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Summary of Issues Response

Marguerite Lake Compressed Air Energy Storage Project

Prepared for:
Federation Group Inc.

Prepared by:
Vertex Professional Services Ltd.

Date:
January 2025

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Marguerite Lake Compressed Air Energy Storage Project

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SENIOR PLANNER – REGULATORY, REPORT REVIEW

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Fish and Fish Habitat	

Clarify potential effects to fish and fish habitat in relation to the natural gas supply pipeline and how these effects will be addressed.	A fuel gas pipeline is required to supply natural gas to the expander generators, and the pipeline has potential to impact fish and fish habitat. The pipeline will have a small diameter and be installed within existing easements, reducing the need for new land. Construction from the roadbed will minimize impacts to watercourses, avoiding temporary crossings and culvert modifications where practical.
	
	Federation Group Inc. (Federation) has secured the necessary right-of-way by transferring the abandoned power line easements EZE 840086 and EZE 850219 from ATCO Electric Ltd. (ATCO), and Telus has completed amendments and transfers for EZE 160001 and EZE 160002. These easements have been converted to *Public Lands Act* (PLA) approvals for the following sections:
	• Pipeline (North): Approved under PLA 240861 from 02-06 to 15-06-066-05 W4M as of October 8, 2024
	• Pipeline (Middle): Approved under PLA 240860 from 15-02-065-06 to 04-06-066-05 W4M as of September 12, 2024
	• Pipeline (South): Approved under PLA 240862 from 15-02-065-06 to 14-35-064-06 W4M as of September 19, 2024
	
	Potential impacts to fish and fish habitat as a result of pipeline construction include:
	• Sedimentation of fish habitat
	• Changes to, or losses of:
	  ○ Riparian habitat
	  ○ Habitat structure and cover
	  ○ Fish passage
	  ○ Wetted areas
	
	Mitigation measures to prevent or reduce potential impacts to fish and fish habitat during construction will incorporate Fisheries and Oceans Canada's *Measures to Protect Fish and Fish Habitat* (Government of Canada, 2023a) and meet Code of Practice requirements, where applicable. Using trenchless crossing methods will eliminate the need for instream work and using the existing roadbed for construction will reduce the need for riparian clearing, resulting in a reduction of potential impacts to fish and fish habitat. Additionally, conducting water quality monitoring and incorporating spill prevention practices will further reduce the potential impacts. With the incorporation of these

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<tr><td></td><td>measures, it is expected that no significant impacts to fish or fish habitat will result from pipeline construction. As such, the harmful alteration, disruption, or destruction of fish habitat is not anticipated, aligning with the Fisheries Act.

A fisheries and aquatics desktop review was conducted using the Fish and Wildlife Management Information System (FWMIS) to identify potential watercourse crossings and determine their aquatic resources and sensitivities along the proposed route for the pipeline. A total of three potential watercourse crossings (X01, X02 and X03) were identified and are all unmapped unnamed tributaries to Corner Lake. Complete desktop review results for each potential watercourse are summarized in Table 1.

Table 1. Watercourse Crossing Desktop Review Results
<table>
<tr><th>Crossing ID</th><th>Waterbody Name</th><th>Waterbody Class</th><th>Restricted Activity Period</th><th>Historical Fish Presence</th></tr>
<tr><td>X01</td><td>Unnamed Tributary (Corner Lake)</td><td>Class D</td><td>--</td><td>No fish sampled to date</td></tr>
<tr><td>X02</td><td>Unnamed Tributary (Corner Lake)</td><td>Class C[1]</td><td>April 16 to June 30</td><td>No fish sampled to date</td></tr>
<tr><td>X03</td><td>Unnamed Tributary (Corner Lake)</td><td>Class C[1]</td><td>April 16 to June 30</td><td>BRST, NRPK, NRDC, WALL, WHSC[2]</td></tr>
</table>
[1] Adopts Class C designation as it is an unmapped waterbody that flows into a fish bearing lake
[2] Sampling was conducted near confluence with Corner Lake
BRST = Brook Stickleback; NRPK = Northern Pike; NRDC = Northern Redbelly Dace; WALL = Walleye; WHSC = White Sucker
"--": Not applicable/recorded

Based on the results of the desktop review, habitat quality may be low within the unnamed tributaries to Corner Lake at the crossing locations X01, X02 and X03. Impacts to fish and fish habitat as a result of the proposed pipeline are anticipated to be minimal if appropriate mitigation measures are implemented. A field investigation will be performed prior to construction to verify the potential watercourse crossings identified during the desktop review and to determine the quality of existing fish habitat, if present. Additional site-specific mitigation will be developed based on the site visit, if required.</td></tr>
<tr><td>Clarify whether potential effects to surface water and subsequent effects to fish and fish habitat have been considered.</td><td>Potential effects to surface water and subsequent impacts to fish and fish habitat have been thoroughly evaluated for the facility. Potential Project-related effects from the natural gas pipeline were discussed above. The hydrology assessment conducted for the facility, which included analysis using LiDAR data and field surveys, identified local</td></tr>
</table>

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	waterbodies and drainage patterns. No drainages or waterbodies were identified within the Project area for the facility, indicating that hydrological connectivity to other waterbodies, whether they are fish-bearing or not, does not exist. As such, potential effects to surface water and subsequent impacts to fish and fish habitat are not anticipated. To mitigate potential impacts, a comprehensive stormwater management system has been planned, consisting of a retention pond and a perimeter ditch system designed to capture and manage runoff. The stormwater pond will retain water long enough for sediments to settle and pollutants to be treated, ensuring that any discharge meets the water quality criteria outlined by the *Environmental Protection and Enhancement Act* (Government of Alberta, 2024a). This controlled release minimizes downstream erosion and contamination, aligning with best practices for industrial site management. It should be noted that the Hydrology Assessment is a preliminary evaluation and not a final design report. Detailed plans addressing potential impacts, such as erosion, water quality, and stormwater pond location, operation and maintenance will be developed during the design phase. These further stages will ensure comprehensive management and adherence to environmental standards, confirming that no significant effects to surface water or fish habitat are expected.
Migratory Birds, Other Birds and Their Habitats	
Need for mitigation details and monitoring measures for migratory birds that nest on human infrastructure or man-made features.	Federation has outlined robust mitigation measures to address potential impacts on migratory birds nesting on infrastructure, which includes the following: • Structure placement away from high use areas, avoiding or reducing the use of guy wires, and marking for increased visibility (through window decals, line markers, other high contrast markers) may help to reduce wildlife collisions with infrastructure • Installation of deterrents such as netting or spikes to discourage migratory birds from roosting or nesting on buildings or structures • Coordinate with utility owners to ensure the designs comply with the Avian Power Line Interaction Committee (APLIC) Avian Protection Plan Guidelines (Edison Electric Institute's Avian Power Line Interaction Committee and the U.S. Fish and Wildlife Service, 2005) • General mitigation measures will include clearing and construction activities will be scheduled outside the Migratory Bird Nesting Period (April 1 to August 30) to comply with *the Migratory Birds Convention Act* (MBCA; Government of Canada, 1994) and Alberta *Wildlife Act* (Government of Alberta, 2022). If clearing or

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	construction during this period cannot be avoided, a pre-construction nest and wildlife sweep will be conducted within seven days prior to activity Should active nests or potential wildlife features be found, species-specific buffers based on federal and provincial guidelines will be established and monitored until the nests have fledged or have been cleared by a biologist. As needed, Federation will coordinate with the appropriate regulatory body regarding any variance to mitigation and monitoring measures, especially with regard to mobile equipment or equipment critical to operations. Additionally, Project personnel will be encouraged to report any wildlife sightings, including nests, during site orientation, ensuring continuous monitoring and adherence to regulations.
Clarify potential effects to migratory birds related to sensory disturbances, including how potential effects will be addressed.	Potential effects on migratory birds related to sensory disturbances, such as noise and visual disruptions, have been thoroughly considered and key mitigations have been provided in Appendix E of the Initial Project Description (IPD). Sensory disturbances can disrupt migratory birds' natural behaviors, particularly during breeding, foraging and migration periods. To mitigate noise impacts, the Project will incorporate several measures: • Maintaining and utilizing noise-reducing equipment, such as mufflers on machinery, to keep noise levels within provincial and municipal guidelines • Designing equipment or enclosures to reduce major sources of noise, including the expander enclosure, the compressor enclosure, and the instrument air building to have absorptive interior liners with inlet and exhaust ventilation silencers • Scheduling noisy construction activities outside of peak migration and nesting periods whenever possible • Limiting construction activities causing elevated noise levels to daytime hours, when birds are generally less sensitive to disturbances Visual disturbances, such as the movement of large machinery and increased human activity, will also be managed. Buffer zones will be established around key bird habitats to minimize human presence near sensitive areas. Additional measures include: • Using light shields or directional lighting to lessen sky glow and use photocells or motion detectors to control light fixtures visited infrequently • Using barriers or visual screens to reduce the visual impact of construction activities near nesting sites

