

Welcome

Halkirk 2 Wind Project Information Sharing Session

Capital
Power 

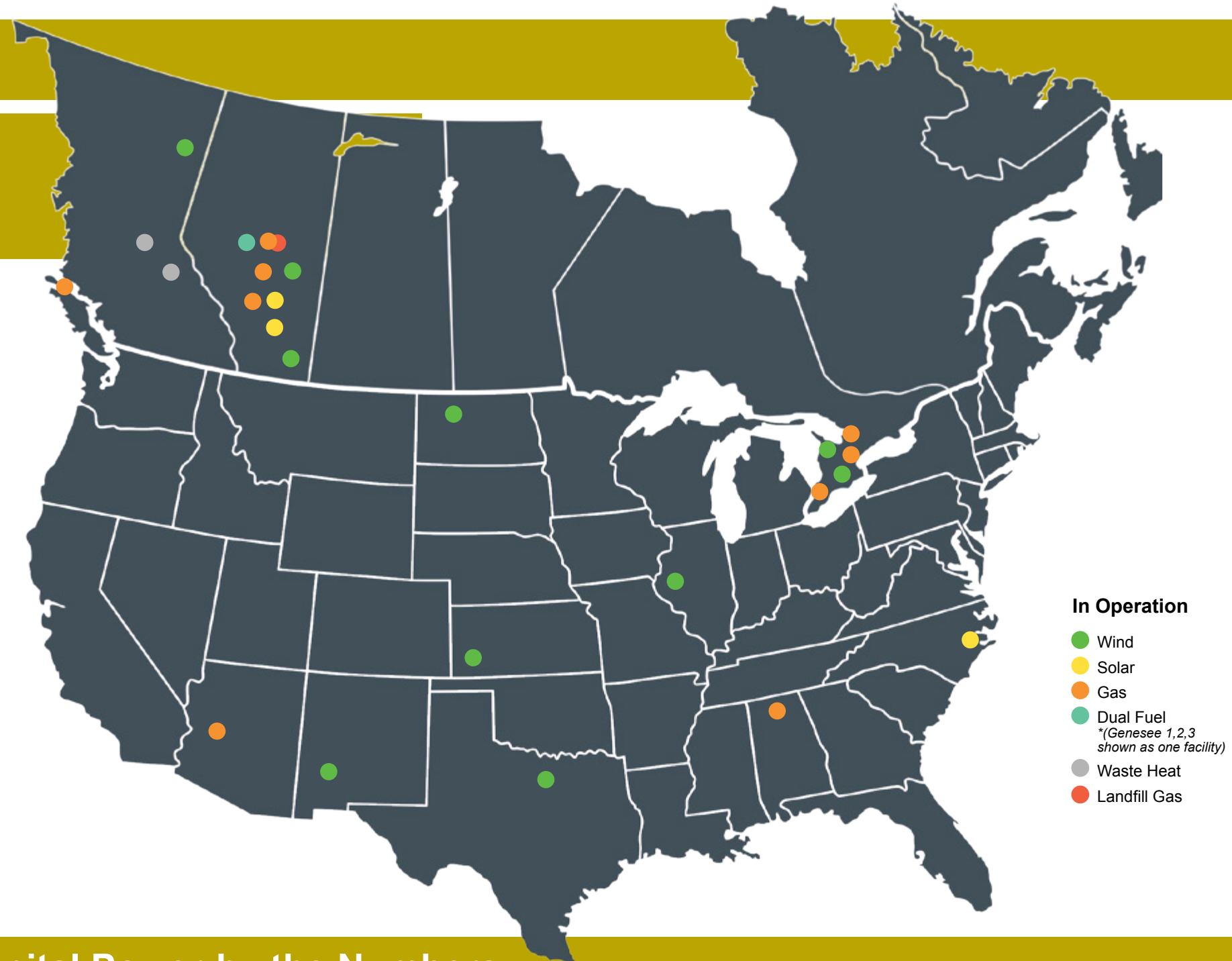
About Capital Power

Advancing to Net Carbon Neutral by 2050

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 have also made investments in carbon capture and utilization to reduce carbon impacts and are committed to be off coal in 2023.

Within Alberta, we have interests in nine power generation facilities totaling nearly 2,800 MW of power generation, including the 353-MW Whitla Wind facility, the largest wind facility in the province. We're currently constructing a 75-MW solar project in the Municipal District of Taber and repowering our Genesee 1 & 2 coal units to natural gas combined cycle (NGCC) units, which will provide an additional 538 MW of net capacity.



Capital Power by the Numbers

Approximately

6,600MW

Renewables in
Advanced Development

385MW

In Alberta and North Carolina

Facilities

27*



Employees

780



2022 WORLD'S MOST
ETHICAL
COMPANIES
WWW.ETHISPHERE.COM
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Building and Growing

Our Renewables Portfolio

Capital Power is a leading developer of renewables in Alberta, and we have been the largest provider of new generation in the province for the past 20 years.

- Proven track record of developing, owning and operating safe, efficient, and cost-competitive wind facilities.
- Over 1,300 MW of owned wind generation capacity throughout North America, including more than 500 MW in Alberta.
- Since 2010, constructed 9 wind facilities throughout North America.
- Completed 41-MW Strathmore Solar project in March 2022 - our first solar facility in Canada.
- 75-MW Enchant Solar facility construction is underway in MD of Taber with operations planned in late 2022.
- 3 solar facilities in advanced development in North Carolina totaling 160 MW.

We work to build and operate power generation facilities that align with the interests and priorities of our stakeholders and the communities in which we operate.



Halkirk 2 Wind Project Overview

- 151 MW
- Maximum of 35 wind turbines
- Located on privately owned land in Paintearth County, Alberta
- Townships 39 and 40 and Ranges 14 and 15
- ~\$56 million in tax revenue to the County of Paintearth over an ~30-year life of the project

General project boundaries:

