APPENDIX I
SHADOW FLICKER MODELING RESULTS

Receptor ID	Easting (m)	Northing (m)	Predicted Shadow Hours/Year	Maximum Minutes Per Day
R1	385025	4918758	0:00	0
R2	382079	4916553	0:00	0
R3	383696	4920002	0:00	0
R4	381314	4916545	0:00	0
R5	382753	4916746	0:00	0
R6	384983	4918710	0:00	0
R7	384541	4917239	0:00	0
R8	382309	4917226	0:00	0
R9	381584	4919011	0:00	0
R10	381959	4916170	0:00	0
R11	383637	4917293	6:06	10.5
R12	384967	4918925	0:00	0
R13	381168	4916677	0:00	0
R14	382377	4917246	0:00	0
R15	382807	4918606	16:27	14.4
R16	384895	4918739	0:00	0
R17	381895	4916148	0:00	0
R18	384040	4917207	1:39	5.61
R19	381732	4916065	0:00	0
R20	383465	4917450	8:10	13.3
R21	382079	4918379	5:21	7.68
R22	382131	4917432	15:43	13.68
R23	381155	4917050	0:00	0
R24	381850	4917978	5:25	8.5
R25	383740	4918149	17:08	14.21
R26	384343	4919018	3:43	6.6
R27	384674	4917722	0:00	0
R28	381908	4918597	1:48	6.08
R29	382118	4918251	10:05	9.9
R30	383853	4920086	0:00	0
R31	384734	4918871	1:21	5.44
R32	381179	4917174	1:31	5.44
R33	381678	4919395	0:00	0
R34	381164	4917110	0:00	0
R35	384679	4918874	1:30	5.78
R36	381719	4919185	0:00	0
R37	383909	4917806	0:00	0
R38	383719	4919946	0:00	0
R39	384386	4918972	2:57	6.6
R40	382287	4917300	0:00	0
R41	381712	4919326	0:00	0
R42	381586	4917317	2:53	7.14
R43	382901	4918908	0:00	0
R44	384768	4918859	1:16	5.44
R45	383880	4918145	10:05	12.92
R46	381137	4917086	0:00	0
R47	381115	4917083	0:00	0
R48	381885	4918864	1:48	5.94
R49	381036	4917114	0:00	0
R50	383335	4919494	0:00	0
R51	381056	4917026	0:00	0
R52	383581	4915929	0:00	0
R53	383429	4920166	0:00	0
R54	382831	4918623	14:47	14.7
R55	382706	4916786	0:00	0
R56	381846	4916125	0:00	0
R57	382478	4917078	0:00	0
R58	381836	4918882	1:41	5.61
R59	383180	4919284	0:00	0
R60	382002	4917513	6:20	10.88
R61	384355	4919015	3:28	6.6
R62	383760	4920066	0:00	0
R63	381819	4917634	7:07	9.62

Receptor ID	Easting (m)	Northing (m)	Predicted Shadow Hours/Year	Maximum Minutes Per Day
R64	381086	4917139	0:00	0
R65	381936	4918105	6:20	9.45
R66	382129	4916529	0:00	0
R67	383532	4915973	0:00	0
R68	381185	4917124	0:00	0
R69	381690	4917429	3:11	7.82
R70	381883	4918650	1:45	6.27
R71	383266	4919542	0:00	0
R72	382044	4917757	0:00	0
R73	381794	4919111	0:00	0
R74	381141	4917099	0:00	0
R75	380960	4917088	0:00	0
R76	382054	4917694	5:53	11.22
R77	381979	4918486	3:06	6.6
R78	381678	4917350	0:00	0
R79	383971	4918091	8:05	11.56
R80	384542	4917221	0:00	0
R81	382089	4916543	0:00	0
R82	384579	4918899	1:50	5.78
R83	381773	4917914	4:46	8.16
R84	383445	4917330	0:00	0
R85	381800	4919010	1:39	5.44
R86	381104	4917150	0:00	0
R87	384413	4918948	2:38	6.27
R88	383792	4920095	0:00	0
R89	381885	4918843	1:50	5.94
R90	381905	4918748	1:49	6.27
R91	383964	4917778	0:00	0
R92	381714	4916397	0:00	0
R93	381895	4918392	1:49	6.27
R94	382311	4917969	0:00	0
R95	383461	4917481	7:59	12.54
R96	383171	4919143	0:00	0
R97	383206	4919346	0:00	0
R98	381556	4918988	0:00	0
R99	383433	4920176	0:00	0
R100	382056	4917741	0:00	0
R101	381062	4917051	0:00	0
R102	383602	4916027	0:00	0
R103	381656	4919427	0:00	0
R104	383192	4919324	0:00	0
R105	383816	4920011	0:00	0
R106	382461	4917074	0:00	0
R107	383623	4917261	7:59	10.8
R108	381837	4916133	0:00	0
R109	382679	4916815	0:00	0
R110	381931	4918129	6:15	9.1
R111	384306	4919877	0:00	0
R112	381914	4918068	6:05	8.84
R113*	383548	4918238	30:56:00	26.25
R114	384863	4918750	0:00	0
R115	383622	4917305	6:09	10.5
R116	382263	4917940	5:02	9.72
R117	384711	4918893	1:24	5.44
R118	381164	4917110	0:00	0
R119	385182	4918446	0:00	0
R120	382938	4918728	0:00	0
R121	383670	4915910	0:00	0
R122	382433	4917153	0:00	0
R123	382883	4918902	0:00	0
R124	380949	4917080	0:00	0
R125	382672	4916792	0:00	0
R126	383985	4918128	7:39	11.22

Receptor ID	Easting (m)	Northing (m)	Predicted Shadow Hours/Year	Maximum Minutes Per Day
R127	381294	4917160	1:55	5.78
R128	385079	4918554	0:00	0
R129	383335	4919522	0:00	0
R130	383738	4920052	0:00	0
R131	384031	4920021	0:00	0
R132	383612	4919927	0:00	0
R133	383482	4919681	0:00	0
R134	381913	4918409	1:53	6.6
R135	383705	4915905	0:00	0
R136	381909	4917882	0:00	0
R137	382079	4917534	7:45	11.9
R138	384517	4918940	2:06	5.94
R139	381200	4917079	0:00	0
R140	382108	4917591	0:00	0
R141	385014	4918938	0:00	0
R142	381562	4919010	0:00	0
R143	382044	4917637	5:59	11.22
R144	381739	4916044	0:00	0
R145	381270	4917154	1:50	5.78
R146	381721	4919384	0:00	0
R147	383521	4919674	0:00	0
R148	382090	4918288	8:54	9.24
R149	382823	4918633	14:00	14.4
R150	382104	4918214	10:32	9.57
R151	382419	4916967	0:00	0
R152	381217	4916691	0:00	0
R153	383807	4920037	0:00	0
R154	383820	4920052	0:00	0
R155	381821	4918678	1:36	5.94
R156	384144	4917470	0:00	0
R157	382932	4916727	0:00	0
R158	385150	4918493	0:00	0
R159	381514	4919035	0:00	0
R160	384320	4917393	1:01	4.76
R161	383225	4919377	0:00	0
R162	383782	4920004	0:00	0
R163	382122	4917771	0:00	0
R164	383870	4920094	0:00	0
R165	383188	4919180	0:00	0
R166	381127	4917156	0:00	0
R167	381796	4917509	8:15	9.25
R168	382150	4916507	0:00	0
R169	381454	4919041	0:00	0
R170	383161	4919229	0:00	0
R171	381659	4919223	0:00	0
R172	383919	4917807	5:24	10.08
R173	382035	4917699	5:33	10.89
R174	384039	4917227	1:38	5.61
R175	382724	4916769	0:00	0
R176	381212	4916624	0:00	0
R177	382936	4916670	0:00	0
R178	381215	4917136	1:40	5.44
R179	383293	4919470	0:00	0
R180	381239	4916704	0:00	0
R181	381307	4916662	0:00	0
R182	381331	4916635	0:00	0
R183	384735	4918899	1:19	5.44
R184	384522	4918908	2:02	5.94
R185	383517	4917314	12:33	12.6
R186	384645	4918896	1:34	5.78
R187	383200	4919307	0:00	0
R188	380975	4917079	0:00	0
R189	382415	4917195	0:00	0

