



WEST HANTS REGIONAL MUNICIPALITY REPORT

Information ☐	Recommendation ☒	Decision Request ☒	Councillor Activity ☐
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To: Committee of The Whole

Submitted by: 
Mark Phillips, CAO and Acting Director of Planning, Kari Fougere

Date: February 25, 2025

Subject: Wind Farm Cumulative Visual Effects Study

LEGISLATIVE AUTHORITY

Nova Scotia Municipal Government Act, Section 65 authorizes Council to expend funds for municipal purposes.

DECISION REQUEST

That Council approve a Visual Effects Study of Existing and Proposed Wind Farms in the Vaughan and Upper Vaughan area to Dillon Consulting Limited for the amount of \$60,845.00 plus applicable taxes plus an additional contingency of 10% or \$6,084.50 to support the project

Further that the total funding amount of \$66,929.50 for the study be supported by the West Hants Regional Municipality's operating reserves.

BACKGROUND

At the November 2024 Council meeting the following direction was provided to staff regarding a wind farm proposal, specifically the Bear Lake application as it was presented to Council for first reading at that time.

MOVED BY COUNCILLORS B. MORTON AND MCLEAN THAT COUNCIL POSTPONES FIRST READING AND REQUESTS STAFF COME BACK WITH INFORMATION INCLUDING A CUMULATIVE VISUAL EFFECTS STUDY FOR THE PROJECT. MOTION CARRIED

Property ☐	Public Opinion ☐	Environment ☐	Social ☐	Economic ☐	Councillor Activity ☐
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DISCUSSION

After the November Council meeting the municipality received correspondence from the Provincial Planning Department regarding the MPS and LUB amendments forwarded by Council. In response the amendments were approved and further amended by the province as authorized and imposed by Minister Lohr. Most notably the change in setback requirements and the removal of the consideration of visual intrusive impacts on the landscape from the MPS when the municipality is evaluating wind farm applications.

Further, as it relates to the first reading and the application, the applicants for the Bear Lake project have withdrawn their initial application for the project which would have been evaluated under the previous land use regulations. They have resubmitted and the application will be forwarded to PAC/HAC for review and evaluated under the newly amended regulations.

With regards to the study, the Planning Department staff reached out to qualified firms for proposals to complete a study of this nature from a standing offer list of vendors. In return, staff received one proposal at the cost of \$60,845.00 plus applicable taxes. If awarded the study's completion date was anticipate to be August 2025, with a January 2025 start date (7 months). Dillion Consulting is proposing to complete a viewshed analysis, visual simulations and shadow flicker analysis for the South Canoe Wind Farm, the approved Benjamin Mills Wind Farm and the proposed Bear Lake Wind Farm (Vaughan and Upper Vaughan Area).

- Viewshed Analysis
 - The data will be used to characterize the study area from a land use perspective and to identify the location of sensitive receptors to be included in the analyses (visual simulation and shadow flicker). Sensitive receptors may include residences, institutional buildings, cabins, or public gathering spaces and viewpoints.
 - For the viewshed analysis a 15 km study area from each of the turbines will be created.
 - These desktop analyses will be used to identify areas where turbines have the potential to be visible from, and the number of turbines that may be visible.

Visual Simulation

- Fifteen (15) viewpoints will be selected in the field and photos taken from these locations.
 - Photo montages will be created for ten (10) of the fifteen (15) locations.
 - Permission from property owners will have to be obtained to complete fieldwork.
- Shadow Flicker Analysis
- A 1.5km study area will be defined for each wind turbine.
 - The analysis will be created for two (2) scenarios. 1. Worst Case Scenario (bare earth with no vegetation) and 2. Vegetation Scenario
 - Shadow Flicker Analysis will be compared against thresholds set by the Province of Nova Scotia.

At the February COTW meeting Council discussed the value of the study as the Bear Lake application has been withdrawn and the original motion was connected to the Bear Lake application. Further, that the Province has removed the consideration of visual intrusive impacts on the landscape from the MPS when the municipality is evaluating wind farm applications.