- North TWP 402
- South TWP 394
- West RR 154
- East RR 135

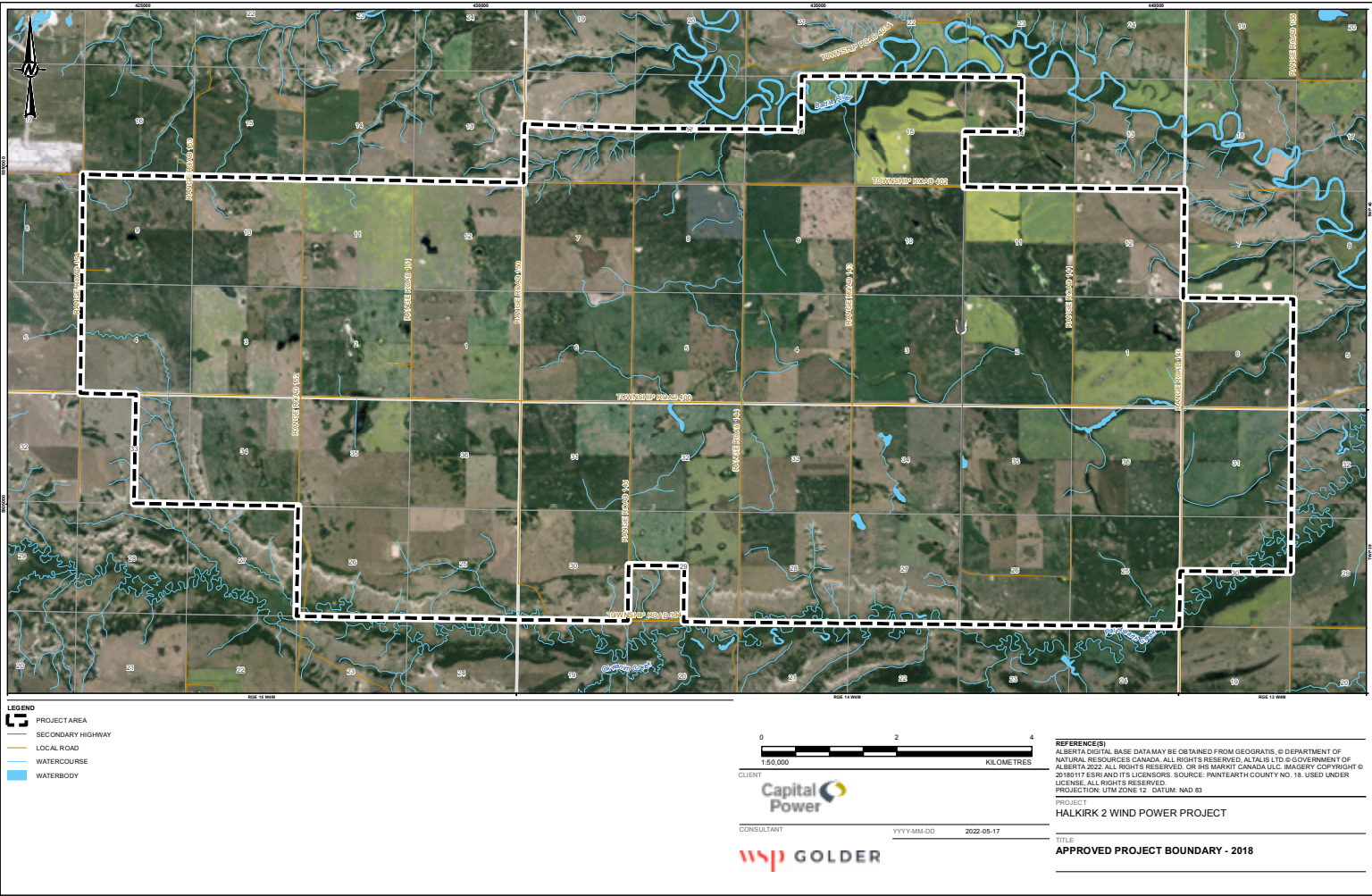


Halkirk 2 Wind Project Boundary

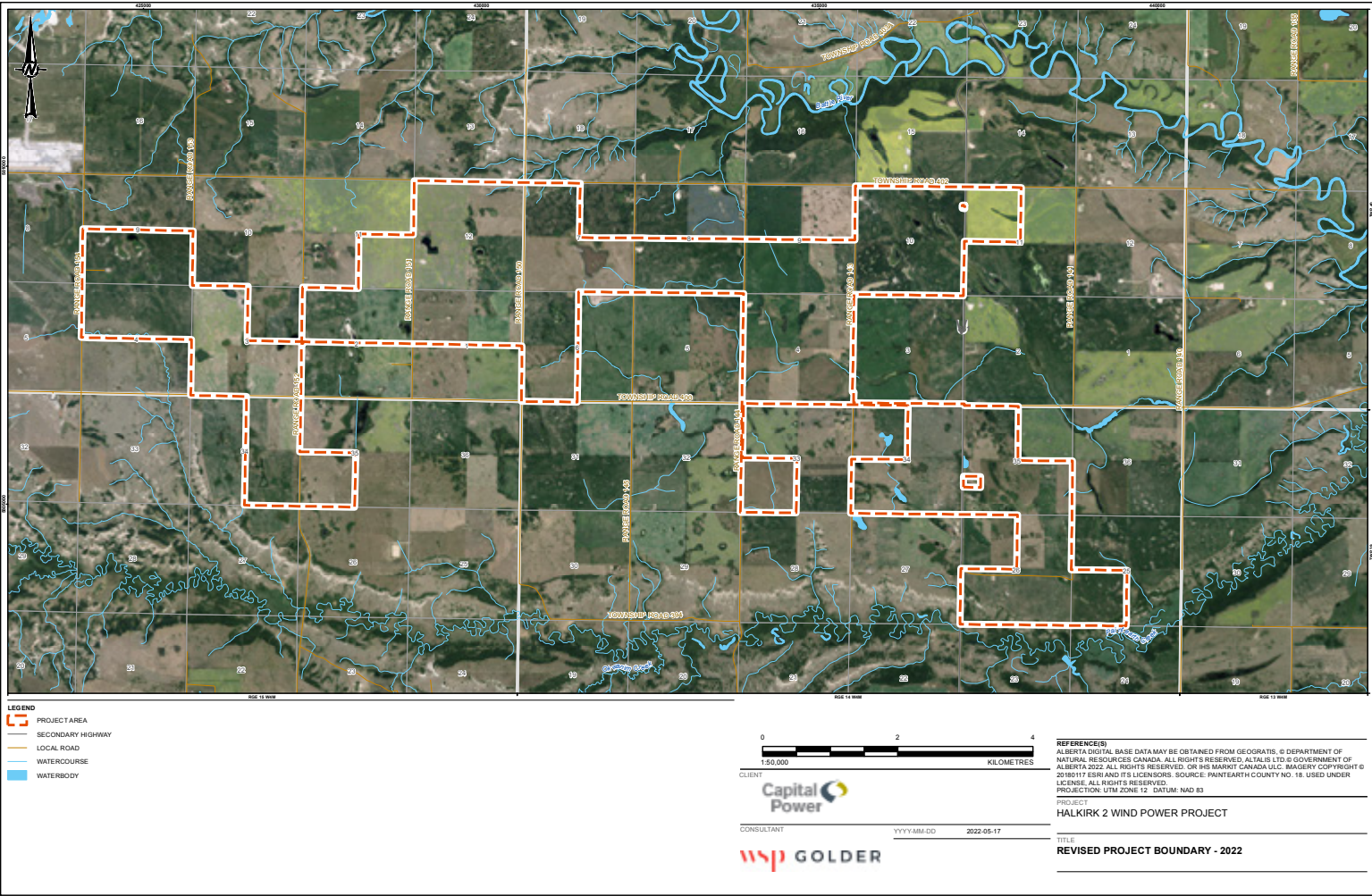
The revised project’s permanent footprint is expected to be 64 acres, which is a **43% reduction** from the approved permanent project **footprint** to account for the **53% reduction in wind turbine** generators.

The project’s boundary is comprised of all participating lands with project infrastructure. i.e., wind turbines, collector lines or access roads.

