloch Engineering followed written procedures and all work was completed in general accordance with the work plan. GHD field staff did not raise any concerns in regard to the private water well sampling or EMBP soil sampling. GHD field staff did not observe the borehole surface water and soil sampling procedures.

Memorandum

7 September 2023 – Revised 20 October 2023 – Updated 17 November 2023

To	Dave Rushton/Steven Travale, Municipality of South Bruce		
Copy to	Michelle Nearing/Katie Langdon, NWMO		
From	Sarah Andrew, Laura Lawlor, Allan Molenhuis, Greg Ferraro and Jennifer Son/AD/nv	**Tel**	+1 519 884 0510
Subject	Environmental Media Baseline Program – Year 1 Baseline Report (Final Draft Report) – Peer Review Comments	**Project no.**	11224152-MEM-58

1. Introduction

This memo provides the Municipality of South Bruce (South Bruce) peer review team's (PRT's) comments on the *Environmental Media Baseline Program – Year 1 Baseline Report* (Final Draft Report) prepared by Canada North Environmental Services (CanNorth), Geosyntec Consultants International, Inc. (Geosyntec), and Saugeen Valley Conservation Authority (SVCA; August 2023) for South Bruce's consideration and internal circulation as per the South Bruce Nuclear Exploration Project joint study review flow process.

This memo will also be submitted to the Nuclear Waste Management Organization (NWMO) and their consultants (CanNorth, Geosyntec, and SVCA) by GHD Limited (GHD) as per the peer review protocol process.

2. Peer review approach

The PRT's review of the Final Draft Report was carried out by GHD (Subject Matter Experts [SMEs] and Lead Consultant). The peer review process was completed in alignment with the peer review protocol that was developed to support a collaborative approach between NWMO and South Bruce while maintaining independence during the process. In accordance with the peer review protocol process, the PRT reviewed the Final Draft Report having the following questions in mind:

– Are there any significant concerns, issues, and/or omissions with the Final Draft Report?
– What are our initial observations/impressions on the quality of the Final Draft Report?
– Are the baseline study findings interpreted and presented in a clear and understandable manner?
– Does the Final Draft Report reflect the most current information available?

3. Peer review comments

As stated above, the comment disposition table (**Table 1**) lists our initial comments on the Final Draft Report. It is understood that NWMO and their consultants will provide responses to these comments and address each comment where appropriate as part of finalizing the report.

Based on completion of the peer review, the results obtained for Year 1 for surface water, hydrology, drinking water, and general site characterization information presented in the Final Draft Report are found to support the overall objective of developing baseline conditions to support the development of the working Conceptual Site Model (CSM) for the biophysical environment. It is recommended that the Final Report be consistent in providing interpretation of the results, next steps of the program, and how the baseline biophysical environment information will be integrated with the results of the Geoscience Program to prepare an overall CSM for the Deep Geological Repository (DGR) site setting.

Table 1 Comment Disposition Table - Environmental Media Baseline Program – Year 1 Baseline Report