Receptor ID	Easting (m)	Northing (m)	Predicted Shadow Hours/Year	Maximum Minutes Per Day
R190	383516	4916009	0:00	0
R191	383345	4917083	0:00	0
R192	381740	4919362	0:00	0
R193	383654	4920029	0:00	0
R194	383171	4919208	0:00	0
R195	382665	4916834	0:00	0
R196	381734	4917460	7:24	8.88
R197	382757	4916724	0:00	0
R198	381943	4917508	6:39	11.1
R199	381820	4918966	1:42	5.61
R200	385055	4918982	0:00	0
R201	383983	4918149	7:38	11.22
R202	384057	4917191	1:34	5.61
R203	381687	4916309	0:00	0
R204	381150	4916660	0:00	0
R205	382108	4918194	10:03	10.5
R206	381693	4919319	0:00	0
R207	381292	4916578	0:00	0
R208	382776	4916721	0:00	0
R209	384558	4917218	0:00	0
R210	381989	4917526	5:58	10.88
R211	382060	4916560	0:00	0
R212	382512	4917082	0:00	0
R213	383470	4917328	14:54	13.32
R214	382639	4916847	0:00	0
R215	384941	4918713	0:00	0
R216	382466	4917101	0:00	0
R217	383556	4915956	0:00	0
R218	382145	4916524	0:00	0
R219	383646	4915947	0:00	0
R220	384555	4918943	1:55	5.94
R221	381360	4916612	0:00	0
R222	381707	4916236	0:00	0
R223	384920	4918735	0:00	0
R224	383263	4919427	0:00	0
R225	381773	4917482	7:46	9.25
R226	382810	4918640	13:34	14.1
R227	382066	4916585	0:00	0
R228	382450	4917131	0:00	0
R229	383448	4917489	8:16	12.87
R230	382914	4918897	0:00	0
R231	384431	4918924	2:29	6.27
R232	381187	4916588	0:00	0
R233	382590	4916898	0:00	0
R234	384782	4918846	1:14	5.44
R235	382439	4917163	0:00	0
R236	381244	4916692	0:00	0
R237	382079	4918319	7:48	8.4
R238	381881	4918030	5:42	8.84
R239	383729	4919937	0:00	0
R240	382610	4916876	0:00	0
R241	382159	4917461	14:33	14.4
R242	381746	4917920	4:32	7.82
R243	381258	4916613	0:00	0
R244	381631	4919411	0:00	0
R245	385061	4918585	0:00	0
R246	381976	4917520	5:48	10.54
R247	381222	4917198	1:37	5.44
R248	381508	4917342	2:26	6.8
R249	381401	4917281	2:06	6.12
R250	381104	4916860	0:00	0
R251	381966	4917585	5:12	10.85
R252	381944	4917576	9:29	11.1

Receptor ID	Easting (m)	Northing (m)	Predicted Shadow Hours/Year	Maximum Minutes Per Day
R253	381912	4917551	8:52	10.73
R254	381942	4918385	1:58	6.6
R255	381923	4918350	0:00	0
R256	383397	4919672	0:00	0
R257	382220	4917894	0:00	0
R258	383612	4917393	5:06	10.23
R259	382112	4916023	0:00	0
R260	382076	4918160	8:46	10.5
R261	382118	4918098	0:00	0
R262	382022	4918104	7:30	10.15
R263	382662	4918508	0:00	0
R264	381898	4917556	9:06	10.36

*Please note that the guidelines used in the shadow flicker assessment do not apply to R113 as it is associated with a commercial property

APPENDIX J
ELECTROMAGNETIC INTERFERENCE STUDY CORRESPONDENCE

April 15, 2013

Mr. Danny Splettstosser
Whynotts Wind, Limited Partnership
4845 Pearl East Circle, Suite 200
Boulder, CO 80301

Dear Mr. Splettstosser,

RE: Summary Report – Electromagnetic Interference Study (EMI)
Proposed Whynotts Settlement

INTRODUCTION

Strum Consulting have been mandated by JUWI to verify the impact of the deployment of a 2 turbine proposed windfarm on the telecommunication systems operating within the region. This report presents the preliminary results of the impact study, identifying telecommunication systems in the proposed windfarm area that might be affected by interference due to the deployment of the wind turbine generators. The study aims to identify radar and navigation systems, broadcast systems and point to point communications susceptible to be affected by windfarm interference. Consultation zones related to broadcast TV, Radio and TV Reception points have been provided on Figure 2.

The methodologies used in this study are in accordance with the RABC/CanWEA published guidelines.

This assessment has been completed using the coordinates listed in Table A, below, as placement and elevation of the wind turbines.

Turbine ID	X	Y	Ground Elevation (meters)	Nacelle Height (meters)	Rotor Diameter (meters)	Total Height (meters)
WTG1	382281	4917616	98	100	122	259
WTG2	383256	4918189	99.91	100	122	261

Coordinates – UTM Zone 20 North

TELEVISION BROADCAST SYSTEMS

Of the telecommunication systems susceptible to interference from the wind turbine operation, analog television reception is likely to be affected. Analog television interference from wind turbine generally occurs as video distortion taking the form of a movement of the picture synchronized with the blades passage frequency. It should also be noted that analog signal transmission has been predominantly replaced the majority of TV broadcast operators have converted their analog NTSC TV stations to the

ATSC North American digital standard. As required by a decision of the CRTC (Public Notice CRTC 2007-53),

In the case of the Whynotts Settlement site, no analog television broadcast stations were found to be located within the 1 kilometer consultation zone. The nearest station according to the Industry Canada Spectrum Direct database is located 52 kilometers from the proposed windfarm.

Based on the equation $R=0.051*B*\sqrt{T}$, where B is equal to the length of one of wind turbines blades in meters, and T is equal to the number of proposed turbines it has been calculated that receivers of analogue over the air broadcasts within a *4.5 kilometer* radius from the geographical centre of the proposed wind turbine farm would in all likelihood experience some level of static and ghosting on local analog over the air reception; however, most broadcasting and receivers now employ the new digital signal standard as required by a decision of the CRTC (Public Notice CRTC 2007-53) So any negative overall impact to the area should be limited at best.

CBC Radio-Canada

CBC Radio-Canada has introduced specific criteria for assessing the interference of wind turbine generators in relation to its broadcast infrastructure. *(Document: CBC Radio-Canada Involvement and Requirements Concerning Wind Energy*). This document mandates that an inventory of all CBC/Radio-Canada's existing television broadcasting transmitters within 89 kilometres of the project be looked at for potential inference concerns.

