



Meaford - December 11, 2019, Open House Questions

<https://www.tcenergy.com/operations/power/pumped-storage-project/12-11-2019-open-house-questions/>

About TC Energy

Who is TC Energy? Is it a public or private company?

TC Energy, a publicly traded company, (formerly known as TransCanada) and its affiliates deliver the energy millions of people rely on every day to power their lives and fuel industry. Focused on what we do and how we do it, we are guided by core values of safety, responsibility, collaboration and integrity. Our more than 7,000 people are committed to sustainably developing and operating pipeline, power generation and energy storage facilities across Canada, the U.S. and Mexico. TC Energy's common shares trade on the Toronto (TSX) and New York (NYSE) stock exchanges under the symbol TRP. Visit TCEnergy.com to learn more.

What is your previous experience with hydro and/or pumped storage?

TC Energy owns or has interests in 10 power generation facilities with combined capacity of approximately 6,000 megawatts (MW) – enough to power more than five million homes. Nearly half of the power we provide is generated from an emission-less nuclear power facility (through our 48.5 per cent ownership in the Bruce Nuclear Station) and we are leaders in the development and operation of high efficiency, natural gas-fired generating stations.

TC Energy operated 13 hydroelectric facilities (including stations, dams, and reservoirs) from 2004 to 2017 with a combined generating capacity of 584 MW on the Connecticut and Deerfield rivers systems in New Hampshire, Vermont, and Massachusetts.

Would you recommend buying or selling stock in TC Energy today?

For more than 65 years we've delivered on our commitment to meet the ever-increasing demand for energy in a safe and sustainable manner. Visit TCEnergy.com/Investors to learn more about TC Energy's investment portfolio.

Construction

Which road will provide access to the proposed facility site?

We are in the process of exploring access for construction which is dependent on feasibility studies as well as further project design. Access roads on 7th Line and 9th Line are being reviewed, however 7th Line has a limited ability to support traffic as compared to other roads such as 9th Line. We are also looking to determine if there are further alternative roadways.

What is the tonnage/volume of soil to be excavated and where will it be disposed of?

A number of factors will contribute to the volume of soil excavation including the design of the reservoir, the size and number of headraces, the size of the powerhouse as well as actual subsurface ground composition. Ideally, we will use all the material excavated on site for other construction related needs. Further information will be available following the completion of feasibility studies and engineering design.

Decommissioning

What happens after the facility operates for 50+ years? How will the facility be decommissioned?

The project will be designed to operate in excess of 50+ years but, depending on the energy needs at that time and any needs for upgrades or refurbishment, the project life could be extended. At the end of the project's life, it will be decommissioned in compliance with the regulations in effect at that time. TC Energy considers several factors when identifying facilities that may be decommissioned such as the ability to meet customer requirements, integrity of the facility and operating costs. All aspects of the life cycle of an energy facility – from design and construction to operation and decommissioning are regulated. When TC Energy plans to decommission a facility, we submit an application to the regulator that provides information on, amongst other things, safety, the environment, and stakeholder and Indigenous engagement. The decommissioning work only begins after we receive regulatory approval.

Who pays to decommission the facility when its useful life is over?

As the facility owner, TC Energy would be responsible for any costs associated with decommissioning.

Will the area be restored to a natural state?

The end state of the site after decommissioning will depend on the requirements of the regulator at the time and is expected to be informed by input from landowners, stakeholders and Indigenous groups based on current processes. It is anticipated that final decommissioning would include restoration of the site to an appropriate state compatible to the adjacent conditions. If the adjacent areas are forested and the land owner desired a similar final condition, the site would be prepared and planted so that it would support a comparable forest cover.

Greenhouse Gas and Air Emissions

How will you manage methane emissions that will result from reservoirs? New research shows estimated methane emissions are 34 per cent higher than previously thought. How do you ensure the baseline data you are using is current and non-biased?

We do not expect the reservoir for this project to be a source of methane emissions or methyl mercury because we are proposing to build the artificial reservoir on land that will be prepared by removing vegetation and organic materials at the start of construction. Methane and methyl mercury are sometimes produced in reservoirs that contain vegetation, organic materials areas or have natural inflows from overland surface water that can transport organic materials and nutrients. The design of the project's upper reservoir will avoid generation of these by products.

What is the total carbon output of all gas plants operated by TCE and carbon equivalent of all pipelines operated by TCE?

We are committed to managing our greenhouse gas (GHG) emissions, focusing on our GHG intensity and continuing to integrate climate considerations into our overall business strategy, risk management and business development. In 2018, TC Energy's direct GHG emissions were 13,500,000 tCO₂e.

We believe our efforts and ongoing commitment to reduce the GHG intensity of our operations, combined with the substantial and continued investments we have made in lower-emission and emission-less energy, position us well to adapt to and thrive in a lower-carbon economy. Looking forward, the global demand for energy is expected to continue to grow and we are well-positioned to be a preferred partner in the safe, reliable and sustainable delivery of that energy for decades to come.

What are the emissions associated with building the facility?

Emissions associated with building the facility would primarily come from the production of materials, construction and transportation, similar to any large civil project such as roadways, building of public transit lines, construction of municipal services, etc. As part of the federal and provincial environmental assessments, we will be quantifying estimated project related GHG emissions and assessing the results. That data and analysis will be included in the public regulatory filings for the project.

What are the emissions associated with pumping the water up?