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
1	Section 2.0 EMBP	JS	Can you please provide details on how the determination of shallow groundwater is from 0 to 100 m bgs.	The 100 m is a guideline only used to separate the shallow groundwater program from the NWMO Geosciences deeper geologic and groundwater investigation program (down to 1 km) which has a different, although complimentary and overlapping, focus than the EMBP. The actual depth of the sampling and investigation associated with the shallow groundwater program will be determined by the Geosciences team as they advance the characterization of the shallower intervals and install the monitoring network.	Comment satisfactorily addressed.
2	Section 2.0 EMBP Figure 2-1	JS	While the figure is a concept, please confirm the scale in the figure is correct.	This figure is meant to be a concept and the depths are approximate. A disclaimer can be added that the figure is conceptual.	Comment satisfactorily addressed.
3	Section 3.1.1 Study Areas Figure 3-1	JS	The area of interest (AOI) and NWMO land is not easily identified given the overlay. Would suggest making this clearer.	This is shown in more detail in Figure 3-2 (as noted in comment 4, incorrect reference to figure 4 in the legend has been updated).	Comment satisfactorily addressed.
4	Section 3.1.1 Study Areas Figure 3-1	LJ	Black box mentions refer to Figure 4 for details. We only see Figure 4-1 which is not a figure of this area. Should this reference Figure 3-2 in the legend instead?	This was an error. The legend has been updated to cross-reference Figure 3-2.	Comment satisfactorily addressed.
5	Section 3.1.1 Study Areas	LJ	*"Figure 3-1 presents the surface water quality stations sampled during the Year 1 program; a detailed map showing the locations within the LSA_{SW} and AOI is provided in Figure 3-1."* Change second in-text figure reference to Figure 3-2.	Noted. This has been corrected.	Comment satisfactorily addressed.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
6	Section 3.1.1 Study Areas	LJ	Lakes bullet point states five lakes were included in the program, but six lakes are referred to. Lake Huron is listed as a reference lake which may be where this is misleading. Appendix A report (Section 2. Surface Water) lists 6 lakes.	The beginning of the bullet points indicates five smaller recreational lakes. Lake Huron is not a smaller, recreational lake. Wording has been revised to indicate Lake Huron is an additional, larger lake.	Comment satisfactorily addressed.
7	Section 3.1.2 Contaminants of Potential Concern	JS	*"At the remaining sampling locations situated in the Saugeen River, lakes, and wetlands, the COPC list was reduced and does not include PAHs, VOCs, SVOCs, PHCs, dioxins and furans, and organochlorine pesticides since these contaminants are either specific to potential near-field Project impacts, such as fuel spills, or are not directly related to potential Project impacts."* Was there any additional historic reviews completed to confirm the absence of these parameters to exclude them to establish baseline?	A review of data sources was included in the Data Gap Report. Some information was found for Teeswater River (MECP, SVCA) and Lake Huron (Bruce Power, CNSC). There was no information available for these COPC for the Teeswater River but there is information in Lake Huron. As indicated in the text, these COPC were selected due to near-field Project impacts or not directly related to potential impacts. The Year 1 program showed that there was no indication of PAHs, VOCs, SVOCs, PHCs or OC pesticides being present. Based on the data collected, it can be assessed whether there is a need to expand the spatial extent of the sampling during the Program Review.	Comment satisfactorily addressed. Deferring to Program Review Report for further assessment
8	Section 3.2.1.1 Water Quality Statistical Analyses Table 3-1	JS	Please define N in the table.	N has been replaced with n, and a footnote has been added to indicate this refers to number of samples.	Comment satisfactorily addressed.
9	Section 3.2.1.1 Water Quality Statistical Analyses	JS	Under 1a) under the bullet, "*If there was a value for dissolved, it was given preference in the assessment of the data over the guideline for total*." Should the word metals be after the word dissolved and total?	Yes, this has been revised in the report.	Comment satisfactory addressed.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
10	Section 3.2.1.1 Water Quality Statistical Analyse Guideline Comparisons	JS	Under 2) and 3), can you please provide the rationale as to why the guidelines from other jurisdictions were selected?	Additional text has been added to Section 3.2.1.1 explaining the selection of the sources of the guidelines.	Comment satisfactorily addressed.
11	Section 3.2.1.1 Water Quality Statistical Analyses Guideline Comparisons	LJ	*"Suter and Tsao (1996)."* Include document title for greater detail similar to the other listed documents.	This has been corrected in the report.	Comment satisfactorily addressed.
12	Section 3.3.1.1 Limnology Table 3-3	JS	For Oppleck sampling location, there are no values for turbidity, should this be NA?	Response 1: There is in fact Year 1 turbidity values for Oppleck; it was overlooked because the Survey123 forms were filed with the site name McGlinn Lake. Oppleck lake was not part of the original study design; it was added to the monitoring program when access permissions could not be secured for McGlinn Lake. When sampling started, the Survey123 forms had already been set up by an external contractor using the waterbody name “McGlinn Lake”. SVCA staff used the McGlinn Lake forms for Oppleck data, making sure to always note the sample id was SB_SW_Oppleck. No EMBP data or samples have ever been collected by SVCA at McGlinn Lake. Response 2: That said, the values were highly variable and often negative, and thus the values have not been added to the table. The text has been revised to discuss this.	There are no turbidity values for Oppleck Lake in Table 3-3. It currently shows as NA. Response 2: Noted.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