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	Federation will implement these mitigation strategies while adhering to an adaptive management approach. Regular monitoring during construction and operation phases will help assess the effectiveness of these measures. If behavioral disruptions among migratory birds are observed, additional strategies will be employed to minimize further impacts. These comprehensive noise and visual disturbance mitigation measures ensure compliance with federal and provincial wildlife protection regulations, including the MBCA (Government of Canada, 1994). This approach helps protect migratory birds and minimizes potential disruptions throughout the project lifecycle.
Comment regarding the proponent obligations stemming from the Migratory Birds Convention Act, 1994 and its regulations.	The Project is fully committed to complying with all obligations under the MBCA (Government of Canada, 1994) and its associated Migratory Bird Regulations (Government of Canada, 2024a). The MBCA and its Regulations prohibit the disturbance, destruction, or removal of migratory birds, their eggs, or active nests (as well as year-round for Schedule 1 species) without authorization, and the Project has implemented several measures to ensure compliance with these obligations. To ensure compliance, clearing and construction activities will be scheduled outside the nesting period whenever possible. If activities must occur during this time, pre-construction nest sweeps will be conducted to identify active nests or wildlife features, followed by the establishment of species-specific buffers to protect these sites. Additionally, Project personnel are instructed to report sightings of active nests and wildlife, facilitating the implementation of timely protective measures. The MBCA's regulations guide these practices to ensure that potential project impacts on migratory birds are mitigated effectively.
Need for information on potential effects to migratory birds related to the stormwater pond, and how these effects will be addressed.	The potential effects of the stormwater pond on migratory birds have been carefully evaluated as part of the IPD for the Project. Stormwater ponds can attract and pose risks to migratory birds, especially waterfowl and other species that may use the pond for resting or foraging. To address these potential effects, the following measures will be implemented: • Design to Minimize Attraction: The stormwater pond is designed as part of an industrial stormwater management system and not intended as a permanent habitat for wildlife. The engineering of the pond will avoid features that encourage bird usage, such as gentle slopes or extensive open water areas, to reduce the likelihood of birds settling near the active Project area. The pond is also fenced to discourage entry or ease of movement of wildlife, including migratory birds • Water Quality Management: To ensure the safety of any birds that may come into contact with the pond, the stormwater management system will include measures to capture and treat runoff before it is

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	discharged. This prevents contaminants like oils, sediments, or chemicals from accumulating in the pond. Regular monitoring of water quality will be conducted to identify and address any potential contamination risks, protecting bird health • Bird Deterrents: If necessary, non-invasive bird deterrents will be utilized to discourage birds from frequenting the pond. This could include visual deterrents, such as flags or reflective materials, and auditory deterrents placed around the pond to prevent nesting or gathering • Monitoring and Adaptive Management: Federation will regularly monitor the presence and activity of migratory birds near the stormwater pond. Should an increase in bird activity be observed, additional mitigation measures will be implemented, such as further modifications to the pond design or the enhancement of deterrent systems. This adaptive management approach ensures that potential risks to migratory birds are promptly addressed These comprehensive strategies ensure that the stormwater pond fulfills its primary role in managing runoff while minimizing impacts on migratory birds. This approach helps protect birds from potential hazards and ensures compliance with environmental and wildlife protection regulations, including the MBCA (Government of Canada, 1994).
Species at Risk, Terrestrial Wildlife and Their Habitats	
Clarify mitigation measures for impacts to amphibian species at risk, which may arise from loss and indirect impacts to wetlands.	The amphibian surveys conducted at and within proximity to the facility identified only Wood Frogs and Boreal Chorus Frogs, both of which are considered secure species federally and provincially. The facility is currently located outside the range of the other two remaining species of frogs (i.e., Columbian Spotted Frog, Northern Leopard Frog) and two species of toads (i.e., Plains Spadefoot Toad, Great Plains Toad). There is potential for Canadian Toad and Western Toad to be present at or near the facility as they have been historically recorded in the region, but they were not identified during the appropriate amphibian surveys. The Canadian Toad is considered 'Sensitive' in Alberta but is listed as 'Not at Risk' federally. The Western Toad is considered 'May be at Risk' in Alberta and 'Special Concern' under Schedule 1 of the *Species at Risk Act* (SARA; Government of Canada, 2024b). Mitigation measures for potential impacts on amphibian species and species at risk (SAR), especially from wetland loss or indirect effects, have been outlined for the Project. These strategies include: • Wetland Protection and Buffer Zones: Establishing a 100 m year-round buffer zone around amphibian breeding ponds to minimize disturbances. As activities are expected to occur within this buffer, a

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	comprehensive mitigation plan, including monitoring and exclusion measures for all amphibians identified and with the potential to occur, will be implemented. • Avoidance and Habitat Conservation: Project design focuses on minimizing impacts to wetlands through strategic planning and avoiding amphibian habitats where practical. Reclamation efforts will follow any necessary disturbances post-construction. • Hydrological Stability and Monitoring: The stormwater management system will maintain stable water levels and flow patterns in nearby wetlands to prevent indirect hydrological impacts. Regular monitoring will ensure conditions remain conducive for amphibian habitats. • Timing: Construction near wetlands will be scheduled outside of breeding seasons when possible. All open excavations will be inspected periodically and covered or filled if possible before water is allowed to enter and provide potential for amphibian habitat. A pre-construction wildlife sweep should include identification of any amphibians or habitat features, followed by the establishment of species-specific buffers to protect these sites. • Adaptive Management: Construction as outlined in the Mitigation Plan will assess the effectiveness of these measures and, if necessary, implement additional mitigation or actions. These comprehensive strategies are designed to comply with provincial and federal conservation laws, ensuring the protection and preservation of amphibian SAR throughout the Project lifecycle.
Concern regarding land use change and potential effects to species at risk and terrestrial wildlife such as sensory disturbances and cumulative effects, and how potential effects will be addressed.	The area is currently an active grazing lease, the new facility would constitute a change in land use but was sited on an active grazing lease to reduce the overall impact of the Project on the area. Additionally, the pipeline component of the Project uses existing easements, and the site was chosen to take advantage of existing roads and power infrastructure to the greatest extent practical. Federation has/will apply the following mitigation measures: • Minimizing Land Disturbance: The Project is designed to limit land disturbance during both construction and operation. By focusing activities in previously disturbed or less sensitive areas and reducing the Project footprint, habitat loss for terrestrial wildlife and SAR is minimized • Timing: Disturbances, where possible, will be timed to avoid sensitive wildlife periods • Noise Mitigation: Construction activities causing elevated noise will be restricted to daytime hours to reduce disruption to nocturnal and noise-sensitive species. Machinery will be equipped with noise-reducing technologies, such as mufflers, to maintain noise levels within acceptable limits. Compliance monitoring will be conducted to ensure noise regulations are met and impacts on sensitive species are minimized

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Visual Disturbances: Barriers or screens may be used near sensitive areas to reduce visual disruptions, particularly where SAR are present. Construction and operational lighting will be designed to minimize light pollution, especially near sensitive habitats
Cumulative Effects: With the mitigation measures proposed in Appendix E of the IPD, cumulative impacts on terrestrial wildlife and SAR are expected to be minimal, with strategies in place to manage habitat fragmentation and maintain functional wildlife corridors
Monitoring and Adaptive Management: Ongoing monitoring throughout the Project lifecycle will assess the effectiveness of these mitigation measures. Adaptive management strategies, such as additional habitat restoration, noise or visual barriers, or procedural changes, will be implemented if negative effects are observed to ensure minimal impact on SAR and terrestrial wildlife

These comprehensive strategies ensure compliance with environmental regulations and minimize sensory and cumulative effects on SAR and terrestrial wildlife.
</td></tr>
<tr><td>Need to provide an inventory of all species at risk and any critical habitat that may interact with the Project. Include avoidance, mitigation, and monitoring measures.</td><td>
The inventory of species at risk (SAR) that have historically been observed within 5 km of the facility was provided in Table 14-1 of the IPD and is summarized in Table 2 (Facility Record Origin). A similar review was undertaken for the pipeline as shown in Table 2 (Pipeline Record Origin).

