

Appendix I

Preliminary Transport Management Plan

WOLFE ISLAND WIND PROJECT PRELIMINARY TRANSPORT MANAGEMENT PLAN

for:

**Transport of Turbine Components
Transport of Civil and Electrical Components
Transport of Project Workers**

Submitted To

Canadian Renewable Energy Corporation



Prepared By



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1. PROJECT DESCRIPTION

Canadian Renewable Energy Corporation (“CREC”), a wholly owned subsidiary of Canadian Hydro Developers Inc., is developing a wind generation plant on Wolfe Island, Frontenac County, Ontario, Canada. This transportation Management Plan (“TMP”) summarizes preliminary transportation plans for the following project construction elements:

- Wind turbine components;
- Civil and electrical materials for the construction of roads, foundations, electrical collection systems, electrical substation, and other supporting infrastructure; and
- Contractors equipment and labour for the project.

2. GOAL

This Transportation Management Plan (TMP) has been prepared for to document strategies that are being put in place for safe and effective management of turbine components, civil and electrical materials, equipment and personnel being moved to and from Wolfe Island from within proximity of the City of Kingston surrounding area. The goal of this TMP is to control, manage and ensure safe passage of materials, equipment and personnel; minimize disruption and inconvenience to existing transportation infrastructure users; enhance project communications; and minimize any possible stress on the infrastructure en-route to the site during the construction period.

The TMP will also detail or describe how any potential issues can or will be resolved between the Construction Manager and various stakeholders, for example the Ministry of Transportation, Township of Frontenac and/or Island residents.

3. CONSTRUCTION TRANSPORTATION PLANS

The construction of the Wolfe Island Wind Plant will occur over several months. It has been identified that the Ontario Ministry of Transport Ferry Wolfe Island III will have very limited and possibly no capacity to accommodate the construction project during certain periods. Accordingly peak and shoulder ferry use periods have been identified and the project will arrange and manage additional private barge transport capacity as outlined below.

Additionally, concerns have been expressed about the magnitude of traffic that the construction project could potentially generate on the road network in the City of Kingston. A traffic analysis was done by Stantec (Appendix II) concluding that there should be no issues on the City side in terms of road capacity, which is further ameliorated because CREC plans to focus their transportation systems / facilities / infrastructure outside of the City. To alleviate any concerns, the project intends to adopt the measures outlined below to minimize the impact of construction traffic within the City of Kingston and on the existing ferry.

3.1 Wind Turbine Components

The supply of the wind turbines has been awarded to Siemens Canada Limited. Eighty-six (86) wind turbine/towers will be erected during the period June 2008 through approximately October 2008.

Shipment of components from the European factory will commence early April 2008. The first vessel's arrival will generally coincide with the St. Lawrence Seaway ("Seaway") being open and free of ice. Due to consideration of the quantity, height, weight and length of the components, the Port(s) of Ogdensburg and Prescott have been selected as the primary Ports of discharge for ocean transport vessels. Up to 10 vessels will be required to transport all of the wind turbine components from Europe to the above destination Ports. These will arrive over a period of 20 weeks.

Leased barges will be utilized to transport tractor trailer units carrying turbine components between the Ports of Ogdensburg and/or Prescott and Wolfe Island. To expedite loading and unloading of the barge and minimize sound, the operation will be predominantly a roll-on/roll-off operation at the Winter Dock at Dawson Point, Wolfe Island.

Wind turbine components will be transferred to trucks at Port and delivered to the following location(s) depending on construction and erection requirements:

- a) Directly to the turbine site (preferred option),
- b) Directly to a Wolfe Island temporary Lay-down area, or
- c) Directly to temporary Port storage.

Approximately 750 wind turbine component truck loads will be transported over Wolfe Island roads from the Dawson Point Winter dock to turbine sites during the period May 2008 through till approximately October 2008. Approximately 100-150 of these loads will be conventional truck & trailer configurations. The remainder will utilize specialized transport equipment with the required axle sets to distribute loads. For public safety all non-conventional loads will have front and rear escort or “pilot” vehicles accompany the truck movement on public roads. Refer to Appendix I for turbine component weights and dimensions.

