June 8, 2023

Via Email ministre-minister@ec.gc.ca; information@iaac-aeic.gc.ca

To: Environment and Climate Change Canada

Attention: The Honourable Steven Guilbeault, Minister of Environment and Climate Change and the Impact Assessment Agency of Canada

Request: For Designation of the Proposed Smoky River Wind Project Under the Impact Assessment Act (IAA)

Dear Honourable Minister Guilbeault and the Impact Assessment Agency of Canada:

We are making this request for consideration as concerned members of the public, regarding ABO Wind Canada Ltd. (the "Proponent") and their planned September, 2023, application to the Alberta Utilities Commission (the "AUC") for approval of the proposed Smoky River Wind Project (the "Project").

This request is organized as follows:

Section A - Requestor Information and Background

Section B - Project Description and Proponent Background Information.

> Unless this project is designated under s. 9(1) of the IAA, it will not be subject to a mandatory federal review, since it is not identified in the Physical Activities Regulations; is not federally funded, and would be situated on privately-held, cultivated lands.

Section C - Designation Request

> We submit that this Project warrants federal designation since it has the potential to cause significant direct or indirect adverse effects that either:
> (a) fall within federal jurisdiction or
> (b) could extend beyond the boundaries of the province of Alberta.

Based on this, we are requesting that the Minister of Environment and Climate Change (the "Minister") use their discretion to designate the Project for federal review under section 9(1) of the Impact Assessment Act (the "IAA").

Thank you for your time and consideration of this request.

Yours truly,

Burt Hockey and Jackie Garvin

A. Requestor Information and Background

Burt Hockey and Jackie Garvin (Hockey)
Contact Information: Email: <personal information removed> Landline: <personal information removed>

We became aware of this project in July, 2020, during the NAV Canada Land Use review (File #20-2137) of the application to construct a meteorological tower within the Obstacle Clearance Circle (OCC) of our registered aerodrome (CNP6). We clearly communicated to the Proponent at that time that safety is non-negotiable and that we would not support any future wind farm proposal that did not comply with the 4,000 meter setback per TP1247E.

We received official notification of the Project in February, 2023, as landowners (SE/4-12-80-21 W5M) living within 1,500 meters of a proposed power plant >10 MW (as required by AUC Rule 007).

We also have several non-aviation concerns regarding this Project.

Where our concerns are solely within the jurisdiction and boundaries of our municipality (e.g. land use bylaws), we are working to address them at that level.

Provincially, the regulatory body for this Project is the Alberta Utilities Commission (AUC). We reviewed the provincial regulatory framework, scope and requirements included in the AUC approval process.

We reviewed whether similar concerns to ours:

- had been identified previously
- how the Proponent had responded to them
- and how the AUC's decision was made on unresolved issues.

As a representative, current example, we used the AUC eFiling system's (https://www2.auc.ab.ca/) public documentation for the Proponent's Buffalo Plains Wind Farm Project (application 26214 which was approved in February, 2022).

We then reached out to the Proponent to express these concerns, and attended the Proponents' Open House in Falher, AB on April 5, 2023, to direct specific questions regarding migratory birds to their Environmental Consultants to confirm whether our understanding of their study, and the provincial environmental review process and requirements was correct, as directed by the Proponent's Social Engagement Lead.

Based on our research, the unresolved concerns that are relevant for this request for federal consideration due to their potential adverse effects beyond the project, municipal and provincial boundaries are:

1. Migratory Birds - Cumulative Impact on Non-Nesting / Transitory Seasonal Populations

2. Wildfire Risk - Potential Impacts Beyond the Project Boundaries

These are both examined in detail in Section C.