The SARA status for the Common Nighthawk and the Short-eared Owl was incorrectly listed as ‘Threatened’ in Table 14-1 of the IPD. The SARA status of both species is ‘Special Concern’ as shown in Table 2.

Table 2. Inventory of Species at Risk for the Facility and the Pipeline
<table>
<tr><th>Common Name</th><th>Scientific Name</th><th>Status Alberta[1]</th><th>COSEWIC Status[2]</th><th>SARA Status[2]</th><th>Facility Record Origin[1]</th><th>Pipeline Record Origin[3]</th></tr>
<tr><td>Mammals</td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>American Badger</td><td>Taxidea taxus</td><td>Sensitive</td><td>Special Concern</td><td>Special Concern</td><td>Historical</td><td>Historical</td></tr>
<tr><td>Bobcat</td><td>Lynx rufus</td><td>Sensitive</td><td>-</td><td>-</td><td>Historical</td><td>Historical</td></tr>
<tr><td>Canada Lynx</td><td>Lynx canadensis</td><td>Sensitive</td><td>Not at Risk</td><td>-</td><td>Historical</td><td>Historical</td></tr>
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	Fisher	*Martes pennanti*	Sensitive	-	-	Historical	Historical
	Wolverine	*Gulo gulo*	May be at Risk	Special Concern	Special Concern	Historical	Historical
	Amphibians						**-**
	Boreal Toad	*Anaxyrus boreas*	Sensitive	Special Concern	Special Concern	Historical	-
	Canadian Toad	*Anaxyrus hemiophrys*	May be at Risk	Not at Risk	-	Historical	-
	Birds						**-**
	American Bittern	*Botaurus lentiginosus*	Sensitive	-	-	Historical	Historical
	American Kestrel	*Falco sparverius*	Sensitive	-	-	Historical	Historical
	American White Pelican	*Pelecanus erythrorhynchos*	Sensitive	Not at Risk	-	Historical	-
	Bald Eagle	*Haliaeetus leucocephalus*	Sensitive	Not at Risk	-	Incidental	-
	Baltimore Oriole	*Icterus galbula*	Sensitive	-	-	Historical	-
	Barn Swallow	*Hirundo rustica*	May be at Risk	Special Concern	Threatened	Breeding Bird Survey	-
	Barred Owl	*Strix varia*	Sensitive	-	-	Historical	-
	Black Tern	*Chlidonias niger*	Sensitive	Not at Risk	-	Breeding Bird Survey, Historical	-
	Cape May Warbler	*Dendroica tigrina*	Sensitive	-	-	Historical	-
	Common Nighthawk	*Chordeiles minor*	Sensitive	Special Concern	Special Concern	Incidental, Historical	-

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	Common Yellowthroat	*Geothlypis trichas*	Sensitive	-	-	Historical	Historical
	Eastern Kingbird	*Tyrannus tyrannus*	Sensitive	-	-	Breeding Bird Survey	-
	Forster's Tern	*Sterna forsteri*	Sensitive	Data Deficient	-	Historical	-
	Great Blue Heron	*Ardea herodias*	Sensitive	-	-	Historical	Sharp-tailed Grouse Survey; Historical
	Horned Grebe	*Podiceps auritus*	Sensitive	Special Concern	Special Concern	Historical	Historical
	Least Flycatcher	*Empidonax minimus*	Sensitive	-	-	Incidental	Historical
	Pied-billed Grebe	*Podilymbus podiceps*	Sensitive	-	-	Historical	-
	Peregrine Falcon	*Falco peregrinus*	At Risk	Not at Risk	-	Historical	-
	Pileated Woodpecker	*Dryocopus pileatus*	Sensitive	-	-	Historical	-
	Sandhill Crane	*Grus canadensis*	Sensitive	-	-	Historical	Historical
	Short-eared Owl	*Asio flammeus*	May be at Risk	Threatened	Special Concern	Historical	-
	Sora	*Porzana carolina*	Sensitive	-	-	Historical	Historical
	Sprague's Pipit	*Anthus spragueii*	Sensitive	Threatened	Threatened	Historical	Historical
	Sharp-tailed Grouse	*Tympanuchus phasianellus*	Sensitive	-	-	Historical	Historical

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Western Wood-pewee	*Contopus sordidulus*	May be at Risk	-	-	Breeding Bird Survey, Historical	Historical
Wilson's Snipe	*Gallinago delicata*	Sensitive	-	-	Breeding Bird Survey	-

[1] Data obtained from FWMIS data provided by the area biologist for the region

[2] Government of Canada (2024d)

[3] Data obtained from Species Summary Report from FWMIT for 1,000 m from the approximate pipeline footprint

'-' - Indicates 'Not Applicable'

The facility and pipeline are located with the Sharp-tailed Grouse Survey Area and an agricultural grazing lease but there is no designated critical habitat for any SAR located within or adjacent to the Project footprint (Government of Canada, 2023b).

Best management practices to protect SAR focus on preventing human-caused mortality of SAR, reducing the risk of predation associated with anthropogenic features and activities, and protecting and conserving critical habitat (Government of Alberta, 2021).

As outlined in Appendix E of the IPD, proposed avoidance strategies for the facility include the following:

- Clearing from approximately February 15 through April, in suitable habitat will be avoided or minimized due to potential for disturbing early nesting birds such as Northern Goshawk, Short-eared Owl, and other bird SAR
- Construction should occur outside the Migratory Bird Nesting Period (B5, April 1 to August 30; Government of Canada, 2024c) to be compliant with the MBCA (Government of Canada, 1994) and Alberta *Wildlife Act* (Government of Alberta, 2022). Alternately, if any clearing or construction occurs during the early nesting or migratory bird nesting period, a pre-construction nest and wildlife sweep should be completed no more than 7 days prior to construction activities. If a nest or potential wildlife feature is discovered, a species-specific appropriate buffer, based on provincial and federal guidelines, should be established and maintained until the nest has fledged or the area has been cleared by a biologist

As outlined in Appendix E of the IPD, proposed mitigation avoidance strategies for the facility include the following:

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	• Should wildlife wander into the area where ongoing operations may be hazardous to the wildlife, operations will cease until the animal moves on • If a wildlife feature of a SAR is observed, a professional biologist should implement a species-specific appropriate buffer, based on provincial and federal guidelines or in consultation with the appropriate regulator, until the nest has fledged or the area has been cleared by the biologist As outlined in Appendix E of the IPD, proposed monitoring strategies for the facility include the following: • Project personnel and contractors will be encouraged to record wildlife sightings and report these to a Project representative during site orientation. Wildlife Observation Forms, including time, date, location of the observation, as well as behaviours observed, will be the key method for reporting these sightings. All sensitive and endangered species sightings will be reported to the appropriate regulator • Any wildlife mortalities or injuries will be reported to Project personnel and, as deemed necessary, the appropriate regulator • Amphibian breeding ponds will have a recommended 100 m year-round setback. If new activities cannot be avoided within the setback, a mitigation plan will be developed. The mitigation plan may include mitigation measures such as amphibian monitors, exclusion fencing, amphibian assessments and amphibian salvage and relocation. All necessary permits will be obtained For the pipeline, federal legislation will be followed, with any required surveys being conducted within one year of pipeline construction as well as the migratory bird sweep and wildlife sweep.
Concern regarding potential effects to terrestrial wildlife. Request that the Project not harm wildlife.	The Project is committed to protecting terrestrial wildlife. To avoid, minimize and mitigate for any potential harm, outcomes regarding habitat loss and fragmentation, habitat connectivity and movement, and wildlife injury and mortality have been considered. Examples of measures that have been or will be implemented include, but are not limited to, siting near existing disturbance, utilizing existing easements for associated pipeline, limiting land disturbance, avoiding construction during sensitive times, and keeping noise and lighting within safe levels. Buffer zones will also be set up around important features or habitats. Ongoing monitoring and adaptive management will help identify and address any issues that come up, ensuring wildlife safety and following environmental legislation and regulations.
Outline mitigation measures to reduce on-site vehicular traffic collision with wildlife.	To reduce potential wildlife mortality or injury related to vehicle collisions at the Project site, the following mitigation measures will be implemented: • Reduced Speed Limits: A reduced speed limit will be enforced to minimize the risk of wildlife-vehicle collisions

