

Welcome

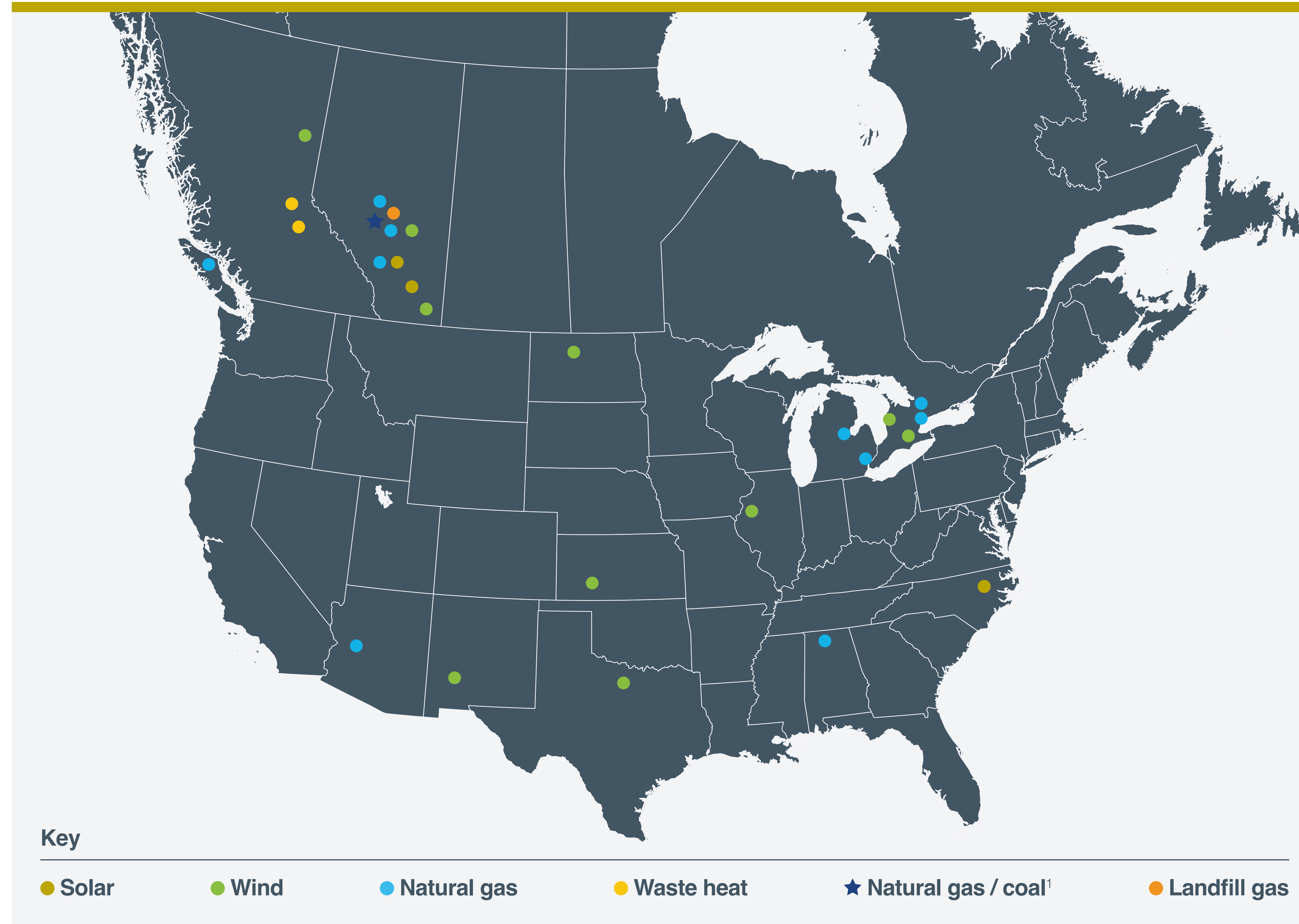
Genesee Proposed Carbon Capture Project

Open House | April 2023



Capital
Power 

About Capital Power



¹ Representing Genesee Generating Station Units 1, 2 and 3. Off-coal in 2023.

Advancing to Net Zero by 2045

At Capital Power, we create dependable, cost-effective and innovative electricity solutions to power a sustainable future for generations to come.

Capital Power (TSX: CPX) is a growth-oriented North American wholesale power producer with a strategic focus on sustainable energy headquartered in Edmonton, Alberta. We build, own, and operate high-quality, utility-scale generation facilities that include renewables and thermal. We are investing in carbon capture and utilization to reduce carbon impacts and will be off coal in 2023.

Capital Power owns approximately **7,500 MW** of power generation capacity at **29 facilities across North America**. Within Alberta, we have interests in 10 power generation facilities totaling more than 2,800 MW of power generation, with the Genesee Generating Station accounting for nearly half of that total.

Capital Power by the Numbers

29
Facilities

7,500MW
Approximately

800
Employees

Genesee Generating Station Overview

The Genesee Generating Station consists of three power generation units which provide nearly **1,400 MW** of baseload generation or approximately **10% of Alberta's power generation** effective capacity. Genesee 1 & 2 and Genesee 3 are undergoing repowering and coal-to-gas transformations, respectively. We will be off-coal in 2023.

