MEMO

Appendix H.4.B.1

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Subject: **Georgian Bay (Ontario) Pumped Storage Hydropower Project**
Closed AI Query – Summary of 325 Public Comments (including 93 attachments) submitted to IAAC, plus the Meaford Community Readiness Study (1,849 pages) As Summarized using Google NotebookLM Artificial Intelligence (AI)

The **Google NotebookLM** AI summary below is based on 325 public comments and 93 attachments (PDF) as submitted in response to the Initial Project Description released by IAAC on Mar 6, 2026. In addition, the Deloitte Meaford Community Readiness Study Apr 27, 2026, has been included in this otherwise closed query. See enclosed listing of attachments included or excluded from this AI analysis. Duplicates have not been excluded.

May 21, 2026 12:45 pm version AI results.

Overview of sources (325 Public Comments + 93 Public Comment Attachments + Community Readiness Study)

The provided documents present a multifaceted debate regarding the **Ontario Pumped Storage Hydropower Project** proposed by **TC Energy** near Meaford. Support for the initiative comes from **LiUNA**, which emphasizes the significant **economic benefits**, including the creation of thousands of **construction jobs** and the reinforcement of Ontario's **clean energy infrastructure**. Conversely, numerous experts and community groups raise alarms about **environmental integrity**, citing risks such as **aquatic organism mortality**, the disturbance of **unexploded ordnance** on military land, and the potential for **groundwater contamination** through fractured karst geology. Critics also argue the project is technologically **obsolete**, suggesting that **battery energy storage systems** offer a more cost-effective and less intrusive alternative. Additional concerns focus on **long-term safety**, the lack of a **decommissioning plan** for the massive reservoir, and the potential for **permanent damage** to the protected **Niagara Escarpment**. Formal resolutions from the **Municipality of Killarney** and detailed reports from local climate groups further underscore a significant **public opposition** based on perceived financial and ecological threats.

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1. What are the content deficiencies of the Initial Project Description?

The Initial Project Description (IPD) for the Ontario Pumped Storage Project has been identified by numerous stakeholders, including municipalities, local residents, and environmental organizations, as being **materially incomplete and insufficient** to support a public interest determination. The sources outline several critical content deficiencies across multiple domains:

Dam Safety and Public Risk

- **Absence of Failure Analysis:** The IPD contains **no analysis of dam failure scenarios**, dam-break modeling, or downstream inundation mapping.
- **Geological Suitability:** Stakeholders argue the IPD fails to assess the risks of placing a 26-million-cubic-metre reservoir on the **Niagara Escarpment's karst and fractured bedrock**, which may lead to leakage or instability.
- **Active Military Context:** The document does not account for the unique risks of building a dam adjacent to **active military training areas** involving live-fire and explosives.
- **Emergency Planning:** There is a complete lack of **emergency preparedness or evacuation plans** for the approximately 300 homes and farms located directly below the proposed reservoir.

Decommissioning and Long-Term Liability

- **Lack of a Credible Plan:** The IPD defers decommissioning methods to a future date rather than providing a technically grounded plan at the approval stage.
- **Financial Assurance:** There is **no cost estimate for decommissioning** or proposed financial security mechanism (such as a bond or trust fund) to ensure taxpayers are not left with the liability of site rehabilitation.

Environmental and Aquatic Impacts

- **Open-Loop Risks:** The IPD is criticized for failing to characterize the ecological consequences of an **open-loop design**, specifically the chronic daily mass entrainment and impingement risk to fish.
- **Missing Baseline Data:** There is an **absence of baseline studies** for water quality, sediment, and aquatic ecosystems in Georgian Bay, as well as terrestrial Species at Risk (SAR) beyond a few listed species.
- **Thermal and Turbidity Modeling:** The document lacks quantitative hydrodynamic and thermal modeling to assess how pumping will affect **water clarity, temperature regimes, and winter ice ecology**.

Legacy Contamination and Site Characterization

- **Mobilization of Toxins:** The IPD does not adequately address the risk that large-scale excavation and tunneling will **mobilize legacy military contaminants** (including heavy metals and unexploded ordnance) into groundwater and Georgian Bay.
- **Incomplete Disclosure:** Stakeholders claim the proponent has **withheld or failed to disclose** findings from its own site investigations, such as borehole data and geotechnical reports.

Greenhouse Gas (GHG) Disclosure

- **Embodied Carbon:** The GHG disclosure **omits the embodied carbon** associated with the massive quantities of cement, concrete, and steel required for construction.
- **Outdated Estimates:** The claim of a 490,000-tonne annual operational saving relies on a **six-year-old study** and does not account for the current grid emission factor or the project's own construction-phase debt.
- **Net-Zero Pathway:** The IPD fails to provide a **credible pathway to net-zero emissions**, which is a regulatory requirement for projects operating beyond 2050.

Inadequate Alternatives Analysis

- **Superficial Comparison:** The IPD is accused of dismissing alternatives like **closed-loop systems or grid-scale battery storage** without a genuine, documented comparative assessment of their relative environmental and economic merits.
- **Project Need:** It does not reconcile the project proposal with the fact that the **IESO has twice determined** the project does not provide sufficient value to Ontario ratepayers compared to other non-emitting resources.

Socio-Economic and Infrastructure Omissions

- **Misleading Employment Claims:** Headline figures of 41,000 jobs are described as **"materially misleading" economic multipliers**, contrasting with the actual disclosure of only **20 to 30 permanent operational positions**.
- **Segmentation (Piecemealing):** The IPD excludes critical project-interdependent components from its scope, such as the **80 km transmission corridor** and the required relocation of existing DND infrastructure.
- **Impact on Drinking Water:** There is no assessment of the risks to **private shoreline water intakes** or municipal systems that may be compromised by turbidity or contamination during construction.
- **Nuisance Impacts:** The document lacks **noise modeling and vibration impact assessments** for both the construction (e.g., multi-year blasting) and operational phases.

2. <u>What are the main issues and environmental concerns raised by local residents?</u>

Local residents have raised a vast array of issues and environmental concerns regarding the proposed Ontario Pumped Storage Project. These concerns are not limited to Meaford but extend across the Georgian Bay region, including the Town of The Blue Mountains, Tiny Township, and communities on the eastern shore near Parry Sound.

The main issues can be categorized into the following areas:

Water Quality and Drinking Water Safety

- **Contamination Risks:** Residents fear that large-scale excavation and tunneling will disturb 80 years of military contaminants—including heavy metals, unexploded ordnance (UXO), and "forever chemicals" (PFAS)—releasing them into the groundwater and Georgian Bay.

- **Turbidity and Clarity:** There is significant concern that the daily cycling of 23–26 million cubic metres of water will stir up deep lakebed sediments, causing permanent turbidity that would degrade the bay's notably clear waters.
- **Threats to Private Wells:** Many shoreline residents rely on private shore wells or drilled wells that lack advanced municipal filtration. They worry project activities will cause these wells to go dry, become murky, or become chemically contaminated.
- **Municipal Intakes:** Residents note that the Meaford municipal water intake is located only a few kilometres from the proposed outlet and could be compromised by turbidity or toxins.

Dam Safety and Public Risk

- **Catastrophic Failure:** The proposed reservoir would hold 26 million cubic metres of water high on the Niagara Escarpment, directly above approximately 300 homes, farms, and cottages. Residents frequently cite the **2005 Taum Sauk dam failure** as evidence of the catastrophic risk to human life and property.
- **Geological Instability:** There is concern that the **karst (fractured limestone)** of the Niagara Escarpment is unsuitable for a structure of this scale, as it may lead to unpredictable leakage, sinkholes, or foundation failure under the immense daily weight fluctuations.
- **Active Military Context:** Building a major dam adjacent to an active training range where heavy artillery and explosives are regularly used is described by residents as "irresponsible" and "insane".