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	• Controlled Vehicle Access: Restrict the use of vehicles, including ATVs and UTVs, to essential activities only to reduce traffic and associated risks to wildlife • Wildlife Observation and Reporting: Project personnel will be encouraged to record and report wildlife sightings to help monitor animal presence and inform necessary adjustments • Waste Management: Proper containment and removal of food waste and debris to prevent attracting wildlife to high-traffic areas • Ongoing Monitoring: Regular site checks and reporting of any wildlife mortalities or injuries to the appropriate regulators for further action These measures, along with site management practices, will ensure that potential impacts on wildlife are minimized and that the Project complies with environmental guidelines.
Climate Change and Greenhouse Gas Emissions	
Describe the Project's resilience to future climate change, and where relevant, how it is considered in project design.	The surface equipment and facilities are built to operate efficiently under a wide range of temperatures, which helps ensure that the Project remains reliable even as climate conditions change over time. The ongoing monitoring plans for wildlife, surface water, and habitat impacts indicate a flexible approach that can adapt to changing environmental conditions. This allows for the modification of operations if climate-related issues arise.
Clarify the Project's greenhouse gas emissions and contribution to climate change following the Strategic Assessment of Climate Change and the Government of Canada's long-term goal to achieve net-zero emissions by 2050. Include the Project's impacts on carbon sinks.	The Project supports Canada's net-zero emissions goal by 2050 by minimizing greenhouse gas emissions and integrating renewable energy storage. The Project also protects natural carbon sinks, such as forests and wetlands, by minimizing land disturbance and using an area that has already been cleared. Furthermore, the Project will comply with all existing and future regulations related to air emissions to ensure ongoing alignment with national climate goals.
Concern regarding long-term investments in fossil fuel electricity generation and carbon emissions.	The Project is focused on supporting the transition to a low-carbon energy future by facilitating the storage of renewable energy and providing a reliable, dispatchable source of electricity with low emissions during peak demand when renewables are not available. This balance ensures that the Project contributes to lowering carbon emissions while maintaining energy reliability.

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	The Project aligns with long-term climate goals, including Canada's target to achieve net-zero emissions by 2050, and will comply with all current and future regulations related to emissions to ensure ongoing environmental responsibility.
Clarify how carbon capture or other mitigation measures are being considered to reduce the Project's greenhouse gas emissions, including technical and economic feasibility.	The Project is designed with the future capability to operate its turbines using hydrogen, which would result in zero emissions during electricity generation. One of the primary options for producing hydrogen is through the use of BrightLoop™ technology, a chemical looping process developed by Babcock & Wilcox. This innovative technology generates hydrogen from natural gas while simultaneously capturing and separating carbon dioxide (CO_2) for sequestration. By incorporating this technology, the Project can become net zero and aligns with Canada's net-zero goals. The BrightLoop process offers both technical and economic advantages over traditional hydrogen production methods. Its integration with on-site hydrogen salt cavern storage at Marguerite Lake allows for efficient and cost-effective hydrogen production and storage, eliminating the need for extensive hydrogen transportation infrastructure. These mitigation measures, including the potential for carbon capture and hydrogen storage, are being thoroughly assessed for their technical feasibility and cost-effectiveness, ensuring that the Project can meet both environmental and economic objectives.
Need for additional information and clarification on project greenhouse gas emissions estimates for all phases of the Project, including emissions from acquired energy.	The Project will rely on acquired energy from the grid during the compression phase, and associated greenhouse gas emissions will depend on the energy mix of the grid at the time. As Alberta's electricity grid transitions to more renewable sources, these emissions will decrease accordingly. The Project is actively exploring options to reduce reliance on carbon-intensive energy sources for acquired power, including the potential for agreements with renewable energy providers. Detailed emissions estimates for each phase will be provided in accordance with federal and provincial reporting requirements, ensuring transparency and compliance with environmental regulations. These estimates will be updated as the Project evolves.
Indigenous Engagement and Consultation	
Need for additional information on meaningful engagement with Indigenous Peoples and clarity on engagement that has occurred, and ongoing and/or pending engagement activities.	Federation recognizes the need for direct and ongoing engagement with Indigenous groups that have shown interest in the Project. This commitment is demonstrated through consultations with Indigenous groups identified by the Aboriginal Consultation Office (ACO) and the ACO's subsequent adequacy assessments. Federation has engaged in partnerships and consultations with Indigenous groups as directed by the ACO as part of the DML application process.

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	The wildlife assessment was conducted concurrently with Indigenous community engagement and consultation. Feedback from Indigenous groups was reviewed during the preparation of the IPD and informed the proposed mitigation measures to ensure habitat connectivity and protect against habitat loss and sensory disturbance to wildlife. Similarly, the vegetation assessment was conducted alongside Indigenous engagement, and feedback was considered in the IPD preparation. Federation has also engaged with communities that submitted comments to the IAAC and asserted Traditional territory in the Project area. Where responses were not received, Federation has documented its efforts and remains open to discussing, and where applicable resolving, the specific concerns of Indigenous Groups regarding the proposed Project. Additionally, Federation will promptly report any chance discoveries of archaeological or paleontological resources, historic sites, or previously unidentified Indigenous traditional use sites to the appropriate contacts and stakeholders, including Indigenous groups, ensuring respect and protection for these important cultural and historical elements.
Comment regarding the adequacy of consultation and engagement with Indigenous Peoples.	The ACO deemed consultation adequate for all Indigenous groups potentially impacted by the Project. Despite this decision, Federation has continued to engage with Indigenous groups that have demonstrated interest in the Project.
Indigenous Peoples' Current Use of Lands and Resources for Traditional Purposes	
Clarify potential effects to wildlife and vegetation, corresponding to potential effects on harvesting rights, traditional food sources and food security of Indigenous Peoples, and how these effects will be addressed.	Federation has carefully considered the Project's potential effects on wildlife, vegetation, traditional food sources, and food security for Indigenous groups and communities. From the Project's outset, efforts were made to minimize disturbances and cumulative effects, reducing impacts on harvesting rights, traditional practices, and the availability of natural resources. The Project has been designed to create a small disturbance area. It is strategically sited on an active grazing lease adjacent to existing linear infrastructure, significantly reducing the need for new land development, extensive clearing, or additional access roads. Ancillary Project activities are confined to existing easements alongside an all-weather arterial road, further limiting environmental disruption. These measures are designed to preserve wildlife, vegetation, and traditional food sources, ensuring their continued availability for Indigenous groups.

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Concern regarding the proximity of the Project to Harvesting areas and traditional use areas. Clarify changes to access for traditional use.	The Project area is adjacent to Range Road 61A (highway) and across the road from an electrical substation. The Project occurs in a fenced, active grazing lease, which likely reduces the potential for harvesting and traditional use in the area. The Project area is primarily tame pasture (87%) with a few small wetlands (13%). There are forested areas outside the disturbance area that could be used for traditional purposes (e.g., hunting). One of the considerations when selecting the site for the Project was to minimize new access to reduce any impacts to traditional land uses. The Project is located adjacent to an existing highway and will access directly from this road. In addition, the disturbance area is across the highway from an existing electrical substation and within the fenced perimeter of a grazing lease.
Clarify potential impacts to current use of lands and resources for traditional purposes.	The Project area is located adjacent to Range Road 61A (a highway) and across the road from an electrical substation. It is situated within a fenced, active grazing lease, which likely limits the potential for harvesting and traditional use in the immediate area. The Project footprint primarily consists of tame pasture (87%) with a few small wetlands (13%). Forested areas outside the disturbance footprint remain available and could support traditional activities, such as hunting. Given the small size of the Project footprint and the characteristics of the area, traditional use within the immediate vicinity is expected to be low. However, Federation remains open to discussing and, where applicable, resolving specific concerns related to the proposed Project.
Health Conditions of Indigenous and Non-Indigenous Peoples	
Need to identify and locate sensitive receptors (e.g., hospitals, schools, retirement complexes, assisted care homes) and traditional land use when determining potential project-related impacts on human health during all phases of the project.	The Project is not located in proximity to residences, schools, public spaces, recreational areas or other services. The nearest school is in Iron River, approximately 10 km west of La Corey, Alberta. La Corey is home to the Willow Prairie Senior Citizens Club, approximately 16 km south of the Project. The Bonnyville Senior Citizens Drop-In Centre is located in Bonnyville, Alberta, approximately 21 km south of the Project. Additionally, the Project has been designed to potentially be zero emissions (hydrogen-ready and in proximity to a carbon capture pipeline).
Clarify potential surface water, groundwater and soil quality changes from the Project. Consider existing water sources, how Indigenous Peoples consume water, and potential effects on human health.	Potential Project-related effects on surface water, groundwater and soil quality have been assessed and could include: • Change in groundwater or soil quality due to saltwater spills, fuel spills or other chemical spills • Reduction in groundwater levels as a result of wetland clearing and dewatering activities, as well as withdrawal of water from source wells • Increased turbidity, increased suspended sediments or contaminants in surface water • Alteration of surface drainage behaviour • Loss of soil quality due to spills