13	Section 3.3.1.2 Anions, Nutrient, Organics and Physical Properties Fig 3-3 to 3-5	LJ	Agree with comment in text regarding refinement of guidelines when a larger dataset is available. Lake and river colour coding difficult to differentiate between – consider greater gradient variation between lake, river, and wetland. Alternatively, add river, lake, or wetland to title along x-axis.	Figures have been revised to better differentiate colour	Comment satisfactorily addressed.
14	Section 3.3.1.3 Bacteriological Tests Fig 3-6 E. Coli	LJ	Same comment as above.	Figure has been revised to better differentiate colour	Comment satisfactorily addressed.
15	Section 4.1 Program Overview Section 4.1	JS	Is there a figure that can be referenced that identifies the LSA_{HYD}?	The boundary of LSA_{HYD} has been added to Figure 4-1	Comment satisfactorily addressed.
16	Section 4.1 Program Overview Meteorology	SA	*"For the hydrology component, the most important data collected are ambient temperature and precipitation, which will be used to assess the frequency of intense rainfall, major flooding events, drought conditions, and snow cover seasonality.'* Will also support determining seasonal melt periods.	Agreed, added this to the paragraph.	Comment satisfactorily addressed.
17	Section 4.1 Program Overview Figure 4-1	SA	No label shown in legend for waterbody. Are the study lakes (first column of Table 4-1) shown on Figure 4-1?	Waterbodies are included in the legend, inset map is added to make it easier to see the stations near the AOI. At this scale, most of the lakes/wetlands included in the study are too small to see but the monitoring station provides the location of the lakes and wetlands. A second figure (Figure 4-2) has been added at a smaller scale that shows the AOI/LSA in better detail to show the monitoring locations.	Comment satisfactorily addressed.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
18	Section 4.1 Program Overview Table 4-1	SA	Should include SB_MET_AOI in the table.	This has been added to Table 4-1.	Comment satisfactorily addressed.
19	Section 4.1 Program Overview Table 4-1	SA	SB_FLOW_BeattySaugeen_01 is identified in Figure 4-1. Was flow monitoring conducted at this station as part of the program? If so, should it be included in this table?	The Saugeen Beatty station is a reference site operated by the Government of Canada's hydrometric monitoring network. This has been added to Table 4-1 with a footnote.	Comment satisfactorily addressed.
20	Section 4.2.1.1 Water Level	SA	*"Throughout Year 1 of the monitoring period, maintenance visits were conducted to ensure that instrumentation defects, battery life, and wildlife did not affect the continuous collection of water level data."* Are manual level measurements taken directly at the logger collected during these visits?	No manual measurements were taken during the site visits.	Response acknowledged.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
21	Section 4.2.1.1 Water Level	SA	Appendix B indicates the staff gauges were not surveyed. Is there a reason why? Having surface water elevations may be beneficial for future studies or modelling purposes.	Response 1: The staff gauge locations are located outside of areas where the proposed project is expected to have immediate impact on. In addition, these discrete measurements are too coarse in spatial and temporal resolution to benefit any actual modeling effort. Response 2: For the baseline study, the water depth data from different seasons at each individual lake/wetland are compared so that the seasonal variation can be estimated and it can be determined if the waterbody is ephemeral. For these purposes, ground elevation data are not required. In addition, with the coordinates of the staff gauges, the bottom elevation of the staff gauges can be estimated using the bathymetry contour data if required. This would not be as precise as a field survey, but would suffice. Ultimately, the staff gauge dataset is not important for the baseline study. Due to the large distance of the project location from any of these lakes, no impact is expected to the lakes/wetlands.	Response 1: not understood, further clarification required. Response 2: If the purpose of water level monitoring at the staff gauges is for qualitative purposes (i.e., seasonal fluctuations) and not quantitative, then this is acceptable.
22	Section 4.2.1.4 Meteorology	SA	*"In late August 2021 a meteorological station was installed at SB_MET_AOI (Figure 4-1 and Table 4-1)."* This station is not in Table 4-1, it's shown as SB_WL_TWW for meteorology. Should include this station ID with SB_WL_TWW.	This has been added to Table 4-1.	Comment satisfactorily addressed.
23	Section 4.2.1.4 Meteorology	SA	Is the met station visited at a set frequency to check sensors/equipment? Is any equipment decommissioned during the winter or is data collected year-round (i.e., heated tipping bucket)?	Monthly maintenance visits. No seasonal decommissioning.	Response acknowledged.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