Ecological and Aquatic Impacts

- **Fish Mortality:** The open-loop design is heavily criticized for its potential to kill millions of fish annually through **entrainment and impingement** (being sucked into or pinned against intakes).
- **Spawning Habitat Destruction:** Construction and operations are expected to destroy critical spawning grounds for Lake Whitefish, Lake Trout, and Smallmouth Bass located along the "Cape Rich Steps".
- **Species at Risk (SAR):** Residents and local experts highlight that the project area is home to over **30 Species at Risk**, including the Western Chorus Frog, Tri-coloured Bat, Butternut Tree, and Jefferson Salamander, whose habitats would be permanently lost or fragmented.
- **Escarpment Destruction:** The permanent destruction of approximately **500 acres of the Niagara Escarpment**, a UNESCO World Biosphere Reserve, is viewed as an "inexcusable" environmental loss.

Socio-Economic and Community Impacts

- **Property Values and Insurance:** Homeowners fear their properties will become unmarketable and that they will be unable to obtain flood insurance due to the proximity of the "impact zone".
- **Construction Nuisances:** Residents anticipate **six or more years of multi-year blasting**, drilling, and 24-hour industrial noise and light, which will disrupt their health and "quiet enjoyment" of the area.
- **Infrastructure Strain:** The influx of up to 1,700 construction workers is expected to overwhelm Meaford’s small hospital, already over-capacity schools, and limited housing market.

- **Traffic Congestion:** Heavy industrial traffic—estimated at hundreds of truckloads daily—is expected to cause safety issues and damage quiet rural roads like 7th Line and Highway 26.

Project Need and Economic Viability

- **Obsolescence and Alternatives:** Many residents argue the project is an "antiquated" technology that will be obsolete by the time it is built, favoring **grid-scale battery storage** which is described as faster to deploy, less invasive, and more cost-effective.
- **Inefficiency:** Concerns were raised that the facility is a **net consumer of energy**, losing approximately 25–30% of the electricity it uses to pump water uphill.
- **Taxpayer Burden:** Residents object to what they see as a "for-profit project" that relies on billions in public funding while shifting all environmental and financial risks to Ontario ratepayers and local citizens.

Lack of Transparency and Trust

- **Proponent Credibility:** There is deep skepticism regarding TC Energy's history of pipeline leaks and its lack of experience in building pumped storage facilities or dams.
- **Process Concerns:** Residents feel the community engagement has been "promotional" rather than genuine and that the project is being "pushed through" behind closed doors despite twice being rejected by the IESO.

3. How will Pumped Storage fishkill residuals, including the seagull problem and, DND and residential water intakes, impact recreational shorelines and the aquatic and wildlife ecosystems?

The proposed Ontario Pumped Storage Project's "open-loop" design, which involves daily cycling of massive volumes of water, is expected by residents and environmental groups to generate significant fish mortality, creating cascading impacts on the regional environment and shoreline communities.

Fishkill Residuals and the "Seagull Problem"

The operation of the plant's intake and discharge structures is predicted to cause massive annual fish kills through entrainment (being sucked into turbines) and impingement. These "residuals"—the biological remains of millions of fish and invertebrates—pose unique risks:

- **Attraction of Nuisance Wildlife:** Residents at "Sea Gull Cove" and nearby properties are concerned that a regular supply of dead or injured fish and plankton from the turbines will attract a massive increase in the **seagull population**. This could lead to intense noise from calling and flight, as well as significant pollution on land and water from **bird excrement**.

- **Putrefaction and Odors:** Ground-up marine life is expected to **putrefy**, potentially altering the water's **pH and oxygen content**. This process is predicted to produce "terrible odors" and nauseating biological waste that would compromise the aesthetic and recreational value of public and private beaches.

Impact on Water Intakes (Residential and DND)

The project's activities threaten the source water for thousands of residents and the military base:

- **Biological Waste in Shore Wells:** Shoreline current models show that turbidity and putrefied marine life could flow directly into **private shore wells**. These residential systems typically use basic UV filtration and are not equipped to handle biological waste in this form.
- **Clogging and Filtration Failure:** High turbidity from daily water cycling and construction is expected to **clog water intakes and filtration systems**, potentially depriving residents of clear, potable water.
- **DND and Municipal Risks:** The **DND water treatment plant intake** and the Meaford municipal intake (located approximately 6.6 km away) could be compromised by sediment plumes and the mobilization of legacy military contaminants during construction and operation.

Impact on Recreational Shorelines

The "pristine" nature of Georgian Bay's shoreline—a key driver for the local tourism economy—faces several threats:

- **Water Quality Degradation:** Repeated discharges from the reservoir are likely to create a "churned up brown version of Georgian Bay" due to persistent turbidity from clay sediments.
- **Thermal Disruption:** The discharge of water with altered temperatures (warmer in summer, cooler in winter) will disrupt the natural thermal stratification near the shore, affecting recreational swimming and boating.
- **Devaluation of Property:** Residents fear that the combination of noise, vibration from pumps, visual scarring of the escarpment, and the risk of biological or chemical contamination will materially reduce **property values**.

Impact on Aquatic and Wildlife Ecosystems

The project is described by some stakeholders as an "environmental disaster" for the fragile Georgian Bay basin:

- **Food Web Disruption:** The mass removal of lower food web organisms (plankton, macrozooplankton) and the death of prey fish will significantly impact the natural food chain, potentially causing **eutrophication**—a state of high nutrient content and low water quality.
- **Destruction of Spawning Grounds:** Critical spawning habitats like the "Cape Rich Steps" and honeycomb rock formations for Lake Trout and Lake Whitefish will be threatened by sediment plumes and physical disturbance from the intake/outlet structures.
- **Cumulative Stress on Ecosystems:** The project layers additional physical, thermal, and biological pressures onto an ecosystem already stressed by climate change and invasive species (like quagga mussels), risking a **permanent transformation** of the bay's ecology.

- **Wildlife Displacement:** On land, the reservoir and dam construction would destroy 500 acres of the Niagara Escarpment, permanently fragmenting the habitat of up to **30 Species at Risk**, including endangered bats, birds, and amphibians.

4. What fish species are most at risk in the area?

Based on the sources, several fish species are identified as being at high risk due to their conservation status, their reliance on specific habitats within the project area, or their vulnerability to the proposed plant's operations.

Legally Protected Species at Risk (SAR)

Numerous species in the project area are protected under provincial and federal legislation:

- **Lake Sturgeon:** Listed as **Endangered** provincially and federally (though legally still "Threatened" on some federal schedules while updates are finalized). They are a culturally significant species that use the project area's waters.
- **Cisco (Lake Herring):** Several forms of Cisco are of high concern. While the "Shortjaw Cisco," "Kiyi," and "Bloater" are considered introgressed or extirpated, the **Blackfin Cisco** is specifically identified as **Threatened**.
- **Deepwater Sculpin:** A federally listed species of **Special Concern** documented in the project area.
- **American Eel:** Identified as **Threatened** in the Georgian Bay region.
- **Black Redhorse:** A member of the sucker family listed as **Threatened**.
- **Lampreys:** Both the **Silver Lamprey** and the **Northern Brook Lamprey** are listed as species of **Special Concern**.

Species Facing Ecological Crises

Beyond legal status, certain native species are at high risk due to existing environmental stressors and the project's physical impacts:

- **Lake Whitefish:** This species is currently facing a **"recruitment crisis"** in southern Georgian Bay, with very little survival of young fish for nearly 20 years. The project's intake and discharge structures are located near the **"Cape Rich Steps,"** which provide critical spawning habitat that depends on being silt-free—a condition threatened by project-induced turbidity.
- **Lake Trout:** After a long recovery effort, Lake Trout populations remain fragile. Their historic spawning grounds are in the direct vicinity of the proposed intake/outflow manifolds, putting spawning adults, hatchlings, and juvenile fish at severe risk.

Vulnerability to Plant Operations

The "open-loop" design creates chronic risks for all fish species in the area:

- **Entrainment and Impingement:** Small fish and larvae are highly vulnerable to being sucked into turbines (entrainment) or pinned against screens (impingement). Evidence from the comparable Ludington facility suggests that **millions of fish could be killed annually**, with young fish being the most affected.