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	To mitigate these potential impacts, the Project will implement measures including: • Developing a comprehensive groundwater monitoring program • Constructing engineered containment systems to ensure cavern operation integrity • Implementing a stormwater management program, including runoff and sedimentation ponds • Minimizing wetland dewatering and adhering to the Environmental Protection Plan (EPP), which incorporates contingency plans for spill prevention and containment These measures will avoid and mitigate impacts, preventing indirect effects on nearby water wells and surface water bodies. Consequently, no adverse effects on drinking water sources used by Indigenous or non-Indigenous communities are anticipated. Additionally, Federation will implement key mitigation measures and best management practices, as outlined in Appendix E of the IPD. These include water and soil monitoring to ensure that potential effects on human health, including those of Indigenous Peoples, are effectively mitigated.
Need for additional information on country/traditional foods used by Indigenous Peoples, potential effects to these foods, food security or human health.	Federation engaged with the 11 Indigenous communities identified by the ACO and later with communities that submitted comments to the IAAC, asserting Traditional territory in the Project area. These engagements aimed to identify and address specific concerns related to the Project, including potential effects on country/traditional foods, food security, and human health. Federation remains committed to ongoing dialogue and, where applicable, resolving concerns raised by Indigenous groups regarding the Project. The Project is anticipated to result in a temporary, incremental reduction in the area available for plant harvesting within the disturbance footprint. However, no indirect effects on the health of country foods or the abundance of plants for traditional harvesting outside the affected area are expected. This conclusion is supported by the implementation of robust mitigation measures, including: • Preventing the introduction and spread of invasive species • Minimizing the likelihood of spills of hydrocarbons or saline water • Developing and implementing contingency plans to mitigate potential spills

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	Through these measures, the Project seeks to protect traditional food sources, maintain food security, and support the health and well-being of Indigenous communities.
Need for additional information regarding noise and air quality as they relate to potential effects on human health, and how these effects will be addressed.	As the Project will be operating 24 hours per day, Federation will use noise mitigation strategies to meet the more stringent nighttime permissible sound level (PSL) of 40 A-weighted Decibel (dBA) as established by AUC Rule 012 for the Project. The Project will also comply with Noise Control Bylaw/1657 for the M.D. of Bonnyville. The nearest residence is located 900 m to the southwest of the Project. This residence is used by the grazing lease manager for part of the year. As there are no residences, nursing homes or other long-term care facilities within 500 m of the disturbance area and the nearest community is 16 km away, noise is not expected to affect human health in the area. The Project will consist of a single 125 megawatt (MW) compressor train (electric driven) and two 160 MW expander train turbines. The energy requirements of the expander train turbines will be supplied by natural gas which will emit oxides of nitrogen (NOx). The expander train turbines will utilize Selective Catalytic Reduction (SCR), using ammonia (NH_3) to reduce NOx emissions. This will result in emissions of NH_3 when SCR is employed. The Project will also use a diesel-fueled emergency generator and fire water pump that will be used in emergency situations (non-routine situations). A systematic review of the nitrogen dioxide ($NO_{2)}$ and NH_3 concentrations that could be expected from the operation of the Project was undertaken. The modelling results indicate that the routine and non-routine (emergency) operation of the Project will comply with the stringent Alberta Ambient Air Quality Objectives (AAAQO) for NO_2 and NH_3 for the emission limits evaluated. Additionally, there are no residences or other human lodging facilities within 500 m of the Project. Project-related effects on air quality are not expected to affect human health in the area.
Need for additional information regarding potential effects on geological stability considering the subsurface storage component of the Project.	The drilling and operation of disposal and cavern wells will strictly adhere to the Alberta Energy Regulator (AER) *Directive 065: Resources Applications for Oil and Gas Reservoirs* (Directive 065; Government of Alberta, 2024b) and AER *Directive 051: Injection and Disposal Wells – Well Classifications, Completions, Logging, and Testing Requirements* (Directive 051; Government of Alberta, 2023). Regarding geological stability, there is no risk of inducing seismic events during construction or operation. The disposal and cavern wells will operate at a maximum of 90% of the fracture gradient, as required by AER Directive 051 for Class II and Class III wells (Government of Alberta, 2023). Federation will fully comply with all applicable regulatory directives, including AER Directive 065 and Directive 051, throughout the drilling and operational stages of the project. Furthermore, the company will carefully follow any

<table>
<tr><th>ISSUE</th><th>RESPONSE</th></tr>
<tr><td></td><td>additional guidance or requirements issued by the AER and Alberta Environment and Protected Areas (AEP) to ensure safety and maintain high environmental standards.</td></tr>
<tr><td colspan="2">Indigenous Peoples' Social and Economic Conditions</td></tr>
<tr><td>Clarify Indigenous employment, economic opportunities and participation, including any barriers and how the Project ensures equitable outcomes for Indigenous communities.</td><td>Federation maintains a "hire-locally first" policy and is dedicated to providing equitable opportunities for Indigenous communities. Recognizing potential barriers such as skills gaps, limited access to training programs, remote location challenges, and lack of awareness of opportunities, Federation will work on measures to address these challenges. Indigenous communities that have expressed interest in the Project will be informed of upcoming training, employment, and contracting opportunities to ensure they can fully access the economic benefits associated with the Project.

Additionally, Federation and Cold Lake First Nations (CLFN) have established a mutually beneficial agreement and are now Project Partners, acknowledging that the Project lies fully within CLFN's traditional territory, Denne Ni Nennè. This Agreement brings significant long-term benefits to CLFN, including workforce training, capacity-building, economic participation, and sustainable development, while reflecting a shared commitment to addressing barriers, creating equitable opportunities, and preserving traditional lands and resources.</td></tr>
<tr><td>Need for demographic information for Indigenous Peoples and proximity of Indigenous communities to the Project.</td><td>The closest Indigenous community is the Cold Lake First Nations Reserve 149B, located approximately 32 km east of the Project site. CLFN has close to 3,000 members, many of whom live on CLFN Reserve Lands and continue to exercise their Aboriginal Rights throughout CLFN's traditional territory, Denne Ni Nennè. The nearest Métis Settlement is Kikino Métis Settlement (KMS), approximately 85 km west of the Project. Currently, there are no comprehensive land claim or self-government agreements in the Project's vicinity (Government of Canada, 2016; Government of Alberta, 2024c).

A summary of demographic information for the 11 Indigenous Groups identified in the IPD is presented in Table 3. Demographic data was summarized from the Statistics Canada 2021 Census Profiles (Statistics Canada, 2024a). Demographic data was not available for the Onion Lake Cree Nation in 2021 and 2016 data was used (Statistics Canada, 2024b).