There will be no direct emissions associated with pumping the water from the lower to upper reservoir. Electricity is required to move water into the reservoir during operation. We plan to use clean (wind, hydro, nuclear) excess energy from the power grid during non-essential, low-demand periods. Currently this low-demand energy is typically exported at a loss or entirely wasted.

Indigenous and Community Relations

Please explain how you plan to include the Indigenous people of territory in your planning & consultation period.

Indigenous engagement on this proposed project aims to foster productive dialogue and exchange of information with Indigenous groups. Our goal is to identify issues and concerns related to potential project impacts on Indigenous or Treaty Rights or interests and to discuss measures to avoid, mitigate and manage these potential effects. Information shared through this process will contribute to the project design and environmental planning.

While the underlying principles remain the same, the scope and depth of engagement may vary according to the potential for project-related effects, the identified interests of each Indigenous group, and each group's unique protocols and preferences for the gathering and sharing of information within their community. Indigenous groups may be provided with capacity support to enable direct engagement and collaboration with TC Energy.

Is it true that TCE has offered SON multiple millions of dollars to partner with on this project?

TC Energy is committed to working with the Saugeen Ojibway Nation (SON) to establish a long term mutually beneficial partnership, including a potential commercial partnership for the project. As it is still early days for the project, no commercial agreement has been reached at this point, however TC Energy remains committed to discussing the project and our plans to advance its development with the SON.

You advised SON that you will not commence construction unless they are supportive of the project. Will you make the same commitment to the host community (Meaford)?

Ensuring the Municipality of Meaford is meaningfully engaged and respected is critical to the advancement of the project. The strength of this relationship has a direct impact on our ability to build and operate this project. Building relationships with local communities helps us understand our potential impacts on the community, mitigate adverse effects and seek opportunities for economic participation and community investments. We are committed to working collaboratively with the Municipality of Meaford to ensure we contribute in a meaningful way. By engaging early with the host community and listening, we create project plans with better outcomes for everyone involved. It is our hope that we can build trust with the Municipality of Meaford to build a project that everyone in the community can support.

Why were SON identified as a potential commercial partner?

TC Energy seeks to build long-term relationships with Indigenous groups whose Rights or interests may potentially be affected by its activities. TC Energy is of the view that working directly with Indigenous groups through community investment, education, training, employment and contracting leads to long-term benefits for Indigenous groups.

The Saugeen Ojibway Nation communities have been approached about a commercial partnership for a number of reasons, including, but not limited to, proximity of the project to Reserve lands, a current title claim and recognized commercial fishing rights. There is currently no commercial partnership in place.

Will the Municipality of Meaford have any input on the impact studies?

Absolutely. We understand this project will have an impact on the Municipality of Meaford, and should it proceed, we are committed to working with the municipality to understand their concerns and to seek their input and ideas so that we can ensure the project is developed in a manner that is mutually beneficial. We will engage early, openly and frequently with the municipality throughout all stages of the proposed project, including providing ongoing opportunities to provide input into, and review the outcomes of, the various environmental and socio-economic studies and assessments that will be undertaken.

Are temporary housing proposed for the workers? If so, what will happen to the temporary facilities after construction? How many units? I've heard that ~ 400 units are proposed & that they will be turned over to the Town for non-profit housing. If true, I am concerned about the ability of a small rural municipality to accommodate the socio-economic impacts of a relatively large number of low-income families. For example, Barrie could absorb these families, but Meaford likely can't.

We have heard concerns from the community about the options for housing workers related to the project; we have not yet developed detailed plans for worker housing and as such the location and precise nature (temporary, permanent) of worker housing has yet to be determined. Numerous studies will be completed to gather site-specific information about the land, environment and communities within the vicinity of this proposed project. This includes a socio-economic effects assessment that will

consider increased demand for housing and accommodation and the potential effects. We will continue to engage with communities and stakeholders with regards to accommodation options. The accommodation strategy will consider temporary housing and be developed in consultation with governments and service providers in key communities. These studies will be made public and will be used to evaluate the potential effects of the project and identify opportunities to avoid, or minimize, negative impacts during construction and operation.

After the construction period, what benefits will this project have for the residents of this community?

Residents will share in the broader benefits of the project in terms of reduction of greenhouse gas emissions, lower electricity costs, and improved reliability of the electrical system. However, at a local level, the project is also expected to have a significant positive impact on local community economies during operation through the creation of skilled jobs, purchasing of local goods and services (e.g. equipment parts, fabrication, consulting, construction services, labour, materials such as gravel, etc.), and the associated indirect and induced financial benefits. As an example, in Napanee where TC Energy is constructing a 900 MW power facility, since 2015 the project has resulted in over approximately \$300 million of local spending to date – most of this spend is related to labour and materials.

A socio-economic effects assessment will be completed that will provide more information regarding anticipated direct, indirect, and induced benefits of the project (i.e. employment, personal income, GDP, government tax revenue, etc.). This information will be made public and will be used along with the other studies to evaluate the potential effects of the project.

Once in operation, it is anticipated the facility will employ approximately 20 permanent positions. There will also be significant local contracting work to support operations and maintenance in addition to the direct operations roles.

What kind of financial benefit to the municipality of Meaford through increased tax assessment of the 4th Cdn div training center does TC Energy forecast?

TC Energy supports communities in which it operates and recognizes that the development of this project will have an impact on the Municipality of Meaford. We are committed to paying our fair share so that the project does not burden the Municipality or local residents. Over the coming months, we will be working with the Municipality to understand their interests and learn how we can ensure the project has a positive economic impact.