- **Thermal and Turbidity Stress:** Species like **Lake Trout** are "obligate cold-water fish" with low thermal tolerance; the daily discharge of thermally altered water could disrupt their local habitat. Increased turbidity can also **clog fish gills**, cause death, and degrade spawning beds.
- **Invasive Species Competition:** Habitat disturbances and warmer water may allow invasive species like the **Round Goby** to further thrive, potentially outcompeting native darter species and consuming the eggs of native fish.

5. Why are the shoreline and offshore limestone honeycomb reefs important to Nottawasaga Bay fish species?

The shoreline and offshore limestone honeycomb reefs, particularly those along the **Cape Rich to Meaford corridor**, are vital ecological features that serve as critical **spawning and nursery grounds** for numerous native and commercially significant fish species in Nottawasaga Bay.

Their importance is defined by the following roles:

Critical Spawning Habitat

- **Lake Whitefish:** Unlike many other fish, Georgian Bay Whitefish spawn on limestone **honeycomb shoals at depths of 6 to 14 metres**. These fish rely on the specific flat limestone and shale plates where small cobble accumulates to deposit their eggs in late autumn.
- **Lake Trout:** Identified as "shoal spawners," Lake Trout utilize these limestone rock formations running parallel to the coastline. They require the **interstitial spaces** (the gaps between rocks) found in these rugged landscapes to protect their eggs from predators and ensure they stay oxygenated throughout the winter.
- **Cisco (Lake Herring):** These fish spawn alongside Lake Trout on the same honeycomb formations. As a key prey species containing up to 30% fish oil, their successful reproduction on these reefs is essential for the health of predator fish populations.
- **Other Species:** These grounds also support **Yellow Perch**, **Smallmouth Bass**, and "literally hundreds" of pelagic and benthic marine organisms that form the base of the aquatic food web.

Ecological and Economic Foundation

- **Recruitment and Recovery:** These reefs are central to long-term population viability. For example, while Lake Whitefish are currently facing a "recruitment crisis," the **"Shale Steps"** near Cape Rich remain their primary target for reproduction.
- **Support for Indigenous Fisheries:** The fish produced naturally along these pristine limestone coastlines are a major support for the **Neyaashiinigmiing (Cape Croker) fishing industry**, which supplies fresh fish to local and international markets.
- **Biodiversity Hotspots:** The unique underwater topography—characterized by steep bathymetric gradients and exposed bedrock—creates a **"cold-water highway"** that allows sensitive species like Lake Trout to remain near the shore even in late summer.

Sensitivity to Disturbance

The importance of these reefs is also highlighted by their **extreme sensitivity to silt and turbidity**. The sources note that these habitats must remain "silt-free" for successful reproduction. Residents

and experts fear that the proposed project's water cycling will stir up deep lakebed sediments, causing turbidity that could **smother the honeycomb formations** and "destroy the habitat forever." Additionally, invasive **Quagga Mussels** already stress these shoals by covering rocks and producing pseudofeces (waste) that can smother incubating eggs.

6. What are the specific concerns regarding unexploded ordnance?

The presence of **unexploded ordnance (UXO)** at the 4th Canadian Division Training Centre (4 CDTC) Meaford site is a central concern for residents, municipalities, and federal authorities. Because the site has been used for live-fire training for over 80 years, vast tracts are littered with "duds" and munitions scrap that pose unique risks to the proposed project.

Specific concerns regarding UXO include:

Accidental Detonation and Worker Safety

- **Risks During Excavation:** Construction involves massive earth-moving activities, including tunneling, drilling, and blasting. Stakeholders fear that these activities could accidentally trigger legacy explosives buried in the soil.
- **Unquantifiable Danger:** The Department of National Defence (DND) has admitted it is "nearly impossible" to provide a full tally or map of the type and amount of ammunition remaining on the 19,000-acre base.
- **Seismic Triggers:** There is concern that the vibrations from multi-year construction blasting through karst rock could destabilize nearby UXO in the designated "impact area".

Environmental and Toxic Contamination

- **Release of Toxins:** Disturbing the soil for the reservoir and tunnels risks mobilizing legacy contaminants associated with ordnance—such as heavy metals (lead, arsenic, zinc) and "energetic materials"—into local groundwater, private wells, and Georgian Bay.
- **White Phosphorus:** Specific sites on the base are considered so contaminated they are off-limits to military personnel. One such area is labeled "White Phosphorus," a substance used in incendiary shells that ignites on contact with oxygen and can cause severe burns or organ failure.
- **Leaching into Source Water:** Residents who rely on Georgian Bay and private shore wells for drinking water are particularly concerned that UXO-related chemicals will enter the water table once the soil is roiled by construction.

Proponent and Process Deficiencies

- **Lack of Experience:** Internal DND documents suggest that TC Energy has "limited to no experience" working in areas with UXO. Stakeholders note the company has never before removed or disposed of unexploded ordnance for a project of this scale.
- **Unrealistic Timelines and Costs:** The DND has expressed concern that TC Energy's construction schedule and budget do not realistically account for the "enormous scope of work" required for UXO clearance, which must be performed before construction can even begin.

- **Incomplete Assessment:** The Initial Project Description (IPD) is criticized for failing to provide baseline data on the density and distribution of UXO or a plan for how reservoir flooding would affect future detection and recovery of ordnance.

Dam Safety and Long-Term Risk

- **Structural Integrity:** There is no assessment in the IPD of how an accidental UXO detonation or ongoing military training could affect the structural response of the 4.5-kilometre ring dam.
- **Liability Concerns:** Because the project is on federal land, if UXO clearance is mishandled or causes environmental damage, there is significant concern that **taxpayers, rather than the proponent**, will ultimately bear the liability for remediation and legal settlements.

7. What are the Earthquake and Seismic Risks to Pumped Storage Infrastructure at Meaford DND?

The sources identify several earthquake and seismic risks associated with the proposed Ontario Pumped Storage Project at the Meaford DND site, ranging from natural tectonic events to human-induced vibrations from military training.

Natural Seismic Risks and Historical Activity

- **Regional Seismicity:** Although the region is considered a stable continental area, it has a history of moderate earthquakes. Residents and experts point to a **4.3 magnitude earthquake in October 2005** centered in Georgian Bay near Thornbury (approximately 30 km from Meaford) that shook buildings and was felt up to 100 km away.
- **Recent Quakes:** More recent events include a **1.6 magnitude quake** north of Wiarton in 2024 and a **3.7 magnitude quake** in Orillia in January 2026.
- **Destabilization of Infrastructure:** There is significant concern that such seismic events could weaken or destabilize the proposed **4.5-kilometre ring dam**, which is projected to rise 20 metres above ground level and hold 26 million cubic metres of water.

Human-Induced Seismic Risks

- **Active Military Training:** The project's location on an active base means it is subject to continuous human-induced seismic activity. Heavy artillery fire and explosions from munitions training regularly cause ground vibrations that residents report can rattle windows and shake homes kilometers away.
- **Accelerated Bedrock Fracturing:** Experts warn that this ongoing seismic activity may **further accelerate the fracturing** of the already sensitive and fractured karst bedrock of the Niagara Escarpment.
- **Unexploded Ordnance (UXO) Stability:** Blasting during project construction through karst rock is questioned for its potential to destabilize 85 years' worth of **unexploded ordnance** in the nearby military "impact area".

Geological Vulnerabilities

- **Karst and Fractured Bedrock:** The proposed reservoir would sit on the **Amabel and Lockport dolostone formations**, which are characterized by karst features like conduits and voids. These

geological conditions are highly sensitive to **seismic loading**, which could trigger structural collapse, foundation failure, or sudden leakage pathways.

- **Vibration Pathways:** Tunnels bored through the escarpment provide a continuous rock mass connection between underground machinery and the surface. The fractured nature of the dolostone acts to **actively conduct vibrations** and hydraulic pressure pulses to the surface.

Deficiencies in Project Planning

- **Lack of Analysis:** Critics and local residents highlight that the **Initial Project Description (IPD)** fails to identify, classify, or assess these long-term safety risks.
- **Omission of Seismic Loading:** The IPD reportedly contains **no dam safety analysis**, which would traditionally include an assessment of how the structure would respond to seismic loading or high-energy impact events like a direct ordnance strike.
- **Unresolved Liability:** Because the project is on federal land, stakeholders have expressed concern regarding who would be legally liable for damages if a seismic event caused a catastrophic failure of the reservoir.