Table 3. 2021 Demographic Information for the Indigenous Groups Identified in the IPD
<table>
<tr><th>Indigenous Group</th><th>2021 Population</th><th>Land Area in km^2</th><th>Average Age</th><th>Gender</th><th>Employment Rate</th><th>Average Total</th><th>Percent with a high school</th></tr>
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		(on Reserve)					Income in 2020	diploma or equivalency
	Cold Lake First Nation	920	139.83	35.5	49% male 51% female	32.1.0	41,200	34%
	Beaver Lake Cree Nation	401	55.88	30.1	Not specified	22.4	40,000	16%
	Buffalo Lake Metis Settlement	379	335.68	34.3	48% male 52% female	21.1	36,400	22%
	Elizabeth Metis Settlement	594	246.45	33.2	Not specified	37.2	41,400	24%
	Fishing Lake Metis Settlement	414	348.64	36.5	Not specified	26.2	35,600	22%
	Heart Lake First Nation	211	47.47	26.9	Not specified	39.3	Not specified	45%
	Kehewin Cree First Nation	1,038	79.64	30.3	Not specified	32.6	34,200	24%
	Kikino Metis Settlement	978	441.92	32.9	Not specified	37.8	40,600	29%
	Onion Lake Cree Nation (2016 data)	3,285	585.71	21.3	49% male 51% female	32.9	23,053	13%
	Saddle Lake Cree	1,075	270.29	30.6	Not specified	42.5	39,300	40%

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	First Nation | | | | | | | | Whitefish (Goodfish) Lake First Nation | 880 | 83.00 | 28.0 | Not specified | 25.2 | 27,000 | 13% Source: Statistics Canada (2024a and 2024b)
Social and Economic Conditions of Non-Indigenous Peoples	
Clarify where the workforce for the Project will be sourced and whether a local workforce will be trained. Provide details on the workforce and proactive equality, diversity and inclusion measures.	Federation is committed to sourcing its workforce locally whenever possible, providing training and opportunities to support community employment. The Project's hiring strategy prioritizes local talent, especially from Indigenous and nearby communities, to ensure that local residents benefit from job creation and economic growth. Workforce needs will include a range of skilled professionals, such as engineers, project managers, and tradespeople, who are essential during the design, construction, and operational phases of the Project. To promote diversity and inclusion, Federation will implement proactive measures to support equitable hiring practices. This includes encouraging participation from individuals of various educational, cultural, and gender backgrounds, and ensuring the recruitment process is inclusive and fair. These measures are part of Federation's broader commitment to fostering an inclusive work environment that supports equality, diversity, and local community development.
Need for additional information on the project budget and local spending to help evaluate the local economic impact.	As published in the Alberta Major Projects, the estimated cost for the Project is $500 Million CAD (Government of Alberta, n.d.). Federation is committed to sourcing talent locally whenever possible. This includes looking to the local communities for workforce and materials.
Need for additional information regarding the Project's impact to the local economy and consideration of the lack of local services in the area.	The Project is a long-term facility that will provide meaningful employment in the region for decades to come. The Project is committed to supporting the local economy by actively engaging local businesses and suppliers whenever feasible. This commitment aims to ensure that the economic benefits of the Project are distributed within the community, fostering local business growth and creating a positive ripple effect throughout the region.
Clarify any assistance that will be given to employees once the Project has reached the end of its lifespan.	The Project is expected to operate for 30 years or more. Once it is no longer required and ready for decommissioning, Federation will undertake decommissioning and reclamation activities in accordance with the regulations, project-specific approvals, and desired end land use applicable at that time, as outlined in the IPD.

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	The Project is expected to generate up to 20 full-time jobs during its operational phase. When the Project comes to the end of its lifespan, Federation will prioritize transitioning operational personnel to other roles within the company, ensuring they have access to new employment opportunities.
Clarify the Project's job creation, direct or indirect.	The Project is expected to create significant employment opportunities, both directly and indirectly. During the construction phase, the Project is projected to generate up to 200 full-time jobs. Once operational, it will sustain up to 20 full-time positions. Additionally, the Project has an employment multiplier of 1.7 (Government of Alberta, 2020), which indicates that for each direct job created, 0.7 additional jobs will be supported indirectly. This means the 200 construction jobs could potentially contribute to a total of 340 jobs when including indirect employment, enhancing economic growth in the local and regional communities.
Clarify employee compensation and working conditions to help determine the Project's economic effects.	In Alberta, employee compensation and working conditions are governed by the Employment Standards Code, which sets the minimum standards employers must adhere to. These regulations ensure that employees receive fair compensation and work under acceptable conditions, thereby influencing the economic impact of projects like the Marguerite Lake CAES Project.
Need for engagement with Employment and Social Development Canada (ESDC) programs. Consider sharing information with the Indigenous Skills and Employment Training (ISET) service delivery providers and meeting with ISET agreement holders.	Engagement with Employment and Social Development Canada and Indigenous Skills and Employment Training (ISET) service delivery providers has not been undertaken at this stage of the application process. However, Federation acknowledges the potential value of such engagement and will evaluate the possibility of sharing relevant Project information with ISET service delivery providers as the Project advances to later stages.
Vulnerable Population Groups (Gender-Based Analysis Plus)	
Consider Gender-based Analysis Plus at all stages of the Project, including a Gender-based Analysis Plus assessment of possible social and health impact of various population groups within two kilometers of the disturbance area or more.	As mentioned in the IPD, the Project is located on Crown land approximately 16 km north of the hamlet of La Corey, Alberta, within the M.D. of Bonnyville. La Corey is the nearest community to the Project. The Project falls within the Wolf Lake Provincial Grazing Reserve (WLPGR; Provincial Grazing Reserve [GRR] 8865) boundary. The nearest residence, the WLPGR Headquarters/residence in SE-34-064-06 W4M, is located approximately 900 m southwest of the disturbance area. The next closest residence is over 2 km away and is located in NE-21-064-06 W4M. The nearest residences are shown on Figure 5 of the IPD. As previously mentioned, to promote diversity and inclusion, Federation will implement proactive measures to support equitable hiring practices. This includes encouraging participation from individuals of various educational, cultural, and gender backgrounds, and ensuring the recruitment process is inclusive and fair. These measures are part of Federation’s broader commitment to fostering an inclusive work environment that supports equality, diversity, and local community development.

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Acoustic Environment	
Need information related to ambient noise surveys, timing of construction activities, predicted noise levels during construction and operations, mitigation of noise effects and follow-up plans.	Federation conducted an ambient noise survey and noise impact assessment in compliance with AUC Rule 012 (Government of Alberta, 2024f), which mandates the inclusion of cumulative noise effects from adjacent baseline facilities. The assessment considered the existing Marguerite Lake substation, wellpads, and other nearby industrial activities. The Project area, surrounded by grazing lands and oil and gas operations, is adjacent to a highway and other industrial developments. To minimize noise effects, Federation has committed to several mitigation measures: • Designing equipment enclosures, such as those for the expander and compressor, with acoustic interiors and ventilation silencers • Installing a silencer on the water heat recovery stack and air inlet filter face • Maintaining all equipment and the compressed air energy storage (CAES) facility (e.g., ensuring mufflers are intact and equipment is properly greased) to prevent excessive noise • Limiting construction activities that produce significant noise to daylight hours and adhering to local noise by-laws. If higher noise levels are anticipated, noise exemption approvals will be obtained With these mitigation measures in place, predicted sound levels from the Project will meet AUC Rule 012 standards for both daytime and nighttime at the nearest residential receptor, with estimated noise levels remaining below the nighttime PSL of 40 dBA.
Surface Water and Groundwater	
Need for additional details on existing water sources for drinking and recreational use. Clarify potential effects and mitigation measures.	Based on a summary of the regional hydrogeology presented in the Baseline Hydrogeology Assessment report, several aquifers (Sand River Formation, Ethel Lake Formation, Bonnyville Formation, Muriel Lake Formation, and Empress Formations Unit 1 and 3) were identified as having the potential for drinking water usage. A 5 km radius search of water well users was conducted in January of 2023, yielding five wells reported as domestic and/or domestic and stock, and completed at varying depths. These locations will be field verified prior to construction to determine well completion, physical location (i.e., coordinates), water and volume usage, and yield. Barbara Lake and Marguerite Lake were identified as waterbodies used for recreational purposes in the area. Potential effects to groundwater drinking sources are a reduction in water levels for water well users withdrawing from the same aquifer as the proposed source wells at the site. Mitigation measures will be to install source wells in different aquifers to minimize drawdown at the existing water wells and adjust groundwater extraction rates as