B. Project Description and Proponent Background Information

Project Name:	**Smoky River Wind Project**
Project Website:	https://www.smokyriverwind.com
Project Description:	The Project is proposed on privately-owned land between the Village of Nampa and the Town of Falher, east of Highway 2 (see map). The Project would comprise of up to 27 turbines, each with an expected nameplate capacity of 6.2 to 7.2 MW, a hub height of 100 to 120 metres and a blade length of 80 to 90 metres. The Project Development Area (see map) covers approximately 7,000 acres, in the Municipal District (M.D.) of Smoky River. https://www.abo-wind.com/media/en/range-of-activities/canada/smoky/map_770.jpg
Project Timeline: Preliminary Schedule *(when construction and operations would occur)*	Timeline — Activity Spring 2022 to Fall 2022 — Environmental Field Studies February 2023 — Public Notification and Project Information Package 1 April 5, 2023 — Open House June 2023 — Project Information Package 2 2Q2023 — Submission of Renewable Energy Project Submission Report to Alberta Environment and Parks August 2023 — Project Information Package 3 September 2023 — AUC Application Submission Q2 2024 — AUC Review and Approval Q2 2025 — Start of Construction (assuming two seasons for construction) Q4 2026 — Commencement of Operation
Proponent Contact Information:	Dave Berrade, M. Dev. Social Impact and Engagement Lead, ABO Wind Canada Ltd. dave.berrade@abo-wind.com +1 (587) 576-5339
Project Proponent:	**ABO Wind Canada Ltd.** ABO Wind opened an office in Alberta in 2017. ABO Wind Canada mainly focuses on developing wind energy and photovoltaic projects in Alberta and Saskatchewan. The following proponent and parent company information was taken directly from: ABO Wind AG's website https://www.abo-wind.com; their 2022 Annual Report https://www.abo-wind.com/media/en/pdf/annual-reports/annual-report_abowind-2022-en.pdf; and 2023 05 Investor Presentation https://www.abo-wind.com/media/pdf/flyer/IR-Presentation.pdf. *ABO Wind Canada is 100% owned by ABO Wind AG.* *The Buffalo Plains project in the Canadian province of Alberta, with an output of 514.6 megawatts, is the largest approved wind energy project in the country. ABO Wind Canada fully developed and then sold the rights of the ready-to-build wind farm to Copenhagen Infrastructure Partners (CIP) in the summer of 2022. The project extends over around 17,500 hectares.* *ABO Wind AG was incorporated in 1996, and is headquartered in Wiesbaden, Germany.* *It is publically traded on German stock exchanges, and is owner-managed with the families of the founders/Managing Directors holding the majority of shares.* *ABO's core business is the development and construction of renewable energy projects.* *The company is currently working on the development and construction of projects with more than 20,000 megawatts of capacity worldwide.* *ABO Wind aims to sell these renewable energy projects after connecting them to the grid at the latest. Typically, such agreements with the buyers provide for further collaboration with ABO Wind to get the projects ready for construction and then to build and operate them. We work with the owners of the projects we develop on a long-term basis and in a spirit of trust. Energy cooperatives, municipal utilities, international energy groups, investment companies, insurance companies, and pension funds are among our satisfied customers.*

C. Designation Request

For the two unresolved concerns that we have identified potential adverse effects that would not be localized to the previously developed (cultivated) lands in the Project boundaries, we have outlined:

- A description of the potential adverse effect, including what area of federal jurisdiction this effect applies to under the IAA
- How this potential adverse effect could occur and a description of how the project would cause the potential adverse effect (directly or incidentally) within federal jurisdiction
- Risk Assessment and Management
    - Whether the potential adverse effects can be adequately managed through other existing legislative or regulatory mechanisms
    - Whether an assessment of environmental effects will be carried out by another jurisdiction

1. Migratory Birds – Cumulative Impact on Non-Nesting / Transitory Seasonal Populations

"Wind power projects have the potential to adversely affect wildlife, particularly aerial wildlife such as birds and bats. Three main types of adverse effects on birds have been identified: direct fatalities, disturbance, and habitat loss. **While the impact of individual projects may often be low, with the growth of the industry, the potential of wind energy production to adversely affect wildlife on a cumulative basis increases. Proper siting of wind energy facilities is a key factor in mitigating adverse environmental effects**." Wind turbines and birds : a guidance document for environmental assessment : CW66-363/2007E-PDF - Government of Canada Publications - Canada.ca

If submitted to the Alberta Utilities Commission (AUC), and approved, this development would be the first commercial wind farm north of Edmonton, setting a precedent for wind development in the boreal region of Northern Alberta, where four major North American flyways converge.