8. What is the risk of reservoir overflow breach torrential flood inundation of adjacent civilian lands?

The risk of a reservoir overflow, breach, or torrential flood inundation at the proposed Ontario Pumped Storage Project is characterized by stakeholders as a **low-probability but high-consequence event** with potentially **catastrophic results** for the civilian community.

The primary risks and concerns identified in the sources include:

Scale and Proximity of the Threat

- **Massive Water Volume:** The proposed 375-acre reservoir would hold **26 million cubic metres** (26 billion litres) of water, which residents describe as sitting "literally above our heads".
- **Elevation Advantage/Risk:** The reservoir would be perched on the Niagara Escarpment, approximately **150 to 174 metres above Georgian Bay**.
- **The "Impact Zone":** Approximately **300 homes, farms, and cottages**—housing an estimated **700 to 800 people** (nearly 10% of Meaford's population)—are located directly downgradient in the potential flood path.

Geological and Structural Vulnerabilities

- **Unstable Karst Foundation:** The reservoir would be built on fractured dolostone and limestone containing **karst features** (voids, conduits, and caves). Hydrostatic pressure from daily water cycling could lead to **"piping"** (soil eroding through rock fractures), sinkhole formation, and eventual structural collapse of the ring dam.
- **Active Military Environment:** The project's location on an active military base introduces unique risks. Ongoing **heavy artillery fire and explosives training** create ground vibrations that could destabilize the dam or accelerate bedrock fracturing. Stakeholders also note the risk of a **direct ordnance hit** or accidental detonation of unexploded ordnance (UXO).

- **Seismic Risks:** Historical seismic activity in the region, including a **4.3 magnitude earthquake in 2005**, raises concerns that natural shocks could provoke a catastrophic collapse.

Environmental and Weather Hazards

- **Overflow Scenarios:** Overtopping could occur due to instrumentation failure, operator error, or uncontrolled pumping.
- **Extreme Weather:** Increasing frequencies of **atmospheric rivers and extreme rainstorms** could overwhelm drainage systems.
- **Wind-Induced Failure:** High winds could generate waves capable of eroding the dam's crest or overtopping the embankment.

Potential Consequences of a Breach

- **Niagara-Like Flows:** Engineering consultants estimate that a catastrophic breach could result in torrential flows of **5,100 to 5,300 cubic metres per second**—a rate approaching the average annual flow of the **Niagara River**.
- **Rapid Inundation:** Historical precedents like the **2005 Taum Sauk dam failure** show that a full breach can occur in as little as **15 to 25 minutes**, leaving **no time for emergency warnings or evacuation** for residents.
- **Physical Devastation:** Such a flood would cause "torrential flooding, inundation of both DND and civilian lands, major slope and valley erosion... and very high potential for **loss of both civilian and military life**".

Planning and Financial Deficiencies

- **Lack of Analysis:** The Initial Project Description (IPD) is heavily criticized for containing **no dam safety analysis**, failure scenario modeling, or downstream inundation mapping.
- **Insurance and Liability:** Many residents report that insurance companies have refused to provide coverage for "matters pertaining to TC Energy's proposed project," leaving homeowners **unable to obtain flood insurance** or secure their property values.

9. How does a 'Closed Loop' versus an 'Open Loop' Pumped Storage system compare at Meaford DND?

The proposed Ontario Pumped Storage Project at Meaford DND is currently designed as an **open-loop system**, a choice that is the primary driver for many of the environmental and ecological concerns raised by stakeholders. In contrast, a **closed-loop system** is frequently cited in the sources as a less invasive and environmentally preferable alternative.

The following sections compare the two systems based on the source materials:

1. Connection to Natural Water Bodies

- **Open-Loop (Proposed):** This system maintains an **ongoing hydrologic connection** to a natural body of water—in this case, Georgian Bay. It utilizes the bay as the lower reservoir, repeatedly withdrawing and discharging massive volumes of water (approximately 23 billion litres) every day.

- **Closed-Loop (Alternative):** In a closed-loop system, the reservoirs are **isolated from natural waterways**. Water circulates indefinitely between two artificially created reservoirs. While it may require an initial fill from a natural source, it does not require the continuous large-scale water exchange that characterizes open-loop designs.

2. Aquatic and Ecosystem Impacts

- **Open-Loop Risks:** Because it draws directly from Georgian Bay, the open-loop design poses chronic risks of **fish entrainment and impingement**. Stakeholders point to the Ludington facility in Michigan, which reportedly killed millions of fish annually due to its open-loop design. It also risks disrupting thermal stratification and altering flow regimes in the bay.
- **Closed-Loop Benefits:** A closed-loop design would **substantially or entirely eliminate** these risks to fish habitat and aquatic organisms because it decoupled from the living ecosystem of Georgian Bay. The U.S. Department of Energy has confirmed that closed-loop systems carry significantly lower environmental impacts than open-loop designs.

3. Water Quality and Contamination

- **Open-Loop Concerns:** Daily cycling in an open-loop system can stir up **lakebed sediments**, causing permanent turbidity. There is also concern that this cycling could disperse sequestered contaminants, such as heavy metals or PFAS, throughout the bay.
- **Closed-Loop Mitigation:** By using self-contained reservoirs, a closed-loop system **bypasses the environmental impacts** of compromised water quality in a natural body of water. It removes the risk of contaminant transport between the construction site and the public waters of Georgian Bay.

4. Flexibility and Location

- **Open-Loop Constraints:** This design is site-specific; it **must be located adjacent to an open body of water** with a significant elevation gradient. This often requires building in environmentally sensitive "green-field" sites like the Niagara Escarpment, which may be far from the power grid and require long transmission lines.
- **Closed-Loop Flexibility:** Closed-loop systems can be sited in more diverse locations, such as **abandoned mines or quarries**. For example, the Marmora project in Ontario is a closed-loop design that rehabilitates a brownfield mine site rather than altering a natural body of water.

5. Operational Efficiency

- **Open-Loop:** Proponents of the Meaford project estimate a round-trip efficiency of approximately **70% to 75%**. Some critics argue that the necessity of "slow rate" pumping to minimize aquatic disturbance in an open-loop system further restricts its ability to respond quickly to grid demands.
- **Closed-Loop:** Closed-loop systems are often able to utilize **variable rate technology**, allowing them to adjust more flexibly to shorter, less predictable troughs in grid use.

Comparison Summary Table

Feature	Open-Loop (Meaford Proposal)	Closed-Loop (Alternative)
Lower Reservoir	Georgian Bay (natural)	Artificial/Constructed pond or basin
Water Usage	Daily exchange with public water	Recirculates within an isolated system
Fish Impact	High risk of entrainment/mortality	Minimal to none (isolated)
Water Quality	Risk of turbidity/toxin dispersal	Bypasses natural water impacts
Site Selection	Restricted to natural shorelines	Can use brownfields/mines
Environmental Risk	Widespread and longer-lasting	Substantially lower

10. How do BESS and High Voltage Transmission proximity compare to this project?

The proximity of Battery Energy Storage Systems (BESS) to high-voltage transmission infrastructure offers a significant advantage over the proposed Meaford Pumped Storage Project, which is geographically fixed by the need for specific natural features.

Proximity and Siting Flexibility

- **BESS:** Battery systems are highly flexible in terms of location. They can be built **virtually anywhere**, allowing them to be sited on brownfield industrial sites directly **adjacent to centers of high energy demand and existing high-voltage transmission corridors**. One expert notes that BESS can even be built **underneath or adjacent to any high-voltage corridor in Ontario**.
- **The Project:** In contrast, the Meaford project is constrained by two physical requirements: a significant elevation gradient (the Niagara Escarpment) and an open body of water (Georgian Bay). Consequently, the project is located **distant from potential hydro connections** and far from major energy demand centers like the GTA.