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	required. Potential cumulative effects on the source aquifer(s) from other industrial users will also be evaluated when developing mitigative measures. Given the lateral distance of the proposed Project site to Barbara Lake (approximately 6 km) and Marguerite Lake (approximately 2.6 km), effects to water levels and/or quality from site operations (i.e., dewatering activities during site construction and operation of the runoff pond) are not expected.
Comment regarding potential impacts to groundwater related to the subsurface storage activities and brine disposal. Request for details of the groundwater and stormwater management plans.	Impacts to groundwater quality from storage activities and brine disposal are not expected. The salt cavern brine will be disposed by injection into the Middle Cambrian Basal Sandstone Unit. The injection of this brine will follow all AER Directive 051 requirements for Class II disposal/injection wells (Government of Alberta, 2023). Groundwater will be safeguarded by ensuring that the surface casing for both of the proposed disposal wells is cemented a minimum of 15 m below the base of groundwater protection (BGWP). At the Project location, the top of bedrock (i.e., the base of Quaternary drift deposits) is considered the BGWP as non-saline aquifers are not present within bedrock formations. At the disposal wells surface drilling location, the deepest formation containing non-saline groundwater within the Quaternary drift deposits is the Empress Formation Unit 3. With respect to protection of shallow groundwater zone such as the water table, Federation will not be using brine ponds for storage but rather, de-sanding centrifuges will be used to separate high levels of solids prior to direct disposal of brine into the disposal wells. A detailed Stormwater Management Plan will be developed prior to construction. Proposed details on the stormwater management plan were discussed above in the Fish and Fish Habitat Section.
Wetlands	
Need for additional information on wetlands to understand potential effects and mitigation measures, including the potential for direct and indirect impacts.	Federation has taken comprehensive steps to assess and mitigate potential impacts to wetlands associated with the Project. Initial field surveys for the Wetland Assessment and Impact Report were conducted by qualified assessors in April 2021, and additional vegetation surveys were completed in June and September 2022 to ensure surveys included seasonal variation. This approach ensured that wetland vegetation, soil, and hydrologic characteristics required for accurate identification were thoroughly documented. Wetland assessments followed Pathway 5 from the Alberta Wetland Identification and Delineation Directive, which is the most comprehensive approach and includes both desktop and field verification. Wildlife surveys that included wetlands were summarized in the Wildlife Assessment. Additionally, the Alberta Wetland Rapid Evaluation Tool (ABWRET) ABWRET-A form was completed according to provincial guidelines and reviewed by AEP, confirming the wetlands' classification and value. Federation's use of an in-lieu fee payment for wetland compensation aligns with the Alberta Wetland Policy, ensuring compliance and support for wetland conservation efforts.

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	The dugout, identified as part of the Wetland 1 complex, was assessed as a shallow open water/seasonal graminoid marsh/dugout. Mitigation measures, including the development and implementation of a comprehensive Stormwater Management Plan, will ensure the continued use of this feature. The plan will include a runoff/sedimentation pond and a perimeter ditch system to manage stormwater volume effectively. Ongoing monitoring of water levels in the dugout will be conducted, and corrective actions will be taken as necessary.
Soils	
Need for additional information on baseline soil conditions and details for reclamation.	A total of 12 soil inspections were completed by qualified personnel on July 28, 2022. Data collected during the soil inspections included topography, drainage moisture regime, surface stoniness, soil profile description, parent material, as well as soil classification into subgroup and series. The number of soil inspections completed corresponds to survey intensity level 1 (SIL1), that requires at least one inspection per polygon, and between 0.2 and 1.0 inspections per hectare (Mapping System Working Group, 1981). The topography in the disturbance area comprises an undulating landscape, with slopes ranging from 0 to 2%, including four distinct depressions. Parent materials comprise several, often contrasting, layers of till deposits ranging in texture from sand to clay. Topsoil (LFH+A Horizon) depth in the upland areas averaged 20 cm (Range 15 to 28 cm). Subsoil thickness (AB+B Horizon) averaged 26 cm (Range 16 to 45 cm). The thickness of the peat (O Horizon) in the depressions averaged 13 cm (Range 10 to 16 cm). Soil samples were taken at four representative sites to a depth of 100 cm and submitted for analysis. These horizons were rated Fair as reclamation materials, mainly due to fine texture and pH. One sample tested had an Unsuitable rating due to the high saturation percentage. As the soil was in a depression and was holding water, it would not be suitable for reclamation or construction due to its instability. It should be noted that subsoil on the disturbance area has textures ranging from loamy sand to heavy clay. This results in a wide range of suitability ratings as sandy textured soils rate poorly, as sand does not hold water, and clay rates poorly, as it does not allow drainage as a growing medium. During soil salvage, subsoil will be mixed, diluting the poorly rated textures and creating a balanced growing medium. All topsoil within the Project area will be salvaged where there is mineral topsoil or organic materials shallower than 40 cm. Mineral topsoil will be salvaged to color change and will include both the LFH and A horizons where applicable. Subsoil will be salvaged from the upland portions of the Project area to a maximum depth of 30 cm. Federation has retained the baseline data of the reclamation suitability of the sampled horizons, as well as an interpretation of the

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	soil map units, including average topsoil salvage depth, topsoil-subsoil contrast, wind erosion risk, water erosion risk, compaction and puddling risk. Federation has also retained an inventory of the reclamation materials for the Project footprint including approximate areas, and volumes of topsoil and subsoil for each soil map unit located within the Project area. The Project is expected to be in operation for 30 years or more. Once the Project is no longer needed and is ready to be taken out of operation, Federation will decommission and reclaim the area as per regulations of the time, the Project-specific approvals and the desired end land use. It is anticipated that the fuel gas pipeline will be abandoned in place. The equipment and buildings, and fence will be removed, and the gravel will be salvaged. Subsoil will be ripped in areas where compaction is present. The site will be regraded and topsoil and subsoil piles will be redistributed. Reclamation and revegetation will depend on the desired end land use. It is expected that the baseline soils and landscape information assessed and retained by Federation will assist in reclamation efforts.
Cumulative Effects	
Need for additional information regarding cumulative effects and potential monitoring of these effects. Clarify whether the cumulative effects analysis includes traditional knowledge.	The cumulative effects identified by Indigenous groups during the consultation process generally align with Federation's environmental impact assessment. Concerns raised include the displacement of Indigenous peoples from preferred traditional use areas due to noise, increased personnel activity, traffic, and associated safety risks. Additional concerns raised include: vibration, potential safety risks related to storage (such as geophysical instability, air release, and interactions between leaked air and existing oil wells), as well as the long-term impacts of the Project during decommissioning and reclamation phases. Federation continues to address these concerns through ongoing communication and, where applicable, the implementation of mitigation measures. Based on the implementation of mitigation measures and best management practices, Federation will comply with or exceed all existing guidelines and regulatory standards. Key mitigation measures to reduce Project-related effects include: • Developing and implementing a groundwater monitoring program • Following the EPP measures and contingency plans for spill prevention and containment • Constructing engineered containment to guarantee the integrity of the cavern operation • Following the wetland mitigation measures in the EPP, including a runoff pond or sedimentation pond designed to current best practices • Developing a stormwater management plan

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	• Designing equipment/enclosures, to reduce major sources of noise. This includes ensuring that the expander enclosure, the compressor enclosure and the instrument air building are acoustic buildings with absorptive interior liners with inlet and exhaust ventilation silencers • Installing a silencer on the water heat recovery stack and the air inlet filter face • Maintaining equipment and the CAES facility in order to minimize excessive noise (e.g., mufflers intact, greased properly) • Limiting construction activities causing elevated noise levels to daylight hours and adhering to applicable local noise by-laws • Maintaining exhaust systems • Controlling dust and odour emissions • Avoiding burning of construction debris • Limiting traffic • Avoidance of idling vehicles • Conducting air emissions monitoring as per the specifications and approval conditions Based on the implementation of these measures, the Project is not expected to cause high magnitude adverse effects to human health through effects to groundwater and surface water, noise and air. The noise propagation contour is expected to be less than 35 dBA at a distance 2 km from the edge of the disturbance area. Concentrations of air emissions rapidly diminish as distance from the site increases and the modelling results indicate the Project will comply with the AAAQO for NO_2 and NH_3. Once the Project becomes operational, Federation will participate in regional monitoring initiatives.
Need for the Project	
Need for additional information on the intended use of the proposed compressed air energy storage, to provide an estimate and justification for the yearly operating hours and the required storage duration.	The Project is designed to provide reliable, large-scale energy storage to support Alberta's transition to a low-carbon energy grid. The CAES system plays a critical role in grid stability by storing excess renewable energy, such as wind and solar, and dispatching it during peak demand or when renewable sources are unavailable. The CAES system will act as a dispatchable energy resource, balancing supply and demand fluctuations in Alberta's grid. It absorbs excess energy during low-demand periods, like nighttime when wind generation is high, and releases it during peak demand or low renewable energy generation, ensuring reliable integration of renewable energy into the grid.