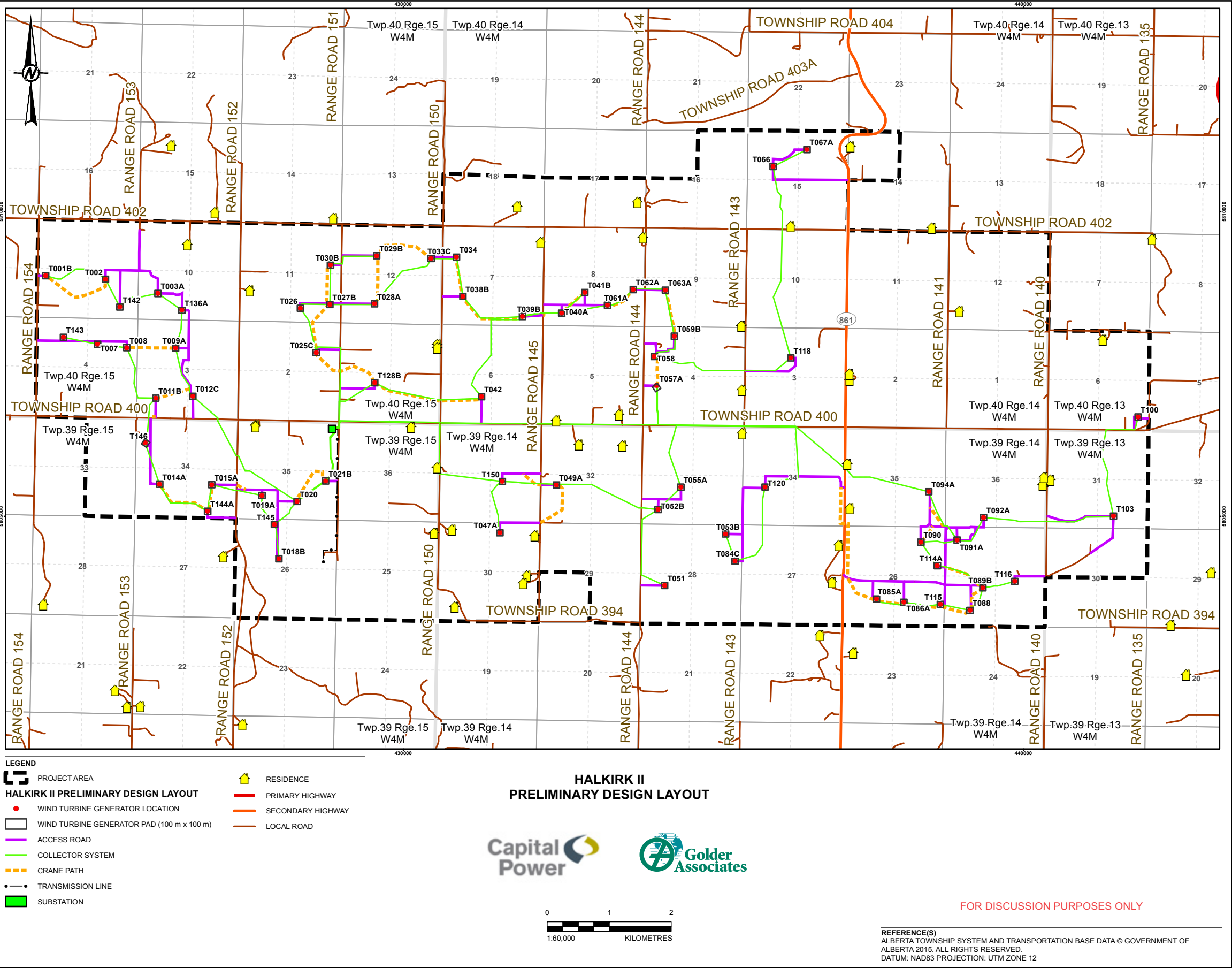
Approved project boundary, 2018



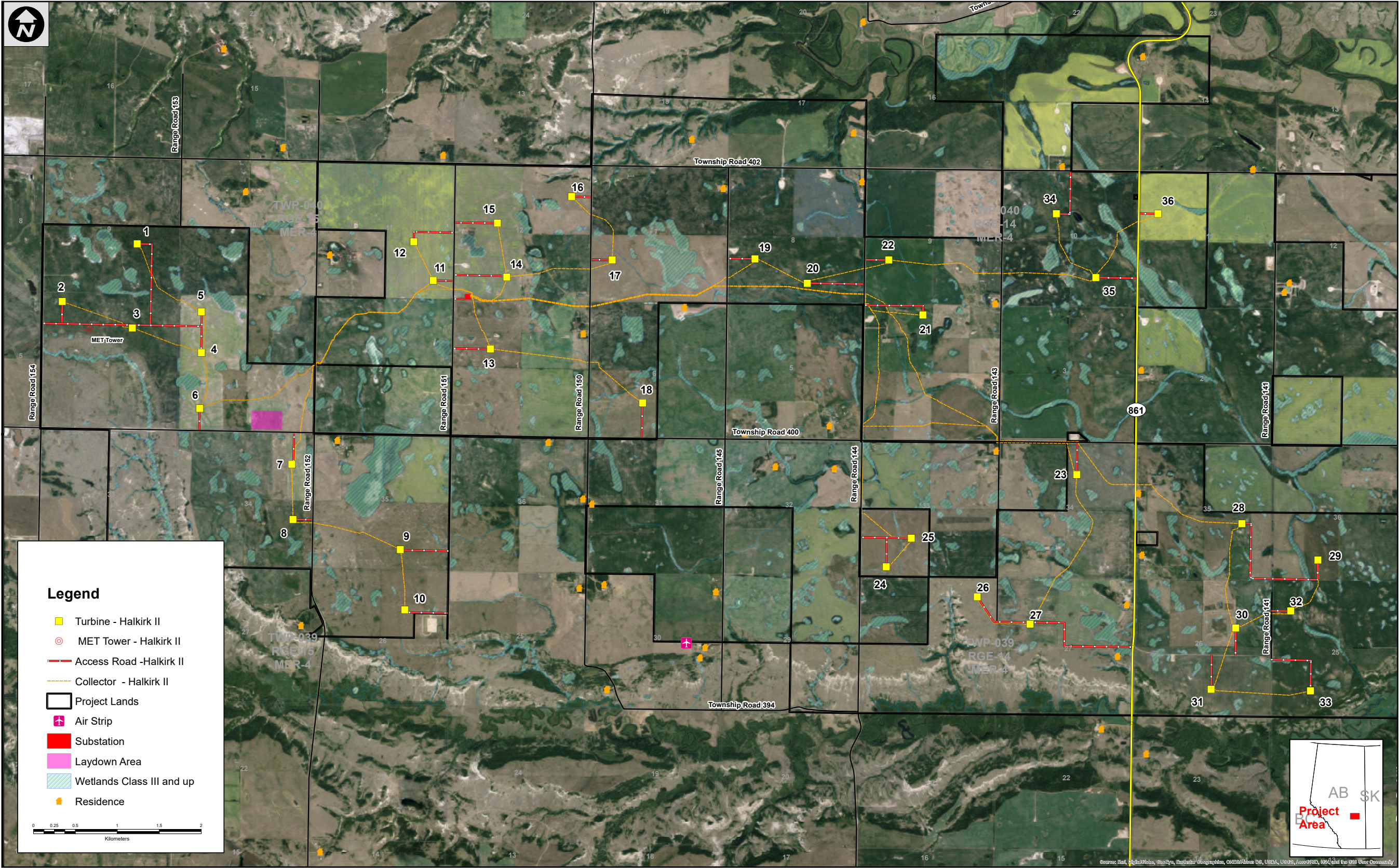
Revised project boundary, 2022



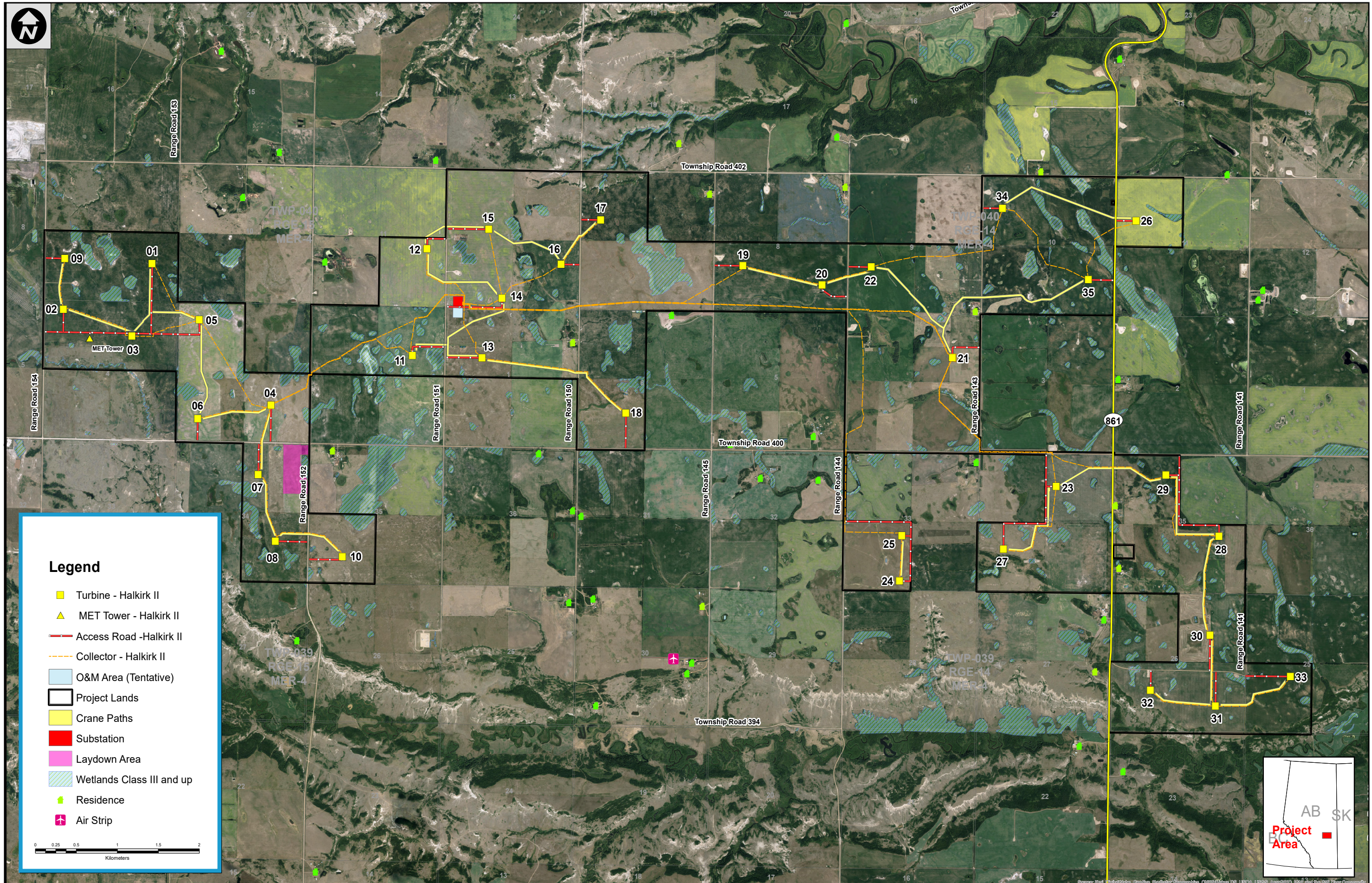
Halkirk 2 Wind Project Preliminary Design Layout 2016