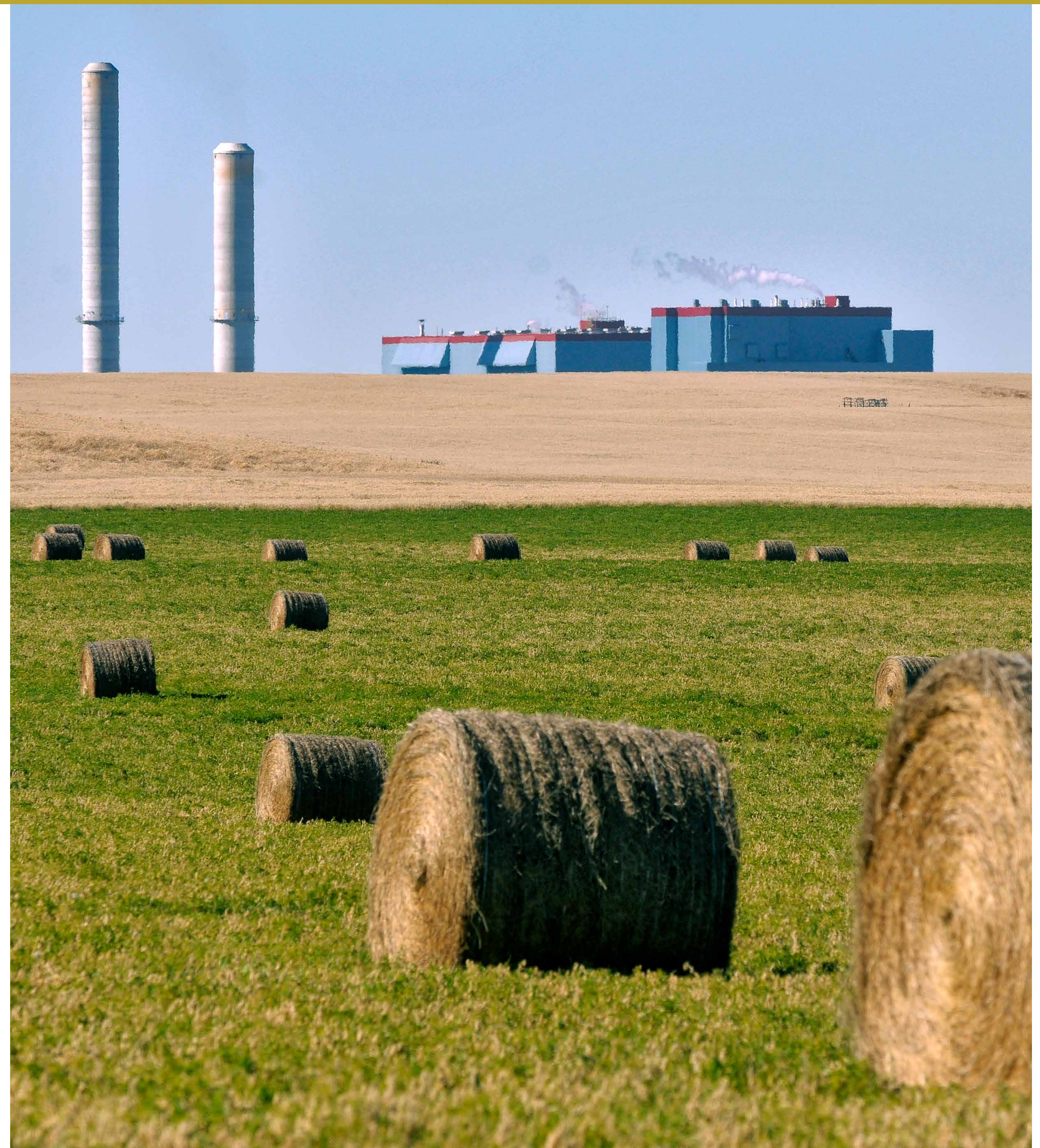
Moving off-coal in 2023, more than 6 years ahead of government mandate.

Genesee 1 & 2

- Commissioned in 1989 (Genesee 2) and 1994 (Genesee 1), can produce 880 MW (gross) of power generation.
- We are repowering Genesee 1 & 2 to natural gas combined cycle (NGCC) generation units, which involves installing new gas-fired combustion turbines and heat recovery steam generators, while utilizing the existing steam turbine generators. The two repowered units will provide an additional 538 megawatts of net capacity totalling 1,338 MW. The repowered assets will utilize best-in-class NGCC technology and are expected to set a new standard for gas generation efficiency in Canada.
- Genesee 1 & 2 will become dedicated NGCC units in 2024. The project is on schedule to achieve simple cycle commissioning of both units in 2023.

