

Appendix E – Environmental Reference Materials

This preliminary analysis outlines potential mechanisms by which contaminants could be disturbed or dispersed during large scale construction and operation activities. It is not a site specific assessment and is provided for contextual reference in relation to contamination concerns identified in the main submission.

Figures

Strategic Environmental Assessment

Survey of Endangered Bats

Figures

FIGURE LIST

1.0 Proponent's Conceptual Key Project Components

Fig H.1.1 Preliminary Project Components and Conceptual Rendering (Stantec)

2.0 Civilian Lands - Site Photos

Fig H.2.1 Fractured Karstic Dolostone Outcrop - County Rd 12 and 25 Sideroad area - Typical of IPD Proposed Reservoir Site

Fig H.2.2 Nearshore Turbidity at the mouth of Warren Hill Creek (source DND Sideroad 30)

Typical Water Supply Shoreline Dug Wells fed by Shallow Seepage / Turbidity Plumes

Fig H.2.3 Taum Sauk Hydroelectric Power Station (Missouri) Ring Dam Reservoir Failure and Replacement

3.0 Potential Reservoir Breach Torrential Flooding Hazard Envelope

Fig H.3.1 Hazard Envelope

Fig H.3.2 Parcel / Residence Count

4.0 Ludington Pumped Storage Reservoir

Fig H.4.1 Existing Ludington, Michigan Pumped Storage Reservoir

5.0 High Voltage Transmission

Fig H.5.1 Southern Ontario

Fig H.5.2 Bruce to Essa including Meaford

6.0 DND Lands

Fig H.6.1 Monitoring Locations DND Lands (Royal Military College)

Fig H.6.2 Direction of Groundwater Flow on DND Lands for Monitors less than 20 m Deep (Arcadis)

Fig H.6.3 Groundwater Analytical Results and Ground Elevation (LiDAR) of Monitor

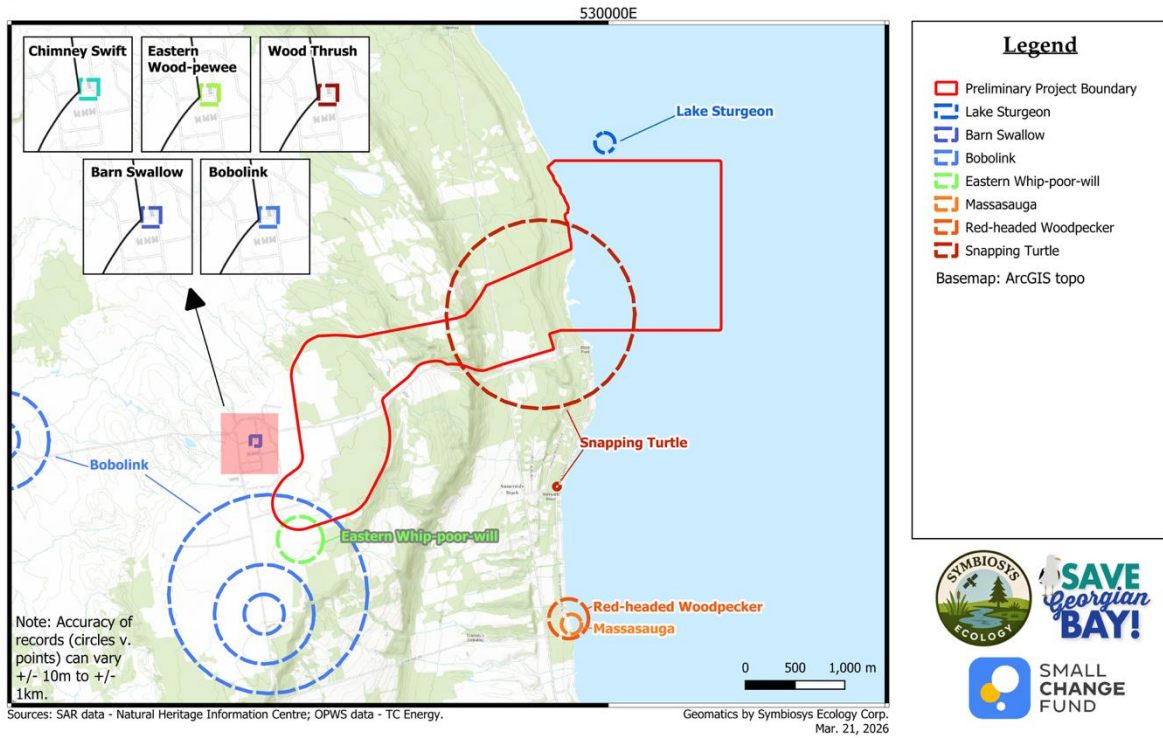
Fig H.6.4 Bathymetry with Water Intake / Discharge Circle, Tailraces