Alternatively, Council discussed the value of the study to guide Council into the future from a broader perspective helping to address the question, of “how many wind farm projects are too many for our region”? A study in the Vaughan and Upper Vaughan area may help Council in their visioning exercise or land use considerations in the future.

Staff are presenting this report and recommendation as a follow up to Council’s direction provided in November of 2024 and to seek Council’s direction on this matter.

NEXT STEPS

To seek direction from Council.

FINANCIAL IMPLICATIONS

Visual Effects Study of Existing and Proposed Wind Farms in the Vaughan and Upper Vaughan Area– submitted by Dillon Consulting Limited

Study Value : \$60,845.00 plus applicable taxes plus \$6,084.50 contingency plus applicable taxes

Council will be encouraged to reflect on the operating reserve policy and reserve allocations during the 2025/26 budget deliberations to ensure the use of the operating reserves is in alignment with not only the policy but the overall affordability of studies and projects as it relates to the reserve utilization outside of the budget process.

ALTERNATIVES

- Council may not approve the study.

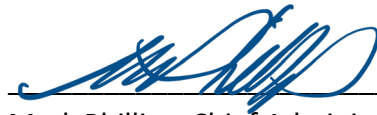
ATTACHMENTS

- Nova Scotia Department of Municipal Affairs Letter, January 14, 2025 - West Hants Municipal Planning Strategy and Land Use By-law amendments RE Large Scale Wind Turbine Setbacks

CHIEF ADMINISTRATIVE OFFICER REVIEW

N/A

Report Prepared by:



Mark Phillips, Chief Administrative Officer



WEST HANTS REGIONAL MUNICIPALITY

VISUAL EFFECTS STUDY OF EXISTING AND PROPOSED WIND FARMS

January 10, 2025

Submitted by Dillon Consulting Limited

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January 10, 2025

West Hants Regional Municipality
76 Morison Drive
Windsor, N.S.
B0N 2T0

Attention: Kari Fougere, LPP, MCIP
Acting Director of Planning and Development

Offer of Services – Visual Effects Study of Existing and Proposed Wind Farms in West Hants Regional Municipality

Dillon Consulting Limited (Dillon) is pleased to provide the following offer of services to West Hants Regional Municipality (West Hants) for a visual effects study for existing and proposed wind farms in the Vaugh and Upper Vaugh area of West Hants, for your consideration.

The broad tasks for this project are summarized below. Should your expectations differ from the scope of work proposed, we would be pleased to discuss this with you and revise our submission accordingly. We look forward to working with the West Hants team on this project.

Dillon understands that this work is being conducted under the terms and conditions of the standing offer agreement between Dillon Consulting Limited and West Hants Regional Municipality dated October 10, 2024.

Sincerely,

DILLON CONSULTING LIMITED



Jeff Benjamin
Associate

JAB:jmt

Our Project: eOffer # 508267



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PROJECT UNDERSTANDING

West Hants Regional Municipality would like to better understand the potential cumulative visual effects of multiple wind energy projects in the Vaughan/Upper Vaughan area. These projects include the existing South Canoe Wind Farm, the approved Benjamins Mill Wind Farm (construction pending), and the proposed Bear Lake Wind Farm. To assess the overall visual impact on the landscape and community, the municipality is seeking a "cumulative visual effects study." Dillon is proposing to complete a viewshed analysis, visual simulations and shadow flicker analysis for these three wind farms to better understand the visual effects in this area. These results will be summarized in a report and a presentation prepared for Council.

The three (3) existing and proposed wind farms are the:

- **South Canoe Wind Farm:** The South Canoe Wind Farm is an existing wind generating facility of 34 turbines with a capacity of approximately 100 MW.
- **Benjamins Mill Wind Farm:** The Benjamins Mill Wind Farm is a proposed project with up to 28 wind turbine generators (WTGs), capable of producing up to 150 MW of renewable energy.
- **Bear Lake Wind Farm:** The Bear Lake Wind Farm is a proposed onshore wind energy project with up to 15 wind turbines, located near Upper Vaughn, New Ross, and Windsor Forks, Nova Scotia. The project will have a maximum generating capacity of 105 MW, based on the largest turbine option being considered (7.0 MW).