Is TC Energy involved in, or have funds from TC Energy been allotted to the building of our new school and/or library?

At this preliminary stage of the project, TC Energy has not committed funding to the building of a new school and/or library in Meaford. However, through our engagement, we will work to identify areas where we can contribute to strong, safe and vibrant communities through local partnerships and initiatives. TC Energy has a community investment program that provides valuable tools and resources to first responders, helps fund educational programs, supports important community needs and strengthens environmental stewardship and sustainability through local and regional investments. Investing in and giving back to the communities where we operate are important parts of being a good

neighbour, a trusted partner and an employer of choice. [Click here](#) for more information about our Build Strong program.

Will the \$3B+ assessment value the project be included in the municipality general assessment and taxed accordingly?

TC Energy supports communities in which it operates and recognizes that the development of this project will have an impact on the Municipality of Meaford. We are committed to paying our fair share so that the project does not burden the Municipality or local residents. Over the coming months, we will be working with the Municipality to understand their interests and learn how we can ensure the project has a positive economic impact.

An assessment of the net economic impact of the development, construction and operation of the project will be undertaken as part of the environmental assessment required under provincial and federal regulations. The socio-economic effects assessment will provide more information regarding anticipated direct, indirect, and induced benefits of the project, including government tax revenue. This information will be made public and will be used along with the other studies to evaluate the potential effects of the project.

How many jobs will remain after construction that are full time?

Once in operation, it is anticipated the facility will employ approximately 20 permanent positions. There will also be significant local contracting work to support operations and maintenance in addition to the direct operations roles.

Who pays for the extra infrastructure needed in the community (i.e. police, medical) to ensure safety for residents with 800 mainly male workers?

At TC Energy, safety is our top priority – of our employees, contractors and the public. We will undertake a comprehensive socio-economic effects assessment that will consider increased demand on community infrastructure, including medical and emergency services. Findings of the effects assessment will be used to identify opportunities for TC Energy to avoid or mitigate pressures on local services during construction and operation.

TC Energy is committed to covering costs of impacts on services and components of the local economy – for examples – roads, emergency and protective services, housing and accommodations, health, recreation and educational services during the development of the project.

How many skilled jobs anticipated?

Construction of project components such as the powerhouse and substation, and associated infrastructure will require a specialized workforce, material and equipment. We estimate construction would require approximately 800 skilled trades over a period of four years. Once in operation, the facility will employ approximately 20 permanent positions. There will also be significant local contracting work to support operations and maintenance in addition to the direct operations roles.

How many unskilled jobs anticipated?

Studies will be completed to gather site-specific information about the communities within the vicinity of this proposed project. One of these studies is a comprehensive socio-economics effects assessment that considers local labour requirements and business supply base.

How will you accommodate 800 jobs?

A socio-economics effects assessment will be completed and it considers labour requirements and increased demand for housing and accommodation and the potential effects.

Construction of the project will require specific subsets of workers and equipment, and some of these workers may be available locally. The project expects to source labour, goods and services from communities in Grey, Bruce and Simcoe Counties, including Indigenous communities, as well as from elsewhere in Ontario and beyond.

The project has not yet developed detailed plans for worker accommodations, but numerous studies will be completed that will consider increased demand for housing and accommodation and the potential effects. We will continue to engage with communities and stakeholders with regards to accommodation options. The accommodation strategy will be developed in consultation with governments and service providers in key communities that considers temporary housing.

Would you really hire Meaford residents to build this facility? A facility like this requires skill labour under specific union guidelines?

TC Energy utilizes qualified and competitive companies and individuals to plan, build and operate our facilities. We believe in supporting local communities near our projects and provide opportunities through employment and contracts to local people and businesses. As such, we require our prime contractors to hire qualified, local subcontractors. These relationships are critical to the success of our projects and operations while benefiting local communities.

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In order to facilitate this local involvement, TC Energy and our contractors reach out to local businesses to understand local capacity and TC Energy maintains a list of local contractors our prime contractors may access to conduct work on our facilities. TC Energy includes expectations in contracts with prime contractors to hire qualified, local contractors and employees.

Land

Is this area part of the Niagara escarpment? If so, is it not part of the biosphere reserve?

The proposed site of the pumped storage facility is not located within the Niagara Escarpment. If an overland transmission line is selected as the means of connecting to the electrical system, a crossing of the escarpment is likely necessary and would be planned and permitted in accordance with the Niagara Escarpment Commission policies and guidelines.

Will there be impacts to property values? How will you assess this?

We do not anticipate that the project will have an impact on surrounding property values. All of the major infrastructure, except the transmission connection, is planned within the confines of the Meaford base and water exclusion zone. There may be short-term (construction related) impacts to surrounding residents and we will keep surrounding landowners informed of any potentially disrupting activities.

How will you compensate property owners near the plant, reservoir and/or transmission lines, whose property may be affected?

As the project progresses, TC Energy representatives will reach out to landowners who may be directly affected by the project to engage in open, transparent and respectful conversations regarding required land rights and associated compensation. TC Energy representatives will work with directly affected landowners to assess potential impacts as a result of the project and will undertake necessary analysis to support a collaborative discussion on compensation matters. The establishment of compensation for the acquisition of land rights required for the project will be based on the fair market value of the lands.

Will the land that this project be located on be purchased or leased? If leased, what would the lease terms be?