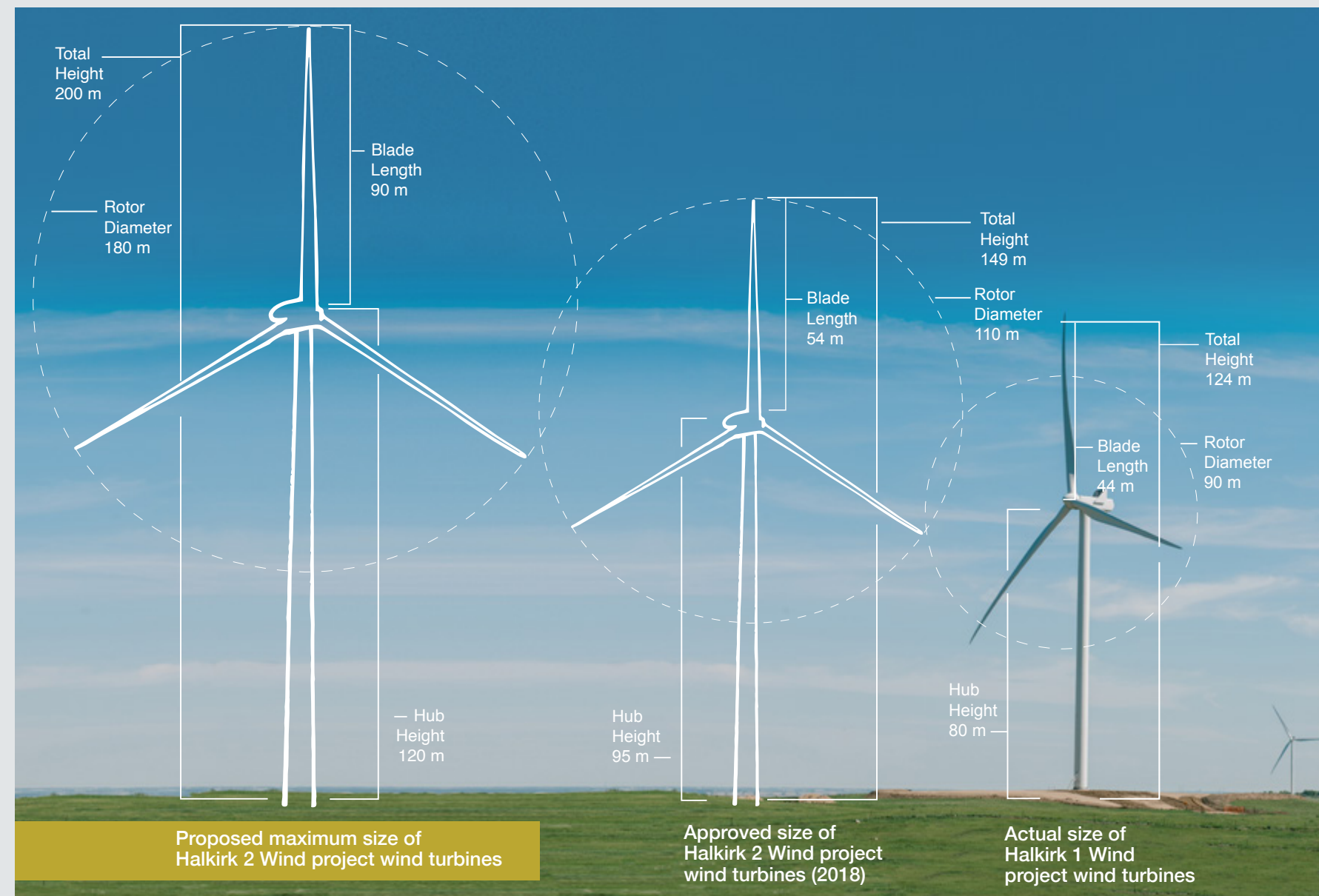
Halkirk 2 Wind Project Preliminary Design Layout — November 2021



Halkirk 2 Current Wind Project Design Layout — May 2022



Halkirk 2 Wind Project Technology



Above rendering depicts the maximum size wind turbine technology being considered for Halkirk 2 in comparison to the size of the Vestas V110 wind turbines approved for the project in 2018 and the Vestas V90 wind turbines in operation at our existing Halkirk 1 Wind energy facility, located south of the proposed project area.

Significant advances have been made in wind turbine technology. Today's wind turbines are larger in size and generally have larger output, which has allowed us to **decrease the number of wind turbines by 53%** from the current approved design based on 74 wind turbines to a **maximum of 35 wind turbines** (pending final selection of make and model) for a maximum generating capacity of 151 MW. The wind turbines being considered have the following parameters:

- Rated power generation between 4.3 and 6 MW
- Maximum of:
 - 120 m hub height
 - 90 m blade length
 - 180 m rotor swept diameter
 - total tip height not in exceedance of 200 m.
- The specific wind turbine model will be determined at a later date. We will submit a final project update prior to construction that includes our selected wind turbine technology and specific parameters.

Connecting to the Grid

Capital Power is applying to amend the existing approval (Permit and Licence 22563-D03-2018) for the Goldeye 620S collector substation that will connect the project to Alberta's Interconnected Electric System.

The substation is proposed to be located in the southwest corner of SW 12-40-15-W4, approximately 1,800 m north and 350 m east of the previous approved location at NE 35-39-15-W4M. The substation site will be approximately 75 m by 80 m or 1.5 acres with an enclosed chain-link fence securing the area.

The planned in-service date of the substation is Q3, 2024.

The substation will mainly consist of electrical equipment, including:

- One 240/34.5 kV, 167 megavolt-ampere (MVA) main power transformer
- One 240 kV outdoor circuit breaker
- Up to 6 34.5 kV outdoor collector circuit breakers
- Metering, disconnect switches, capacitor bank and other associated electrical equipment
- A small protection and control building located inside the substation
- Communication system back to Tinchebray 972S substation



Development Schedule and Regulatory Approvals

Proposed Project Schedule	
Activity	Timing ¹
Stakeholder engagement and consultation	Ongoing throughout development
Alberta Environment & Parks Renewable Energy Project Submission application	Q2 2022
Alberta Utilities Commission amendment application	Late Q4 2022
Alberta Electric System Operator interconnect	Throughout development
Anticipated AUC amendment permit approval	Q2/Q3 2023
Paintearth County development permits	Q2/Q3 2023
Target for construction to begin	Q3 2023
Access road construction	Q3 2023
Turbine foundation construction	Q2 2024
Collector line installation	Q2-Q3 2024
Goldeye Substation construction	Q2-Q3 2024
Turbine delivery	Q3-Q4 2024
Turbine assembly	Q3-Q4 2024
Commissioning	Q3-Q4 2024
Commercial operations (COD)	Q4 2024

¹Anticipated schedule, pending regulatory approval

The Halkirk 2 Wind Project was approved by the AUC (Proceeding 22563-D01-2018) in April 2018 and received a time extension (Proceeding 25047-D01-2020) in March 2020.

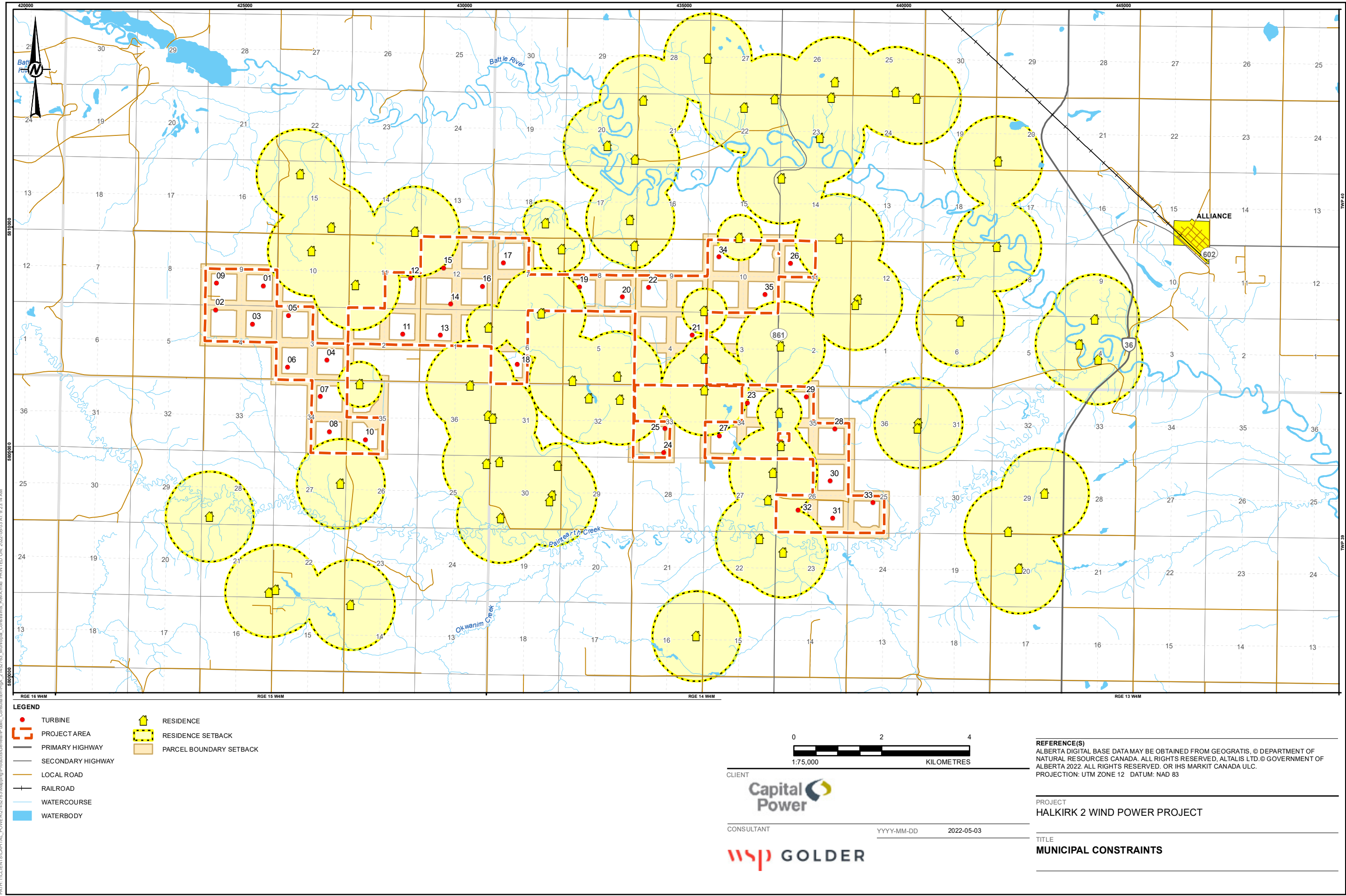
We’ve since redesigned and made a number of refinements to the project, which requires us to amend the project’s existing approval. We’re targeting to apply to the AUC in late 2022 requesting an amendment for the proposed refinements as well as a time extension for the construction completion date from December 1, 2022 to Q4 2024.