High-Voltage Transmission Requirements

- **BESS:** Because they can be built close to the grid, BESS projects can **eliminate the need for new, long-distance transmission infrastructure**.
- **The Project:** The Meaford facility requires a high-voltage connection (230 kV or 500 kV) to the provincial grid. The "crow flies" distance to the **Essa Transformer Station** is approximately **75 km**, and the **Meaford Transformer Station** is about **21 km** away. Proposed connection routes include:
    - **Overland:** An 80 to 100 km corridor that would traverse forests, private properties, and the Niagara Escarpment Plan Area.

- **Subsea:** A 50 km high-voltage cable buried under the lakebed from Meaford to Wasaga Beach, with further terrestrial connections to Stayner.

Comparative Impacts of Transmission Proximity

Feature	BESS (Battery Storage)	Meaford Pumped Storage Project
Grid Proximity	Can be sited directly next to existing grid nodes.	Remote; requires 50–100 km of new high-voltage corridors.
Transmission Cost	Minimal; infrastructure is localized.	Massive; billions required for long-distance lines or subsea cables.
Land Use	Small footprint (e.g., 100 acres for 1,000 MW equivalent).	Large footprint (500 acres) plus extensive transmission right-of-ways.
Environmental Risk	Low; avoids disturbing sensitive landscapes.	High; risk to escarpment, subsea ecosystems, and private land.

Stakeholders emphasize that BESS acts as a **"virtual transmission line"** to reduce grid congestion without the heavy infrastructure and environmental scarring associated with the long-distance transmission lines required for the Meaford site. Additionally, the IESO has noted that pumped storage projects currently **do not compare favorably** to battery storage when considering these factors and overall ratepayer value.

11. How does karst terrain affect the stability of the proposed ring dam and reservoir?

The presence of **karst terrain**—a geological landscape characterized by fractured carbonate bedrock (limestone and dolostone), underground conduits, and voids—presents several critical stability risks to the proposed ring dam and reservoir on the Niagara Escarpment.

According to the sources, the specific impacts of karst on infrastructure stability include:

1. Structural Collapse and Sinkhole Formation

The proposed reservoir would hold approximately **26 million cubic metres of water**, exerting a massive hydrostatic load of roughly **26 billion kilograms** on the underlying bedrock. In karst environments, subsurface voids or cavities can suddenly cave in under this immense weight, triggering **sinkhole formation** and potentially causing a catastrophic collapse of the reservoir floor or the dam foundation.

2. Massive Uncontrolled Seepage and "Piping"

Karst conduits and enlarged fractures provide natural "leakage pathways" that can transmit millions of litres of water per day with very little resistance.

- **Internal Erosion:** High water pressure can force water into these channels, leading to **"piping,"** where soil is washed out from beneath the dam.

- **Undermining the Foundation:** As soil "boils out" through these conduits, the dam foundation can be progressively undermined until a breach occurs.

3. Cyclical Hydrostatic Loading and Fatigue

The facility's operation involves a daily cycle of filling and emptying the reservoir.

- **Pressure Pulses:** These repeated cycles impose fluctuating hydraulic pressures—described as "pressure pulses"—on the fractured rock.
- **Progressive Widening:** These pulses can force water deeper into fractures, potentially enlarging existing cavities and widening dissolution features over the facility's operational life, which leads to **rock fatigue** and long-term instability.

4. Differential Settlement

Because karst terrain is non-homogeneous and contains irregular voids, the bearing capacity of the ground varies significantly from one point to another. This can cause **differential settlement**, where parts of the 4.5-kilometre ring dam settle more than others, leading to structural cracks and loss of capacity to hold water.

5. Sensitivity to Construction and External Vibrations

Karst bedrock is uniquely sensitive to vibrations:

- **Construction Blasting:** Blasting and heavy compaction during construction could trigger new sinkholes or enlarge existing subsurface voids.
- **Military Activity:** The project's location on an active base means continued human-induced seismic activity (artillery and explosions) may **further accelerate the fracturing** of the already sensitive dolostone.

6. Assessment Deficiencies

Stakeholders and geological experts have noted that the **Initial Project Description (IPD)** acknowledges known karst conditions but fails to provide a formal analysis of how these conditions affect dam safety. Specifically, the IPD lacks:

- **Detailed Karst Mapping:** No 3D geophysical surveys or deep borehole data (beyond 30m) have been disclosed to map hidden conduits.
- **Dam Break Analysis:** There is no modeling to show how the karst foundation would respond to a structural failure or extreme weather event.
- **Committed Mitigation:** Critics argue the proponent uses non-committal language (mitigating "where feasible"), which does not meet international dam-safety standards for reservoirs built on such sensitive terrain.

12. <u>What are the specific risks to migratory bird pathways?</u>

The proposed Ontario Pumped Storage Project is situated along a **critical migratory bird flyway** that spans Georgian Bay and the Niagara Escarpment. Stakeholders and environmental experts have identified several specific risks to these migratory pathways:

1. Physical Hazards and Avian Collisions

- **Transmission Infrastructure:** The project requires a new high-voltage transmission corridor (overland or subsea-to-land). High-tension lines present a significant risk of **avian collisions**, particularly where they pass through wooded regions and established bird migration corridors.
- **Intake and Discharge Structures:** Because the daily cycling of water is expected to prevent natural ice formation in the vicinity of the intake/discharge structures, **avian species may congregate** in these open-water areas during winter. This could lead to unnatural congregation patterns and increased exposure to industrial activity.

2. Loss and Fragmentation of Migration Stopover Sites

- **Escarpment Destruction:** The permanent destruction of approximately **500 acres of the Niagara Escarpment** removes vital habitat for migratory birds. The escarpment and Georgian Bay shorelines are described as essential **stopover and refueling sites** for millions of migrating landbirds.
- **Wetland and Stream Disruption:** Migratory birds rely on the mosaic of wetlands and streams on the escarpment plateau. Constructing the reservoir could **cut off water flow** to these vital areas downstream, degrading the foraging and nesting resources birds need during their migrations.

3. Disruption from Artificial Lighting and Noise

- **Industrial Lighting:** The project will introduce extensive **artificial lighting at night (ALAN)** during both the multi-year construction phase and long-term operations. ALAN is known to **disorient migrating birds**, potentially causing them to deviate from their natural pathways or collide with structures.
- **Construction Nuisances:** Sustained noise and vibration from six or more years of blasting and heavy vehicle traffic may displace birds from traditional nesting and stopover habitats.

4. Attraction to Hazardous Infrastructure

- **Reservoir Risks:** There is concern that the large reservoir could act as an **"attractive nuisance,"** drawing in migratory species. However, the reservoir's lack of vegetation margins, fluctuating water levels, and changing temperatures may not support the diverse insect life birds need, potentially leading to **reproductive failure or mortality** for species that attempt to use it.
- **The "Seagull Problem":** The predicted annual mortality of millions of fish through the turbines could provide a regular food supply that attracts a massive increase in **nuisance bird populations** (such as seagulls). This could disrupt the natural balance of local bird communities and lead to significant pollution from bird excrement.

5. Deficiencies in Migration Modeling

Stakeholders argue that the **Initial Project Description (IPD)** fails to adequately address these risks. Critical gaps include:

- An absence of **baseline surveys** and quantitative modeling regarding the project's impact on migration corridors.
- A lack of disclosure regarding the **sequencing of construction** to avoid sensitive breeding or migratory periods.
- No analysis of how the **long-term presence of the reservoir** will alter bird habitats and regional migration patterns.

13. <u>What are the tunnelling and underground powerhouse hazards?</u>

The construction and operation of the proposed underground powerhouse and water conveyance tunnels at the Meaford site involve significant geological, atmospheric, and safety hazards. According to the

sources, these risks are compounded by the site's unique status as an active military training area and its complex karst and shale geology.