Should the project demonstrate feasibility, a long-term access agreement with Department of National Defence (DND) is likely to support access for construction and operation. This agreement would allow use under the Dominion Water Power Act and is not a change in ownership. The land will not be purchased nor leased. Right of access under the long-term access agreement with DND will include reimbursement for costs incurred by DND and compensation for impacts. Fees will be payable to the federal government under the Dominion Water Power Act for use of the water resource.

Can a landowner refuse access? Will TCE use eminent domain?

Our goal would be to contain the facility to as much extent as possible within the confines of the Meaford base and in the case of the transmission lines, within existing corridors. Where private lands are required, TC Energy is committed to working with landowners affected by the project to resolve issues and reach mutually acceptable agreements for the land rights required for the project. It is TC Energy's preference to negotiate voluntary agreements with all landowners and only resort to available legislated expropriation procedures when efforts to obtain negotiated agreements have been exhausted.

Has TCE bought land for housing?

We are at the preliminary stages of the project. TC Energy has not yet assessed the requirements of acquiring land for housing for the project.

Noise

Will nearby residents be exposed to loud noises when the system is operating?

We anticipate that the project would generate sound while in operation, but expect that the sound would be limited to the immediate area of the proposed pumped storage facility within the restricted area of the military base. We anticipate that the primary source of operating sound from the facility would be the rotating pump/turbine equipment and transformers. The turbines and pumps will be located below ground, which should reduce audible sound. We will be required to meet provincial noise

standards during operation, otherwise the project will not be approved by the Regulator. To ensure we are compliant with the noise regulations, site-specific studies and noise modeling will be a component of the environmental assessment process. The results of these studies will be available to all residents as part of this environmental assessment process. TC Energy will consider currently available, proven technologies and mitigating measures to effectively reduce, as much as possible, project sound that might be emitted.

How is noise assessed and what are the operating guidelines?

TC Energy would build and operate the facility in compliance with Ontario's Environmental Noise Guideline and in consideration of Health Canada Guidance for Evaluating Human Health Impacts in Environmental Assessment: Noise. Existing noise levels will be characterized and local potential points of reception (POR) will be identified. PORs are defined as sensitive land uses with human activity including locations like dwellings, campgrounds, schools, hospitals, community centres, place of worship, etc. PORs are evaluated using the baseline noise levels and will be determined by qualified technical specialists and a noise impact assessment will be conducted. The predicted noise levels will be compared with relevant noise impact assessment criteria to determine noise impacts. Potential noise mitigation measures will be recommended where predicted impacts may occur.

Design

What is a penstock? Headrace?

A penstock is an enclosed pipe or duct that conveys water between the reservoir and the pumps and turbines. A headrace is a broader term for the transportation of water between the reservoir and the pumps and turbines and can include a penstock or tunnel in this type of pumped storage application.

How much energy (MW) does it take to pump the water into the reservoir?

Approximately 1,000 megawatts (MW) of energy is required to fill the reservoir. It takes longer to fill the reservoir because it is completed at a lower water flow rate as the pumps work against gravity and friction, which means the pumping cycle takes longer than the generation cycle. (approximately 11 hours to fill completely from empty).

What is the size of the reservoir?

The upper reservoir is anticipated to have a surface area of 375 acres with a depth of 20 meters. It is currently proposed to be approximately 1.7 km long by 0.9 km wide.

What volume of water will move up and down every 24 hours?

As the project is currently proposed, a full pumping and generation cycle would move approximately twenty million cubic metres of water from Georgian Bay into the upper reservoir and back. Our current expectation is that a full cycle on a long-term average would take just over 24 hours.

What power source will be used to pump the water? Bruce Power? Gas fired electricity?

Electricity would be required to move water into the reservoir. We plan to use clean excess energy from the power grid during non-essential, low-demand periods. Most of this energy would come from

existing wind, hydro or nuclear power generation. This low-demand energy is typically exported at a loss or entirely wasted.

What is the net energy loss of the facility given pump / generator / heat loss?

From an efficiency perspective, a modern pumped storage facility operates between 70 and 75 per cent approximate efficiency and our proposal is expected to fall in this range. It should be noted that the electricity used in our proposed project is excess electricity that would otherwise be wasted or exported. As a result, we are turning a 100 per cent loss into a 75 per cent gain for the benefit of Ontario consumers and environment.

The project is planned on the escarpment; karst (limestone) is notoriously difficult to predict water flow. What will line the reservoirs to keep it sealed?

It is still very early in feasibility planning and a determination of the most appropriate lining material has not been made at this time. However, we will ensure there is separation of the reservoir from underlying and adjacent sediments through engineering design. We will be conducting extensive geotechnical and geophysical studies to ensure the design accounts for local conditions.

What is size of powerhouse (generation facility) building that will be in the water versus on land?

The powerhouse would require a surface area of approximately two acres. This building itself would be located underground with some components above ground. The powerhouse will not be in the water.

Safety and Integrity

What is TC Energy's safety record?

Our goal is for our facilities to operate safely every day so that the public, our workforce and the environment aren't affected by an incident involving our assets. Safety is, and always will be, our number one value. By reinforcing a disciplined set of rules and providing rigorous training, we approach every day with our goal of a zero-incident workplace. More information about safety at TC Energy is available in our Corporate Responsibility Report.

How can we feel confident in your ability to handle this project given the performance of other projects, for example failures on the Keystone Pipeline that have resulted in oil being released into the environment?