The potential adverse effect of placing a wind farm in this location is that species mortality will be much higher than estimated, and it will have a serious long-term effect on migratory avifauna (birds and bats).

Installation of wind turbines would result in direct mortality, due to collision by avifauna during migration. Migratory species that successfully navigate this wind farm may be seriously impacted longer-term due to the cumulative impact of wind turbines along their migration route to their food source - flying insects.

Risk Assessment and Management

AUC's Rule 007 requires an extensive Alberta Environment and Parks (AEP) environmental review and impact assessment, including spring and fall migration surveys within the proposed project area (and a one km buffer zone), per the Alberta Wildlife Directive for Wind Energy Projects (2018).

The AEP environmental review ensures compliance with the Federal Migratory Birds Convention Act and Species At Risk Act for species that breed in the Project's region, based on provincial requirements and AEP-FWS policy and protocols.

The AEP Bird Migration Survey Protocol (2020) was developed for AEP by two consulting firms, including the one the Proponent used for this Project (McCallum Environmental).

At the Proponent's Open House in April, 2023, we confirmed with McCallum Environmental that:

- AEP bird migration surveys are visual and do not include night time or inclement weather monitoring.

This will necessarily understate mortalities for birds that migrate at night (e.g. passerines) or that may have higher collision risk in poor weather, as a result of flying lower than in clear conditions to maintain visual contact with the ground (e.g. geese).

- Insects are not included in the AEP Environmental Assessment (including migratory insects like butterflies, moths, dragonflies and beetles) that insectivorous avifauna (birds and bats) would eat.
- Cumulative mortality estimates (beyond the scope and one km buffer zone for each project) for migratory birds is not an AEP requirement, nor industry best practice in Alberta.

Mandatory environmental studies (carcass counts) are required for three years post-construction by the AEP, and mitigation measures are put in place if mortality numbers are much higher than expected.

This standard mitigation would not adequately address these anticipated adverse effects since:

- A gap exists in the provincial process for migratory species that stopover short-term to feed or rest on a nearby body of water, or that overfly the Project to breed somewhere else (beyond the one km buffer zone).

- Several Important Bird Areas (IBA's) upon major migratory corridors are outside of this one km buffer zone. The proposed eastern edge of the Project borders IBA AB115 (Frank Lake North); and the Project is in close proximity to Kimiwan Lake (AB055); and Alberta Conservation sites in Alberta Wildlife Management Unit 523: the Lac Magloire Uplands (C2-79) and Rat Lake (C2-44). Source websites: Canadian Important Bird and Biodiversity Areas www.ibacanada.com; Alberta Discover Guide www.albertadiscoverguide.com.

- Although the AUC may elect to take regional cumulative impacts into consideration, the scope is very limited.

  For example, with the Proponent's Wind Buffalo Plains Wind Farm project, the impact of one other wind farm in the same municipality was considered (where high mortality had already been identified as an issue requiring mitigation by residents). Both projects were also close to another IBA – McGregor Lake and Travers Reservoir (AB016) https://www.ibacanada.ca/site.jsp?siteID=AB016.

- AEP does not have guidelines or a current standard "acceptable" mortality loss for avifauna on a regional or provincial basis.

- Alberta does not require submission of this information to the Wind Energy Bird and Bat Monitoring Database *(per the most current report – 2018).*

  This would allow a broader perspective of the mortality risk and current and potential impact wind development within Alberta has on continental species populations.