Atmospheric and Explosive Gas Hazards

- **Gassy Ground Risks:** The project requires tunnelling through deep bedrock formations (Blue Mountain, Collingwood, and Utica equivalents) known to contain **shale gas (methane)** and **hydrogen sulphide (H_2S)**. Experts warn that these tunnels may effectively become "horizontal gas wells" during construction.
- **Explosion and Toxicity:** Methane presents a critical **explosive hazard**, while hydrogen sulphide is both toxic and corrosive to equipment. Global data on tunnelling in gassy ground indicates a high probability of **worker injuries, fatalities, and multi-year schedule delays** due to gas inflows.
- **Ventilation Challenges:** Standard ventilation systems often fail at the screw conveyors of tunnel boring machines where gas discharges are most concentrated, requiring complex aspiration systems to manage explosive limits.

Geological and Structural Hazards

- **Karst Instability:** The powerhouse and tunnels would be excavated in **fractured and karstic bedrock** characterized by voids, conduits, and dissolution channels. This creates risks of **sudden subsurface collapse**, sinkhole formation, and unpredictable bearing capacity.
- **Shale Heave:** The formations involved, particularly the Queenston and Blue Mountain shales, are sensitive to **"heave"** (swelling or movement), which necessitates the immediate installation of reinforced structural liners as excavation progresses.
- **Hydraulic Hazards:** Tunnelling under Georgian Bay carries a risk of **unintended construction flooding** if submerged bedrock ravines or fault structures are encountered.
- **Rock Fatigue:** The weight of 26 billion kilograms of water combined with daily cycling may cause **rock fatigue**, leading to the development of new fractures and faults in the weak bedrock over time.

Unexploded Ordnance (UXO) and Contamination

- **Accidental Detonation:** Tunnelling and blasting occur in an area where 80 years of military training have left an unquantifiable amount of **unexploded ordnance** in the soil and subsurface. Blasting through karst rock could destabilize these legacy explosives.
- **Mobilization of Toxins:** Large-scale excavation risks "unlocking" and **mobilizing legacy contaminants**—including heavy metals (lead, arsenic), "forever chemicals" (PFAS), and energetic materials—into the groundwater and Georgian Bay.
- **Contaminated Spoil:** Boring the penstock tunnels is estimated to produce **74,000 tons of "spoil"** (excavated dirt and rock), much of which may be contaminated and must be pumped up and disposed of safely.

Operational and Nuisance Hazards

- **Structure-Borne Vibration:** Placing the powerhouse underground does not eliminate noise; rather, **vibration propagates through the bedrock**—a continuous rock mass connection—to residential receptors on the surface.

- **Cavitation and Water Hammer:** Large reversible pump-turbines will routinely experience **cavitation**, generating broadband hydraulic noise and pressure surges. Additionally, mode transitions between pumping and generating create **water hammer**—impulsive pressure waves that transmit structural loads into the surrounding rock.
- **Emergency Response Gaps:** The project introduces needs for **specialized confined space rescue** that may exceed current municipal capabilities.
- **Security Vulnerabilities:** Siting a 1,000 MW critical energy asset on an active military base creates unique **physical and cyber security risks**, including the potential for unauthorized control leading to uncontrolled reservoir discharge.

14. What are the anticipated Project Greenhouse Gas emissions including methane?

The anticipated greenhouse gas (GHG) emissions for the Ontario Pumped Storage Project are a subject of significant dispute between the proponent (TC Energy) and local stakeholders. While the Initial Project Description (IPD) provides specific estimates, critics argue these figures are materially incomplete and based on outdated data.

Construction Phase Emissions

- **Proponent Estimate:** The IPD estimates that the construction phase will generate approximately **598,153 tonnes of carbon dioxide equivalent (t CO_2e)** over five and a half years.
- **Omission of Embodied Carbon:** Stakeholders highlight that this estimate covers only fuel combustion from vehicles and vegetation clearing. It **omits the embodied carbon** associated with the massive quantities of cement, concrete, and steel required for the 4.5-kilometre ring dam and underground powerhouse. Studies suggest embodied carbon can represent over 50% of a large dam's total construction emissions.
- **Critic Estimates:** Independent assessments suggest total construction emissions could range from **800,000 to 1,500,000 tonnes of CO_2**. One specific calculation estimates that 11 million litres of diesel fuel alone will produce 275,000 tons of CO_2 effluent.

Methane (CH_4) Emissions

Methane is identified as a critical but under-analyzed component of the project's GHG profile:

- **Geological Methane (Shale Gas):** The project involves tunneling through deeper bedrock formations (Blue Mountain and Collingwood shales) known to contain **natural methane gas**. Experts warn these tunnels may act as "horizontal gas wells," requiring these gases to be **vented to the atmosphere** during construction, which would have significant GHG impacts.
- **Reservoir Decomposition:** Critics note that reservoirs can be sources of methane through the **decomposition of inundated organic matter** under anaerobic conditions. While this is a common issue for conventional hydropower, stakeholders argue that the daily "wetting and drying" of the reservoir margins in a pumped storage system must be assessed under IPCC guidelines.

Operational GHG Impact

- **Proponent Claim:** TC Energy claims the project will deliver a net reduction in Ontario grid emissions of **490,000 t CO_2e annually**, equivalent to removing 150,000 cars from the road.

- **"Energy-Negative" Counter-Argument:** Critics emphasize that the facility is a **net consumer of electricity**, requiring approximately 30% more energy to pump water up than it generates on release. The net climate benefit depends entirely on whether the pumping power comes from non-emitting sources or from gas-fired "peaker" plants.
- **Impact on U.S. Exports:** A major concern is that diverting emission-free nuclear power from Ontario's surplus to the project will reduce exports to U.S. states (like Michigan and Minnesota) that rely heavily on coal and gas. This could indirectly **increase CO_2 emissions by 700,000 to 1,400,000 tonnes per year** in those jurisdictions.

Net-Zero Requirements

Under the Strategic Assessment of Climate Change (SACC), the project is **federally required to achieve net-zero emissions** if it continues to operate beyond 2050. Stakeholders argue the current IPD contains no credible pathway, offset mechanism, or monitoring framework to meet this regulatory obligation.

15. What are the Transmission Alternatives to connect Meaford DND, Pumped Storage to 230 kV lines?

To connect the proposed 1,000 MW Ontario Pumped Storage Project to the provincial grid, high-voltage transmission lines of either **230 kV or 500 kV** will be required. Currently, the project proponents have identified two primary alternative routes, though a final "preferred route" has not yet been determined.

The main transmission alternatives identified in the sources are:

1. Subsea Transmission Option (Stayner Connection)

This option is frequently cited as the alternative developed in response to community concerns regarding overland high-voltage lines.

- **Route:** This would involve burying approximately **50 kilometres of high-voltage cable** along the bottom of Georgian Bay from the project site in Meaford to a landing point in **Wasaga Beach**.
- **Onshore Connection:** From Wasaga Beach, the connection would continue for an estimated 15 kilometres via underground or overhead lines to Hydro One's **Stayner Transformer Station**.
- **Preference:** The Municipality of Meaford has formally declared its preference for this subsea option to minimize terrestrial impacts on the community.

2. Overland Transmission Option (Essa or Meaford Connection)

This alternative involves traditional land-based high-voltage corridors.

- **Essa Transformer Station:** An overland corridor extending approximately **80 to 100 kilometres** from Meaford to Hydro One's **Essa Transmission Station** near Barrie. This route would traverse forests, agricultural lands, and parts of the Niagara Escarpment and Beaver Valley.
- **Meaford Transformer Station:** A shorter land connection (approximately **21 kilometres** "as the crow flies") to the existing Meaford Transformer Station.

- **Voltage Constraint:** Sources note that the Meaford TS is currently served by a **115 kV line**. Utilizing this connection for the project would likely require **upgrading or replacing** approximately 67 kilometres of existing transmission infrastructure to 230 kV.
- **Protected Areas:** This route would likely traverse the Niagara Escarpment Plan Area and a UNESCO World Biosphere Reserve.

Key Technical and Environmental Considerations

- **Grid Proximity:** Stakeholders point out that the project is "distant from potential hydro connections," requiring these massive infrastructure builds regardless of the route chosen.
- **System Lifespan:** While the project has a projected life of 50 to 100 years, buried high-voltage cables typically last only **40 years**, requiring costly and disruptive replacement during the facility's operation.
- **Impacts:** Overland routes face opposition due to potential **deforestation, habitat fragmentation, and devaluation of private property**. Subsea options raise concerns regarding **benthic disturbance** and the impact of heat and electromagnetic fields on marine life.
- **Battery Alternative:** Critics often contrast these massive transmission requirements with **Battery Energy Storage Systems (BESS)**, which can be sited directly adjacent to existing high-voltage corridors or centers of demand, potentially eliminating the need for new long-distance transmission lines.