TC Energy is a leading developer of energy infrastructure. Incidents are unfortunate and rare. Pipelines are the safest way to transport the energy that millions of people rely on every day. Our pipeline safety programs are among the most robust in the industry and the most important part of our business. TC Energy is committed to building and operating this project safely.

What protection is in place for residents that live in close proximity to the reservoir? How will people be protected if there is a breach of the wall (i.e. an earthquake damages the facility)?

TC Energy will design the project to meet or exceed engineering standards and will construct the project adhering to strict design and safety standards. The facility will be subject to regular inspection and maintenance throughout the operational life of the project. Project design will include emergency control measures as backup in the event of unforeseen circumstances. TC Energy is committed to

building and maintaining safe facilities with the protection of people, the environment and assets in mind. The last thing TC Energy would want is for any critical incidents to occur at this or any other facility.

Pumped storage is a proven technology that has been utilized for over a century. Over 160,000 megawatts (MW) of pumped storage capacity exists worldwide today, including 165 MW right here in the Ontario. TC Energy's proposed project will be subject to numerous regulatory approval processes, including an Environmental Assessment approval from the Ministry of the Environment, Conservation and Parks and will be subject to Dam Safety review approval.

Can you guarantee no accidents / incidents with respect to the reservoir failing?

TC Energy will build this project to the highest possible environmental and industry standards. TC Energy is committed to designing the project to meet or exceed engineering standards, constructing to the specification and standards required by the design, and operating the project under a rigorous inspection and maintenance program.

It is important to recognize there are over 15,000 dams in Canada and 121 large dams in Ontario — the planned reservoir will also be a large dam — we depend on them to protect the public. Extreme floods are a primary cause of dam failures, whereby rapid surface runoff exceeds the holding capacity of the reservoir. In contrast, the reservoir proposed is not fed by an upstream natural body of water and will not be subject to extreme flooding events. The maximum flooding event in this area can be managed by running the facility at full output for a few minutes.

How many residences in an inundation zone is “okay”?

Acceptability of residences within an inundation zone downstream of a dam is guided by professional organizations or regulators. For this project, the Canadian Dam Association provides guidance relating to safety considerations and standards.

There are over 15,000 dams in Canada and 121 large dams in Ontario which are of the same scale as the reservoir — and we depend on them to protect the public.

The escarpment is full of fissures. How do you ensure the water doesn't escape through other, non-engineered means (i.e. existing streams)?

Groundwater and surface water will be studied as part of the environmental and engineering studies to understand both surface and sub-surface water flow. As an example, groundwater field studies will be conducted and will include the installation of monitoring wells to test the hydraulic properties of the substrate and bedrock units underlying the proposed project for baseline analysis. A network of groundwater monitoring wells would be established for continued monitoring of groundwater levels and to understand sub-surface conditions through project construction and operations, for compliance monitoring and due diligence purposes.

Alternatives

Why not use batteries at existing power facilities? There would be no change to the escarpment, no need for new hydro power and the existing infrastructure is already there.

The cost and environmental footprint to replicate this proposed energy storage project using batteries would be significantly higher when the overall lifecycle impact (mining, manufacturing, installation, replacement and disposal). Batteries do have important roles in the future electricity system (typically for shorter durations), but pumped storage is the most economic and environmentally responsible solution to meeting Ontario's bulk system storage needs. For comparison, the largest lithium-ion battery in the world is 100 megawatts and has less than two-hours of storage capacity.

How many wind turbines and/or solar panels would it take to generate the power needed to fill the reservoir?

Ontario has a diverse power system. This project would be an environmental and economic solution to address deficiencies in Ontario's electricity system – like at night when the province generates more power than it needs.

This facility would largely be filled using surplus nuclear, wind and hydroelectric power, reducing the need to start gas-fired facilities during periods of high demand.

How is this more efficient than using the natural flow of a river?

A hydroelectric generating facility uses the natural flow of a river to produce electricity. A pumped storage project does not produce electricity, but instead takes electricity from the electricity grid at times of excess and stores it for use at other times of need. A hydroelectric generating facility and the pumped storage system serve different purposes.

Why not build a lower water reservoir, also called a closed loop system, and avoid using Georgian Bay?

We have evaluated the potential for a closed loop lower reservoir and have determined the loss of elevation would affect the capacity of the project to the degree that it reduces the value of the project. Feasibility studies are continuing to refine our knowledge of the site and to inform design and solutions to manage the potential effects of the planned open loop system.

New hydro generating stations in other countries are reducing environmental effects. There are over 5,000 former mines in Ontario. Why not put a pumped storage facility there, or an abandoned quarry, where the land has already been impacted?

Development of an economical pumped hydro storage project must consider various design criteria, including:

- Proximity to population centres and electrical demand;
- Elevation of approximately 150 metres between the upper and lower reservoirs;
- Proximity to a transmission connection point that can accommodate 1,000 megawatts (MW) of load and generation; and
- Land with limited public access.

Is there another facility like this somewhere else?

There are over 160,000 megawatts (MW) of pumped storage facilities in the world today comprising more than 99% of all energy storage worldwide. Within the United States there are over 22,000 MW of pumped storage facilities, many which have operated for over 40 years. Ontario Power Generation operates a pumped storage facility in Ontario—the Sir Adam Beck Pumped Storage Station at Niagara Falls. This 165 MW facility has been operating since 1954.

What other locations has TCE considered for the facility?