  > *This initiative was established in 2008 to enable the collection and analysis of bird and bat monitoring information from Canadian wind power projects. The Wind Energy Bird and Bat Monitoring Database ("the Database") is a joint initiative, managed by Bird Studies Canada (BSC), comprised also of the Canadian Wind Energy Association (CanWEA), Environment and Climate Change Canada (ECCC), and the Ontario Ministry of Natural Resources and Forestry (OMNRF) Source: https://naturecounts.ca/nc/wind/resources.jsp*

  We have estimated the cumulative impact on bird mortality, excluding this Project. Refer to: Appendix I – Bird Mortality Estimate 2013 vs. 2023 Due to Alberta Wind Turbine Developments

  In addition, this Project is being proposed in an area of relatively low winds (compared to other wind farms in Alberta where mortality data has been included in the Database). To compensate for slower wind velocity, the turbines proposed for this Project are 50% larger, with a tip height of 180 m (600 feet) vs. an average of 122 m (400 feet) for the monitoring report. (See Appendix II)

  Due to their increased height, larger blade sweep diameter and lower cut-in speeds the rates for wind turbine mortality for this project may be higher than historical guidance would suggest; especially at night when migratory species are more active, and wind speeds drop.

- Carcass counts don't include insects killed by turbines or the impact of their loss on the species that depend on them. The indirect contributory impact of turbines on migratory species decline is that without adequate food, migrating birds may either have lower fertility, or die en route to their breeding grounds.

> *In the 2019 Global Warming Policy Foundation (GWPF) Report #35, The Impact of Wind Energy on Wildlife and the Environment, Berlin Seminar" the following sobering comments were included in the opening remarks of GWPF Board Member, Professor Fritz Vahrenholt.*
>
> *"…insects hit wind turbines at 100 metres altitude and their dead bodies cake the turbine blades at certain times of year, causing a significant drop in the energy 1 yield. When I was CEO of REPower, the second largest German wind power manufacturer, we had to develop a new technology to allow us to clean the blades, which required washing at least annually, and sometimes twice each year. Initial studies estimate that about 1200 billion migratory insects (or 3600 tons) are killed in this way. To give you an idea of the magnitude of this kill rate: it is about 5%. To be clear: 5% of the migrating insects are destroyed in this way. This is an important revelation, which needs to be investigated properly. The German Wildlife Foundation will be researching whether there is a correlation between the rapid expansion of wind turbines and the estimated decrease of flying insects by 75% in the last 20 years."*
>
> *Source: https://www.thegwpf.org/publications/the-appalling-environmental-cost-of-wind-energy*
>
> *A 2020 German study found that a single turbine might kill about 40 million insects per year. Insects are smaller, and more difficult to "count" than birds. This study raises the possibility of using Meta-barcoding of the contaminant layer on blades to identify affected insect species. Source: (Voigt CC. Insect fatalities at wind turbines as biodiversity sinks. Conservation Science and Practice. 2021;e366. https://doi.org/10.1111/csp2.366)*

Renewable Energy vs. Renewable Resources

The balance between potentially conflicting goals – to go green and preserve wildlife is the job of us all.

Significant progress has already been made towards clean energy goals in Alberta.

The Government of Alberta's Renewable Energy Act and Climate Leadership Plan identified the goal that "By 2030, renewable resources like wind and solar will account for up to 30% of electricity generation".

At 2022 year-end, the Alberta Electric System Operator (AESO) reported that 31% of the installed system power capacity was from renewable fuel sources (20% wind, 6% solar, 5% hydro). https://www.aeso.ca/aeso/understanding-electricity-in-alberta/.

Due to all the factors outlined above, we suggest this Project should be used as a checkpoint for wind energy development in the boreal region of Northern Alberta.

We also submit that failure to designate the Project may undermine public confidence in the assessment process.

2. Wildfire Risk - Potential Impacts Beyond the Project Boundaries

The potential adverse effect of placing a wind farm in this location is that a fire could spread from the Project footprint and municipal boundary, into the nearby Forest Protection Area and escalate to an uncontrolled wildfire.