24	Section 4.3.2 Flow	JS	Suggest adding the rating curves or reference them as there isn't any actual results that have been provided.	Response 1: Ratings curves have been added. Response 2: Ratings curves have been added to Appendix B Year 1 Hydrology Report. See figures 11 and 12. Response 3: Reference added to section 4.3.2 directing reader to Appendix B Figures 11 and 12.	Response 1: There is no reference to where the rating curves can be found in the document. Response 2: Can you please add the reference into Section 4.3.2 to direct the reader to Appendix B Figures 11 and 12. Response 3; Response acknowledged.
25	Section 4.3.4 Meteorology	SA	Appendix B mentions a station in Durham. Is the Mount Forest station the same as the Durham station?	The Durham station was discontinued in the early 2000s and the Mt. Forest station is live to date. They are about 20 km apart and are expected to have similar weather patterns. But different parameters were recorded for different periods of time. The project team is using what's available for the comparison with the AOI weather station data.	Response acknowledged.
26	Section 4.3.4 Meteorology	SA	*"Data from this EMBP station were compared with data from existing Environment and Climate Change Canada (ECCC) meteorology stations in Mount Forest (current EMBP year) and Hanover (historical data form 1981 to 2010).*" How far away are these stations from the SB_MET_AOI station? Can EC station IDs be referenced?	Added station ID and distance to AOI to the paragraph. Spelling error has been corrected.	Comment satisfactorily addressed.
27	Section 4.3.4 Meteorology	SA	*"These inaccuracies necessitated the use of alternative sources for Year 1 snow depth data for the EMBP; thus, snow depth data from the nearby ECCC Goderich station was used to fill this data gap."* Is the snow on ground data used here that is reported for the EC station? Is a final dataset ordered from EC for this or is the online dataset used as is?	This is online dataset used as is.	Response acknowledged.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
28	Figure 5-1	JS	Suggest removing the flow direction arrows. We assume that these arrows are meant to show surface water body flow direction, but the scale of the figure makes it very difficult to see the surface water body.	The arrows have been removed.	Comment satisfactorily addressed.
29	Section 5.1 Program Overview	AM	Suggest adding some detail on why 100 mBGS was chosen as the cutoff for shallow groundwater.	See response to comment #1. A footnote has also been added to the text in Section 5.1.	Comment satisfactorily addressed.
30	Section 5.2.2 Data Analyses	AM	*"Ontario Drinking Water Quality Standards (ODWS MC; Ontario Regulation…"* ODWS should be ODWQS to avoid confusion and please define MC. O. Reg 169/03 does not have Aesthetic objectives for sodium. The reference should be ODWS AO.	The references have been clarified by modifying reference to O. Reg 169/03 to be the ODWQS. MC, which was used for microbiological or chemical, is no longer needed since different acronyms are now being used (ODWQS vs ODWS AO). The reference for sodium has been modified to refer only to ODWS AO.	Comment satisfactorily addressed.
31	Appendix A Appendix C Year 1 EMBP Surface Water Chemistry Results Tables	LJ	Consider adding additional columns showing max, min, mean values based on each sampling location (in future years these columns will show the ongoing max, min and mean – not just for that year's values). We see similar stats are included in Appendix H – may want to consider condensing into one table for future reports.	Tables can be condensed in future years as per the recommendation.	Response acknowledged.
32	Appendix A Appendix C – Year 1 EMBP Surface Water Chemistry Results Tables	LJ	Include legend note indicating that orange highlight is a guideline exceedance for that parameter. Grey highlight – no data available/not monitored. What is the difference between "not collected" in some boxes and the grey highlight shown in others? (i.e., for ORP values).	Legend note has been included. The “not collected” vs grey cells are just a formatting issue stemming from how we compiled the data. To correct this issue, all “not collected” cells in the surface water chemistry results tables have been corrected to be simple grey cells.	Comment satisfactorily addressed.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
33	Appendix B Standard Operating Procedure for Surface Water Limnology and Water Sample Collection	LL	*"Trip Blank – One Per Survey"* Define a 'survey' unit.	Response 1: One trip and field blank were collected per season (4 per year). Changed language in report from 'survey' to 'season' to clarify. Response 2: The adequacy and frequency of QA/QC sample collection will be re-evaluated during the program review.	Response 1: Comment is satisfactorily addressed, although the response raises concerns with the technical approach. A single trip blank for the season is not meaningful – it is only representative of the samples collected on that particular day. This is a concerning study design item that must be resolved in any future water chemistry sampling activities. Response 2: Response acknowledged.
34	Appendix A Appendix F Tables F.5 - F.36	LL	Define what is meant by a Candidate Reference Area. Wetland and river surface water stations within and outside of the AOI are identified as Candidate Reference Area(s). This is different than the 'Candidate Reference Site' terminology applied in Section 4, Table 4-1.	Candidate reference area = candidate reference site. Terminology is inconsistent because the 2 sections were authored by different organizations. For consistency, "area" has been changed to "site" in the report.	Comment satisfactorily addressed.