16. <u>Are there other Alternative Pump Storage Sites available on DND Lands?</u>

Based on the source materials, there are several identified **alternative pumped storage sites** on the Department of National Defence (DND) lands at the 4th Canadian Division Training Centre (4 CDTC). While the proponent, TC Energy, has focused its Initial Project Description (IPD) on the "Garrison Site" at the southeast corner of the base, local stakeholders and engineering reviews have proposed other locations that they argue are technically and environmentally superior.

The primary alternative sites identified include:

1. Mountain Lake Site Alternatives

A comprehensive review by Hunter and Associates identified two overlapping site alternatives on the upland southeast of **Mountain Lake**.

- **Scale and Capacity:** These sites could potentially generate **3,000 MW or more**—triple the capacity of the currently proposed project. They include conceptual designs for a circular **400-acre site** and a circular **800-acre site**.
- **Safety Advantages:** These locations are remote from populated civilian areas, meaning a reservoir breach would not pose the same life-threatening flood hazard to the ~300 homes located below the proposed Garrison Site.
- **Geological Suitability:** The Mountain Lake sites are situated on impervious **shale uplands**, which would minimize the risk of reservoir leakage compared to the fractured karst terrain of the Garrison Site.
- **Operational Trade-offs:** The primary disadvantage is that these sites encroach on DND **live-fire ranges and unexploded ordnance (UXO) impact zones**, requiring significant cleanup and relocation of military functions.

2. North End of the Base (Clay Banks)

Stakeholders understand that a location along the north end of the base, near the **"clay banks,"** was considered at one time.

- **Pros:** This location is extremely remote with **no residents nearby**, offering the least potential for human mortality in the event of a dam failure.
- **Cons:** It would likely interfere with active DND training operations on the base.

3. East Side of the Base

Earlier conceptual designs from the proponent reportedly showed a plant positioned along the east side of the base, centered between the **southeast corner and Cape Rich**.

- **Pros:** Like the North End option, this is considered a remote location with limited potential for property damage or mortality if the reservoir were to fail.
- **Cons:** Its impact on specific DND operations remains uncertain in the provided materials.

Comparison of Alternative Locations on DND Lands

Site Location	Characterization	Key Benefit	Key Drawback
Garrison Site (Proposed)	Southeast corner adjacent to barracks	Proximity to existing base infrastructure	High risk to ~300 civilian homes directly below
Mountain Lake (Hunter Review)	Upland southeast of Mountain Lake	Higher capacity (3,000 MW); safer shale foundation	Encroaches on live-fire ranges and UXO zones
North End (Clay Banks)	Remote northern shoreline	Maximum public safety; no nearby residents	Likely interferes with DND training
East Side (Cape Rich area)	Central eastern shoreline	Remote; limited damage potential	Impacts on DND operations uncertain

Critics argue that the IPD is deficient because it fails to meaningfully analyze these alternatives, particularly the Mountain Lake options, which offer significantly greater energy storage and lower risk to the civilian community.

17. What is TC Energy's environmental track record?

TC Energy's environmental track record is a major point of concern for local stakeholders, who describe it as a history of **pipeline failures, regulatory non-compliance, and significant carbon emissions**. Critics argue that the company's past performance undermines its claims that the Ontario Pumped Storage Project will be built and operated safely.

The following key areas define TC Energy's environmental and corporate track record as presented in the sources:

Pipeline Spills and Safety Records

- **Keystone Pipeline Leaks:** The company's Keystone Pipeline has experienced several major spills, including a **383,000-gallon spill** in North Dakota in 2019 and a **13,000-barrel spill** in Kansas in 2022. The Kansas spill resulted in cleanup costs exceeding **$480 million (US)**.
- **Industry Comparison:** According to the National Energy Board (NEB), between 1992 and 2014, TC Energy (then TransCanada) or its subsidiaries were responsible for **17 of the 39 major pipeline accidents** in Canada, accounting for nearly half of the serious breaches on federally regulated pipelines during that period.

- **Regulatory Warnings:** The US Pipeline and Hazardous Materials Safety Administration (PHMSA) noted in 2023 that Keystone's safety record was **"worse than the US average"** and suggested its maintenance programs might be inadequate to address a "repetitious pattern of failures."

Regulatory Non-Compliance and Fines

- **Coastal GasLink Infractions:** In British Columbia, the Coastal GasLink pipeline project has faced significant regulatory scrutiny, receiving **59 warnings, 13 stop-work orders, and over** $800,000 in fines **for non−compliance. Specific fines include $340,000** for repeated non-compliance and **$346,000** for failing to comply with environmental regulations and providing "false and misleading" maintenance information.
- **IESO Fine:** In 2023, TC Energy was fined **$3.72 million** by Ontario's Independent Electricity System Operator (IESO) for making submissions that were deemed **"knowingly and recklessly misleading or deceptive"** and failing to correct them.

Corporate Greenhouse Gas Profile

- **Total Emissions:** TC Energy's primary business—piping and burning fossil fuels—generates approximately **13,500,000 tonnes of CO_2 emissions annually**, equivalent to the emissions of roughly **4.1 million cars**.
- **Greenwashing Concerns:** Residents and environmental groups accuse the company of "greenwashing" the Meaford project to provide a "green veneer" to its fossil-fuel-centric business model. They point to strategic partnerships with conservation groups (such as an $11.4 million commitment to the Nature Conservancy of Canada) as efforts to manage its reputation rather than its environmental impact.

Engagement and Ethical Concerns

- **First Nations Relations:** The sources cite historical "bad-faith engagement" with First Nations, specifically noting that the Lubicon Cree and the Athabasca Chipewyan First Nation felt their concerns were ignored or that the company attempted to "buy them off" during pipeline project developments.
- **Covert Lobbying:** Leaked recordings of company calls in 2024 allegedly showed an executive (who later resigned) boasting of **covert lobbying tactics** used to secure government approvals.
- **Legal Tactics:** In 2014, documents revealed a public relations strategy that included a **$5 million Strategic Lawsuit Against Public Participation (SLAPP)** to discourage opposition to the Keystone XL pipeline.

Stakeholders emphasize that TC Energy has **no experience building or operating pumped storage facilities**, raising alarms that a company struggling with its core competency (pipelines) is now proposing to build a 26-billion-litre reservoir directly above a residential community.

18. <u>Does Meaford have significant medical, health and residential accommodation capacity to support the influx of workers and families required to construct the Pumped Storage?</u>

Based on the provided sources, **Meaford does not currently have the capacity** in medical, health, or residential services to support the anticipated influx of construction workers and their families for the Pumped Storage Project.

The following details from the sources highlight the specific capacity constraints:

Medical and Healthcare Services

The local healthcare system is described as already operating under significant strain and is not equipped for a rapid population surge.

- **Hospital Constraints:** Meaford Hospital is a small facility with only **15 inpatient beds** (surging to 17 during peak periods) and approximately 100 staff. It lacks specialized equipment, such as an **MRI machine**, and has no abundance of doctors.
- **Primary Care Gap:** Primary care access is severely limited; most existing family physicians have full patient rosters, and the town lacks a **dedicated walk-in clinic**.
- **Emergency Wait Times:** Current emergency department wait times average 1 to 1.5 hours for low-acuity cases and ~4 hours for total stays; an influx of transient workers is expected to lengthen these wait times.
- **Recruitment Barriers:** The lack of available rental housing in Meaford makes it difficult to recruit temporary physicians or specialists to scale up services.

Residential Accommodation

Planners and residents indicate that Meaford's housing market is too small and inflexible to absorb the estimated **800 to 900 temporary workers** required for the project.