Species At Risk (4CDTC Meaford)

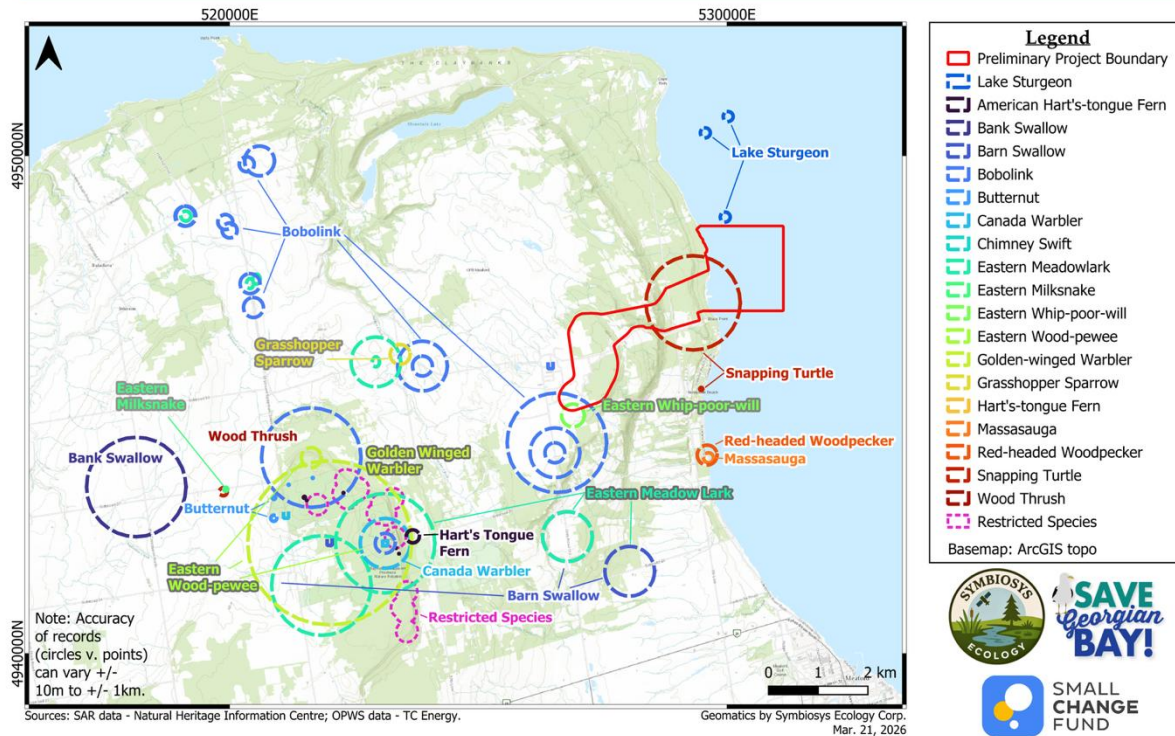
Species	COSSARO Status	COSEWIC Status	SARA Schedule 1	In TCE IPD Report	NHIC Records
Butternut	Endangered	Endangered	Endangered	Yes	Yes
Red-headed Woodpecker	Endangered	Endangered	Endangered	No	Yes
American Ginseng	Threatened	Endangered	Endangered	No	Yes
Canada Warbler	Special Concern	Special Concern	Threatened	Yes	Yes
Eastern Wood-pewee	Special Concern	Special Concern	Special Concern	Yes	Yes
Silver Lamprey* (Great Lakes - Upper St. Lawrence population *)	Special Concern	Special Concern	Special Concern	Yes	Yes
Grasshopper Sparrow	Special Concern	Special Concern	Special Concern	Yes	Yes
Barn Swallow	Special Concern	Special Concern	Threatened	Yes	Yes
Bobolink	Threatened	Special Concern	Threatened	Yes	Yes
Eastern Meadowlark	Threatened	Special Concern	Threatened	Yes	Yes
Eastern Milk Snake	NAR	Special Concern	Special Concern	Yes	Yes
Snapping Turtle	Special Concern	Special Concern	Special Concern	No	Yes
American Hart's-tongue Fern	Special Concern	Special Concern	Special Concern	No	Yes
Lake Sturgeon (Great Lakes - Upper St. Lawrence River)	Endangered	Threatened	Not Listed	Yes	Yes
Wood Thrush	Special Concern	Threatened	Threatened	Yes	Yes
Golden-winged Warbler	Threatened	Threatened	Threatened	Yes	Yes
Eastern Whip-poor-will	Special Concern	Threatened	Threatened	Yes	Yes
Bank Swallow	Threatened	Threatened	Threatened	Yes	Yes
Chimney Swift	Threatened	Threatened	Threatened	No	Yes
St. Lawrence population)	Threatened	Threatened	Threatened	No	Yes
Eastern Small Footed Bat	Endangered	Candidate	Not Listed	Yes	No
Little Brown Myotis	Endangered	Endangered	Endangered	Yes	No
Tri-colour Bat	Endangered	Endangered	Endangered	Yes	No
Northern Myotis	Endangered	Endangered	Endangered	Yes	No
Hoary Bat	Endangered	Endangered	Under Review	Yes	No
Eastern Red Bat	Endangered	Endangered	Under Review	Yes	No
Silver Haired Bat	Endangered	Endangered	Under Review	Yes	No
Monarch	Special Concern	Endangered	Endangered	Yes	No
Yellow-banded Bumblebee	Special Concern	Special Concern	Special Concern	Yes	No
Northern Brook Lamprey	Special Concern	Special Concern	Special Concern	Yes	No
Deepwater Sculpin	NAR	Special Concern	Special Concern	Yes	No
Black Ash	Endangered	Threatened	Under Review	Yes	No
Western Chorus Frog	NAR	Threatened	Threatened	Yes	No