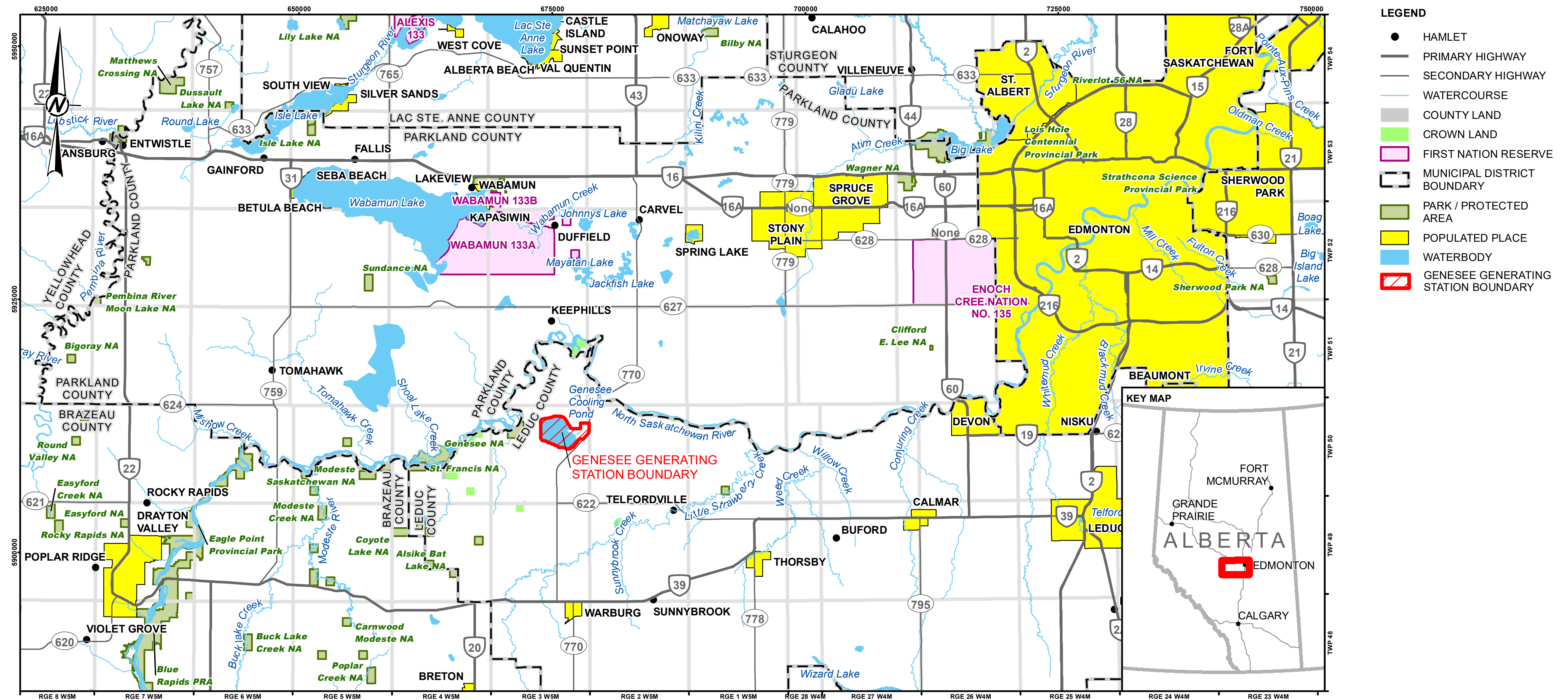
Genesee 3

Commissioned in 2005, the 516 MW unit was later converted to utilize dual fuel (coal and natural gas) before moving to 100% natural gas in 2023.



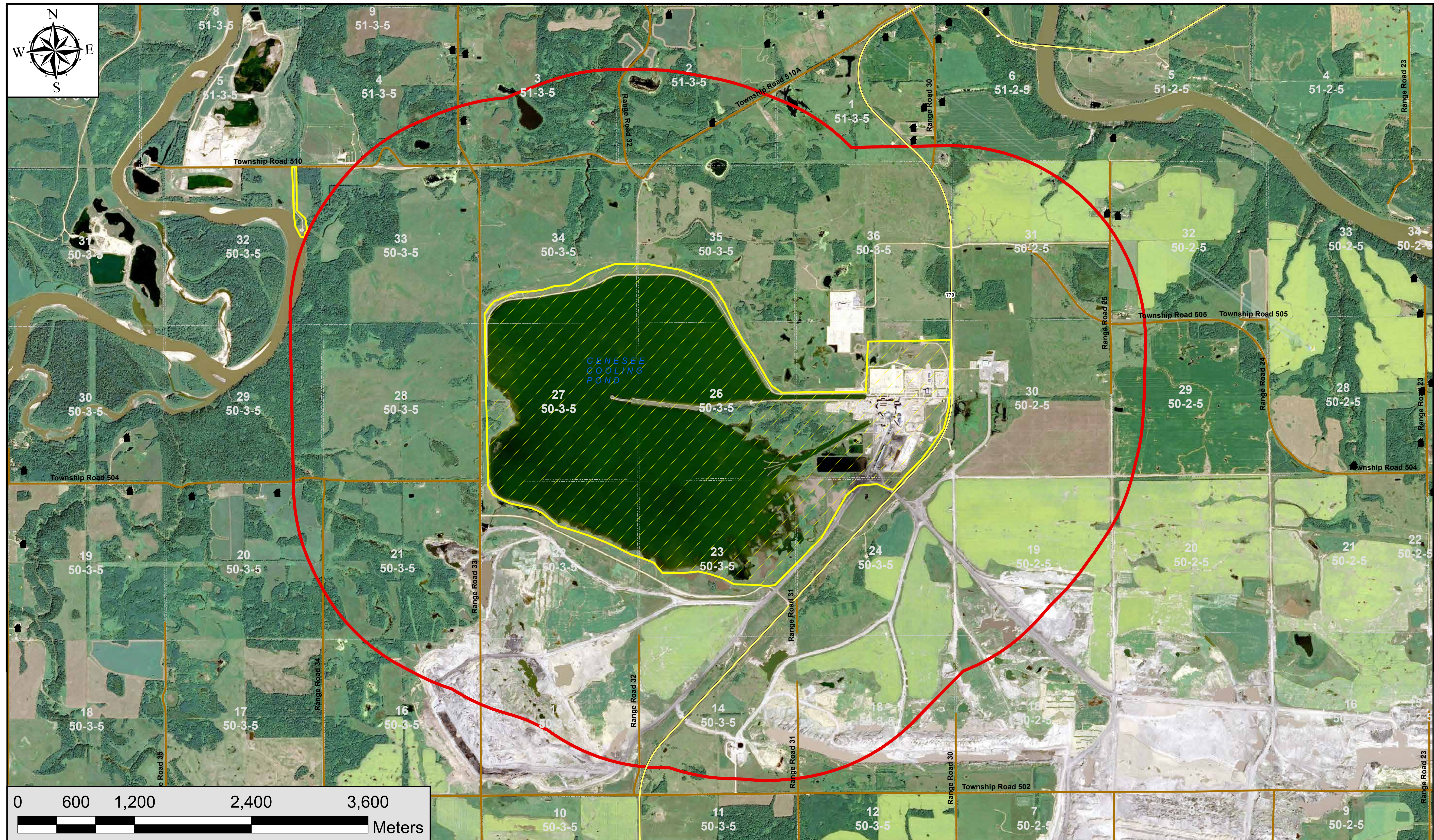
Genesee Generating Station Location and Regional Area