- **Insufficient Stock:** The current housing stock cannot support the influx, forcing many tradespeople to commute from distant communities like Owen Sound, Hanover, and Walkerton.
- **Rental Market Strain:** Meaford has **very low rental vacancy rates**. The expected demand is predicted to drive rental costs to levels that could displace current residents and increase local homelessness.
- **Slow Development:** New housing production is low—under 100 units per year—and is primarily focused on high-priced single-family homes rather than affordable or rental units.
- **Servicing Limits:** Plans for purpose-built temporary worker housing remain conceptual and are strictly limited by **wastewater treatment constraints**.

Broader Social Infrastructure and Education

Other essential services required by families are also at or exceeding their functional capacity:

- **Overcrowded Schools:** Local schools are already over capacity. **Georgian Bay Community School** operates at 114% capacity with over 1,200 students, while **Beaver Valley Community School** operates at 115%. Both rely heavily on portable classrooms.
- **Wastewater Limitations:** The wastewater treatment plant is operating near its limits, and a required expansion would take **four to five years** to plan and build.

- **Emergency Services:** Meaford relies on a **volunteer-based fire service** that already faces daytime coverage challenges because many volunteers work outside the community.
- **Policing:** The local **OPP facility is inadequate** for current needs, failing to meet provincial standards and lacking the space to support additional officers or administrative staff.

In summary, the sources characterize Meaford's social infrastructure as "operating near capacity," with local residents and officials warning that the "boom" phase of the project will likely overwhelm these limited systems.

19. What is the lingering trauma of the 1942 Land Expropriation of 18,000 acres for a Military Base at Meaford?

The 1942 land expropriation for the Meaford military base remains a source of profound **longstanding distrust and "lingering trauma"** for the community, a sentiment that has been reignited and compounded by the proposed Ontario Pumped Storage Project.

The following factors characterize the trauma associated with this historical event:

The Scale and Speed of Displacement

- **Massive Scope:** In 1942, at the start of WWII, the federal government expropriated **over 18,000 acres** of fertile farmland, including fruit orchards, from **more than 150 legal landowners**.
- **Abrupt Relocation:** Families were given only **two to three months** to relocate their homes and move their livestock. Many were forced to leave their standing crops behind to decay.
- **Destruction of Heritage:** Every home, farm, and outbuilding on the site was systematically **destroyed through tank fire and cannon practice**, turning ancestral homesteads into military targets.

The "Broken Promise" of Return

- **Expectation of Repatriation:** Many displaced farmers and their families were led to believe that their land would be **returned to them** once the war was over.
- **Permanent Loss:** Repatriation never occurred. Instead, in 1945, residents were informed the land was too contaminated for habitation, and access was severely restricted after two brothers were killed by unexploded ordnance in 1946.
- **Generational Distrust:** This perceived betrayal created a **"longstanding distrust of government"** that has been passed down through generations of descendants who still live in the area.

Perception of the Current Project

- **A "Second Expropriation":** Many community members view TC Energy's proposal as a **"second expropriation"** of their lands and heritage.
- **Ethical Betrayal:** Residents and descendants feel it is **morally and ethically unacceptable** for land taken for "national priority" (war) to now be used by a **private, for-profit corporation** for commercial gain.

- **Inequitable Access:** Some find it "questionable" that while descendants have been denied access to their family's former home sites for 80 years due to safety risks, a large corporation is suddenly granted access to **750 acres** for industrial construction.

Impact on Indigenous Communities

- **Cumulative Dispossession:** Members of the **Chippewas of Nawash Unceded First Nation** have shared that the 1942 event was an **unfair expropriation of their traditional lands**, adding another layer to the regional trauma and ongoing claims for justice and reconciliation.

The sources suggest that this historical context has transformed the modern project from a mere infrastructure proposal into a **battle over the "Honour of the Crown"** and the healing of an 80-year-old wound. For many, the project is not seen as a "green" solution, but as a **betrayal of the sacrifices** made by their ancestors for the country's defense.

20. What are the Indigenous Concerns about the Pumped Storage Project on DND Lands at Meaford and Applicable Treaty Boundaries?

Indigenous concerns regarding the proposed Ontario Pumped Storage Project center on the **protection of traditional territories, the sanctity of water as a living entity, and the potential disturbance of ancestral remains and culturally significant species**. While the project is often framed as a "partnership" with the Saugeen Ojibway Nation (SON), several Indigenous groups have raised substantive questions regarding its long-term impacts and the adequacy of the consultation process.

Major Indigenous Community Concerns

- **Saugeen Ojibway Nation (SON):** Although TC Energy identifies SON as a primary partner, no commercial partnership agreement had been finalized as of early 2026. SON community members have expressed significant concerns regarding **fish mortality, water quality degradation, and reservoir safety**. Chief Gregory Nadjiwon of the Chippewas of Nawash Unceded First Nation has emphasized that his people are not merely "**validators**" to help the company secure government support but are careful stewards who require full **consideration and compensation**.
- **Curve Lake and Hiawatha First Nations:** These Michi Saagiig Anishinaabeg nations assert that the project is within their traditional territory and will impact their **ongoing spiritual and cultural relationship with the land and water**. They argue that western science fails to account for these spiritual impacts, which cannot be quantified and require deep engagement with Knowledge Sharers.
- **Traditional Harvesting and Fisheries:** Native species such as **Lake Sturgeon (na' me) and Lake Whitefish (adikameg)** are of profound cultural and subsistence significance. Indigenous groups fear that the project's "open-loop" design will cause catastrophic fish kills and disrupt the **Treaty-protected fishery** that supports the economy of communities like Neyaashiinigmiing (Cape Croker).
- **Archaeological and Ancestral Risks:** There is a high concern for **potential Ancestral remains** along historic shorelines that are now underwater. Because the project site was dry land approximately 8,000 to 11,000 years ago, Indigenous nations believe there is a high likelihood of encountering **submerged archaeological deposits** during in-water construction.

- **Water as a Living Entity:** For the Anishinaabeg, water (**nibi**) is a life-giving being rather than a mere resource. They express concern that "utilizing" or "exploiting" this water through massive daily withdrawals and discharges violates their role as its stewards.

Applicable Treaty Boundaries and Disputes

The project site sits within a complex landscape of overlapping treaty claims and historical grievances:

- **Treaty 45½ (1836) and Treaty 72 (1854):** These treaties are cited by SON as the basis for their traditional territory, which includes the project area on the Niagara Escarpment and the waters of Georgian Bay. SON previously claimed **exclusive rights to the bed of Georgian Bay** in a 2004 legal suit; while the suit was withdrawn in 2025, they continue to seek a resolution regarding these contested waters.
- **Treaty 18 (1818):** Several stakeholders and residents argue that the project location actually falls under **Treaty 18**, signed by the Chippewas of Rama, Georgina Island, and Beausoleil. Some submissions dispute the accuracy of project maps, claiming they extend SON boundaries too far east into territory traditionally belonging to these other nations.
- **Williams Treaties (1923):** Nations such as Curve Lake and Hiawatha reference their rights under the Williams Treaties and the 2018 Settlement Agreement, emphasizing that their ancestors traveled and harvested across these Great Lakes watersheds.
- **1942 Expropriation Trauma:** Members of the Chippewas of Nawash have shared that the 1942 expropriation of 18,000 acres for the military base was an **unfair dispossession of their traditional lands**, a trauma that is reignited by the prospect of a private corporation now using those same lands for profit.

Concerns Regarding Process and Good Faith

- **Consultation Standards:** Indigenous nations argue that the project triggers the Crown's **Duty to Consult and Accommodate** under Section 35 of the Constitution, which cannot be fulfilled solely through the proponent's "Coffee Chats" or public participation processes.
- **"Bad-Faith" History:** Critics point to TC Energy's past interactions with the Lubicon Cree and Athabasca Chipewyan First Nation as evidence of **"bad-faith engagement,"** where Indigenous concerns were allegedly ignored or addressed only through attempts to "buy off" opposition.
- **United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP):** Nations are demanding that the Crown ensure **Free, Prior and Informed Consent (FPIC)** is obtained before any approval, noting that a commercial partnership negotiation is not a substitute for collective community-level consent.