* 1987 Record in NHIC dataset

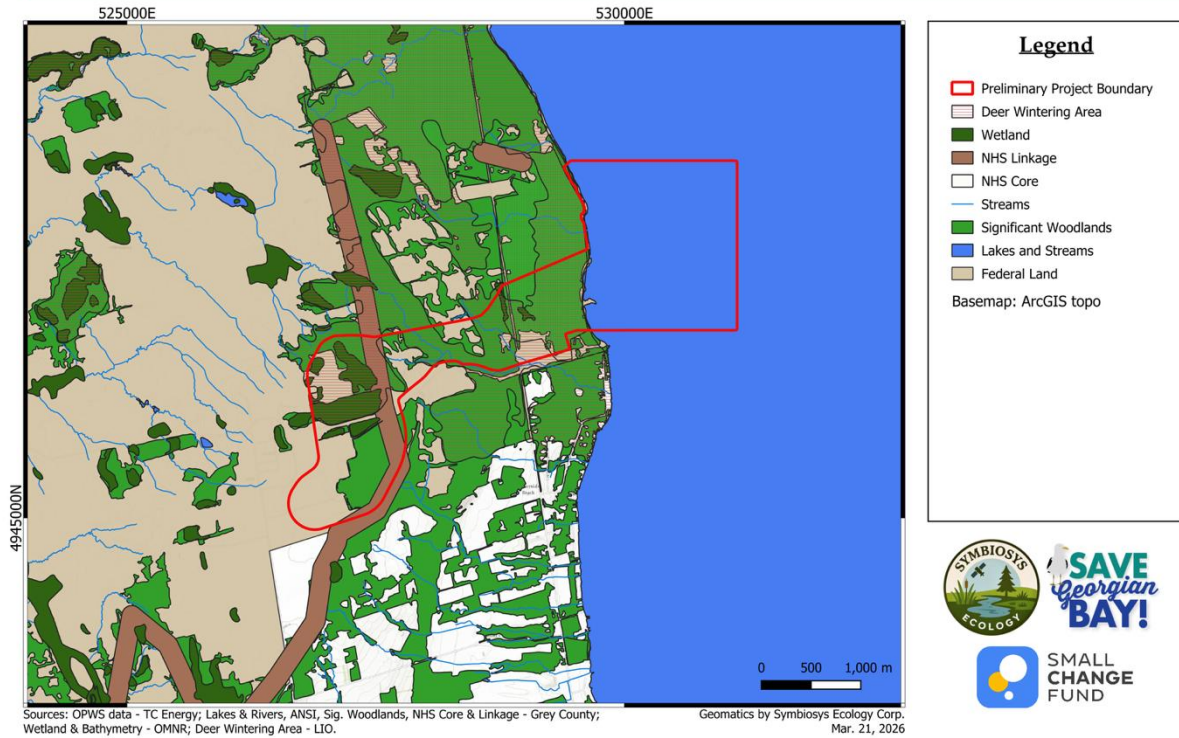
Ontario Pumped Water Storage Proposal: Species at Risk