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	The system is expected to operate at approximately 20 to 30% of its capacity, depending on grid demand and renewable energy availability. Capacity use will fluctuate based on seasonal energy demand and renewable generation variability. The Project is designed to run two expansion turbines for up to 48 hours at a time, providing long-duration energy discharge when needed. This configuration ensures that the CAES system provides a flexible, reliable solution for supporting Alberta's growing reliance on renewable energy while maintaining grid stability during periods of intermittent renewable generation.
Alternative Means of Carrying Out the Project	
Need for clarification on the feasibility of fossil-free alternatives.	Currently available fossil fuel alternatives, such as batteries and adiabatic compressed air energy storage (ACAES), are being considered for their potential to reduce emissions, but they do not yet meet the long-duration and flexibility needs required for Alberta's energy market. Batteries, for instance, typically offer only 2 to 4 hours of energy storage, which is insufficient for extended periods of low renewable generation. Similarly, ACAES plants are generally limited to around 8 hours of storage. These systems provide less flexibility, which is critical for the Alberta market, where cold weather and increasing renewable energy generation demand longer-duration, reliable energy storage solutions. The Project, with its ability to provide up to 48 hours of energy discharge, addresses these challenges by offering the necessary duration and flexibility to support Alberta's transition to a low-carbon, renewable-driven energy system.
Clarify whether construction equipment will have the most modern and clean engines. Consider within the context of air quality and potential impacts to terrestrial and aquatic ecosystems.	All construction equipment used for the Project will comply with the latest provincial and federal regulations for emissions, ensuring minimal impact on air quality and nearby terrestrial and aquatic ecosystems.
Accidents and Malfunctions	
Need for further information on potential accident and malfunction scenarios that could lead to the release of contaminants into the surrounding environment for each phase of the Project. Consider potential effects and how these effects will be addressed.	The Project will incorporate a range of measures to prevent and mitigate potential accidents or malfunctions that could lead to the release of contaminants into the environment. Key strategies include: • Containment and Prevention: Equipment such as turbines and transformers will have containment systems to prevent leaks from impacting surrounding areas. Additional control measures will ensure any potential spills are quickly contained • Fire and Leak Detection Systems: The Project will include fire suppression systems and monitoring equipment to detect leaks, fires and other hazards, allowing for rapid response and shutdown of affected equipment to prevent further risks

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	• Emergency Preparedness Plan: A comprehensive Emergency Preparedness and Response Plan (EPRP) will be in place to manage potential accidents, ensuring effective response and mitigation strategies to protect both the environment and public health. These preventative and responsive measures will minimize the likelihood of environmental impacts from accidents during all phases of the Project. Although there is potential for a large fire or extensive spill to have an effect that extends to areas of Federal jurisdiction (e.g. a fire that starts in the Project-area and extends into Federal lands) such a high magnitude effect is unlikely as the nearest Federal lands are the Cold Lake Air Weapons Range located 20 km to the north and the Cold Lake Indian Reserve 149B located 32 km to the east. In addition, following the implementation of mitigation measures to prevent fires and spills such a high magnitude accident is extremely unlikely. Nevertheless, the Project ERP will provide mitigation measures in consideration of potential accidents and malfunctions that have potential to affect federal jurisdictions such as effects on water bodies, air quality and Federal lands.
Wastes and Emissions	
Clarify the potential effects on air quality considering land clearing activities (burning) and potential deposition of materials in the surrounding environment.	The facility is situated in an area that has already been cleared, and the natural gas pipeline occurs in an existing right-of-way. Minimal land clearing activities are expected. As a result, the potential effects on air quality from land clearing, such as burning and the deposition of materials, will be minimal. Any additional clearing that is required will follow best practices to reduce air quality impacts. This ensures that the Project minimizes emissions and reduces the potential for particulate deposition in the surrounding environment. Regarding other waste generated by the Project activities, Federation is committed to complying with all relevant regulations concerning waste segregation, labeling and disposal requirements. Additionally, Federation will develop a spill prevention and emergency response plan as part of its EPP to manage any accidental spills that may occur during Project operations.
General Project Description	
Need for additional information on incidental activities (e.g. natural gas supply line, telecommunications, electrical transmission line) including routing, portions that are solely for the benefit of the Project, potential effects, and how they will be addressed.	Natural Gas Supply Line: Federation has secured a right-of-way for the natural gas pipeline through the transfer of abandoned power line easements EZE 840086 and EZE 850219 from ATCO, and EZE 160001 and EZE 160002 from Telus. These easements have been converted to Alberta PLA dispositions (Government of Alberta, 2024d) approvals for different pipeline segments are listed below: • Pipeline (North): Approved under PLA 240861 (from 02-06 to 15-06-066-05 W4M) as of October 8, 2024

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	• Pipeline (Middle): Approved under PLA 240860 (from 15-02-065-06 to 04-06-066-05 W4M) as of September 12, 2024 • Pipeline (South): Approved under PLA 240862 (from 15-02-065-06 to 14-35-064-06 W4M) as of September 19, 2024 Electrical Transmission Line: As part of the system access service request, currently in process with the Alberta Electric System Operator (AESO), the AESO has selected the preferred connection for the Project. This involves constructing a 0.5 km, 240 kV circuit to connect the facility to the existing Marguerite Lake 826S substation using a radial configuration. Additionally, the existing substation will be modified to include one 240 kV circuit breaker to support this connection. Telecommunications Line: The Project aims to utilize the existing fiber optic infrastructure available at the Marguerite Lake substation for operational monitoring and communication. As an incidental activity, this connection supports the Project's operations without requiring the construction of new telecommunications infrastructure. The natural gas pipeline and electrical transmission line are solely intended to support the Project. However, they may also accommodate future phases of the Project, subject to necessary approvals and assessments. Potential Effects and Mitigation: The infrastructure for these incidental activities will be designed to stay within approved easements and disturbance areas to minimize environmental impacts. Mitigation measures, such as using existing easements and following regulatory guidelines, will be implemented to address any potential effects on the surrounding environment and community.
Clarify the amount of energy used in compression mode versus energy recovered in the expansion mode.	The expansion mode has a capacity of 320 MW, allowing energy recovery during discharge. The compression mode operates at 125 MW, used for charging the system. To maintain balance between air mass flow during charging and discharging, the system requires the compressor to run for 1.48 hours for every hour the expander operates. This means that for every 320 MWh of energy discharged (recovered during expansion), 185 MWh of energy is needed for charging (used during compression). The extra energy required during the expansion phase is generated by using a small amount of fuel to heat the air, enhancing the energy output and efficiency of the system.
Clarify the water volume and water source(s) for the Project, including the solution mining component.	The Marguerite Lake CAES Project will require approximately 4,300 m^3/day of water during the cavern mining phase, sourced from both saline and non-saline aquifers. Potential non-saline sources include the Muriel Lake and Empress Formations. Saline sources, such as the Lower Clearwater and Grand Rapids Formations, may also be utilized to

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	supplement the water demand. The precise locations for source wells, observation wells and disposal wells will be determined in a later design phase, based on subsurface data and regulatory considerations. Any required water pipelines will remain within the Project's disturbance area to transport water between the source and disposal wells. This phase of the Project will require applications and authorizations under Alberta's *Water Act* (Government of Alberta, 2024e) to secure water source wells.
Need for additional technical and financial details on the feasibility of hydrogen co-firing and full hydrogen retrofit.	The Project is evaluating the technical and financial feasibility of hydrogen co-firing and a full hydrogen retrofit. This transition leverages BrightLoop™ technology, which generates hydrogen while capturing CO_2. The technical feasibility of hydrogen co-firing is supported by the Project's turbine design, which is capable of increasing hydrogen use over time. The financial feasibility will be further informed by several engineering studies, with a focus on cost-effectiveness and the long-term benefits of reducing emissions and supporting Alberta's renewable energy goals.
Other – Editorial Comments on the Initial Project Description	
Table 14-1 incorrectly lists Peregrine Falcon and Pileated Woodpecker as Species at Risk on Schedule 1 of the Species at Risk Act.	The peregrine falcon (*anatum/tundrius* subspecies) is no longer listed under Schedule 1 of SARA (Government of Canada, 2024d). The pileated woodpecker is also not listed under Schedule 1 of SARA but, rather, is included as a Schedule 1 species under the Migratory Bird Convention Regulations (Government of Canada, 2024a). An updated table has been included in this SOI (Table 2).
Table 14-1 incorrectly lists Common Nighthawk and Short-eared Owl as Threatened under Schedule 1 of SARA.	The common nighthawk and short-eared owl are listed as 'Special Concern' under Schedule 1 of SARA (Government of Canada, 2024d). Table 14-1 of the IPD incorrectly lists the status of these two species. An updated table has been included in this SOI (Table 2).

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