The proposed location within the confines of the Meaford Tank Range has the ideal topographic and geographic conditions for pumped storage, including elevation and proximity to water. The proposed site also occupies a portion of the base that is not expected to interfere with the ongoing operations.

There are other locations in Northern Ontario that could be considered but are not ideal due to transmission constraints and proximity to the electricity grid.

How can you describe this location as isolated when it is in the Town of Meaford?

Isolation in this case refers to the proposed project footprint being located on an active military base on lands that are not accessible to the public. We regret any impression that we have not considered the proximity of residents in relation to the facility — reducing potential negative effects to the community has and will be a critical element in our planning. We are committed to being a good neighbour and working with the community to answer questions and address concerns you may have about this proposed facility.

Nighttime charging of electric vehicles is increasing exponentially, and construction of new wind farms has slowed down. How can you be sure this facility will be needed?

Ontario's Independent Electricity System Operator has identified an emerging and ongoing need for additional electricity (2,000- 3,000 megawatts), starting in the mid-2020s. As part of a study undertaken by a third-party independent consultant, consideration of a future scenario with high electrification including a high penetration of electric vehicles was considered. Even under this scenario, the study demonstrated increased consumer and climate change benefits with the addition of this facility.

This project is not a green energy generating project. Why not build green energy using wind or solar power?

The objective of this proposed project is to utilize the clean electricity system we have in Ontario. It would allow us to use the wind and solar assets that we have, to reduce the need to burn natural gas.

The addition of renewable generation was an improvement to Ontario's electricity environmental footprint, but it added generation that can be more difficult to control or forecast. Wind and solar are products of the meteorological condition which can change quickly and without warning. With the removal of coal-fired generation, the province has fewer power resources to assist in meeting demand when required and, as a result, operating the system has been more challenging.

This project is intended to conserve and store a large proportion of the excess energy already being generated in the province but currently being exported at a loss or simply wasted through curtailment of production. Ontario needs a flexible resource that can start and stop quickly and change its output to help balance supply and demand. Grid-scale storage, like this project, provides the mechanism to

maximize existing and potentially add additional intermittent renewable power if this is a policy objective.

For this project, how much of the power needed to fill the reservoir comes from renewables, hydro or wind? Or is most of it from dirty energy?

Navigant's economic analysis shows that on average the project is expected to reduce CO2 emissions by 490,000 tonnes per year by displacing gas generation in peak hours using emission-free generation (including wind, hydro and nuclear) stored during off-peak hours. As a storage system, excess energy is used to fill the reservoir and it is not anticipated to rely on peak power, which is currently provided by gas-fired facilities in the province. Their report can be found at: TCEnergy.com/PumpedStorage.

Why locate the reservoir beside local residents? Why not move the reservoir on the Base further away from residents?

The proposed location within the confines of the Meaford Tank Range has the ideal topographic and geographic conditions for pumped storage, including elevation and proximity to water. The proposed site also occupies a portion of the base that is not expected to interfere with the ongoing operations. The Department of National Defence (DND) is currently conducting a feasibility study to determine if the site is appropriate given their ongoing military training activities.

What studies have you done to determine pumped storage is needed and more efficient than what is currently being done?

The assumptions surrounding the viability of this proposal were modelled by a third-party independent consultant. Navigant's economic analysis provides a comparison of the economics and environmental impacts under a range of future scenarios and compares that with a reference case without pumped storage. In all cases, the studies indicate savings to electricity consumers and reduced greenhouse gas emissions. Their report can be found at: TCEnergy.com/PumpedStorage.

Are there other existing facilities that are similar in scale to this project (1,000 MW)? If yes, where are they located?

There are seven operational open-loop pumped storage projects in North America with a pumping capacity of 1,000 megawatts (MW) or more. A summary of existing pumped storage facilities, facilities under construction and planned facilities is available at: Hydropower.org.

Environmental Assessment

How far along are both DND and TC Energy with the initial environmental assessments?

TC Energy is in the early planning phase of the environmental assessment. Site-specific environmental studies will be undertaken as part of the environmental assessment required under provincial and federal regulations. We plan to begin environmental field studies in the spring of 2020. These studies are needed to support project design and the regulatory approvals process. We currently anticipate it will take approximately three years to complete the environmental regulatory process and obtain all permits and approvals, and then four years for construction.

The Department of National Defence's is conducting separate, independent studies.

Who pays for the environmental assessment?

Under both the federal and provincial processes, TC Energy is responsible for the costs.

What does "mitigate / mitigation" mean and who decides on the standard for mitigation?

As defined in the Impact Assessment Act 2019, mitigation measures mean “measures to eliminate, reduce, control or offset the adverse effects of a project or designated project, and includes restitution for any damage caused by those effects through replacement, restoration, compensation or any other means.”

Mitigation measures are proposed based on site-specific conditions in consideration of current industry accepted practices, engagement with regulatory authorities, compliance with legislation, regulations and guidelines, consideration of feedback from potentially affected landowners, stakeholders and Indigenous groups, and the professional experience of discipline specialists. Mitigation measures are detailed in the environmental assessment/impact statement for review and approval by the Impact Assessment Agency of Canada and the Ontario Ministry of the Environment, Conservation and Parks.

What is the role of Ontario Ministry of Natural Resources given federal jurisdiction over the Lake and tank range?