CBC Radio-Canada has 5 television transmitter located within the specially requested 89 kilometre consultation zone.

FM BROADCAST STATIONS

Previous studies and simulations in laboratories have shown that FM broadcast reception is generally not affected by the wind turbine operation, as long as a minimum distance of a few hundred meters from the wind turbine is maintained. Perception of FM reception degradation would take the shape of a background "hissing noise" synchronised with the blades rotation.

In the case of the Whynotts Settlement site, no privately owned FM broadcast stations were found to be located within the 1 kilometer consultation zone. The nearest station according to the Industry Canada Spectrum Direct database is located 3.65 kilometers from the proposed windfarm.

CBC Radio-Canada

CBC Radio-Canada has introduced specific criteria for assessing the interference of wind turbine generators in relation to its broadcast infrastructure. *(Document: CBC Radio-Canada Involvement and Requirements Concerning Wind Energy*). This document mandates that an inventory of all CBC/Radio-Canada's existing FM broadcasting transmitters within 5 kilometres of the project be looked at for potential inference concerns.

There are no CBC Radio-Canada FM radio transmitters identified within 5 kilometers of the proposed site.

AM BROADCAST STATION

Just like television signals, AM broadcast signals are amplitude modulated and as such could experience interference from wind turbine operation. However, the AM broadcast systems operate at very low frequency (0.535 – 1.705 MHz) with wavelength much longer than TV signals and thus are not reflected by wind turbine components. The reception of AM broadcast signals will not be affected, unless the receiver is very close to the wind turbine itself (less than a few meters). One should note that the construction of any metallic vertical structure near an AM antenna system (within a few wavelengths) would modify the radiation pattern of the antenna system, as the new structure will react as a secondary radiator. Considering the lightning protection cables within the wind turbine blades, the placement of a wind turbine within proximity of an AM station array might cause serious service disruption.

In the case of the Whynotts site, there are no AM broadcast stations within the proposed windfarm area. The nearest AM broadcast station according to the Industry Canada Spectrum Direct database is located 7.5 kilometers from the proposed windfarm and is operated by *Maritime Broadcast System Limited*.

CBC Radio-Canada

CBC Radio-Canada has introduced specific criteria for assessing the interference of wind turbine generators in relation to its broadcast infrastructure. *(Document: CBC Radio-Canada Involvement and Requirements Concerning Wind Energy*). This document mandates that an inventory of all CBC/Radio-Canada's existing AM broadcasting transmitters within 5 kilometres of the project be looked at for potential inference concerns.

There are no CBC Radio-Canada AM radio transmitters identified within 5 kilometers of the proposed Whynotts site.

RADAR SYSTEMS

Radar systems generally operate in the microwave frequencies from 1 GHz to 10 GHz or more, and use the radio wave reflection to locate and identify any eventual target. Military and civil usage of radar systems is mainly related to air traffic control and meteorology to name a few applications. Any fixed structure in the radar station line of sight will reflect a part of the signal transmitted by the radar back to the radar receiver which will process it. The echo from the structure will be similar to the echo from an aircraft, but will show different particularities designated as its radar signature and processing can differentiate between a structure signature and an aircraft signature, even between two different types of aircraft.

When the structure is fixed, filtration and processing can generally eliminate the structure signature from the radar display, reducing the impact for the radar operator. The navigational radar, especially the long range radar, typically have a slight positive antenna elevation angle, such that structures far enough from the radar station are not visible from the radar station position and generally do not cause any significant radar response. Moving structures like wind turbine cause important disturbance to radar operation, since the signature is continuously changing according to rotor speed and wind

direction. Especially when many wind turbines are clustered in relatively large wind farms, the filtration and processing of these radar echoes become virtually impossible.

The meteorological radars operate in the same way and attempt to measure the cloud density and precipitation as close as possible to the earth surface. In order to achieve a larger coverage area, they are usually installed on higher platforms and their antenna elevation angles are generally close to the horizon and sometime negative, depending on local topography. The presence of fix structures can be dealt with in the same way as for the navigational radar, however since the radar beam is grazing the earth surface, echo from structure even over the horizon are often seen. Attempts to develop filtration and complex processing to cancel the responses from moving structures like wind turbine have been made with disappointing results.

Based on the RABC/CANWEA guidelines, a consultation zone of 60 km radius is required around the Air Traffic Control (ATC) radar stations and around Canadian Coast Guard (CCG) radar station, while an 80 km radius consultation zone is required around the meteorological radar stations. Similarly, the Department of National Defence (DND) requires a 100 km consultation zone around the defence radar stations.

DND AIR DEFENCE AND AIR CONTROL RADAR SYSTEMS

The role of the Canadian Air Defence System is to provide aerospace surveillance, thereby contributing to the defence of North America, through radar systems located throughout Canada's artic, coastal and inland regions. The Department of Nation Defence was contacted to evaluate if potential interference with their installations would be caused by the proposed windfarm.

DND has no objections to the proposed windfarm (see attached correspondence).

DND Radio Communications

DND was also contacted to inquire about potential interference to their radio communications network. A response was received on September 14, 2012 from Mario Lavoie, Spectrum Engineering Technician stated:

"I have reviewed your proposal in respect to DND's radio communication systems, and I have no objections or concerns."

Canadian Coast Guard

The Canadian Coast Guard was contacted to evaluate the project for potential interference in regard to their vessel traffic system radars

To date no response has been received.

Royal Canadian Mounted Police (RCMP)

A request has been forwarded to the RCMP in regard to potential interference with their communication

systems.

To date no response has been received.

VOR AND PRIMARY AIR TRAFFIC CONTROL (ATC) SURVEILLANCE RADAR

The VOR (VHF Omnidirectional Range) use frequencies in the 108-118 MHz band and a combination of amplitude and frequency modulation to facilitate aircraft short-range navigation. The VOR ground stations are generally located within the boundaries of airports but are sometimes located along main navigation corridors for en-route navigation. A clear area of approximately five hundred meters around ground stations should be maintained for proper operation and precision of the airborne receiver. Tall buildings or structures should be avoided at larger distance from the station to avoid distortion of the variable azimuth signal. Previous investigation has shown that wind turbine structures can be considered as static structures regard to VOR operation and the Transport Canada Aeronautical Obstruction Clearance should be obtained as for any other tall structure.

There is one VOR station located approximately 16 kilometers southeast of the proposed wind farm area. A request has been submitted to NavCanada to assess the potential impact of the proposed wind farm on the Halifax (YHZ) airport VOR and primary surveillance radar.

NAVCanada has no objections to the project as proposed (see attached correspondence).

ENVIRONMENT CANADA

A request has been made to Environment Canada (EC) to assess for potential interference with their weather radar installations.

Environment Canada has no objections to the project as proposed (see attached correspondence).

NATURAL RESOURCES CANADA

Natural Resources Canada operates a network of seismic monitoring stations throughout Canada. A request has been send to Natural Resources to determine if any potential interference from the proposed windfarm exists.

To date no response has been received.

Point to Point Systems

The CanWEA/RABC Guidelines recommend a consultation zone within a 1 km radius around the transmit and receive sites for point to point type radio systems, and a cylinder around the transmission path, with a diameter determined as a function of the Fresnel zone.