- A wildfire could spread northeast cause changes to the environment on nearby federal lands (William McKenzie 151K), which is approximately 15 km northeast in Northern Sunrise County.

- Longer-term, an uncontrolled wildfire could cause transportation disruptions of the CN Rail Line from Slave Lake to Hay River, NWT, which could impact the economic conditions of Indigenous peoples relying on it. This rail line lies directly east of this Project in the Forest Protection Area.

The current out-of-control wildfire SWF-068-2023 is an example of this worst case scenario.

It started as a much smaller fire in the Peavine Metis Settlement in early May, which spread into the Forest Protection Area and neighbouring municipality of Northern Sunrise County. This fire remains out of control, and as of June 7, 2023, Forestry reports that it has burned an area of 125,603 hectares. Alberta Wildfire Status Dashboard (arcgis.com) This is 1.5 x the size of the City of Calgary.

SWF-068-2023 has resulted in changes to the environment on federal lands (William McKenzie 151K). We cannot speak to the direct impact this has had on Duncan's First Nation peoples. Our understanding is that most reside near Berwyn, Alberta, on William McKenzie 151A; but the lands of William McKenzie 151K, located within Northern Sunrise Country are now within the boundary of this wildfire.

SWF-068-2023 has also crossed over a portion of the CN Rail line near the east border of the proposed Project. In 2011, when the Slave Lake Wildfire happened, very strong concerns were raised about the impact this wildfire could have on the transport of vital supplies to Hay River.

Today, this rail line remains the only link between Slave Lake and the Northwest Territories. This same concern has not been happened with SWF-068-2023, but incidental impacts due to future wildfire near the Project could cross provincial borders and potentially negatively impact residents many miles distant.

Refer to Appendix III - 2023 05 Wildfire Impact on Federal Lands and CN Rail

How This Project Could Result in This Happening Again

Although rare, turbine and transformer fires happen.

The probability of a fire spreading from the Project site, and potentially contributing to a wildfire in extreme weather conditions similar to a current nearby wildfire (SWF-068-2023) is dependent on:

- the Proponents pre-construction design and mitigation measures (for example: whether automatic fire detection and suppression systems are installed to eliminate the threat) and
- the Proponents Emergency Response Plan (ERP), and turbine shutdown decision points and protocols for fire events when the wildfire risk is extreme.

  Extreme fire risk and behaviour is highly likely when one or more conditions meet the 30-30-30 rule (temperature above 30°C - wind speed above 30 km/hour - relative humidity below 30%).

  Sparks from a fire could quickly spread to the nearby Forest Protection Area.
  The Proponent has advised us that the turbines for this Project have a cut-out speed of approx. 26 m/sec (this is 94 km/hr) – well above the extreme fire risk threshold of 30 km/hr.

Near-term, due to firefighting efforts, the wildfire risk for surrounding burned-out areas has been reduced. But, the forest will regrow, and the risk will return over the 25 year life of this Project.

Risk Assessment and Management

The Rural Municipalities of Alberta (RMA) encourages municipalities to work with government, residents, and landowners through programs such as FireSmart to plan for and mitigate risks of wildfire. Municipalities must address the increased likelihood of disasters and build resiliency into asset management planning and infrastructure investment decisions. Source: Position Statement, Winter 2023 Planning-and-Development-Position-Statements.pdf (rmalberta.com)

Preparing for the threat of wildfire is a shared responsibility.
Community members, community leaders, industry and all levels of government have a responsibility to lessen the effects of wildfire. Source: FireSmart | Alberta.ca

Municipal Risk Management
Control of Fire Hazards is the responsibility of each municipality.

For this project, this is the MD of Smoky River 130, who will manage this through bylaws, and approval of the Project Emergency Response Plan.