We have also submitted a Renewable Energy Project Submission application.

Pending regulatory approval, construction would tentatively begin in Q3 2023 with commercial operations (COD) of the project beginning in Q4 2024.

Capital Power will have an emergency response plan for the construction and operation of the project, developed in consultation with local emergency responders and follow industry best practices.

Municipal Constraints Map



Municipal Land Use Bylaw Requirements

Attribute	Setback ¹
Provincial Highway	As per AB Transportation
Roads	100 m or the greater of blade length + 20 m
Property Lines (leased)	50 m or the greater of blade length + 20 m
Non-participating Property Lines (non-leased)	100 m or the greater of blade length + 20 m
Residences (leased)	The greater of 500 m or as meets <i>AUC Rule 12</i> permitted levels
Non-Participating Residences (non-leased)	The greater of 1,000 m or as meets <i>AUC Rule 12</i> permitted levels
Blade Clearance	Minimum of 7.6 m

¹Setback (i.e., the minimum distance between the wind turbine base and a specific attribute, e.g., house, road, etc.).

The project follows the County’s updated Land Use Bylaw No. 698 – 21 (May 2021) for Wind Energy Conversion Systems.



Project Construction Activities

Upon the decision to proceed, construction activities would include:

- Establishment of a temporary construction laydown yard.
- Access road construction
- Foundation excavation
- Rebar construction for foundations
- Concrete foundation pouring
- Delivery of wind turbine components to site
- Wind turbine assembly
- Collector line installation
- Substation construction
- Met tower erection
- Testing and commissioning
- Construction remediation and site clean up



Noise


Wind turbines produce sound from air flow and mechanical sources:

- Air flow: sound generated as air passes over and between the blades and when the blades pass by the tower.
- Mechanical: sound generated by equipment such as the gearbox and generator, which are located inside the nacelle.

Golder has completed noise modelling for the project in accordance with *AUC Rule 012 – Noise Control* in preparation for the Noise Impact Assessment (NIA). Noise modelling is based on the Vestas V150 4.3 MW wind turbine. Noise modelling accounts for the hub height, noise emissions and quantity/location of wind turbines. Any changes in turbine technology will require an updated NIA and compliance with *AUC Rule 012*.


AUC Rule 012 requires that potential noise impacts be assessed at receptors corresponding to dwellings located within 1.5 km of the Project. The NIA evaluates project compliance by comparing cumulative sound levels to permissible sound levels (PSLs) applicable at receptors.

The revised project design (layout and turbine model) remains compliant with *AUC Rule 012* at all receptors