The tank range is federal land and the Impact Assessment Agency of Canada will serve as the regulator, coordinating the interest of federal authorities including the Department of National Defence, Environment and Climate Change Canada, and Fisheries and Oceans Canada. The Ontario Ministry of the Environment, Conservation and Parks is the regulator on provincial lands and will coordinate with provincial authorities including the Ministry of Natural Resources and many others. Both have indicated support for a coordinated assessment that will address both federal and provincial regulatory requirements.

What is the environmental impact?

As part of early planning we will be undertaking numerous studies that will gather site-specific information about the land, environment and communities within the vicinity of this proposed project. Studies will be conducted in areas of potential impacts and examples of these studies include, but are not limited to:

- The aquatic environment, including fish and fish habitat, water levels, water quality and currents
- The terrestrial environment, including vegetation, wildlife and soils
- The physical environment, including air quality and noise
- Local cultural and socio-economics, including archaeological and cultural resources, land and water use, recreation activity, population, infrastructure and community services
- The results of the studies will be analyzed, and the potential environmental effects will be assessed for the project in the environmental assessment.

Will there be environmental degradation of Beaver Valley?

The only component that could potentially intercept the Beaver Valley would be the overland transmission corridor if this was the selected option to connect the pumped storage facility to the Stayner transmission station. TC Energy is currently evaluating both overland and subsea transmission

line options. Any overland routing would be guided by siting criteria that would strive to minimize effects to land users and the environment. Degradation implies unacceptable negative effects which would not be tolerated by TC Energy or permitted by the federal and provincial regulators.

Fish and Aquatics

Will the project impact fish?

Pumped storage systems involve exchange of water between a lower and a higher reservoir to alternately store and generate electricity. The volume of water during this exchange may vary with site operational needs. We recognize that this exchange of water may impact fish depending on the seasonal population and depth distribution of fish, fish behaviour, and their associated swim speeds. We are currently gathering data to fully understand the local aquatic environment and potential effects to fish as a result of the project, as well as researching design options and other measures that can effectively avoid, minimize or offset for negative effects.

How will fish kills be mitigated?

We know there is a risk to fish from the project. Mitigation for potential fish mortality is catered to the local fish species, the habitat, the water and weather patterns of Georgian Bay, and specific to the design of the pumped storage project. We are currently gathering data and planning field studies to obtain site-specific information about the local aquatic environment, which inform engineering and mitigation design.

Extensive fish and fish habitat studies will be completed to provide a scientific measure of the natural aquatic environment and an understanding regarding the abundance of local fish populations. Biologists will work with engineers to identify potential mitigation that can be used. The assessed effects and proposed mitigation to avoid or minimize effects will be presented to the provincial and federal regulatory agencies as part of the environmental assessment and they will determine if the assessment and measures proposed will adequately protect fish and fish habitat.

How much disturbance will there be to Georgian Bay?

Preliminary planning is based on generalized expectations and assumptions for a pumped storage project of this size. Those assumptions include components we know will be required, such as the upper reservoir, headraces and pumphouse. Some components, like the transmission line, are necessary but have options for siting and execution that could include Georgian Bay, such as a subsea transmission cable. Some elements may be determined to not be necessary, including breakwalls, but have been included as possible feasible options until design indicates otherwise. Any project components that are planned within Georgian Bay will be evaluated in relation to the environmental data being gathered to determine potential effects. As we continue to gather data and work on engineering designs, we will continue to provide updates and engage with concerned landowners, stakeholders and Indigenous groups about these developments.

Will TCE consider a pipe out to deep water to mitigate shoreline impacts- fish entrainment distributing heavy metals in sediment, warming the water & disrupting currents in Georgian Bay?

TC Energy is considering many design options including evaluating the best location for the inlet/outlet of the headraces. We are currently gathering data and completing feasibility studies to learn more about

the aquatic environment which will help us with our engineering design. Engineering design considerations will be evaluated to mitigate potential shoreline effects and will assess the location of the water intake, the velocity of the water being drawn in, the amount of water, and the timing of the water movement (withdrawal and release).

Operations and Compliance

What measures are in place to ensure compliance with mitigation?

There are internal and external means of ensuring compliance with the commitments made by TC Energy in relation to this project. TC Energy has a number of internal mechanisms to ensure that environmental protection measures and commitments identified in the regulatory filings are implemented during the construction and operational phase of the project. The TC Energy Operational Management System (TOMS) underpins corporate health, safety, sustainability, environment and asset integrity programs to ensure commitment compliance, prevent incidents and protect people, the environment and our assets. Commitments that are made during project development are incorporated into these systems and programs to ensure compliance during construction and operation. At the project level, prior to construction and as a key element of the environmental assessment, a project-specific Environmental Protection Plan will be prepared that lists the detailed mitigation measures included in the assessment as well as established environmental protection measures and both management and contingency plans to address anticipated and unanticipated conditions. Environmental construction support measures include the administration of a mandatory Environmental Orientation to all project workers that must be completed prior to starting work on the project, and the employment of Environmental Inspectors who are responsible for promoting and monitoring continuous and consistent compliance with environmental commitments and mitigation measures, and all permit and approval conditions, applicable environmental laws and guidelines, and TC Energy policies and procedures.

Externally, both provincial and federal regulatory authorities have compliance mandates and will ensure adherence to approval conditions. Mitigation monitoring and/or reporting may also be used by provincial and federal regulators to verify that mitigation measures were properly implemented and that those measures mitigated the predicted adverse environmental effects as anticipated by the responsible authority in its decision.

Species at Risk

At what stage are species at risk assessed both on the base and surroundings?