Ontario Pumped Water Storage Proposal: Species at Risk



Ontario Pumped Water Storage Proposal: Natural Heritage



Ontario Pumped Water Storage Proposal: Natural Heritage



Civilian Lands – Site Photos



March 8, 2026

Nearshore Turbidity at the mouth of Warren Hill Creek (Source: DND Sideroad 30)



Typical Water Supply Shoreline Dug Wells fed by Shallow Seepage / Turbidity Plumes

Potential Torrential Flooding Hazard Envelope



File Date: April 1, 2026
 Scale: 1:18,000 @ 11x17"

- DND Boundary (Approx.)
- - - Potential Breach Flood Envelope
- Ring Dam
- - - Below Ground Project Component
- Active Reservoir Volume Bottom (3:1 slope) at 349 m asl
- - - Above Ground Project Component
- - - Preliminary Construction Zone
- Reservoir External Toe (4:1 slope) at 349 m asl
- Preliminary Project Boundary
- Berm Breach and Leakage Potential Flow Path

N

FIG 3.1

Property of
HUNTER and ASSOCIATES
 Environmental and Engineering Consultants

Website: www.hunter.ca

Environment

Relinquishing decision-making: Risk of conflicting priorities

- The decision on whether to allocate DND-owned land to TCE is pivotal.
- If DND decides to relinquish its land, TCE would pursue a federal Impact Assessment (IA). The IA leaves the decision-making to the Minister of Environment and Climate Change on whether the project is in the best interest for Canadians.

To note: Estimates are that the proposed project would destroy approx. 10% of 4 CDTC's wildlife that DND committed to protect (Defence Energy and Environment Strategy).

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Impacts to 4 CDTC

1. **Travel Time** – Increased transport time to proposed Alpha Range relocation, which is the most heavily used range.
2. **Disruption to Training** – Proximity of project during construction and final build will impact individual training throughout.
3. **Reputational Risk** – Base was originally expropriated from Meaford for national service, now the land for a private profit.
4. **Uncertainty to Infrastructure Replacement Timelines** – Any gap between loss of current infrastructure and construction/availability of new infrastructure will impact 4 CDTC operational output. Fragility in both the replacement plan and actual construction of new infrastructure.



NEEDS DATE
Preliminary Analysis of the Dispersion of 4 CDTC Contaminants

The construction and operation of the TCE project will perturb the contaminants from the 4CDTC military base. To understand the dynamics of this contaminant dispersion we need to consider:

1. Contaminant Types and Properties:

- Heavy Metals: Often bind to sediments but can be disturbed by construction activities.
- PFAS: Persistent in the environment, can dissolve in water and spread widely.
- Benzene: Volatile and can disperse through air and water.
- White Phosphorus: Reacts with water and oxygen, potentially harmful.
- Asbestos: Fibers can be airborne and settle in water, posing health risks.

2. Dispersion Mechanisms:

- Construction operations: Disturb the ground and water of the Bay, releasing contaminants.
- Water Currents: Spread contaminants horizontally and vertically in the water column.
- Stormwater Runoff: Washes disturbed contaminants into the Bay.
- Sedimentation: Heavy particles settle to the bottom, while lighter ones remain suspended.
- Atmospheric Deposition: Airborne particles eventually settle onto the water surface.
- Biological Uptake: Contaminants absorbed by aquatic organisms can move through the food chain.

3. Environmental Factors:

- Storms and Winds: Agitate the water, increasing dispersion and resuspension of sediments.
- Fish and Other Aquatic Life: Can uptake and bioaccumulate contaminants, spreading them through movement and feeding.

Dr. Moe Qureshi, Ph.D
Director of Climate Policy and Research
Conservation Council of New Brunswick

Report requested by Save Georgian Bay, 2024

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**is withheld pursuant to sections
est retenue en vertu des articles**

21(1)(a), 21(1)(b), 21(1)(c)

**of the Access to Information Act
de la Loi sur l'accès à l'information**

SOLICITOR-CLIENT PRIVILEGE/PROTECTED B

BRIEFING NOTE FOR THE MINISTER OF NATIONAL DEFENCE

TRANS CANADA ENERGY PUMPED STORAGE PROPOSAL AT 4 CDTC MEAFORD.