A total of 245 search results were identified as point to point radio systems. These results were paired using the call sign field. Where call signs were not available pairing was completed based on Owner and TX/RX frequency pairing. One tower was identified to be within the 1 km consultation zone. This

tower has a call sign of XJN809 and is owned by the local Fire Department. The next closest tower is located 3 km away from the project centre and is owned by The Town of Bridgewater Public Works and is listed as call sign VAC593. Figure 1 (attached) provides the locations of all towers identified within a 10 km radius of the proposed site centre.

CLOSURE

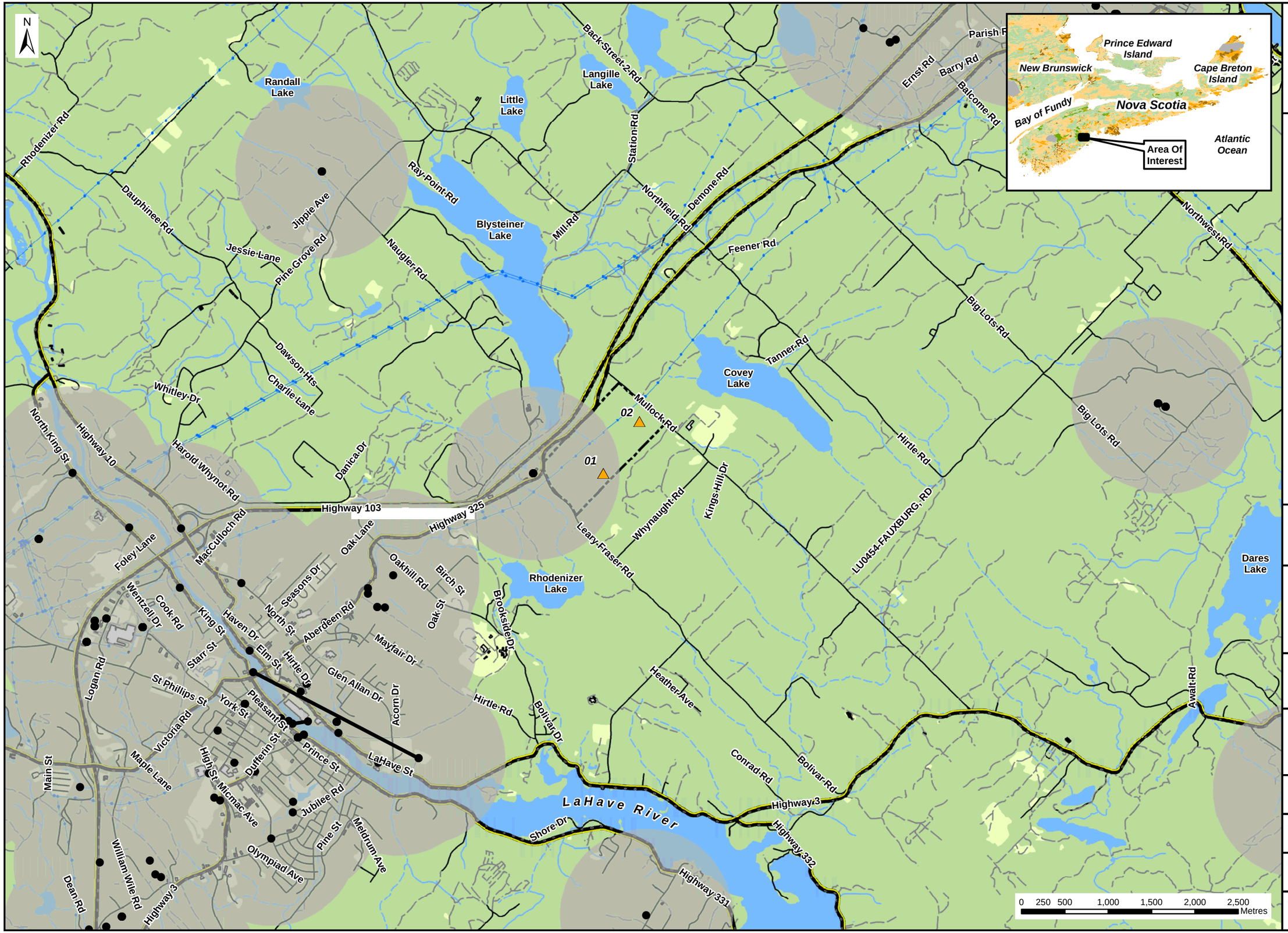
Should additional information become available, Strum requests that this information be brought to our attention immediately so that we can re-assess the conclusions presented in this report. This report was prepared by Chris Gallivan, Environmental Specialist and reviewed by Shawn Duncan, Vice President.

If you have any questions, please do not hesitate to contact us.

Thank you,

Chris Gallivan
Environmental Specialist
cgallivan@strum.com

Shawn Duncan
Vice President
sduncan@strum,com



Notes:

1. Reference: Digital Topographic Mapping By Nova Scotia Geomatics Centre. Radio Tower Locations Obtained Through Industry Canada Website (http://sd.ic.gc.ca/).
2. Projection: NAD83(CSRS), UTM Zone 20 North.

Legend:

- Proposed Turbine
- Point-To-Point Radio Tower
- Point-To-Point Link
- 1 km Consultation Zone
- Project Site Boundary
- Major Roads and Highways
- Roads
- Access Roads / Trails
- Existing Transmission Lines
- Large Structure
- Mapped Stream
- Indefinite Stream
- Water Bodies
- Cleared Area

Point-To-Point Transmission Locations

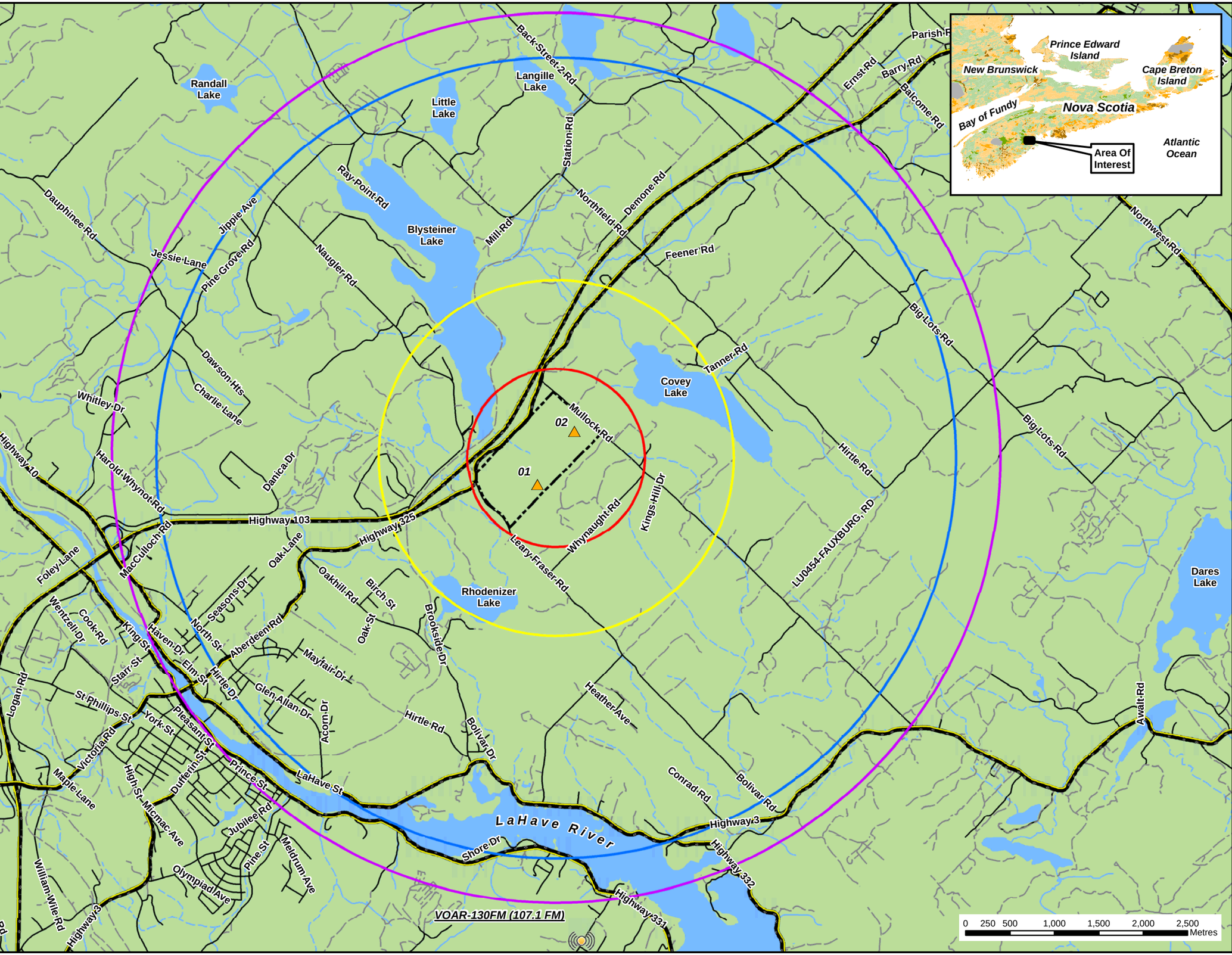
Kwilmu'kw Maw-klusuaqn Negotiation Office
Mi'kmaq Rights Initiative
Our Rights. Our Future.