The Genesee Generating Station is located approximately 70 km west of Edmonton (Section 25, Township 50, Range 3, west of the 5th Meridian) within Leduc County and in Treaty 6 Territory and Métis Region 4.



Project Boundary

The carbon capture project is located entirely on Capital Power owned land within the footprint of the existing Genesee Generating Station and cooling pond.



Proposed Carbon Capture Project Overview

Capital Power is collaborating with Mitsubishi Heavy Industries Group (“MHI”) and Kiewit Energy Group (“Kiewit”) on a front-end engineering and design (FEED) study for the carbon capture facility.

The project will capture CO₂ from the flue gas of the repowered Genesee 1 and 2 using MHI’s proven Advanced Kansai Mitsubishi Carbon Dioxide Recovery Process™.

The carbon capture project is expected to capture up to approximately 3 million tonnes of CO₂ annually and is a significant step forward to meet our net-zero by 2045 target.

On December 1, 2022, Capital Power announced it issued a limited notice to proceed (LNTP) for the \$2.3 billion project with a final investment decision expected in late 2023.

The decision to issue an LNTP reflects the positive interim results from the FEED study and continued progress on the programs the Alberta and Federal governments have taken to encourage and accelerate deployment of carbon capture technology. The Project is anticipated to start capturing carbon as early as 2027.



In July 2022, the project was awarded \$5 million in funding from the Government of Alberta through Emissions Reduction Alberta.

Proposed Carbon Capture Site



The equipment for the carbon capture project will be located on an approximately 10-acre brownfield site (previously developed land) on the south-side of Capital Power's existing Genesee Generating Station in the area depicted in red.

Capital Power will own, operate and maintain the carbon capture equipment located inside the existing boundaries "inside the fence" of the Genesee Generating Station.

The square red towers are the carbon capture equipment's absorbers and are estimated to be ~280-ft high (pending final design) compared to the existing Genesee 3 stack that's ~456-ft high.

Carbon Capture Equipment

Major new equipment to be installed and integrated for each of Genesee 1 and 2:

- Flue gas quencher
- Carbon capture absorber vessel
- Regeneration unit
- CO₂ compression and dehydration units
- Intake and outfall cooling water structure and pipelines
- CO₂ offtake pipeline (to fence line)

Existing Genesee 1 and 2 equipment to be reused:

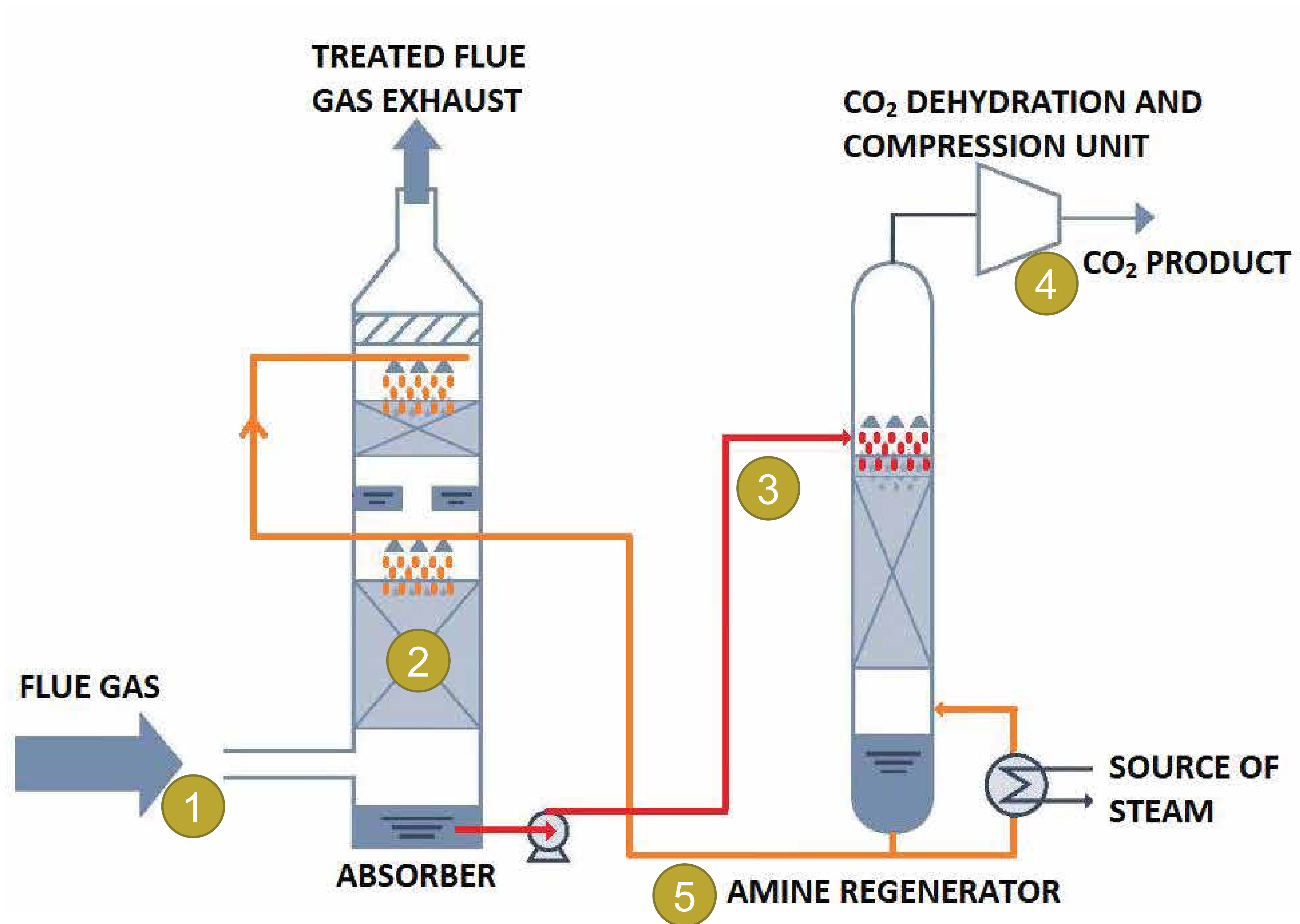
- Circulating water system (Cooling Pond)
- Water treatment facilities and make-up water system

Following Genesee 1 & 2's transition to natural gas, some existing equipment will be retired and dismantled, including:

- Coal and ash handling equipment
- Coal storage and processing (coal house, crushers and conveyor)
- Fly ash silos and conveyors



Simplified Post-Combustion Carbon Capture Flow Diagram



- 1 Flue gas from Genesee Units 1 & 2 stack is circulated through down-flowing amine solution
- 2 Proprietary amine solvent absorbs CO₂ from flue gas
- 3 Amine solvent returns to regenerator and uses heat from steam to release absorbed CO₂
- 4 CO₂ is dehydrated and compressed to pipeline
- 5 Amine solvent returns to capture more CO₂ from flue gas