40 dBA Leq

AT NIGHTTIME

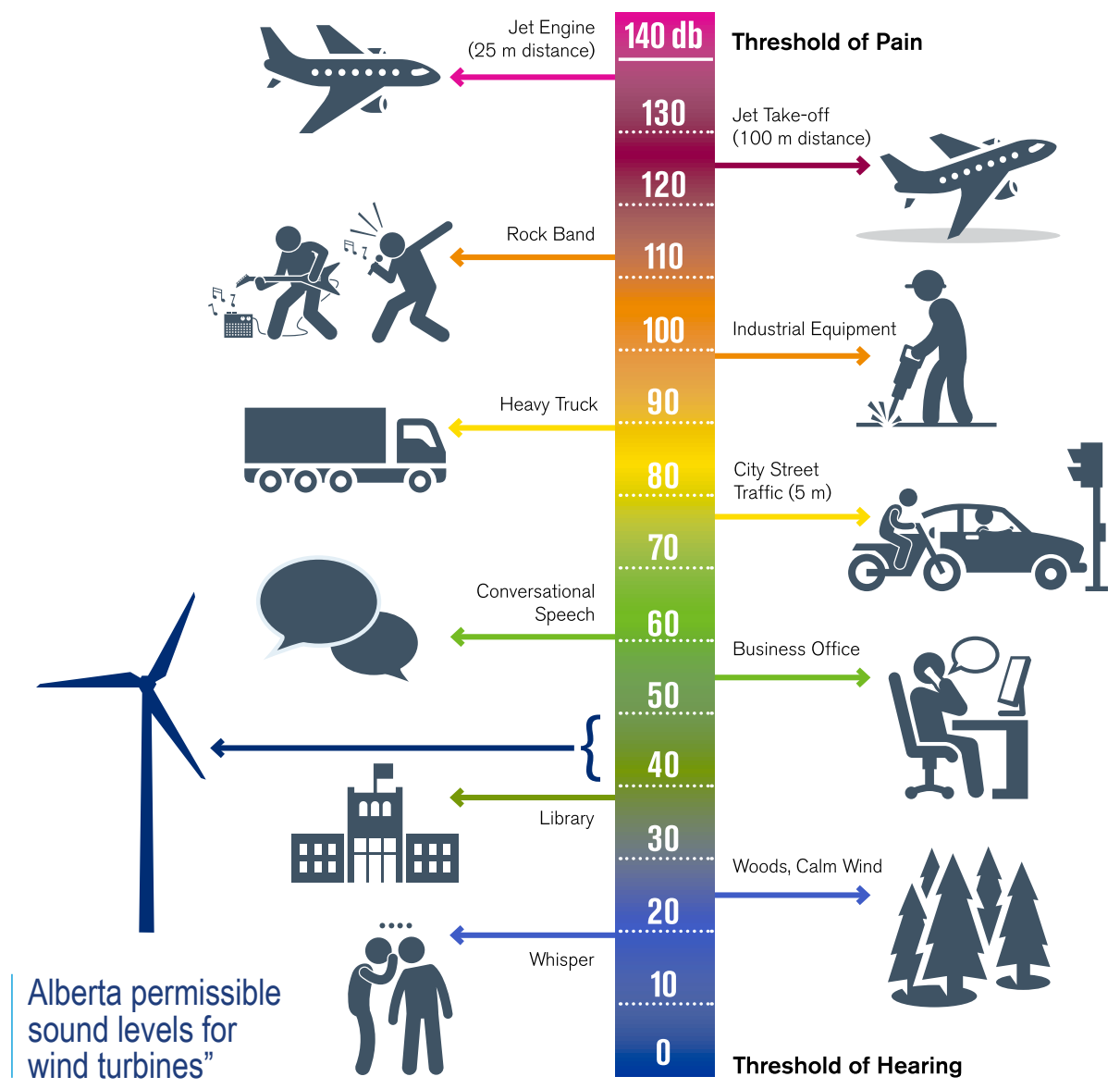


50 dBA Leq

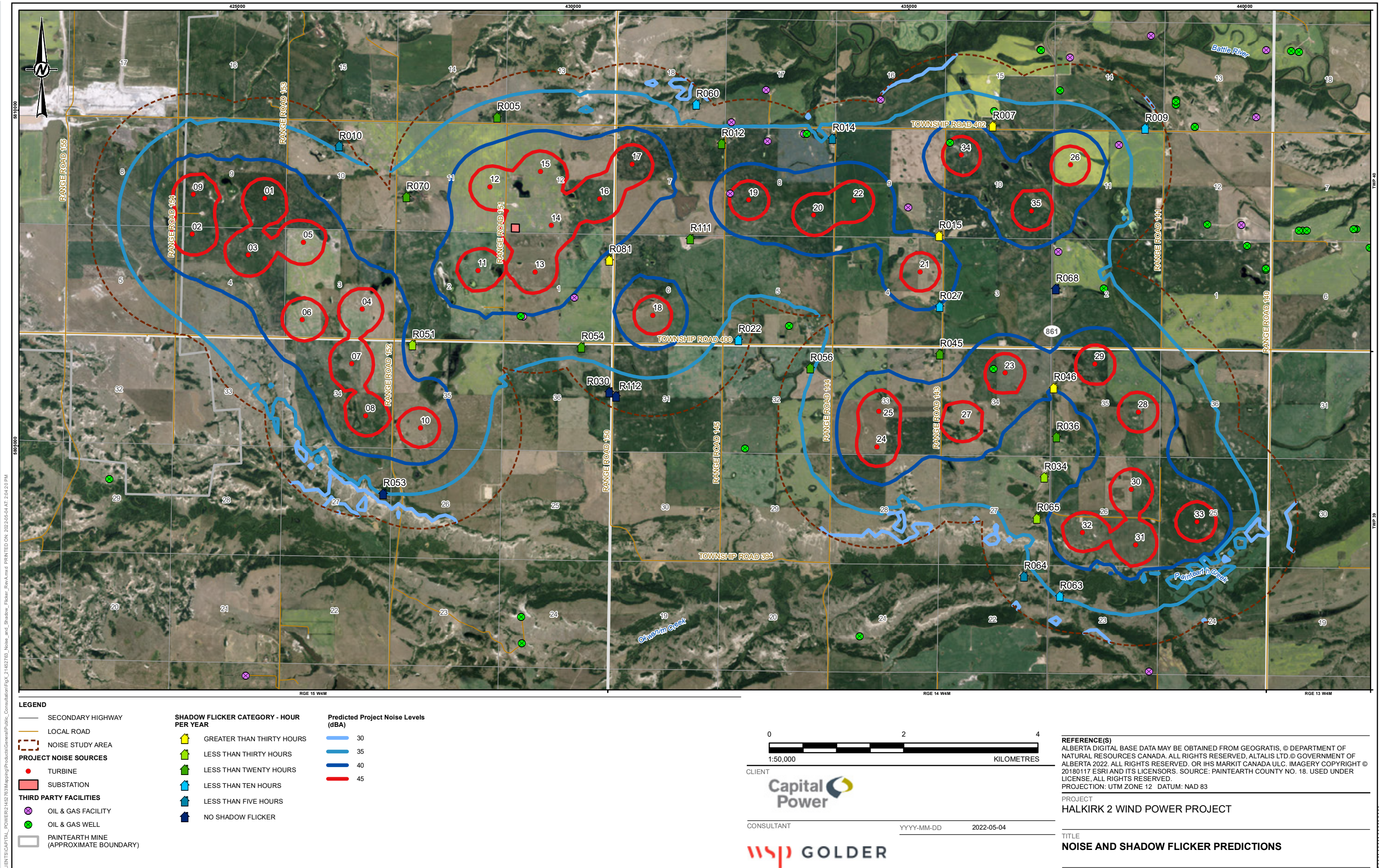
AT DAYTIME

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

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



Noise and Shadow Flicker Map



Shadow Flicker

Shadow flicker only occurs when turbines are operating under specific sun/sky conditions (e.g., clear sky, low angle sunlight – sunrise, sunset). Shadow flicker results from brief reductions in light caused by the rotating blades of the turbine casting shadows on receptors, on the ground, and on stationary objects such as a window at a residence.

Golder has conducted a shadow flicker assessment for the project, which predicts and evaluates shadow flicker at 68 receptors corresponding to dwellings within 1.5 km of the project (the same receptors considered in the NIA). Shadow flicker modelling makes use of project design data (i.e., location, hub height, and rotor diameter for project wind turbines), on-site wind data (i.e., historical wind roses for the project area), publicly available terrain data, and publicly available sunshine statistics.

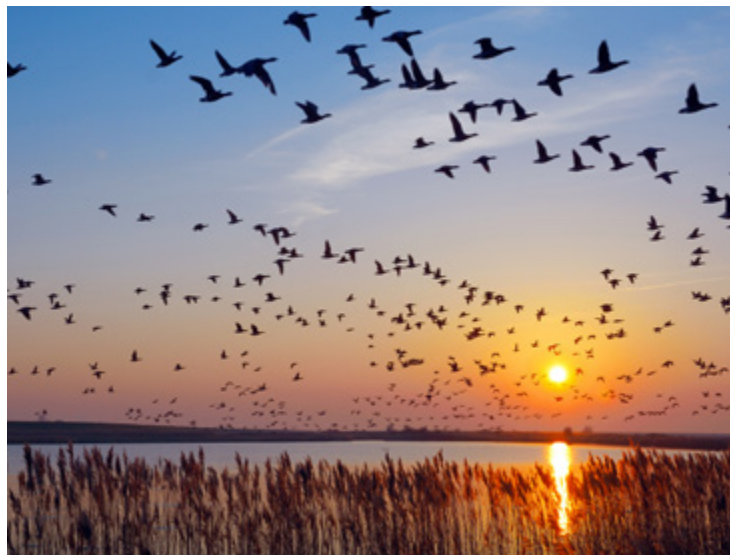
The assessment predicts potential for shadow flicker at specific receptors. The AUC does not set shadow flicker thresholds or limits.



Environmental Surveys/Studies

We continue to keep all necessary permits and surveys up to date for the project in accordance with provincial and federal guidelines and regulations. Capital Power has retained WSP Golder to update wildlife surveys and conduct all required baseline environmental studies to assess and minimize potential effects of the redesigned project on the environment and community. Information on wildlife and wildlife habitat from these various surveys have been included in our Renewable Energy Project Submission Application to Alberta Environment & Parks (AEP). Approval of this application is necessary before submitting our amendment application to the AUC later this year. Surveys or studies completed or in progress include:

Study	Survey Timing	Status
Sharp-tailed Grouse Survey	March 15 to May 15	Completed in 2016, 2018, 2020 and 2022. Additional survey scheduled for 2023.
Raptor Nest Survey	March 15 to July 15	Completed in 2016, 2018, 2020 and 2021. Additional survey scheduled for 2023.
Breeding Bird Survey	Round 1: May 1 to June 15 Round 2: June 16 to July 15	Completed in 2016 and updated in 2021.
Bat Migration Survey	Spring: May 1-31 (continuous monitoring) Fall: July 15 to October 15 (continuous monitoring)	Completed in 2016 and updated in 2021.
Bird Migration Survey	Spring: Early: April 1-20, Mid: April 15 to May 15, Late: May 1-30 Fall: Early: July 15 to August 5, Mid: August 1 to September 1, Late: August 15-September 30	Completed in 2016 and updated in 2021.
Wetland and Land Cover Surveys	June-September	Completed in 2016 and 2017 and updated in September 2021. Additional wetland surveys are planned in the summer of 2022 to support <i>Water Act</i> applications.
Listed Plant Species Survey	Early: May-June Late: July-August	Completed in 2016. Will be updated during the summer of 2022.
Fish and Fish Habitat Surveys	NA	Completed in November 2021.
Potential historical, paleontological and archaeological resource evaluation	May-September	If required, field surveys will be completed in May or June 2022.
Pre-construction Amphibian Surveys	May-September 2023	Surveys will be conducted to verify which wetlands have suitable amphibian habitat in the spring/summer of 2023.
Pre-disturbance Site Assessment (PDSA)	May-September 2023	Soil survey will be conducted to meet the requirements of the <i>Conservation and Reclamation Directive for Renewable Energy Operations</i> .

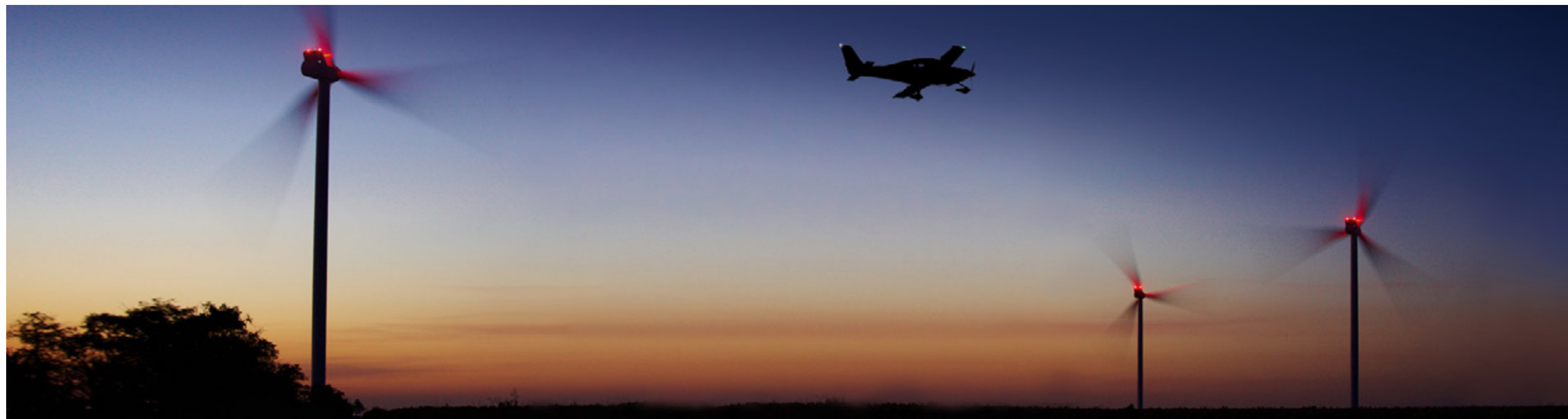


Environmental requirements are detailed in the current Alberta Environment & Parks (AEP) Wildlife Directive for Alberta Wind Energy Projects (2018).