Community Wind Farms Inc.

juwi

Strum CONSULTING

Date: April 2013	Project #: 12-4329
Scale: 1:40,000	Drawing #: 1
Drawn By: H. Serhan	
Checked By: C. Gallivan	



Notes:

1. Reference: Digital Topographic Mapping By Nova Scotia Geomatics Centre.
2. Projection: WGS84, UTM Zone 20 North.

Legend:

- Proposed Turbine
- Radio Tower
- Project Site Boundary

Consultation Zones

- Private TV (1km)
- FM Radio (2km)
- Analog TV (4.5km)
- AM & FM Radio - CBC Radio (5km)
- Major Roads and Highways
- Roads
- Access Roads / Trails
- Mapped Stream
- Indefinite Stream
- Water Bodies

Consultation Zones

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Mi'kmaq Rights Initiative
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juwi

Strum CONSULTING

Date:	Project #:
April 2013	12-4329
Scale: 1:40,000	Drawing #: 2
Drawn By: H. Serhan	
Checked By: C. Gallivan	

From: MARIO.LAVOIE2@forces.gc.ca
Sent: October-11-12 1:51 PM
To: Chris Gallivan
Cc: +WindTurbines@forces.gc.ca
Subject: FW: 12-4329 Electomagentic Interference Study - Potiential 2 Turbine Windfarm - Whynotts Settlement Nova Scotia - Review Request
Attachments: Site Plan Whynotts.pdf.pdf.pdf; 12-4329 Whynotts - Google Earth Overview.tif.tif.tif; WEB2010-BP8A04-01 (Air Force Submission Form) 12-4329 Whynots.xls.xls

I have reviewed your proposal in respect to DND's radio communication systems, and I have no objections or concerns.

Thank you for coordinating with DND.

Have a good Day.

Mr. Mario Lavoie
Spectrum Engineering Technician
National Defence | Défense nationale
Ottawa, Canada K1A 0K2
mario.lavoie2@forces.gc.ca
Telephone | Téléphone 613-992-3479
Facsimile | Télécopieur 613-991-3961
Government of Canada | Gouvernement du Canada

From: Chris Gallivan [mailto:CGallivan@strum.com]
Sent: Thursday, 11, October, 2012 11:26 AM
To: Lavoie MJ@ADM(IM) J6 Coord@Ottawa-Hull
Subject: 12-4329 Electomagentic Interference Study - Potiential 2 Turbine Windfarm - Whynotts Settlement Nova Scotia - Review Request

I am conducting an initial investigation into the placement of a potential 2 wind turbine farm in near Whynotts Settlement, Nova Scotia. We are inquiring to see if there would be potential inference with your operations and the proposed wind turbine installation.

The turbine specifications are as follows:

1. 100 meter high tower with a 3 blade rotor (diameter of 122 metres)

I have included the requested Excel sheet which includes the proposed turbine locations, with coordinates and elevations. A map showing the turbines proposed locations has also been included.

If you have any questions or require additional information please do hesitate to contact me directly.

Regards,

Chris Gallivan
Environmental Specialist

From: ADIN.SWITZER@forces.gc.ca
Sent: October-12-12 2:31 PM
To: Chris Gallivan
Cc: JOCELYN.BELAND@forces.gc.ca
Subject: Initial Analysis - No Impact - Outside Consultation Zone(s) - Whynotts Settlement wind project - Whynotts Settlement, NS - WTA-2118
Attachments: WEB2010-BP8A04-01 (Air Force Submission Form) 12-4329 Whynots.xls

Chris,

We have completed the initial analysis of the proposed wind farm under the project name Whynotts Settlement wind project near Whynotts Settlement, NS. We have assigned a DND case number of WTA-2118, please include this number in any future requests related to this site.
The results of our analysis have shown that in relation to the Department of National Defence (DND) consultation zones outlined on our website [http://www.rcaf-arc.forces.gc.ca/8w-8e/units-unites/page-eng.asp?id=691] and in the RABC/CanWEA document Technical Information and Coordination Process Between Wind Turbines and Radio Communication and Radar Systems the site will have no or minimal impact to DND Operations. As such, with respect to the Department of National Defence; Air Traffic Control, Air Defence Radars and DND airports and NAVAIDS we have no objections with your project as submitted (attached below).
If however, the layout were to change/move, please re-submit that proposal for another assessment using the assigned WTA number listed above. The concurrence for this site is valid for 24 months from date of this email. If the project should be cancelled or delayed during this timeframe please advise this office accordingly.
It should be noted that our office looks at each submission on a case by case basis and as such, concurrence on this submission in no way constitutes a concurrence for similar projects in the same area, nor does it indicate that similar concurrence might be offered in another region.
Finally, the concurrence offered in this email extends only to the subject projects and current proponent. Should the project or any part of it be altered, or be sold to another developer, this office must be notified and we reserve the right to reassess the project.
Thank you for your patience on this matter and for considering DND radar and airport facilities in your project development process.
If you have any questions feel free to contact me.
Thank you.
<<WEB2010-BP8A04-01 (Air Force Submission Form) 12-4329 Whynots.xls>> Adin Switzer Capt AEC Liaison Officer
CCISF/ESICC ATESS/ESTTMA Défense nationale | National Defence
8 Wing Trenton, Astra, ON K0K 3W0
TEL: 613 392-2811 Ext4834 (CSN: 827-4834)
FAX: 613 965-3200
Gouvernement du Canada | Government of Canada ü Please consider the environment before printing this email | S'il vous plaît pensez à l'environnement a

From: Weather Radars Contact,National Radar Program [Ontario] <weatherradars@ec.gc.ca>
Sent: October-17-12 12:26 PM
To: Chris Gallivan; Weather Radars Contact,National Radar Program [Ontario]
Subject: RE: 12-4329 Electomagentic Interference Study - Potiential 2 Turbine Windfarm - Whynotts Settlement Nova Scotia - Review Request
Attachments: Whynotts_Summary.txt

Dear Mr. Chris Gallivan,

Thank you for contacting the Meteorological Service of Canada, a branch of Environment Canada, with an update regarding your wind energy intentions.