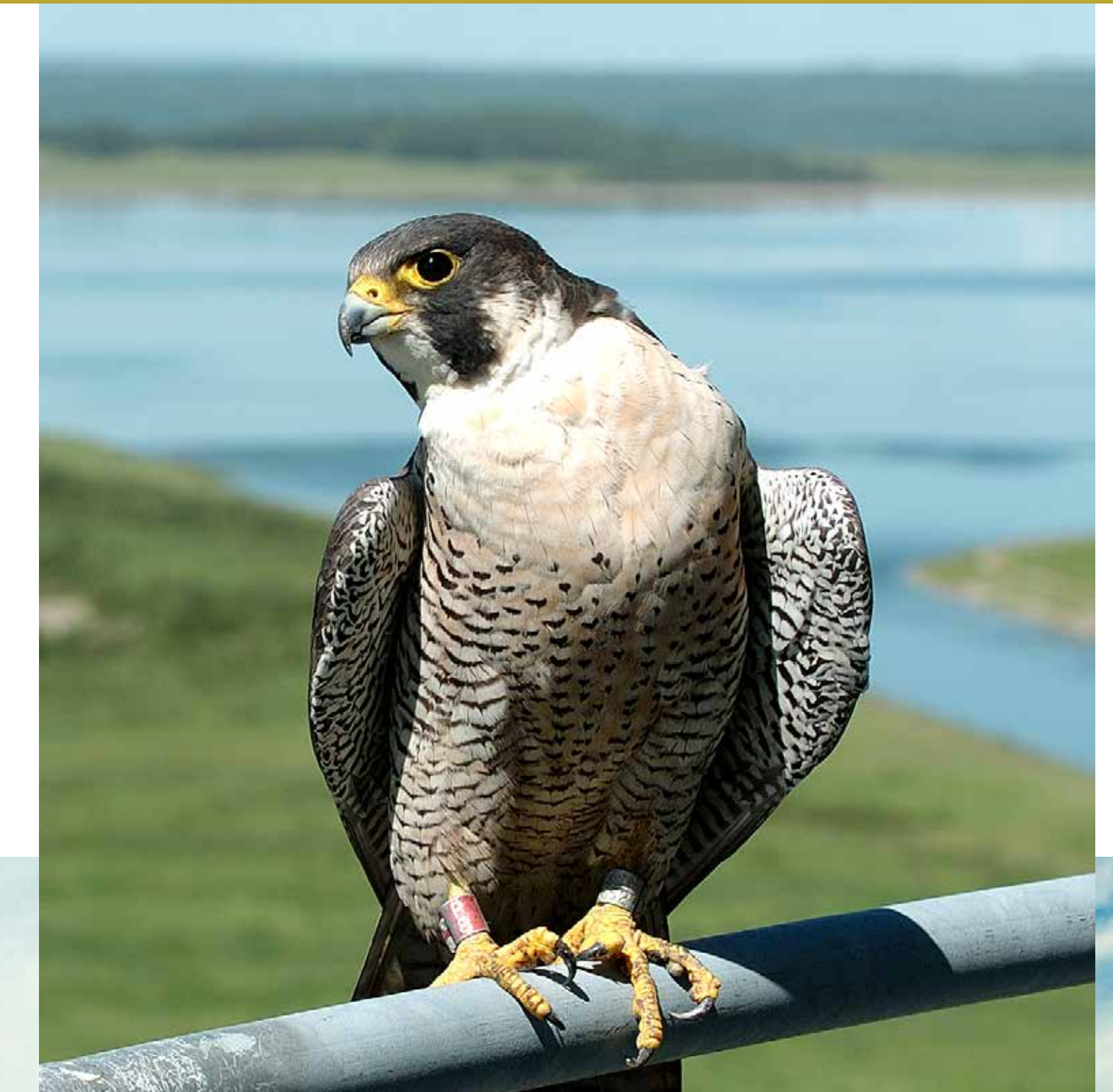
Environmental Surveys/Studies

Capital Power has retained WSP Canada Inc. (formerly Golder Associates) to complete environmental work and assist in preparing the environmental approval applications. Their work includes conducting required air quality assessments and dispersion modeling, noise modeling, wildlife monitoring, fisheries assessment and water quality assessments (chemical and thermal) and modelling.

Terrestrial baseline studies, including wetland, soils inventories and wildlife assessments were undertaken in 2022. The information was used to locate infrastructure, so that no wetlands would be impacted by the project. Given that the project's footprint is within an industrial brownfield site with no identified sensitive habitat, the project poses no impact to wildlife.

An air quality assessment was undertaken to quantify the potential air emission changes associated with the Project and to conduct air dispersion modelling to assess the potential changes to the maximum ground-level concentrations for selected compounds of interest.

The air quality work has assessed that the addition of activities and infrastructure associated with the Project has a localized, minimal effect on air quality and is not expected to negatively impact air quality in the region.



Noise

WSP Canada Inc. has prepared a Noise Impact Assessment (NIA) according to the requirements of *AUC Rule 012 – Noise Control* that will be submitted as part of our application to the Alberta Utilities Commission (AUC). *AUC Rule 012* requires that potential noise impacts be assessed at receptors corresponding to dwellings located within 1.5 km of the Project. With the addition of the carbon capture equipment, the operations at Genesee will remain compliant with *AUC Rule 012* at all receptors.

AUC Rule 012 permissible sound levels (PSLs) at occupied dwellings in the project area are:

40 dBA Leq
AT NIGHTTIME

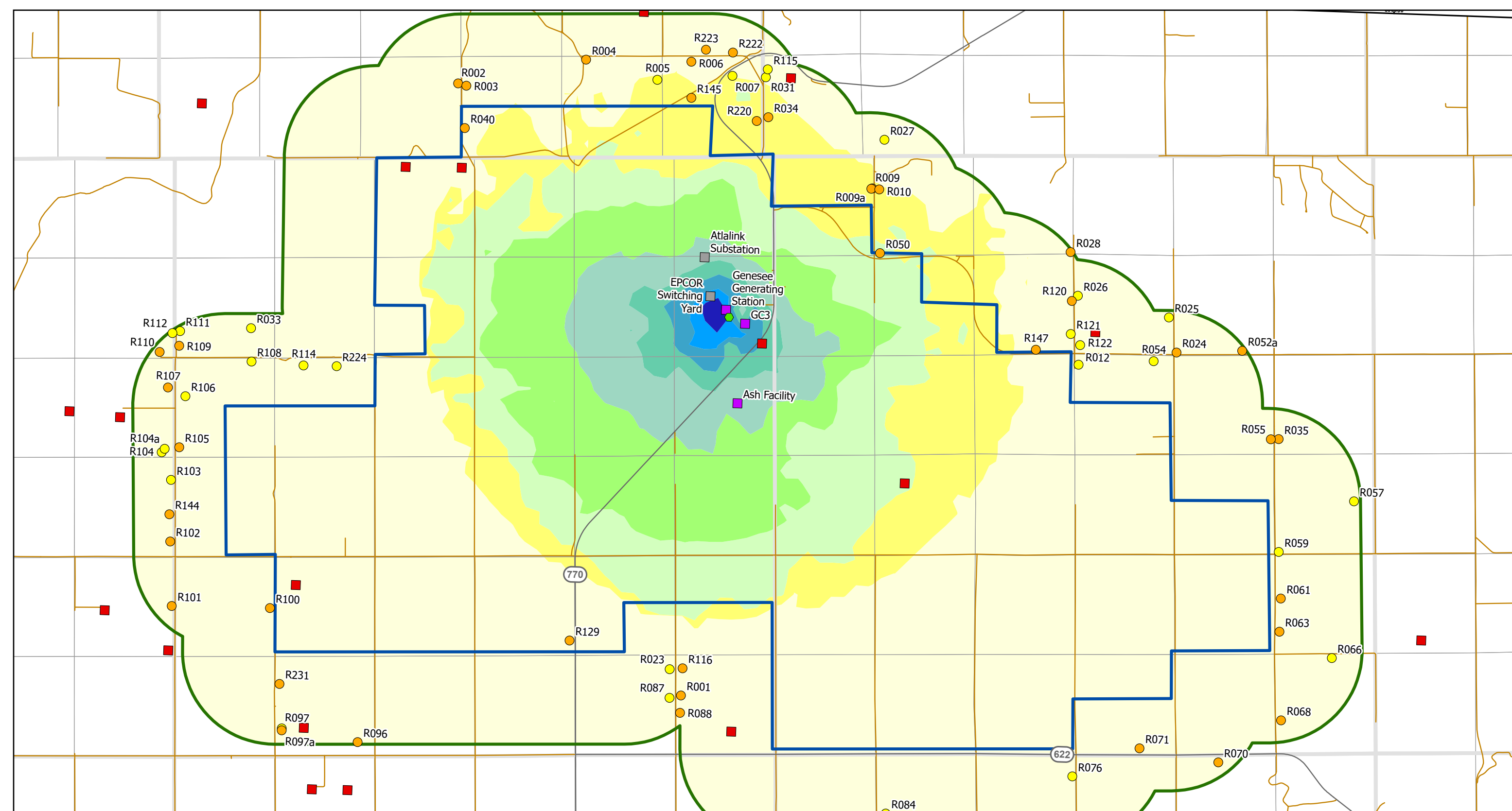
50 dBA Leq
AT DAYTIME

dBA = A-weighted decibel level
Leq = Equivalent continuous sound level

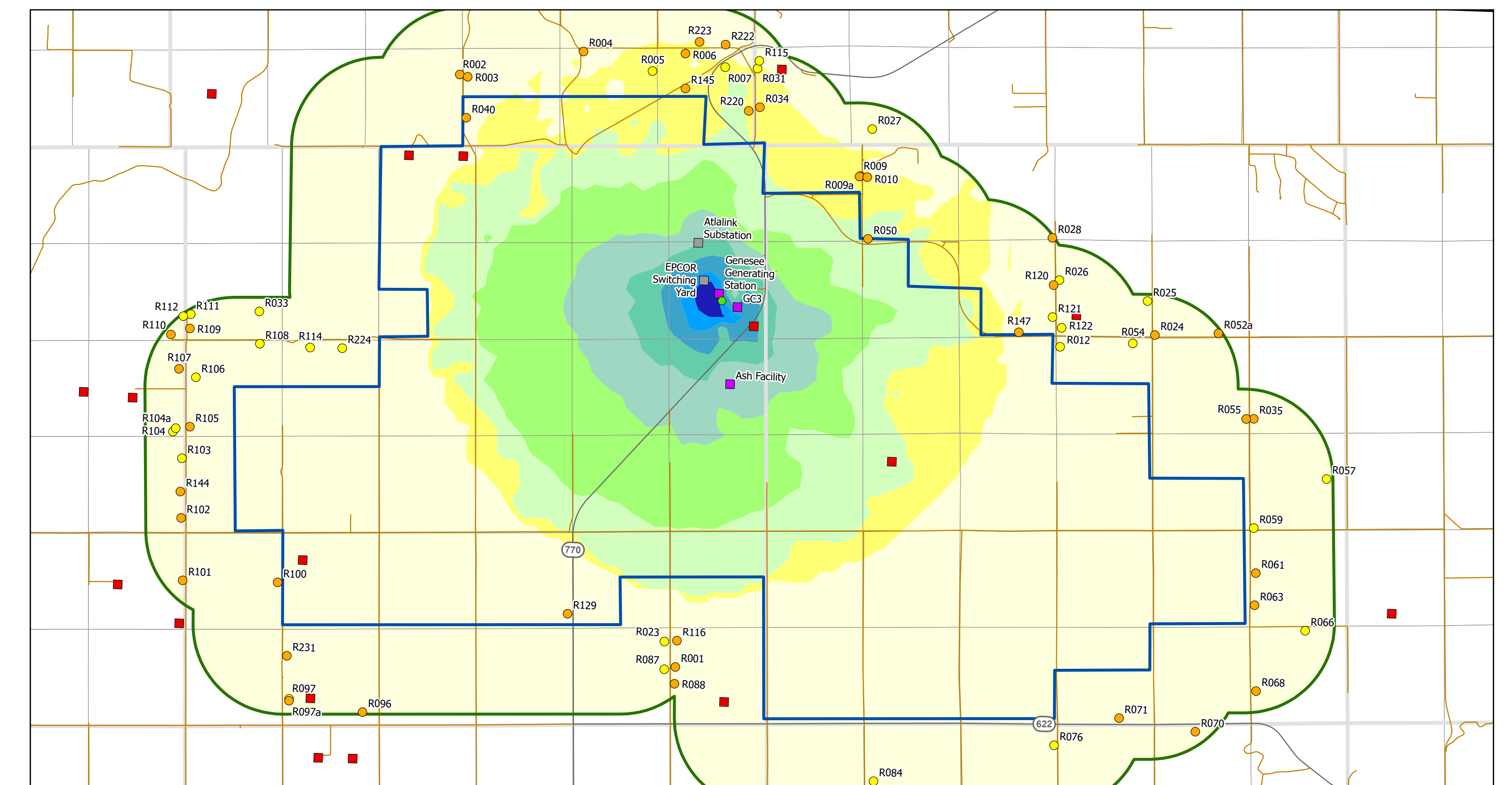
As an example, 40 dBA equates to a library or refrigerator and 50 dBA equates to a conversation in a home or washing machine.