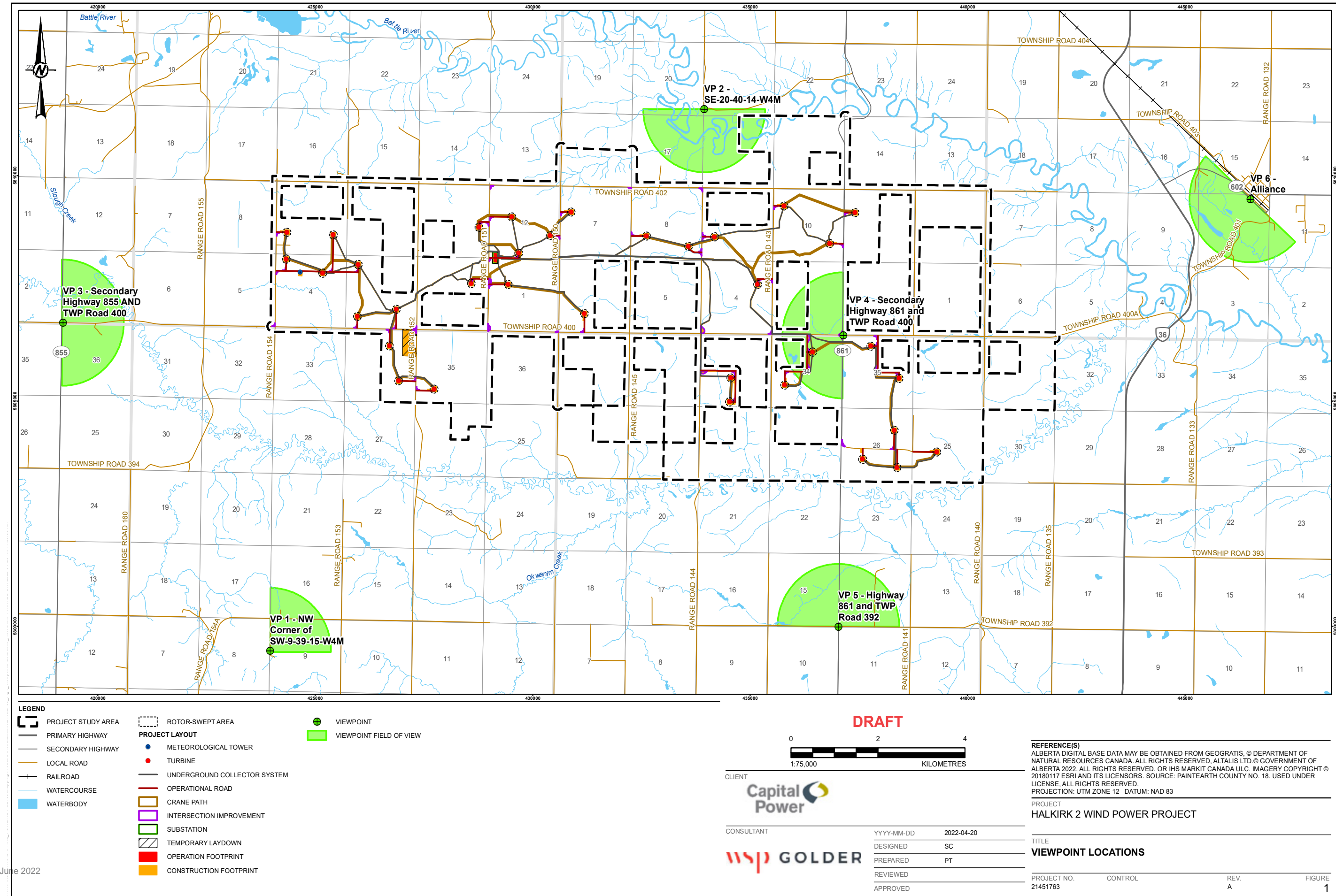
Wind Turbine Lighting

Transport Canada requires wind facilities have flashing red navigation obstruction lights to ensure the safe operation of aircraft. The facility will have the minimum permissible number of navigation lights and the duration and synchronization of the flashes kept to a minimum.

Subject to applicable approvals, Capital Power will install obstruction light mitigation equipment to reduce the effects of turbine lighting on the community. The Aircraft Detection Lighting System (ADLS) uses radar to detect aircraft within the vicinity of the facility and turns on the navigation lighting only when necessary (i.e., if an aircraft is nearby). The navigation lights are typically off when there are no aircraft within the vicinity of the facility.



Location Viewpoints

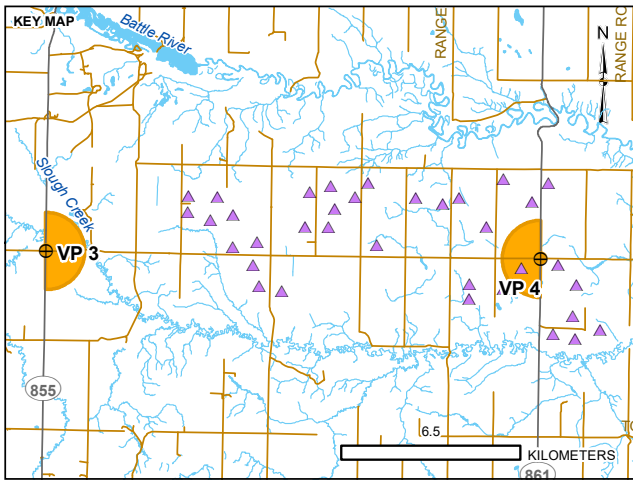
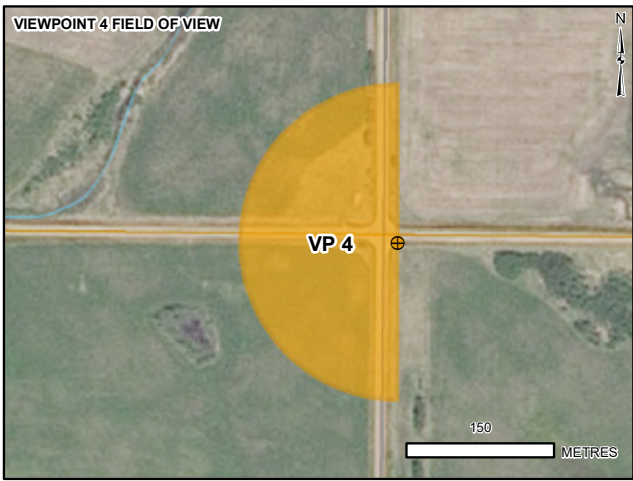
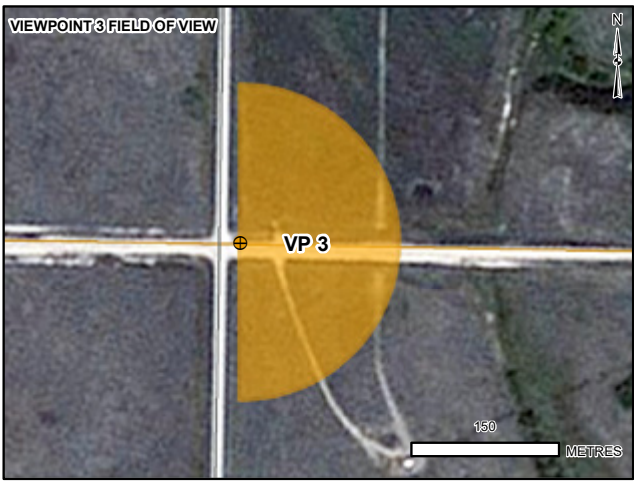


Visual Simulations

VIEWPOINT 3
INTERSECTION OF SECONDARY HIGHWAY 855 AND TWP ROAD 400 LOOKING EAST.



VIEWPOINT 4
INTERSECTION OF SECONDARY HIGHWAY 861 AND TWP ROAD 400 LOOKING WEST.