3.2 Electrical Substation Materials

3.2.1 Substation Transformers

The supply of the two 230 kV electrical transformers for the electrical substation has been awarded to Siemens Canada Limited. The arrival is projected for spring 2008. Based on this expected arrival during low traffic period, the Ministry of Transport’s Wolfe Island III ferry would be utilized to transport the transformers across to Wolfe Island’s Dawson point Winter Dock. Road transport of the transformers will be via specialized multi-axle equipment to meet local road conditions. For public safety, front and rear escort or “pilot” vehicles will accompany the truck movement of the transformers on all public roads. Approximately 5-7 conventional truck and trailer loads of accessories and supplies would accompany the transformers.

3.2.2 Structural steel and Electrical Components for Substation

We estimate approximately 10 conventional truck and trailer loads of structural steel. Conventional truck and trailer units with payloads between 40,000-60,000 lbs will be utilized. The majority of these trucks will be transported on a project-leased barge.

3.2.3 Operations/Maintenance/Control Building

We estimate approximately 10 conventional truck and trailer loads will be required to transport structural steel, doors/windows, maintenance crane, prefabricated control building, etc. for this facility. The majority of this will be transported on a project leased barge. Several flat deck and cargo van trucks will be used to transport smaller equipment such as furniture, computer equipment, spare parts, etc.

3.3 Transmission Line Cables

3.3.1 Underground 230 kV Cable

The supply of 230 kV cable has been awarded to Nexans. This underground cabling is being delivered during the 4th Quarter of 2007 and will be stored at CREC's property in Kingston, Ontario. The cable is spooled on 21 reels that will be transported by conventional truck & trailer configuration. Three of these reels will be transported to Wolfe Island in the spring of 2008 for installation and the remaining 18 will be installed on the Kingston mainland between Sand Bay and the Gardner Substation.

3.3.2 Submarine Cable

The submarine cable will be delivered in September 2008 by the ship contracted to lay the cable. The specialized cable is produced in Europe. No land transport is required. The approximately 7.5 km cable weighing an estimated 700 tonnes will be spooled directly onto the specialized ship's stern deck in Norway. The ship will sail to Kingston and this same vessel will lay the cable within the Lower Gap between Wolfe Island and Kingston.

3.4 Civil and Electrical Materials

Conventional truck and trailer units with payloads between 40,000-60,000 lbs will transport the material listed below. In total, it is estimated that there will be 600-700 tractor trailer loads and the majority of the trucks will be transported on a project-leased barge.

- Site 34.5 kV & Communication Cable - Approximately 50-100 truckloads of cabling will be delivered to Wolfe Island.

- Electrical Transformers - Approximately 30 truckloads of smaller transformers will be delivered to Wolfe Island, for installation at each turbine, three transformers per truck.
- Concrete reinforcement - There will be approximately 200 conventional truck and trailer loads of reinforcing steel bar for turbine foundations and substation construction.
- Turbine Foundation Anchor Bolts, steel plates and assemblies - We estimate approximately 20 conventional truck and trailer loads of anchor bolts and related assemblies.
- Pre-cast Concrete Transformer Bases - We estimate approximately 20-25 conventional truck and trailer loads of pre-cast transformer base assemblies will be required on Wolfe Island.
- Cement Powder for Concrete Batch Plant - We estimate approximately 200 conventional truck and trailer loads of cement powder will be required for turbine and substation foundations.
- Equipment and Site Trailers - Road building and construction equipment will be deployed and demobilized throughout the project by various contractors. The Ministry of Transport ferry Wolfe Island III will be utilized during “low” or shoulder seasons only. Outside of low season the project will arrange & manage additional private barge transport capacity.

3.5 Worker Passengers and Light Vehicles

Stantec’s April 2007 report entitled “Wolfe Island Wind Project- Traffic Study” (Appendix II) identified that there is limited light vehicle and passenger capacity on the Ministry of Transport- Ontario’s ferry *Wolfe Island III* during peak summer and shoulder times.

In order to alleviate stakeholder and agency concerns regarding periods of limited ferry capacity, the project intends to operate a bus service from various collection and drop-off points around and outside the City of Kingston. Bus transport capacity will range from 15- 40 passengers per bus. During the off-peak ferry season these buses could use the *Wolfe Island II* ferry. As summer traffic on the existing ferry increases, there are plans to transport the buses and a limited number of light service vehicles between Wolfe Island and greater Kingston utilizing the project leased barges.