Predicted Noise Levels

One Storey Receptors



Two Storey Receptors



LEGEND

- PROJECT EQUIPMENT
- SECONDARY HIGHWAY
- LOCAL ROAD
- GENESSEE MINE PERMIT BOUNDARY
- NOISE STUDY AREA

BASELINE CASE FACILITIES

- CAPITAL POWER
- THIRD-PARTY AER-REGULATED
- THIRD-PARTY AUC-REGULATED

NOISE RECEPTORS

- ONE-STOREY
- TWO-STOREY

PREDICTED DAYTIME NOISE LEVEL FROM BACKGROUND TRAFFIC (LEQ, DAY; DBA)

- | | |
|----------|----------|
| < 25 | 45 to 50 |
| 25 to 30 | 50 to 55 |
| 30 to 35 | 55 to 60 |
| 35 to 40 | > 60 |
| 40 to 45 | |

Development Schedule and Regulatory Approvals

Capital Power anticipates submitting regulatory applications for the carbon capture project in the first half of 2023. Separate applications will be filed to amend the existing approvals for Genesee 1 & 2 to Alberta Environment and Protected Areas (formerly Alberta Environment and Parks) and the Alberta Utilities Commission (AUC). Prior to construction, we will also apply to Leduc County for building and other development permits. Pending regulatory approval, we expect construction to begin in Q2 2024, with an anticipated in-service date in late Q4 2027.



Proposed Project Schedule

Activity	Timing ¹
Engineering/Project Design	Q2 2021 to Q2 2025
Stakeholder engagement and consultation	Ongoing throughout
Complete and submit Alberta Environment and Protected Areas (AEPA) Environmental Protection and Enhancement Act (EPEA) amendment application	Q1 2023
Complete and submit AUC amendment application	Q2 2023
Front End Engineering and Design (FEED) study complete	Q3 2023
Procurement of major equipment	Q3 2023 to Q2 2024
County permits	Q1/Q2 2024
Target for construction to begin	Q2 2024
Commissioning	Q3/Q4 2027
Anticipated commercial operations date (COD)	Late Q4 2027

¹ Anticipated schedule, pending regulatory approval and final investment decision.

Capital Power in the Community

Capital Power has been an ongoing contributor to the local community and is committed to being a good neighbour. Some recent examples of our support include:

- Warburg Canada Day
- Leduc & District Food Bank
- Warburg and Thorsby Christmas Elves program
- Paul First Nation School
- Genesee Park
- Thorsby & District Cultural and Historical Society
- Warburg Parent School Society
- Annual support for local community halls and cemeteries

Project Benefits to the Community

- ~\$5.4 million in annual property tax revenue to Leduc County over an approximately 25-year life of the project
- Up to 20 - 50 full-time positions once in operations.
- ~580 full-time jobs on average during the three-year construction period.

Stakeholder & Indigenous Engagement

We have regular engagement with Leduc County and the Village of Warburg, and we share information about our operations, maintenance, projects and initiatives with the community in our annual *Genesee Connection* newsletter mailed to neighbours.

Capital Power is committed to Indigenous participation in the proposed carbon capture project and has engaged with neighbouring First Nations and the Lac Ste. Anne Métis Community Association.



Talk with us. We value your input.



Capital Power values your input and we are here to listen.

If you have any questions or comments about the proposed carbon capture project, please talk with us.

Contact us

canadadevelopment@capitalpower.com
1-855-703-5005 (toll free)

Mailing Address

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C/O Indigenous and Stakeholder Engagement
10th Floor EPCOR Tower
1200 – 10423 101 St. NW
Edmonton, AB T5H 0E9

To learn more about the AUC's application process or how to participate in the regulatory review process, visit www.auc.ab.ca

capitalpower.com