- LEGEND**
- TURBINE LOCATION
 - CURRENT VIEWPOINT
 - CURRENT VIEWPOINT FIELD OF VIEW
 - PRIMARY HIGHWAY
 - SECONDARY HIGHWAY
 - LOCAL ROAD
 - WATERCOURSE
 - WATERBODY

VISUAL SIMULATIONS FOR THE CAPITAL POWER HALKIRK 2 WIND POWER PROJECT

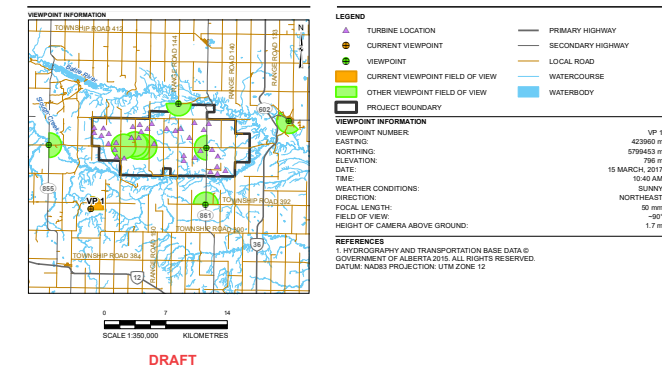
CONSULTANT **wsp GOLDER** CLIENT **Capital Power**

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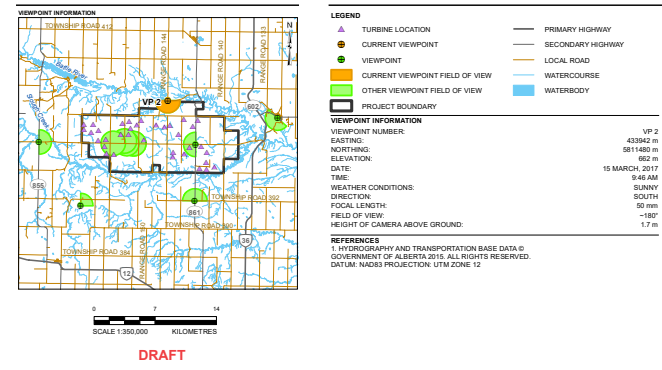
Visual Simulations / Viewpoint 1 and 2

Viewpoint 1



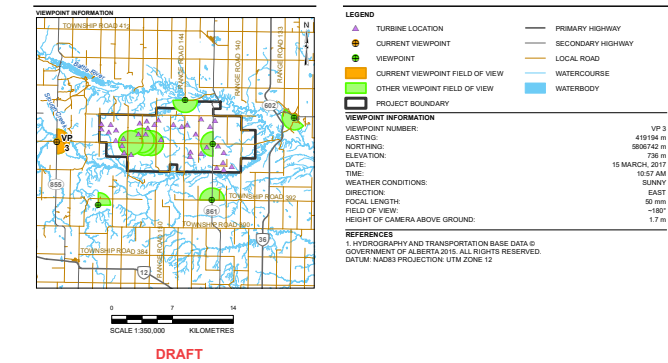
CLIENT	Capital Power
PROJECT	HALKIRK 2 WIND PROJECT
TITLE	VISUAL SIMULATIONS VIEWPOINT 1 NW CORNER OF SW-9-39-15-W4M
CONSULTANT	WSP GOLDER
DESIGNED	PT
PREPARED	SP
REVIEWED	
APPROVED	
PROJECT NO.	21451763
CONTROL	
REV	A
FIGURE	1

Viewpoint 2

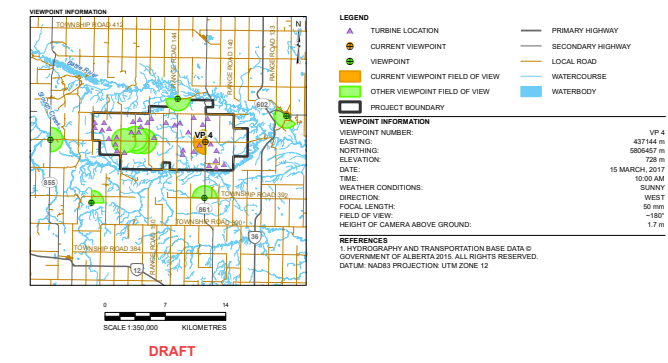


CLIENT	Capital Power
PROJECT	HALKIRK 2 WIND PROJECT
TITLE	VISUAL SIMULATIONS VIEWPOINT 2 SE-20-40-14-W4M
CONSULTANT	WSP GOLDER
DESIGNED	PT
PREPARED	SP
REVIEWED	
APPROVED	
PROJECT NO.	21451763
CONTROL	
REV	A
FIGURE	2

Visual Simulations / Viewpoint 3 and 4

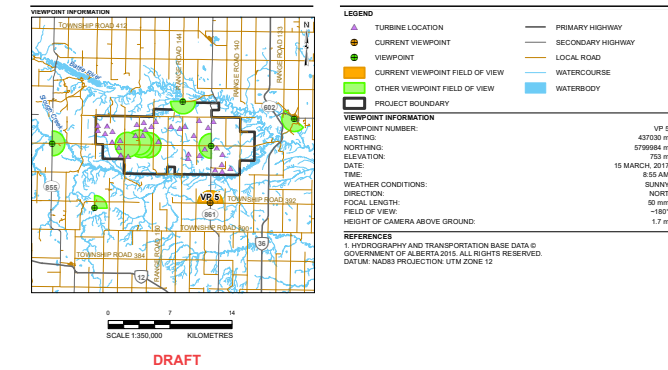


CLIENT	Capital Power
PROJECT	HALKIRK 2 WIND PROJECT
TITLE	VISUAL SIMULATIONS VIEWPOINT 3 SECONDARY HWY 855 AND TWP ROAD 400
CONSULTANT	WSP GOLDER
DATE	2022-04-20
DESIGNED	PT
DRAWN	BP
REVIEWED	
APPROVED	
PROJECT NO.	21451763
CONTROL	
REV.	A
FIGURE	3

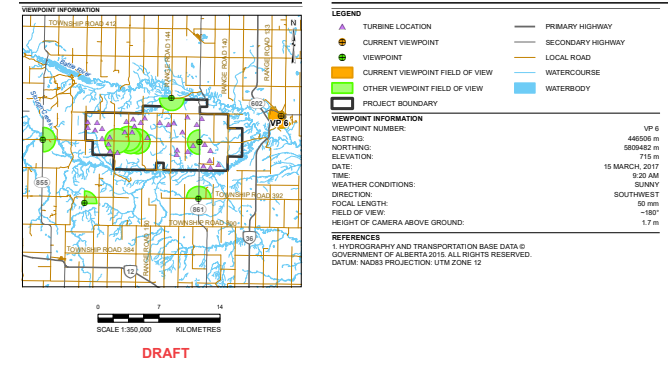


CLIENT	Capital Power
PROJECT	HALKIRK 2 WIND PROJECT
TITLE	VISUAL SIMULATIONS VIEWPOINT 4 SECONDARY HIGHWAY 861 AND TWP ROAD 400
CONSULTANT	WSP GOLDER
DATE	2022-04-20
DESIGNED	PT
DRAWN	BP
REVIEWED	
APPROVED	
PROJECT NO.	21451763
CONTROL	
REV.	A
FIGURE	4

Visual Simulations / Viewpoint 5 and 6



CLIENT	Capital Power
PROJECT	HALKIRK 2 WIND PROJECT
TITLE	VISUAL SIMULATIONS VIEWPOINT 5
CONSULTANT	WSP GOLDER
DESIGNED	PT
PREPARED	BP
REVIEWED	
APPROVED	
PROJECT NO.	21451763
CONTROL	TEST A
FIGURE	5



CLIENT	Capital Power
PROJECT	HALKIRK 2 WIND PROJECT
TITLE	VISUAL SIMULATIONS VIEWPOINT 6
CONSULTANT	WSP GOLDER
DESIGNED	PT
PREPARED	BP
REVIEWED	
APPROVED	
PROJECT NO.	21451763
CONTROL	TEST A
FIGURE	6

Conservation, Reclamation and Decommissioning Planning

As part of the County's Development Permit application, Capital Power will provide a description of potential measures to decommission and reclaim any of the sites or tower locations for review and approval.

The Wind Energy Facility will be decommissioned and reclaimed in accordance with all applicable legislative requirements, including those of the Alberta Utilities Commission (AUC) and Alberta Environment & Parks (AEP).

Final reclamation will be completed in consultation with landowners.

**Reference: Government of Alberta
- Alberta Environment & Parks
(GOA: AEP) 2018. Conservation and
Reclamation Directive for Renewable
Energy Operations. Edmonton, Alberta
66 pp.**

reclamation:

process of restoring disturbed land to its former or other productive uses.

decommissioning:

permanent closure of all/part of an industrial facility, followed by removal of process equipment, buildings and other structures, and the decontamination of the surface and subsurface.



Following construction, farming activities can resume within 15 feet of the wind turbine's pedestal.



Activities generally consist of site clean-up and repairing/reshaping access roads, collector line right of ways and crane paths.



Capital Power will return disturbed land to an equivalent use (i.e. similar to what existed prior to construction).

Community Benefits

We are committed to being a good neighbour and supporting the community.

Halkirk 2 will bring:

- ~\$56 million in tax revenue to the County of Paintearth over an ~30-year life of the project
- Support for local community programs and initiatives
- 200+ jobs during construction over 12-14 months and supply chain opportunities for local contractors, suppliers and spinoff benefits including lodging and restaurants.
- 2-5 permanent positions for operations and maintenance once operational



Contact Us

1-855-703-5005
canadadevelopment@capitalpower.com

Mailing Address

Halkirk 2 Wind Project
C/O Stakeholder Engagement
10th Floor, EPCOR Tower
1200 – 10423 101 St. NW
Edmonton, AB T5H 0E9

Alberta Utilities Commission

www.auc.ab.ca

capitalpower.com