Additionally, CREC is considering providing a worker ferry service that could utilize the existing Barrick Street, Kingston ferry dock ramp and the Wolfe Island Dawson Point winter dock during periods of vacancy. This ferry would make one or two trips, morning and night, on a schedule that does not conflict with the *Wolfe Island III*, subject to approval and co-ordination with the MTO. The proposed ferry passenger service will meet all Transport Canada requirements for operating a passenger ferry.

4. PUBLIC ROUTES

Transport operations will be structured to minimize the use of the Wolfe Island III ferry, supporting infrastructure and the Downtown Kingston area during peak and shoulder periods.

4.1 Movement of Wind Turbine Components

To minimize needless traffic and handling, it is proposed that wind turbine components shall be transported directly from international ships to their Wolfe Island turbine sites wherever possible, subject to conditions for operation on the Island.

In the event that internationally arriving components cannot be delivered to their Wolfe Island turbine sites, the fall back positions in order of priority will be delivery to:

- Wolfe Island temporary lay down area for re-delivery by truck to turbine sites;
- Lay down at the Port(s) of Ogdensburg and/or Prescott for re-delivery by private barge and truck to turbine sites.

The exact barge configuration is still under review. It is estimated that each barge trip may transport up to 50% of one complete wind turbine.

4.2 Movement of Electrical and Civil Materials:

The Construction Manager is planning to establish a marshalling yard outside of Kingston for the receipt of most electrical and civil construction materials. Two or three existing jetty/dock facilities west of Kingston are being considered for the marshalling and barge dock. These are located near the LaFarge, Invista and vacant Bombardier sites near Millhaven. A barge shuttle system will transport construction materials predominantly to Wolfe Island's Winter Dock at Dawson Point. The exact barge configuration is still under review. It is estimated that each barge trip may accommodate up to 8 conventional transport trailers

Separate conditions/hours stipulated in the projects Environmental Review as well as all Provincial and township rules and regulations will be observed and enforced with our contractors. A register of project vehicles will be created and maintained. Independent

transport audits of the non-conventional transport loads will be conducted from time-to-time during the project.

4.3 Movement of Workers, Buses and Light Commercial Vehicles

It has been determined that the MTO Ferry Wolfe Islander III has limited capacity to transport worker foot passengers, service vehicles, mini-vans and buses. Accordingly, during peak and shoulder periods identified by Stantec's Traffic Ferry Study Appendix II), the Construction Manager will make arrangements to set up a project worker shuttle system independent of the Wolfe Island III Ferry, taking into account hours of work and parking requirements.

Consideration is being given for establishing one or more worker pickup points in Kingston where workers could park their personal vehicles for the day. Buses would then transport the workers to their Wolfe Island work sites. Contractor vans and trucks would generally remain on Wolfe Island during construction.

We are currently in discussions with major barge contractors such as McKeil regarding the logistics and scheduling of workers and materials transport between the mainland and Wolfe Island. Considerations are being given to worker schedules, safety, sailing times, adverse weather conditions, other lake traffic, summer sailing regattas, etc. Current planning allows for morning transport of workers on buses to Wolfe Island using a barge, followed by one return barge trip between Wolfe Island and Millhaven carrying tractor trailer units, and a return trip with workers on buses in the evening five or six days per week.

5. ROUTE SURVEY

Wolfe Island and Provincial Highways (where applicable):

Route surveys will be conducted by the contracted trucking company for the various wind turbine component loads to identify route or road modifications that may be required. Specific attention will be paid to: the blade trailer for length, the bottom tower trailer for height and width as well as the nacelle and/or transformer trailer for width and mass.

It should be noted that the current standard and or condition of some of the Wolfe Island roads will require upgrading in order to accommodate the equipment and loads being moved. This may include widening, increasing turning radii, improving load bearing capacity, etc. These improvements will benefit the local Island infrastructure at the sole expense of CREC.

All other transported loads will be within Ministry of Transport Ontario guidelines for the operation of regular transport vehicles as governed by their axles/ licensed weight.