Our preliminary assessment of the information provided to us via e-mail on October 11, 2012 indicates that any potential interference that may be created by the Whynotts Wind Project near Whynotts Settlement, NS will not be severe. Although we would prefer our radar view to be interference free, this is not always reasonable. As a consequence, we do not have strong objections to the current proposal.

If your plans are modified in any manner (e.g. number of turbines, height, placement or materials) this analysis would no longer be valid. An updated analysis must be conducted.

I have also included the data analysis output as requested.

Please contact us at: weatherradars@ec.gc.ca.

Thank you for your ongoing cooperation and we wish you success.

Best Regards,

Carolyn Rennie
National Radar Program
Meteorological Service of Canada
Environment Canada
4905 Dufferin Street
Toronto, Ontario M3H 5T4
Office : 3N-WS12
Carolyn.Rennie@ec.gc.ca
Phone : 416-739-4931

Carolyn Rennie
Le Programme Nationale de Radar
Service météorologique du Canada
Environnement Canada
4905, rue Dufferin
Toronto, Ontario M3H 5T4
Bureau : 3N-WS12
Carolyn.Rennie@ec.gc.ca
Téléphone : 416-739-4931

From: Chris Gallivan [mailto:CGallivan@strum.com]
Sent: Thursday, October 11, 2012 11:21 AM
To: Weather Radars Contact,National Radar Program [Ontario]

Subject: 12-4329 Electomagentic Interference Study - Potiential 2 Turbine Windfarm - Whynotts Settlement Nova Scotia - Review Request

I am conducting an initial investigation into the placement of a potential 2 wind turbine farm in near Whynotts Settlement, Nova Scotia. We are inquiring to see if there would be potential inference with your operations and the proposed wind turbine installation.

The turbine specifications are as follows:

1. 100 meter high tower with a 3 blade rotor (diameter of 122 metres)

I have included a PDF sheet which include the proposed turbine locations, with coordinates and elevations. A map showing the turbines proposed locations has also been included.

Also if you can forward me the Data analysis Output for inclusion in our report it would be great.

If you have any questions or require additional information please do hesitate to contact me directly.

Cheers,

Chris Gallivan
Environmental Specialist

Strum
ENVIRONMENTAL

Bedford • Antigonish • Deer Lake

Head Office:
Railside, 1355 Bedford Highway
Bedford, NS B4A 1C5

Tel: 902.835.5560 (24/7)
Fax: 902.835.5574
Cell: 902.233.6569
www.strum.com

CONFIDENTIALITY NOTICE
This e-mail, and any files sent with it, is confidential, and is for the use of the intended recipient only. If you have received this e-mail in error, please telephone 902.835.5560 or e-mail the sender, and delete the original. Thank you.

March 26, 2013

Your file
Project 12-4329
Our file
12-4531

Mr. Chris Gallivan
Strum Environmental
Railside, 1355 Bedford Highway
Bedford, NS
B4A 1C5

RE: Wind Farm: 2 turbines - Whynotts Settlement, NS
(N44° 24' 17.8830" W64° 28' 07.9245" / 528.2152' AGL / 856.0152' AMSL)

Mr. Gallivan,

We have evaluated the captioned proposal and NAV CANADA has no objection to the project as submitted.

The nature and magnitude of electronic interference to NAV CANADA ground-based navigation aids, including RADAR, due to wind turbines depends on the location, configuration, number, and size of turbines; all turbines must be considered together for analysis. The interference of wind turbines to certain navigation aids is cumulative and while initial turbines may be approved, continued development may not always be possible.

In the interest of aviation safety, it is incumbent on NAV CANADA to maintain up-to-date aeronautical publications and issue NOTAM as required. To assist us in that end, we ask that you notify us at least 10 business days prior to the start of construction. This notification requirement can be satisfactorily met by returning a completed, signed copy of the attached form by e-mail at landuse@navcanada.ca or fax at 613-248-4094. In the event that you should decide not to proceed with this project or if the structure is dismantled, please advise us accordingly so that we may formally close the file.

If you have any questions, contact the Land Use Department by telephone at 1-866-577-0247 or e-mail at landuse@navcanada.ca.

NAV CANADA's land use evaluation is valid for a period of 12 months. Our assessment is limited to the impact of the proposed physical structure on the air navigation system and installations; it neither constitutes nor replaces any approvals or permits required by Transport Canada, Industry Canada, other Federal Government departments, Provincial or Municipal land use authorities or any other agency from which approval is required. Industry Canada addresses any spectrum management issues that may arise from your proposal and consults with NAV CANADA engineering as deemed necessary.

Yours truly,

Chris Csatlos

Christopher Csatlos
for
David Legault
Manager, Data Collection
Aeronautical Information Services

cc ATLR - Atlantic Region, Transport Canada
CDY6 - DAYSPRING AIRPARK
CDT6 - BRIDGEWATER(SOUTH SHORE REGIONAL HOSPITAL)(HELI)
CLL2 - LANGILLE LAKE(WATER)

APPENDIX K
SOUND MONITORING AND MODELING RESULTS

May 3, 2013

Mr. Judd Rogers
juwi Wind
4845 Pearl East Circle, Suite 200
Boulder, CO 80301
USA

Dear Mr. Rogers,

Re: Existing Sound Level Assessment
Whynotts Community Wind Project, Whynotts Settlement, NS

Strum Consulting was retained by juwi Wind to document existing sound levels at the proposed Whynotts Community Wind Project (the Project) site, near Whynotts Settlement, NS.

Results indicate that the average sound levels over the sampling period were 50.7 and 56.0 dBA at the monitoring locations.

This report provides a brief understanding of the scope, methodology and findings of the assessment.

BACKGROUND

The Project consists of a 4 MW wind power development near the community of Whynotts Settlement, approximately 3.5 km northeast of Bridgewater, Nova Scotia. This sound assessment was completed to establish pre-construction sound levels at two locations on the Project site, in advance of post-construction monitoring.

MONITORING LOCATIONS

Monitoring locations were selected within the Project site boundaries, in areas that are close to receptors (Drawing 1, attached). Efforts were also made to locate the monitoring equipment in open locations where sound attenuation from vegetation and topography would be minimal. Table 1 provides basic information for each monitoring location.

Table 1. Monitoring Locations

Monitoring Location ID	Location Within Project Site	Location Relative to Nearest Receptor	GPS Location	
			UTM Easting	UTM Northing
Whynotts West	Near the western corner of the Project site	0.11 km east of the closest residential receptor	382239 m	4917576 m
Whynotts East	Near the eastern corner of the property	0.13 km west of the closest commercial receptor	383408 m	4918230 m

METHODOLOGY

The assessment was completed using Casella CEL-490 real time noise monitor with data logging capability. At each location, the monitor was kept in a locked weatherproof case, with the microphone supported by tripods at a height of 1.5 m above the ground. The microphone was mounted inside an acoustically transparent weather resistant cage, designed to minimize the effects of environmental noise interferences such as wind and rain.