At a community level, FireSmart planning guidelines are based on a 2 km zone surrounding a First Nation reserve, Metis settlement, town, village, and municipal district. This Project is located 15 km from William McKenzie 151K. This guideline is clearly inadequate to mitigate the risk for a wildfire similar to SWF-068.

Provincial Review & Risk Management

Project Approval - AUC Rule 007 requires that a corporate or site-specific (preferred) Emergency Response Plan is in place, outlining site-specific risks and mitigations put in place to manage them (construction and operations phase), and also that emergency mitigation measures that have been identified. Site monitoring measures must be in place.

Proponents must also confirm that local responders and authorities have been contacted or notified regarding the project emergency response plan; and describe any requirements or feedback received and describe how the applicant intends to address the requirements and feedback received.

Post-Construction - a portion of the lands of this Project containing 8 turbines would be subject to the Forest and Prairie Protection Act as follows:

> *The Industrial Wildfire Control Plan (IWCP) is a mandatory requirement under the Forest and Prairie Protection Act. IWCPs are required from all companies operating within one kilometre of public land from March 1 to November 30. If activities are restricted to outside of this period, then no submission is required.*
>
> *The intent is to provide the Government of Alberta with the location of full time employees in order to increase their safety in the event of a wildfire.*
>
> Source: Industrial wildfire control plan user manual (IWCP) - Open Government (alberta.ca)

This measure is also site-specific and focussed on worker safety vs. wildfire containment and spread.

Finally, Section 11 of the Forest and Prairie Protection Act, clearly delineates that railway operators are responsible for firefighting costs associated with fires, when the fire originates in the railway right of way boundaries. Since no equivalent measure is in place for wind farm developments, our assumption is that incidental firefighting costs for a wildfire similar to SWF-068 would accrue to taxpayers vs. the Proponent.

We are working to address our concerns regarding wildfire spread with the Project Proponent, our municipality and the AUC, but the issues raised by a wildfire like SWF-068-2023 do not solely lie within the jurisdiction and boundaries of our municipality and province.

We submit that Designation of this project would help ensure the best result to proactively manage future wildfire risk, and ensure all communities are considered.

CONCLUSION

This Project requires a federal review.

It has the potential to cause adverse effects in two key areas that fall within federal jurisdiction:

1. Migratory Birds - Cumulative Impact on Non-Nesting / Transitory Seasonal Populations.

   The potential adverse effect of placing a wind farm in this location is that species mortality will be much higher than estimated, and it will have a serious long-term effect on migratory avifauna.

2. Wildfire Risk - Potential Impacts Beyond the Project Boundaries

   The potential adverse effect of placing a wind farm in this location is that a fire could spread from the Project footprint and municipal boundary, into the nearby Forest Protection Area and escalate to an uncontrolled wildfire.

We request that the Minister designate the Project using their discretion under section 9(1) of the IAA.

Please contact the undersigned if you need clarification or further documentation regarding the information in the Appendices included with this submission, in order to render your decision.

Thank you for your consideration of this request.

Burt Hockey and Jackie Garvin (Hockey)

Appendix I **Bird Mortality Estimate 2013 vs. 2023 Due to Alberta Wind Turbine Developments**

2013 Data Summary

Zimmerling, J.R., Pomeroy, A.C., D'entremont, M., & Francis, C.M. (2013). Canadian Estimate of Bird Mortality Due to Collisions and Direct Habitat Loss Associated with Wind Turbine Developments. Avian Conservation and Ecology, 8. 2013 Data Source: https://www.ace-eco.org/vol8/iss2/art10

Table 1. Estimated bird mortality per turbine from collisions at wind farms with available carcass search data, and estimated total mortality per province based on the number of installed turbines.