35	Appendix B Section 2.1.3 Water Levels (staff gauges)	SA	*"Note that the staff gauge readings are self-referenced with the intent of tracking water level changes; the reported water levels do not reference any geodetic or local elevation datum."* Is there a reason why they are not surveyed? It appears water levels are surveyed in the lakes, but not the watercourses/wetlands (EMBP SOP for manual water level measurements in Appendix B report)? For future studies or modelling purposes, it may be beneficial to have elevations of surface water as opposed to just the water level.	Surveying the staff gauges was not part of the EMBP study design. The staff gauge locations are located outside of areas where the proposed project is expected to have immediate impact on. In addition, these discrete measurements are too coarse in spatial and temporal resolution to benefit any actual modeling effort. This data was recorded at the lakes because we have the stage-storage relationship for the lakes and the stage data can be used to determine the volume of the lake at the time of survey.	Response acknowledged. Refer to comment #21.
36	Appendix B Section 2.2.2 Continuous Water Levels and Velocity	SA	Should define "H" in the Manning's equation for consistency.	"H" is the gauge height in metres relative to the station datum. Definition added to report.	Comment satisfactorily addressed.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
37	Appendix B Section 2.3.2 Continuous Water Level and Velocity Figure 9 & Figure 10	SA	Were the continuous datasets from SB_Flow_TWR_01 and SB_Flow_TWR_02 compared to precipitation data to identify the source of peaks (i.e., melt versus precipitation versus something else in the system)?	This was completed visually as part of the QA/QC process.	Response acknowledged.
38	Appendix B Section 2.3.4 Methodology	SA	Section 2.2.4 mentions a station in Durham, is this the same station as the Mount Forest Station?	The Durham station was discontinued in the early 2000s and the Mt. Forest station is live to date. They are about 20 km apart and are expected to have similar weather pattern. But different parameters were recorded for different periods of time. The project team is using what's available for the comparison with the AOI weather station data.	Response acknowledged.
39	Appendix B Section 2.3.4 Methodology	SA	*"In most cases, precipitation at the EMBP station was recorded to be lower than what was observed at the Mount Forest Station."* How far away is the Mount Forest station compared to the Site station? Is there a difference in elevation?	The Mount Forest station is 50 km east of the AOI station and approximately 100m higher in elevation which might explain the difference in precipitation. The purpose of the comparison is to confirm that the data collected at the AOI is not significantly different from the nearby stations.	Response acknowledged.
40	Appendix D 2.0 Drinking Water Program Figure 2	AM	Suggest removing the flow direction arrows.	The arrows have been removed.	Comment satisfactorily addressed.
41	Appendix D Section 2.3.3 Water Quality	AM	The discussion of water quality standards could be more clear - see comment 30.	See comments 30 for edits that have been made to clarify.	Comment satisfactorily addressed.
42	Section 1.2	GF	It is assumed Year 2 program ended August 2023. Confirm Program Review Report will include review of Year 1 and Year 2 data	The scope of the Program Review is being discussed with NWMO. The update to GHD will be provided during the weekly scheduled meetings once the scope has been finalized.	It is now understood that the Program review will include results of the Year 1 and Year 2 programs.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
43	Section 2.0	GF	What changes were made to the Year 2 program from review of the Year 1 data? Were the components not completed in Year 1 added to the Year 2 program?	No changes have yet been made. Due to scheduling setbacks, the Year 2 data were collected before the Year 1 data were evaluated. The recommendations from the data review will be incorporated into subsequent sampling campaigns.	Response acknowledged.
44	Figure 2-1	GF	Why is the repository located directly beneath the Town water supply well. This is not the case and provides undue concern.	This figure is a simplified representation and is not meant to convey that the repository is near the water supply well. A disclaimer can be added that the figure is conceptual.	Comment satisfactorily addressed.
45	Section 2.1	GF	Does this mean all components were not sampled in Year 2 ? If yes this leaves only Year 3 for the additional components?	No, the text specifies that each component will be monitored for a total of 1 to 3 years. Although originally the intent was to monitor everything within 3 years, this was not possible, as explained in the text. It is anticipated that the baseline program will continue beyond 3 years.	Response acknowledged.
46	Section 2.2	GF	How the AOI was established should be described?	Discussion added into Section 2.2.	Comment satisfactorily addressed.
47	Section 2.3	GF	Did certain COPC's get removed from the list for the Year 2 2023 sampling program?	No COPCs were removed from Year 2 on the basis of data collected in Year 1 since the data were not yet analyzed. However, as noted in the text, not all parameters are intended to be measured in every sample (in every year has also been added here now).	Response acknowledged.