Species at Risk (SAR) and SAR habitat baseline studies and field surveys will be undertaken in conjunction with the related biophysical baseline studies and environmental assessment surveys which are anticipated to begin in the spring of 2020.

What about the 11 species at risk at this site?

Environmental studies and surveys will be completed to assess the presence or absence of wildlife and wildlife habitat including Species at Risk (SAR) and SAR habitat. Where detected, habitat will be documented to inform assessment of effects, identification of mitigation measures to avoid impacts and any required discussions on habitat offsetting.

Vegetation and Terrestrial

How many trees will be cleared for the facility and path for transmission?

An assessment regarding potential effects to trees and other vegetation will be conducted during the environmental assessment. The results of these studies will be made public through the regulatory filing processes.

How much deforestation is acceptable?

It is TC Energy's mandate to safely develop energy in an economically, environmentally and socially responsible manner. We intend to fully study and understand the potential environmental and socio-economic effects of the proposed project. Site-specific environmental studies will be undertaken as part of the environmental assessment required under provincial and federal regulations. These assessments will evaluate the potential effects of the project and identify opportunities to avoid and minimize negative impacts during construction and operation. Ultimately the decision on the acceptability of the effects of the project after the implementation of mitigation measures rests with the federal and provincial regulatory authorities.

Water Quality

What is the impact on water quality?

Both groundwater and surface water quality and quantity (including Georgian Bay) will be studied to understand the current water quality, using desktop and field studies. Baseline water quality data combined with engineering design will be used to assess the potential effects to water quality. Potential water quality studies could include: changes to temperature, changes in turbidity or water chemistry, and changes to water flow at the intake/outlet in Georgian Bay. A full list of potential effects to water quality would be included in the environmental assessment.

What level of water turbidity is acceptable?

Turbidity is a function of water flows, the material and depth of the outlet, other project structures, and the lakebed.

Site-specific environmental studies including water quality measurements of turbidity, conductivity and pH, will be part of the baseline data collected for the environmental assessment required under provincial and federal regulations. These studies will include an assessment of water turbidity and will be made public.

The provincial and federal ministries have established acceptable guidelines relating to turbidity for the discharge of water during construction and ongoing operations. The project will be designed and constructed so that these levels are adhered to. Baseline monitoring during the environmental assessment will provide a basis for the evaluation and it is expected that ongoing monitoring will be required during operation to assess facility compliance with the naturally fluctuating turbidity levels within Georgian Bay.

How will water turbidity be mitigated?

Engineering considerations are the primary measures that will mitigate water turbidity effects and include factors such as the design and location of the powerhouse and outlet structure. Once the baseline turbidity levels and conditions are established for the localized part of Georgian Bay,

engineering solutions will be developed to mitigate the impact of the facility operation on the local environment.

With current high waters we are dealing with tremendous amount of silt. How will the disturbance of water flow in and out of the bay affect our drinking water?

High water levels, sediment transfer and turbidity are naturally occurring phenomena. The baseline conditions for turbidity will be established during the environmental assessment. Potential for disturbance of water flow in and out of the Bay and associated potential effects will be assessed. These studies will be used to evaluate the potential effects of the project and identify opportunities to avoid or minimize negative impacts during construction and operation. The studies will inform any necessary engineering design refinements to ensure drinking water is not affected as a result of the project.

How will all the turbulence and resulting muddy water impact Meaford water treatment plant?

The facility will be designed to avoid any negative impacts to water sources — we do not anticipate any effect to the Meaford water treatment plant as a result of the project. Disturbance of water flow in and out of the Bay, and associated potential effects, including water quality for the Meaford water treatment plant, will be assessed.

If our water is damaged, will TCE accept responsibility and pay to give us safe water?

TC Energy does not anticipate the project will impact water wells or the Meaford water treatment plant. Baseline conditions and computer modeling will inform engineering design to ensure potential turbidity and flow patterns are understood and controlled so as not to affect drinking water sources.

What impact is there on Georgian Bay's water level?

It is anticipated the impact to Georgian Bay's water level will be imperceptible. The amount of water withdrawn from Georgian Bay to fill the reservoir will be dependent on the final design of the facility and operational variability. At this very preliminary feasibility stage, the approximate reservoir volume is 0.023 km³ compared to an approximate full pool volume of 3,538 km³ for Lake Huron.

Water was several feet below normal for a decade. How much water will be withdrawn from Georgian Bay to fill the reservoir?

The amount of water withdrawn from Georgian Bay to fill the reservoir will be dependent on the final design of the facility. At this project feasibility stage, we can estimate using some conservative assumptions, that the volume of the reservoir will be approximately 0.023 km³. In comparison, the full pool volume of Lake Huron based on available data is approximately 3,538 km³. The withdrawal volume will not be perceptible relative to the total volume of Georgian Bay and Lake Huron. To put in perspective, it would be comparable to removing one cup (250 ml) of water from a backyard swimming pool.

Will groundwater at the facility on the Base that is connected to drinking water wells south and southeast of the base be effected?

Groundwater field studies will be conducted which will include the installation of monitoring wells to test the hydraulic properties of the substrate and bedrock units underlying the proposed project and to collect samples for baseline groundwater quality analysis. This data is needed to fully understand the

near surface geological properties of the area and ensure the project will be designed to avoid adversely affecting regional groundwater supply. It is anticipated a network of groundwater monitoring wells will be established for continued monitoring of groundwater levels and quality through project construction and operations, for compliance monitoring and due diligence purposes.