Each noise monitor was deployed from November 6 to November 12, 2012. Care was taken to locate the equipment in areas where sources of noise contamination (i.e. a stream or power lines) would be minimized.

Each data logger was configured to collect:

- A-Weighted Frequencies (frequency range);
- Slow (S) Time Weighting (response); and
- A sample frequency of 1 minute (sample frequency).

The frequency range for the data runs was 0-140 dB and each logger was calibrated at 114.0 dB at 1 kHz. Each measurement represents the attenuated sound pressure levels collected over 1 minute. These readings were logged every minute over the sampling period at each monitoring location. The data was analyzed to determine a number of parameters, including daytime, evening, and night sound levels. Descriptions of all parameters are attached.

The data are representative of the acoustical environment at the monitoring locations during the monitoring period including all natural and anthropogenic sources of sound, such as wind, wildlife, and traffic.

RESULTS AND DISCUSSION

Results of the assessment are summarized in Table 2.

Table 2. Sound Level Assessment Results

Receptor ID / Parameter (Measured in dBA)	Whynotts West	Whynotts East
LAS_{eq}	56.0	50.7
LAS_{D}	55.0	50.0
LAS_{E}	60.6	52.4
LAS_{N}	54.2	47.1
LAS_{mx}	91.5	82.0
LAS_{mn}	22.0	26.8
LAS_{95}	30.0	31.0

Average Sound Levels (LAS_{eq})

The average sound levels (LAS_{eq}) at both monitoring locations (56.0 dBA and 50.7 dBA) were higher than expected for a rural/sub-urban environment. This is likely attributed to the proximity to both Highway 103 and Route 325 (350 m and 150 m to the northwest of Whynotts West and 380 m and 160 m of Whynotts East).

Daytime vs. Evening vs. Nighttime Sound Levels

Average sound levels during the evening (LAS_E) were higher than the average sound levels observed during the daytime (LAS_D) and nighttime (LAS_N) at both monitoring locations. Daytime levels are typically higher than evening and nighttime levels for a rural / sub-urban area. Data from Environment Canada indicates that there was significant wind activity during the evening hours on November 7th and November 9th, 2012 in the Bridgewater / Lunenburg area (Environment Canada 2012), which may account for higher evening and nighttime sound levels.

Minimum and Maximum Sound Levels (LAS_{mn} and LAS_{mx})

The lowest recorded sound levels occurred early in the morning (between 12:00 and 2:00 am) on November 12, 2012 at both monitoring locations. At this time, wind levels (Environment Canada 2012) and, presumably, traffic levels were low.

The loudest recorded sound level occurred late in the evening on November 7th, 2012 at both monitoring locations. This corresponds with the significant wind activity noted above.

Background Sound Levels (LAS_{95})

The LAS_{95} represents the sound level threshold that is exceeded 95% of the time. This measurement is an objective indicator of background sound levels of an area that are always present. The LAS_{95} calculated at both monitoring locations were similar (30 dBA and 31.5 dBA), and are slightly higher than is typical for rural/sub-urban areas that are not adjacent to large open areas, such as a field or a lake where sound can travel un-attenuated from a multitude of directions.

Predicted Sound Level Exposure vs. Existing Sound Levels

Predictive sound modeling was completed for the Project as part of the Environmental Assessment (EA). Average existing sound level (LAS_{eq}) recorded at the two monitoring locations exceed the predicted Project sound levels at nearby receptors. The highest predicted sound level (during turbine operation) at receptor locations is 45.3 dBA, which is over 5 dBA lower than the lowest average

existing sound level observed (50.7 dBA recorded at Whynotts east). These results indicate that the sound of the turbines will be largely masked by the existing sound levels in the area.

SUMMARY

Sound monitoring was completed at two locations to establish pre-construction sound levels near the perimeter of the Project site. Average sound levels were recorded at 50.7 and 56.0 dBA, which are higher than is typical for rural/sub-urban area, likely because of the Project site's proximity to major transportation roadways. The results indicate that noise from traffic and weather conditions significantly influence sound levels in the area.

Furthermore, the average sound levels recorded exceed the predicted sound levels at nearby receptors, indicating that the sound of the turbines will be largely masked by the existing sound levels present in the area.

If you have any questions, please contact us.

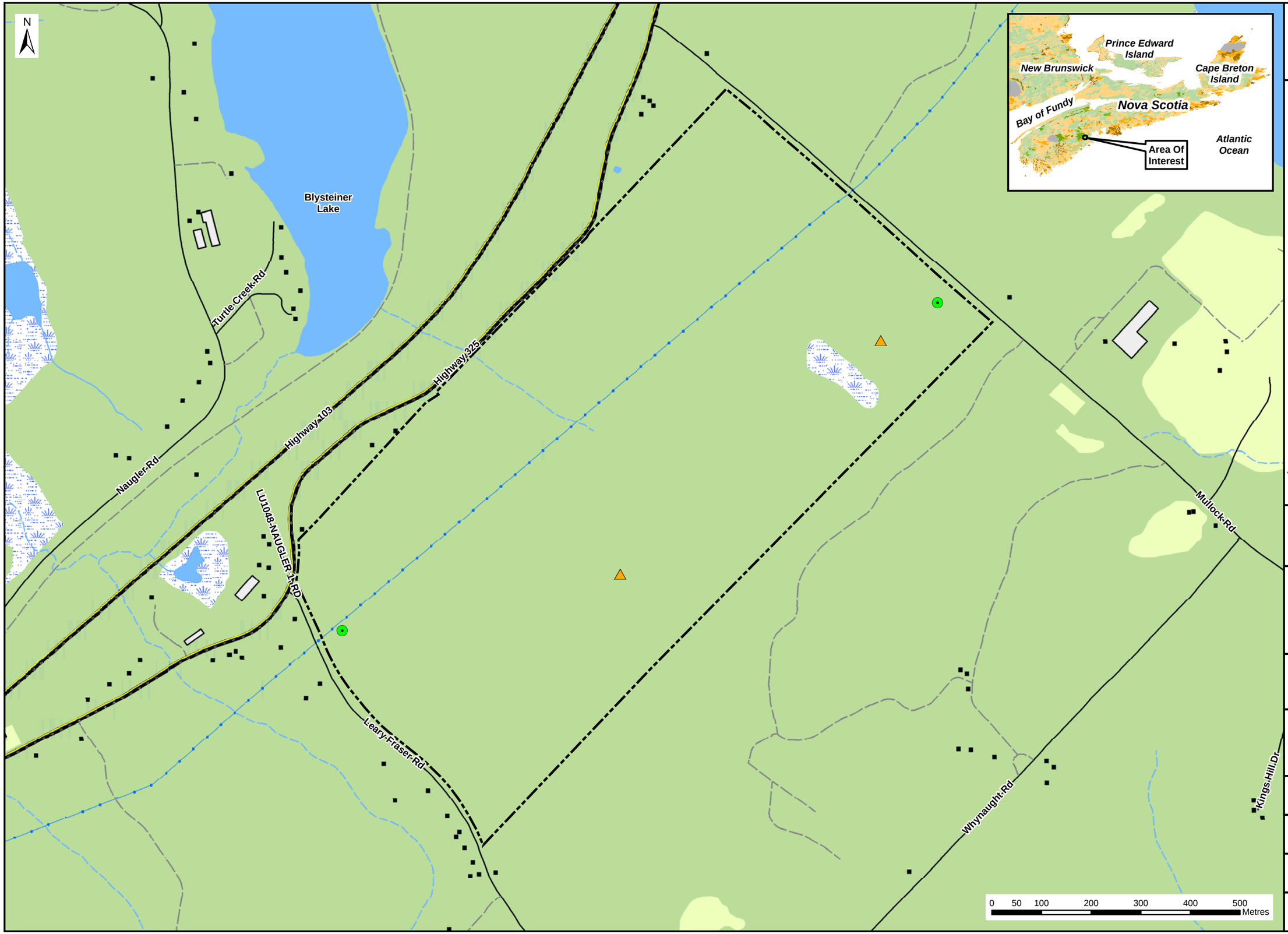
Thank you,

Scott Dickey, MREM
Environmental Specialist
sdickey@strum.com

Shawn Duncan, BSc
Vice President
sduncan@strum.com

REFERENCES

Environment Canada. (2012). National Climate Data Information Archive. Accessed January 2013 from: http://www.climate.weatheroffice.gc.ca/climateData/canada_e.html