Comment Number	Report Section Reference	Subject Matter Expert	Comments from Peer Review	How and Where Comments are Addressed (NWMO to complete)	Peer Review Responses to NWMO Comments (GHD to complete after previous column completed by NWMO)
48	Table 3-2	GF	Saugeen River sampling station has a relatively low ORP and higher turbidity. How many samples? Any indication of a polluting source? Is this a good location for the program objectives?	Response 1: There are 3 measurements from the Saugeen Reference station and 6 measurements from Saugeen Exposure stations taken in the winter, spring, and summer of 2022. The ORP values from those stations are within the range of those measured at the other study areas. The mean turbidity value at the Saugeen Exposure stations is somewhat higher than at other stations but was also found to be highly variable. The applicability of the location to meet the program objectives will be evaluated as part of the Comprehensive Review Report, including the potential for influence of confounding sources, but we feel there is no reason to suspect confounding sources are influencing the site based on the ORP or turbidity values. Response 2: No additional information has been reviewed to suggest this at this point. Further investigation will be completed as part of the program review.	Response 1: Acknowledged. Has there been any additional information that has been reviewed to suggest that there is no reason to suspect confounding sources are influencing the site based on the ORP or turbidity values? Response 2: Response acknowledged.
49	Section 5.1	GF	Was any of this information collected? Is there a map showing location of all private water supply wells?	Yes, the information was collected. A map of individual wells cannot be shown due to confidentiality requirements.	Response acknowledged.
50	Section 5.3	GF	Results do not indicate high levels of impact requiring dilution?	Response 1: Only a few samples required dilution. The text has been revised as follows: “Detection limits varied depending on the dilution that was necessary for the laboratory to complete the analysis but remained below benchmark values.” Response 2: Yes, confirmed.	Response 1: Acknowledged. Can you please confirm that benchmark values are the regulatory guidelines? Response 2: Response acknowledged.
51	Section 5.5	GF	Under what circumstance will the results not be incorporated into the long-term comprehensive baseline monitoring program?	If the SON-South Bruce area is not selected as the repository site.	Response acknowledged.