Province/Territory	No. of Wind Farms	No. of Turbines	No. of Wind Farms Analyzed	Estimated Mortality/Turbine	Predicted Estimated Mortality
Yukon (YK)	2	2	0	8.2†	16
British Columbia (BC)	3	83	2	8.4	697
Alberta (AB)	26	588	7	4.5	2646
Saskatchewan (SK)	5	132	3	10.1	1333
Manitoba (MB)	3	123	0	8.2†	1009
Ontario (ON)	38	965	19	10.8	10,422
Quebec (QC)	15	672	2	5.2	3494
New Brunswick (NB)	4	113	2	2.4	271
Nova Scotia (NS)	26	161	6	11.2	1803
Prince Edward Island (PE)	9	90	2	15.2	1368
Newfoundland (NF)	4	26	0	8.2†	213
Total	135	2955	43		23,273

†Where no data were available for a particular province, the weighted national estimate was used.

2023 Bird Mortality Estimate

Prepared by J. Garvin, based on public data from the current Alberta Electric System Operator (AESO) Current Supply Demand report, individual Wind Asset websites, and current Alberta Major Projects (valued at $5 Million or greater).

For Alberta, 10 years later, the growth in wind turbines has been dramatic.	2013 Study	2023 03 Status & Cumulative Projections				Change
	AB only	AESO Wind Assets (1)	Non-AESO AB Wind Assets (2)	Plus In-Progress Major Wind Projects (3)	Total	
Number of Wind Farms	26	36	7	11 (4)	54	+ 108%
Number of Turbines	588	1,395	18	466	1,879	+ 220%
Estimated Annual Bird Mortality (5)	2,646	6,277	81	2,097	**8,455**	+ 220%
Plus – AUC wind-generated Maximum Capacity (MW)	900 (6,7)	3,618	40	2,138	5,796	+ 544%

NOTES:

(1) Market and System Reporting » AESO, Current Supply and Demand real-time report
(2) Canadian Wind Turbine Database - Open Government Portal (canada.ca) – which includes Alberta data to 2015 only; cross-referenced against CanWea CanREA-Renewable-Project-Data-General-2023-01-17.pdf (renewablesassociation.ca)
(3) Alberta Major Projects
(4) The largest of these 11 projects is the Buffalo Plains Wind Farm (Vulcan County), which was also developed by ABO Wind, consisting of 83 turbines; expected to add 514.6 MW of capacity to the AESO market supply.
(5) Extrapolated values based on 2013 study parameter for Alberta of 4.5 birds per turbine.
(6) https://media.www.auc.ab.ca/prd-wp-uploads/2022/01/InstalledCapacity.xlsx CapGen_Interchange2021.xlsx (auc.ab.ca)
(7) https://media.www.auc.ab.ca/prd-wp-uploads/2022/01/2021CapGenInterchange.pdf