Prior to conducting the analysis Dillon will review the existing registered environmental assessments for each project, as well as the West Hants Municipal Planning Strategy and the Province of Nova Scotia's guidelines for environmental assessments. The analysis will be completed using "worst case" scenarios assuming all turbines for all three (3) sites in operation. Site layouts will rely on the layouts currently identified in the registered environmental assessments and Dillon will complete the analyses on one iteration of the layouts only. Dillon proposes to use WindPro software to model the potential visual impacts of the proposed project. Dillon will use the Wind Pro Basis with the Shadow and Photo Montage modules to conduct these analyses.



SCOPE OF WORK AND METHODOLOGY

TASK 1 – PROJECT MANAGEMENT AND COORDINATION

Regular project reporting, including schedule and budget updates pertaining to the tasks outlined above, will be provided by the Dillon Project Manager. Also included are project management activities such as internal coordination of project activities, writing assignments, client communication, invoicing, internal coordination, and other management activities. These processes are integrated into our customized project plan, which will be developed and shared with the project team and utilized as a roadmap to project delivery in alignment with Dillon’s Quality Standard and Business Administration Manual.

Dillon will complete a project specific Health and Safety Plan (HSP) for necessary field work discussed in subsequent sections. The HSP will include site-specific information such as identification of site activities and potential hazards, proper Personal Protective Equipment (PPE) requirements, and local emergency contact information. The HSP will remain on the project site during field work activities. As part of Dillon’s Health and Safety Policy, daily tailgate meetings will occur by all field team members prior to commencement of field work to identify potential hazards or health and safety concerns, as well as determine mitigation measures to minimize the risk.

TASK 2 – VIEWSHED ANALYSIS

Dillon will conduct a data gathering exercise for the study area to support both the visual simulation and shadow flicker analyses. This data is anticipated to include:

- Existing land use;
- Buildings;
- Road network;
- Digital Elevation Model (DEM);
- Vegetation;
- Parks and protected areas; and
- Aerial imagery

The data will be used to characterize the study area from a land use perspective and to identify the location of sensitive receptors to be included in the analyses (visual simulation and shadow flicker). Sensitive receptors may include residences, institutional buildings, cabins, or public gathering spaces and viewpoints. Sensitive receptors will be selected based on typical criteria for environmental assessments in Nova Scotia and through discussions with West Hants on potential areas of concern. Land use and sensitive receptor mapping will be completed for the study areas for all three projects.

For the viewshed analysis a 15 km study area from each of the turbines will be created. A viewshed analysis will be completed for two scenarios. One scenario will be a “worst case scenario” using the bare earth DEM without any vegetation obstructions. The second scenario will be a “vegetation scenario” and include an estimate of vegetation height across the study area as obstructions to turbine views. These desktop analyses will be used to identify areas where turbines have the potential to be visible from, and the number of turbines that may be visible.

TASK 3 – VISUAL SIMULATION

Areas with potential visibility that overlap with sensitive receptors will be prioritized for visual simulations (photo montages). It has been assumed that 15 viewpoints will be selected based on these criteria to complete photo montages. Digital photographs will be taken in the field at each of the 15 selected viewpoints. Using WindPro and the provided specifications on turbine designs, photo montages will be created for 10 of the 15 viewpoints for a visual simulation at the selected receptor locations. The results of the viewshed analysis and visual simulations will be summarized into a preliminary memo.