ISSUE

1. This Briefing Note is intended to inform and seek the guidance of the Minister of National Defence about the Trans Canada Energy (TCE) proposal to build a Pumped Storage Project (PSP) under the *Dominion Water Power Act* (DWPA) at the 4 Canadian Division Training Centre Meaford (4 CDTC)

BACKGROUND

2. 4 CDTC has been used for military training since the land was expropriated by the Crown in 1942 and is heavily used by the Canadian Army (CA) as a training facility for Regular and Reserve forces in Ontario. 4 CDTC also hosts a variety of other country's military units (i.e. USA, New Zealand, UK and Jamaica) and non-military agencies (e.g. police agencies, emergency and security services). The 4 CDTC Range and Training Area (RTA) is used heavily by 31, 32, and 33 Canadian Brigade Groups, as a primary training area, as well as by 2 Canadian Mechanized Brigade Group and the Canadian Special Operations Regiment. The CA will continue to train at 4 CDTC for the foreseeable future in order to complete training which supports CA operational readiness and deployability both at home and abroad.

3. TCE approached DND in 2016 to explore the possibility of constructing a 1,000-megawatt pumped storage hydroelectric facility on 4 CDTC lands. The footprint required during PSP construction is estimated at 445 hectares (ha) while the final project would require 290 ha. This represents approximately 4% of the gross area (7691 ha), however, the reservoir portion consumes a much more significant portion of the garrison area's developable land. The long-term impact of this loss of space has not yet been fully analyzed. The premise behind the PSP is to consume "off-peak" surplus green energy to pump water into a constructed storage reservoir located at the top of the Niagara Escarpment within the boundaries of 4 CDTC. The reservoir would be emptied during "peak" usage periods, driving turbines to create electricity during high demand periods, reducing provincial reliance on gas-fired generating plants.

4. TCE's PSP proposal anticipates a potential 500,000 ton reduction of Green House Gas (GHG) per year. This figure has been analyzed by TBS's Centre for Greening Government and is deemed credible. If DND deems the PSP proposal can be accommodated and it is awarded an Licence under the DWPA by Indigenous Services Canada (ISC), the Government of Canada could explore opportunities for obtaining GHG reduction credits and other possible potential benefits.

5. TCE submitted an application to CIRNAC¹ in March 2018, and received a priority permit under the *Dominion Water Power Regulations* (DWPR). The priority permit has a term of 12 months and can be renewed annually under the condition that progress is being made towards

¹ The DWPA is now managed by Indigenous Services Canada (ISC).

11 December 2019

RECORD OF DISCUSSION

**4th Canadian Division Training Centre Meaford – Site Development Plan (SDP) -
Environmental Constraints Meeting**

Held on 11 December 2019, Conference room in Bldg. M-153, 4th CDTC Meaford
1300-1530 hrs

Attendees:

(In person)

Stephanie Morris	ADM(IE), DGPR, DRPPP – Senior Planner
Dwayne James	ADM(IE), DGPR, DRPPP – Senior Planner
Capt Cloutier-Labonte	ADM(IE), RP Ops Det Meaford - OC
LCol Fearon	CA, 4th Canadian Division TC Meaford - OC
CWO Mayfield	CA, 4th Canadian Division TC Meaford
Dan Hoyt	CA, 4th Canadian Division TC Meaford – Range Control
Ted Keuncke	CA, 4th Canadian Division TC Meaford – Env O
Mark Wiercinski	CA, 4th Canadian Division TC Meaford - Biologist
Candice Zboch	DCC, Technical Specialist, Real Property Management
Deborah Darigon	CA, 4th Canadian Division – Environmental Coordinator
Stephanie San Miguel	CA, 4 CDSG - Environmental Coordinator

(Via teleconference)

Maj Price	CA, CADTC, HQ
Aubrie Carruthers	CA, CADTC, HQ
Maj Dean	ADM(IE), RP Ops (Ontario)
MWO Herbst	CA, 4 Cdn Div JTFC HQ
Scott Hamilton	ADM(IE), DGESM, DESM
Rachel McDonald	ADM(IE), DGESM, DESM
Veronic Pichard	CA, DLE
Karen Ralston	DCC, representing DLI

1. Stephanie Morris (SM) opened the meeting by welcoming the attendees and conducting a round table for participants to introduce themselves and identify which organization they represent. SM also provided a summary of the meetings intent, which was to discuss the environmental constraints / impacts associated with the site development concepts being developed as a result of the Trans Canada Energy (TCE) Pumped Storage Project and the requirement to develop a Site Development Plan (SDP).