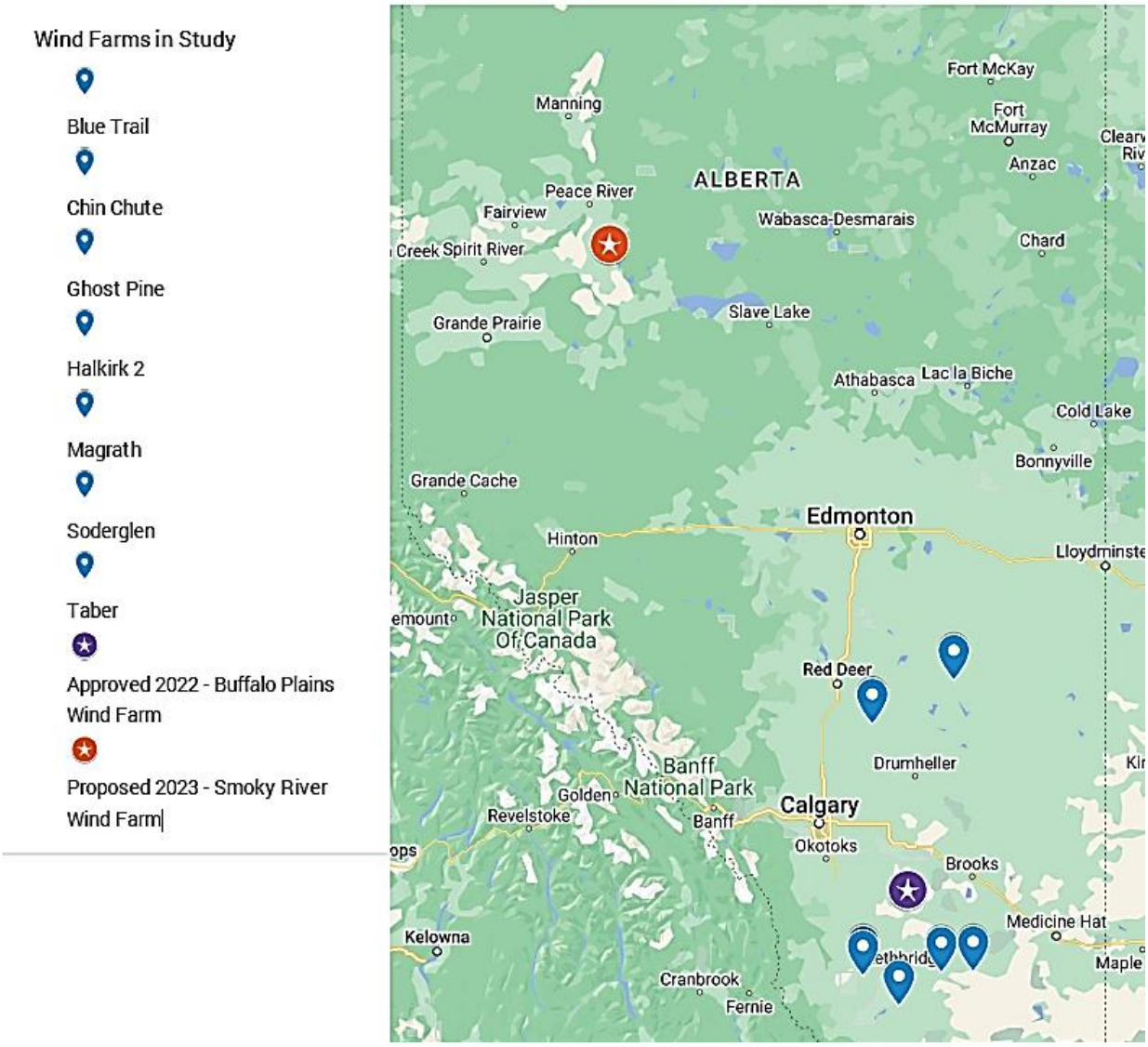
For comparison, the 2018 Wind Energy Bird and Bat Monitoring Database results were:

Region	Total Installed Turbines	Turbines In Analysis	Bat /Turbine	Bat Regional Mortality	Non-raptor /Turbine	Non-raptor Regional Mortality	Raptor /Turbine	Raptor Regional Mortality
Alberta	901	120	6.51 ± 1.34	5,864.88 ± 1,206	2.14 ± 0.4	1,928.08 ± 363	0.11 ± 0.02	100.23 ± 22

Source: https://naturecounts.ca/nc/wind/resources.jsp, Page 48

Appendix II

AB Wind Farms in 2018 Database

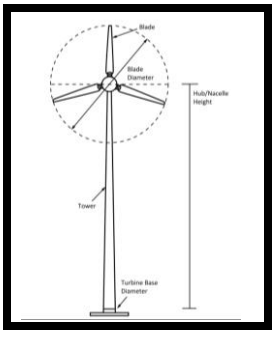


Data Sources:
https://naturecounts.ca/nc/wind/resources.jsp.

Turbine counts confirmed using AESO Supply and Demand Report
https://www.aeso.ca/market/market-and-system-reporting

Turbine tip heights taken from corporate or project websites

See diagram on the right for a tri-blade configuration, calculated as hub height + blade length (= ½ rotor diameter))



Appendix III - 2023 05 Wildfire Impact on Federal Lands and CN Rail