Notes:

1. Reference: Digital Topographic Mapping By Nova Scotia Geomatics Centre.
2. Projection: WGS84, UTM Zone 20 North.

Legend:

- Sound Monitor
- Proposed Turbine
- Project Site Boundary
- Building
- Major Roads and Highways
- Roads
- Access Roads / Trails
- Existing Transmission Lines
- Large Structure
- Mapped Stream
- Indefinite Stream
- Water Bodies
- Mapped Wet Area
- Cleared Area

Sound Assessment Locations

Kwilmu'kw Maw-klusuaqn Negotiation Office
Mi'kmaq Rights Initiative
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Community Wind Farms Inc.

juwi

Strum ENVIRONMENTAL

Date:	Project #:
January 2013	12-4329
Scale: 1:7000	Drawing #: 1
Drawn By: H. Serhan	
Checked By: M. Smith	

Table K1: Sound Modeling Results, Whynotts Community Wind Project *Project # 12-4329*

Receptor ID	Easting (m)	Northing (m)	Predicted Sound Level (dBA)
R1	385025	4918759	25.8
R2	382079	4916554	29.8
R3	383696	4920003	25.9
R4	381314	4916546	26
R5	382753	4916747	33.7
R6	384983	4918711	26.2
R7	384541	4917240	28.4
R8	382309	4917227	36.8
R9	381584	4919012	27.6
R10	381959	4916171	27
R11	383637	4917294	35
R12	384967	4918926	25.8
R13	381168	4916678	25.7
R14	382377	4917247	37.8
R15	382807	4918607	38.4
R16	384895	4918740	26.6
R17	381895	4916149	26.6
R18	384040	4917208	31.5
R19	381732	4916066	25.7
R20	383465	4917451	37.7
R21	382079	4918380	33.4
R22	382131	4917433	36
R23	381155	4917051	26.7
R24	381850	4917979	32.8
R25	383740	4918150	38.8
R26	384343	4919019	29.1
R27	384674	4917723	28.6
R28	381908	4918598	31.2
R29	382118	4918252	34.4
R30	383853	4920087	25.2
R31	384734	4918872	27.2
R32	381179	4917175	27.1
R33	381678	4919396	26.4
R34	381164	4917111	26.9
R35	384679	4918875	27.6
R36	381719	4919186	27.5
R37	383909	4917807	35.3
R38	383719	4919947	26.2
R39	384386	4918973	29
R40	382287	4917301	37.2
R41	381712	4919327	26.9
R42	381586	4917318	30.2
R43	382901	4918909	35.3
R44	384768	4918860	27.1
R45	383880	4918146	36.6
R46	381137	4917087	26.7
R47	381115	4917084	26.5
R48	381885	4918865	29.8
R49	381036	4917115	26.1
R50	383335	4919495	29.9
R51	381056	4917027	26.1
R52	383581	4915930	26.2
R53	383429	4920167	25.3
R54	382831	4918624	38.4

Receptor ID	Easting (m)	Northing (m)	Predicted Sound Level (dBA)
R55	382706	4916787	34.1
R56	381846	4916126	26.3
R57	382478	4917079	36.8
R58	381836	4918883	29.4
R59	383180	4919285	31.8
R60	382002	4917514	34.6
R61	384355	4919016	29
R62	383760	4920067	25.5
R63	381819	4917635	32.8
R64	381086	4917140	26.5
R65	381936	4918106	33.3
R66	382129	4916530	29.8
R67	383532	4915974	26.6
R68	381185	4917125	27
R69	381690	4917430	31.3
R70	381883	4918651	30.8
R71	383266	4919543	29.6
R72	382044	4917758	35.3
R73	381794	4919112	28.2
R74	381141	4917100	26.7
R75	380960	4917089	25.7
R76	382054	4917695	35.4
R77	381979	4918487	32.1
R78	381678	4917351	31.1
R79	383971	4918092	35.4
R80	384542	4917222	28.3
R81	382089	4916544	29.7
R82	384579	4918900	28.1
R83	381773	4917915	32.2
R84	383445	4917331	37
R85	381800	4919011	28.7
R86	381104	4917151	26.6
R87	384413	4918949	28.9
R88	383792	4920096	25.3
R89	381885	4918844	29.9
R90	381905	4918749	30.5
R91	383964	4917779	34.6
R92	381714	4916398	27.2
R93	381895	4918393	31.9
R94	382311	4917970	38
R95	383461	4917482	37.9
R96	383171	4919144	33.2
R97	383206	4919347	31.3
R98	381556	4918989	27.5
R99	383433	4920177	25.3
R100	382056	4917742	35.4
R101	381062	4917052	26.2
R102	383602	4916028	26.8
R103	381656	4919428	26.2
R104	383192	4919325	31.5
R105	383816	4920012	25.7
R106	382461	4917075	36.6
R107	383623	4917262	34.9
R108	381837	4916134	26.4

Sound Parameters

- **The LAS_{eq}** – This is the average noise level that contains the same amount of sound energy as the actual fluctuating sound level during the sample period. This represents the average sound level over the duration of the sampling period.
- **The LAS_{D}** – This is the LA_{eq} of the daytime sound levels between the hours of 07:00 and 19:00. This represents the average sound level during the day over the sampling period.
- **The LAS_{E}** - This is the LA_{eq} of the evening sound levels between the hours of 19:00 and 23:00. This represents the average sound level during the evening over the sampling period.
- **The LAS_{N}** - This is the LA_{eq} of the nighttime sound levels between the hours of 23:00 and 07:00. This represents the average sound level during the night over the sampling period.
- **The LAS_{mx}** – This represents the highest 'slow' time weighted sound pressure level expressed in decibels. This represents the highest sound level attenuated over 1 second recorded during the sampling period.
- **The LAS_{mn}** - This represents the lowest 'slow' time weighted sound pressure level expressed in decibels. This represents the lowest sound level attenuated over 1 second recorded during the sampling period.
- **The LTM_{5}** – This is a time average value calculated every 5 seconds that takes the highest level occurring during the preceding five seconds and assumes that it was present for the whole of the 5 second interval. Comparing the LTM_5 with the LA_{eq} gives an objective measure of how erratic the sound level was throughout the sampling period.
- **The LAS_{95}** – This is the sound level in decibels that is exceeded 95% of the time. This parameter is an objective measurement of the average background sound level measured throughout the sampling period.