TASK 4 – SHADOW FLICKER ANALYSIS

For the shadow flicker analysis a 1.5 km study area from each of the turbines will be created. The analysis will be completed for two scenarios. One scenario will be a “worst case scenario” using the bare earth DEM without any vegetation obstructions. It will also assume the sun is always shining during daylight hours and all turbines are active. The second scenario will be a “vegetation scenario” and include an estimate of vegetation height across the study area as obstructions to turbine views, and use historic weather data to estimate an average of sunny hours. Shadow flicker analysis will be completed in WindPro to estimate the amount of shadow flicker for each receptor identified within the study area. The analysis will be completed for both scenarios and include the total hours per year, number of days per year, and maximum minutes in a single day for each receptor that may be impacted. These results will be compared to industry standard guidelines. The turbines that may impact each receptor will also be identified. The results of the shadow flicker analysis will be compared against thresholds set by the Province of Nova Scotia and summarized into a preliminary memo.

TASK 5 – REPORTING

The report will consist of an introduction, methodology, summary of results, and various figures and maps illustrating the results of the completed analyses. The results from all three tasks, including the viewshed analysis, visual simulation, shadow flicker analysis will be incorporated. This report will include a summary of the potential cumulative effects to the visual environment for all three projects. Additionally, a presentation summarizing the key findings of the project will be prepared. The presentation will be delivered to the Council of West Hants to aid in their understanding of the existing and proposed wind energy projects in the area..



VALUE-ADD WEB APPLICATION

Dillon has significant experience in the use of ESRI desktop (ArcMap, ArcPro) ArcGIS Online, and ArcGIS Enterprise (Portal for ArcGIS) to analyze, manage, and visualize GIS data in an online environment and recommends its software for the project data management solution. Web applications are an interactive website where a user can interact with maps, graphs, and slicers to filter views by data sources. A GIS web application can allow a user to view and query multiple datasets, see summary statistics, and change in data over time. It can also allow a user to drill-down on to a particular area (i.e. turbine location) and see data that overlaps that area. This will allow for a user-friendly interface for the users to better understand the potential overlap between proposed turbines and receptors. An example of a previously completed GIS application can be found below. Dillon will use this as a presentation tool during update meetings with West Hants and during the presentation to council.

NUNAVUT LAND USE PLAN FOR NUNAVUT PLANNING COMMISSION

Dillon and SOAR provided database design, spatial analysis, and cartography to support the preparation of the Draft Nunavut Land Use Plan. Various datasets were created, modified, and analyzed in support of the Nunavut Planning Commission's planning team, working collaboratively with their planners and GIS analyst. The Map B Nunavut Land Use Plan application visualizes the valued socio-economic and ecosystem components identified by the Plan. Due to the volume of data overlaid in this map, a hexagon grid was used to summarize the density of components within three different grid levels, while also being able to view the individual components. This application helps proponents locate their potential project area and determine what uses and components it may intersect.

<https://gis.dillon.ca/maps/apps/webappviewer/index.html?id=c5ac7e5cfe56413c8be9dc9d948bcbca>



PROJECT TEAM

Dillon's lead for this Project will be **Jeff Benjamin, B.Sc.**, who will act as Project Manager, and GIS Project Lead. **Dave Creber** will provide Senior Review. Other staff will support the Project, as needed. CVs can be provided upon request.

Dave Creber is a biologist and environmental engineer with over 20 years of experience in leading and managing environmental studies including environmental impact assessments, environmental site assessments and species at risk studies. He has managed several environmental impact assessments for both public and private sector clients throughout Atlantic Canada. He has worked on multiple renewable energy projects throughout Atlantic Canada providing senior technical support and review. Dave is a Partner in our Fredericton, NB Office and will provide senior technical support and review for this project.

Jeff Benjamin is a GIS specialist with a biology degree (focused on ecology) and over 15 years of consulting experience supporting projects across Canada. He has worked on a variety of environmental management, planning, and risk assessment projects including constraints analysis and site selections, environmental impact assessments, environmental protection and monitoring plans, and municipal planning projects. Jeff has considerable experience in GIS providing data management, spatial analysis, and data visualization support on hundreds of projects of varying scope and complexity for numerous disciplines and industries. He has gained substantial experience in the development of specialized tools for efficient, scalable, and consistent data collection and the data integrity of geodatabases, having managed large multi-year field programs for many disciplines. He has extensive experience using LiDAR to complete various GIS analyses. In support of water resources and biophysical projects, he has used it to delineate watersheds, complete floodplain mapping, and predict potential watercourses and wet areas. Jeff is the Technical Group Strategist (TGS) for the national Spatial Information Management (SIM) team.