4.21(100)

4.21(100)

2. SM indicated that the ADM(IE)'s understanding of the environmental risk areas previously identified by 4 CDTC and 4 Div (ref BN), are that this does not constitute the limits of the environmental risks/constraints at 4 CDTC, and that there would be further possible environmental risks / implications to any further concepts being explored, which would need further evaluation. SM then asked Mark Wiercinski (MW), the 4 CDTC Biologist, to provide a summary and context for the environmental risk map developed to ensure a comprehensive understanding of the mapping provided.

3. MW indicated that the assessment provided was to identify, at a high-level, the environmental risk that would pertain to future development of 4 CDTC. The mapping prepared included the TCE footprint and other known infrastructure movements based on previous concepts provided. MW also indicated that this assessment was based only on a preliminary examination for planning purposes, and that a full evaluation has not been conducted. Various maps and concepts were assessed against certain environmental factors such as species at risk and concerns to identify a conceptual map for planning purposes based on the areas identified in preliminary concept plans. MW also indicated that circles on the map represent individual species encountered on the site during the preliminary study period, and that in the proposed TCE reservoir location alone, 10 species at risk were identified, and at least 5 specific at risk in other locations were preliminarily assessed.

4. SM asked about the implications for moving DND related infrastructure concepts in the SDP to other locations on site, where environmental risk had not been identified on the preliminary mapping prepared. Scott Hamilton (SH) indicated that the issue surrounding species at risk is that any infrastructure project would be required to have a permit from the appropriate regulatory authorities, and that there is always the risk that such a project would not be able to obtain the required permit to proceed. SH indicated that all attempts should be made to avoid those species at risk early in the planning phases to avoid these areas, where possible. Additionally, since the TCE project would displace and require relocation of current operations already conducted on site, there is a significant risk that a permit would not be granted. SH indicated that Environment and Climate Change Canada (ECCC) would be reluctant to provide a permit in these types of circumstances. Rachel McDonald (RM) indicated that this permitting process would not be up to DND.

5. SM asked about the Section 83 clause and whether this would apply in this particular situation. RM indicated that Section 83 would not apply if we are moving infrastructure / redeveloping the site based on the TCE (third party) proposal. Karen Ralston (KR) asked whether the Minister of National Defence could request that Section 83 be applied in this situation. 1

SH also indicated that there have been recent examples of projects being stopped because of species at risk on DND properties. SH indicated that this is a large project proposal that would need to be evaluated based on its risks and merits from a Government of Canada perspective. SH indicated that this type

Site Development Plan
 4th Canadian Division Training Centre, Meaford Ontario

Risk Consideration: Environment

Risk Statement: Preliminary environmental analysis indicates that there is a high degree of environmental risk associated with any new development proposed at 4 CDTC, regardless of the location on the site. There is a risk that the TCE RCP may not receive permits as a result of the Impact Assessment Process, or that there will be mitigation measures imposed that will increase requirements and costs to maintain an environmentally sustainable environment at 4 CDTC.

Risk Assumption: Site environmental issues will be identified during the Impact Assessment process. Environmental impact is anticipated to be complex, given the number of Species at Risk (SAR) known to be present on the site, as well as the abundance of natural habitat that exists on the proposed TCE PSP footprint and SDP proposed relocation lands. Assessment during the early stages of the project development phase will be undertaken to identify and mitigate risks that could introduce negative impact on the attainment of project objectives. The final site selection process, guided by the appropriate background studies, will assist in the mitigation of environmental impacts to the site development and implementation of all projects.

Risk Assumption: Any required environmental impact assessments for the PSP will also consider the areas identified for the relocation and rebuild of 4 CDTC infrastructure, including roads and works.

Risk Assumption: The Federal Contaminated Site Inventory (FCSI) lists several contaminated sites at 4 CDTC which fall within the lands considered in this SDP. Acceptable mitigation measures will be required to address these contaminated sites prior to any disturbance or construction activities.

Risk Assumption: 4 CDTC Meaford is the site of historic munitions, and as a result, UXO can potentially be found throughout the RTAs. It must also be assumed that UXO may be present at any proposed development areas identified in the SDP Concept or Final Development Plan.

Risk Response: If monitoring and mitigation measures are implemented, the **Impact of Risk to the Environment is Low.**

Risk Consideration	Likelihood of Risk	Impact of Risk	Risk Level (Prior to Risk Response)	Risk Response	Risk Level (After Risk Response)
ENVIRONMENT	Likely	Major	High	Monitor & Mitigate	Low

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