Appendix C

36 Guiding Principles

South Bruce Guiding Principles for NWMO's Site Selection Process

The Nuclear Waste Management Organization (NWMO) is seeking an informed and willing host for a deep geologic repository (DGR) to safely store Canada's used nuclear fuel, and a Centre for Expertise. To guide its work, South Bruce held a comprehensive visioning process in 2019 and 2020 to get input on what people cared about most in relation to the Project. The process, in addition to other community input and feedback resulted in the creation of 36 Guiding Principles which focus on safety for people and the environment, ensuring the Project brings meaningful benefits to the community, and ensuring the municipality has a voice in decision-making.

The principles were adopted by Council resolution and they have guided municipal activities and engagement related to the Project. South Bruce is seeking NWMO commitments on how it would meet or address these 36 expectations and aspirations for the Project. This is a key step in determining whether the Project is right for the community and will help people make an informed decision when a public referendum is held to measure willingness to be a host community.

Safety and the Natural Environment

1. The NWMO must demonstrate to the satisfaction of the Municipality that the Project will be subject to the highest standards of safety across its lifespan of construction, operation and into the distant future.

2. The NWMO must demonstrate to the satisfaction of the Municipality that sufficient measures will be in place to ensure the natural environment will be protected, including the community's precious waters, land and air, throughout the Project's lifespan of construction, operation and into the distant future.

3. The NWMO must demonstrate to the satisfaction of the Municipality that used nuclear fuel can be safely and securely transported to the repository site.

4. The NWMO will ensure that the repository site will not host any nuclear waste generated by other countries.

5. The NWMO must commit to implementing the Project in a manner consistent with the unique natural and agricultural character of the community of South Bruce.

6. The NWMO will minimize the footprint of the repository's surface facilities to the extent it is possible to do so and ensure that public access to the Teeswater River is maintained, subject to meeting regulatory requirements for the repository.

7. The NWMO must commit to preparing construction management and operation plans that detail the measures the NWMO will implement to mitigate the impacts of construction and operation of the Project.

People, Community and Culture

8. The NWMO must demonstrate to the satisfaction of the Municipality that it has built broad support for the Project within the community of South Bruce.

9. The Municipality will, in collaboration with community members, develop and establish an open and transparent process that will allow the community to express its level of willingness to host the Project.

10. The NWMO will identify the potential for any positive and negative socio-economic impacts of the Project on South Bruce and surrounding communities and what community benefits it will contribute to mitigate any potential risks.

11. The NWMO, in consultation with the Municipality, will establish a property value protection program to compensate property owners in the event that property values are adversely affected by the NWMO's site selection process and the development, construction and/or operation of the Project.

12. The NWMO, in consultation with the Municipality, will establish a program to mitigate losses to business owners in the event that their business is adversely affected by the NWMO's site selection process and the development, construction and/or operation of the Project.

13. The NWMO, in partnership with the Municipality, will develop a strategy and fund a program to promote the agriculture of South Bruce and the surrounding communities.

14. The NWMO, in partnership with the Municipality, will develop a strategy and fund a program to promote tourism in South Bruce and the surrounding communities.

15. The NWMO, in partnership with the Municipality, will commit to implement programs to engage with and provide opportunities for youth in the community, including investments in education and the provision of scholarships, bursaries and other incentives for youth to remain in or return to the community.