A low-angle, upward-looking photograph of a white wind turbine against a clear blue sky. The blades are the primary focus, radiating from a central hub.

PROPOSED SCHEDULE

We are available to begin work immediately on this project upon your authorization to proceed. Our understanding is that the project schedule will occur with the following approximate milestones:

- Authorization to Proceed: January 24, 2025;
- Kick-off with West Hants: Week of January 27th, 2025;
- Visual Simulation Field Work: June 2025;
- Draft Report: July 2025; and
- Final report / Council Presentation: August 2025.

Dillon assumes one round of edits to final memos based on comments and feedback from draft memos and comments submitted a minimum of two (2) weeks prior to final report submission deadline.



ESTIMATED COSTS

We are prepared to complete this assignment on a lump sum basis in the estimated amount of **\$60,845.00 (not including HST)**. The estimated level of effort to carry out the above-noted scope of work is provided in **Table 1** below.

Table 1: Estimated Costs by Task

TASK AND DESCRIPTION	ESTIMATED COST (Lump Sum, Excluding HST)		
	LABOUR	EXPENSES	SUBTOTAL FOR TASK
Task 1 – Project Management, Project Kickoff, and Invoicing	\$6,190.00	-	\$6,190.00
Task 2 – Viewshed Analysis	\$12,280.00		\$12,280.00
Task 3 – Visual Simulation	\$18,940.00	\$1,000.00	\$19,940.00
Task 4 – Shadow Flicker	\$9,280.00	\$500.00	\$9,780.00
Task 5 – Reporting	\$11,655.00	\$1,000.00	\$12,655.00
Total Estimated Cost (Lump Sum, Excluding HST)	\$58,345.00	\$2,500.00	\$60,845.00

This proposal was prepared based on our current understanding of the scope of the Project. Dillon would be happy to adjust our proposed scope of work and fees. Any work carried out outside of the specific scope of work identified in this proposal will be considered extra and would be subject to prior written authorization, as appropriate.



ASSUMPTIONS, LIMITATIONS

The proposed Scope of Services, Schedule and Fees for Services are interdependent (meaning a change in one may confer change in another), and are based on the following assumptions and/or limitations:

- West Hants will provide written authorization to proceed by January 24, 2025;
- Access to any properties to complete the visual field work will be coordinated by West Hants;
- An assumption has been made that the field work necessary to complete the visual simulations will require two people working for a total of 30 hours each for a total of 60 hours. If additional field time is identified as necessary due to site access constraints or other issues, Dillon's Project Manager will confirm the need for extended field work with West Hants; and
- Edits/comments will be consolidated in a single round of review by West Hants and shall be for clarification purposes only; alternative interpretations/iterations of analysis are not included.
- We have assumed one presentation will be made to council. Additional, presentations can be made to council or interested parties for additional cost.



REFERENCES

- Municipality of West Hants. (2023). *Municipal Planning Strategy*. Available at:
<https://www.westhants.ca/by-laws/west-hants-by-laws/4204-west-hants-municipal-planning-strategy-consolidated-january-10-2023-pdf/file.html>
- Nova Scotia Environment and Climate Change (NSECC). (2017). *A Proponent's Guide to Environmental Assessment*. Available at: <https://novascotia.ca/nse/ea/docs/EA.Guide-Proponents.pdf>
- Nova Scotia Environment and Climate Change (NSECC). (2021). *Guide to Preparing an EA Registration Document for Wind Power Projects in Nova Scotia*. Available at:
<https://novascotia.ca/nse/ea/docs/EA.Guide-Proponents-WindPowerProject>