16. The NWMO will implement the Project in a manner that promotes diversity, equality and inclusion.

17. The Municipality recognizes the important historic and contemporary roles Indigenous peoples have and continue to play in the stewardship of the lands we all call home and will, in the spirit of Reconciliation, work with the NWMO and local Indigenous peoples to build mutually respectful relationships regarding the Project.

18. The NWMO will commit to relocate the working location of a majority of its employees to South Bruce as soon as it is reasonably practicable to do so after the completion of the site selection process.

19. The NWMO will, in consultation with the Municipality, establish a Centre of Expertise at a location within South Bruce to be developed in conjunction with the Project.

Economics and Finance

20. The NWMO, in consultation with the Municipality, will commit to implementing a local employment and training strategy with the objective of ensuring that the majority of employees for the Project are located within South Bruce and surrounding communities.

21. The NWMO, in consultation with the Municipality, will commit to implementing a business opportunities strategy that will provide opportunities for qualified local businesses to secure agreements that support the Project and that requires the NWMO to take all reasonable steps to create opportunities for qualified local businesses to benefit from the Project.

22. The NWMO will commit to implementing a procurement strategy for the Project that gives preference to the selection of suppliers who can demonstrate economic benefit to South Bruce and surrounding communities.

23. The NWMO will enter into an agreement with the Municipality providing for community benefit payments to the Municipality.

Capacity Building

24. The NWMO will cover the costs incurred by the Municipality in assessing community well-being and willingness to host the Project.

25. The NWMO will fund the engagement of subject matter experts by the Municipality to undertake peer reviews of Project reports and independent assessments of the Project's potential impacts on and benefits for the community as determined necessary by the Municipality.

26. The NWMO agrees to cover the costs of the Municipality's preparation for and participation in the Project's regulatory approval processes, including the Canadian Nuclear Safety Commission's licencing process and the assessment of the Project under the Impact Assessment Act (or other similar legislation), that are not otherwise covered by available participant funding.

27. The NWMO will fund the Municipality's preparation of a housing plan to ensure that the residents of South Bruce have access to a sufficient supply of safe, secure, affordable and well-maintained homes.

Services and Infrastructure

28. The NWMO will prepare a review of the existing emergency services in South Bruce and provide appropriate funding for any additional emergency services required to host the Project in South Bruce.

29. The NWMO will prepare an infrastructure strategy that addresses any municipal infrastructure requirements for the Project and will commit to providing appropriate funding for any required upgrades to municipal infrastructure required to host the Project in South Bruce.

30. The NWMO will prepare a review of the existing and projected capacity of South Bruce's road network and will commit to providing appropriate funding for any required upgrades to the road network.

31. The NWMO will enter into a road use agreement with the Municipality that identifies approved transportation routes during construction and operation of the Project and ensures proper funding for maintenance and repair of municipal roads and bridges used for the Project.

Services and Infrastructure (continued)

32. The NWMO, in consultation with the Municipality and other local and regional partners, will prepare a strategy to ensure there are sufficient community services and amenities, including health, child-care, educational and recreational facilities, to accommodate the expected population growth associated with hosting the Project in South Bruce.

33. The NWMO will comply with the Municipal Official Plan and zoning by-law and seek amendments to the Official Plan and zoning by-law as necessary to implement the Project.

Governance and Community Engagement

34. The NWMO will provide the Municipality with an ongoing and active role in the governance of the Project during the construction and operation phases of the Project.

35. The NWMO will continue to engage with community members and key stakeholders to gather input on community vision, expectations and principles, including concerns, related to the Project.

Regional Benefits

36. The NWMO must demonstrate to the satisfaction of the Municipality that the Project will benefit the broader region outside of the community of South Bruce, including local Indigenous communities.

Reach out anytime with your questions, comments, concerns, or if you are seeking more information. We would be happy to hear from you!

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Visit our website:
www.southbruce.ca

Visit our community engagement tool:
www.southbruceswitchboard.ca

Sign up to get Project updates direct to your inbox:
forms.southbruce.ca/Stay-Connected

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