6. COMPONENT LIST AND ASSOCIATE TRANSPORT EQUIPMENT

Specification details regarding dimensions and mass of the various wind generation components are contained in Appendix I. Prior to the start of turbine transport the transport service providers will outline the piloting requirements for each of the component loads.

7. TRANSPORT TIMES, RESTRICTIONS AND CONDITIONS

Separate conditions/hours stipulated in the projects Environmental Review as well as all Provincial and township rules and regulations will be observed and enforced with our contractors.

There are no requirements for formal public notification of wind turbine component load movements. However public notification about the movement of non-conventional loads on the Ferry, on local radio and/or in daily/community newspaper(s) are freely offered by CREC and will be provided by the Construction Manager in the interest of public safety, minimization of disruption to other road users and good community relations.

To date no Special Events have been identified along the route for the period wind turbine components are proposed to be carried. Events will be appended and managed in conjunction with their organizer, as they become known.

8. HAZARDOUS MATERIALS AND MATERIAL SAFETY DATA SHEETS

CREC has made inquiries about the existence of hazardous materials amongst the Siemens-supplied components and containers to be handled and carried. Siemens Canada has confirmed that there are no hazardous materials amongst the components to be carried.

Transport vehicles and equipment carry the usual fluids: diesel, transmission fluids, hydraulic fluids, glycol anti-freeze, gasoline, petroleum-based motor oils. Transport service providers will maintain fuel storage on site in containment areas or double-wall tanks and will conform at all times to requirements for emergency response readiness and safe storage and handling of fuels.

All transport vehicles will carry spill kits with drivers and pilots trained in their use. Barging operators will be conversant with procedures to deal with containment, notification and remedy of any spills.

If there is “Transportation of Dangerous Goods” (TDG) then all Transport Canada regulations, including placarding and manifesting of loads will be undertaken.

9. COMMUNICATIONS

The Construction Manager will hold regular meetings for interested parties and stakeholders for the purposes of communicating project progress and provide a forum to raise any concerns.

Additionally a “hotline” as well as list of major contractors will be posted/ provided.

**Appendix I: Summary Table: Wolfe Island Wind Generation
Components and Specifications**

APPENDIX I - Summary: Wolfe Island Wind Generation Components and Specifications

	nit	Description	Unit Dimension 1	Unit Dimension 2	Unit Dimension 3	Unit Weight Tonnes (m.t.)	Trailer Width and Type	Over- Size Placard	Permits	Piloting per Truck and Trailer
1.	20/40 foot Cntrs.	40-50 units	2.7-2.9mH	12.4 m L	2.45 m W	20-25 m.t.	2.5 m Std	No	N/A	None
2.	Hubs for blade <i>(Complete With 1 Separate Nose Cone Pallet)</i>	86 units <i>(Plus one pallet/Hub)</i>	3.0 m H <i>(3.0 m H)</i>	3.90 m L <i>(3.3 m L)</i>	3.0 m W <i>(2.45 m W)</i>	25.0 m.t. One hub and one pallet per trailer		Yes	-MTO -Frontenac Township -Hydro, other	1 Front x Class 2 Pilot
3.	Blades	261 units	3.2 m H	45.0 m L	2.45 m W	12.0 m.t. One unit per trailer		Yes	-MTO -Frontenac	2 Front pilots 1 Rear Pilot
4.	Bottom Tower Sections	86 units	15.7 m L (Including Foot Bracket)	Top Dia 4.2 m	Bottom Dia 4.5 m	59.5 m.t. One unit per trailer		Yes	-MTO -Frontenac County -Hydro -Other	1 x Class 2 Front pilot 1 x Class 2 Rear pilot
5.	Mid Tower Sections	86 units	27.9 m L (Including Foot Brackets)	Top Dia 4.2 m	Bottom Dia 4.2 m	59.2 m.t. One unit per trailer		Yes	-MTO -Frontenac County -Hydro -Other	1 x Class 2 Front pilot 1 x Class 2 Rear pilot
6.	Top Tower Sections	86 units	37.0 m L (Including Foot Brackets)	Top Dia 2.4 m	Bottom Dia 4.2 m	48.9 m.t. One unit per trailer		Yes	-MTO -Frontenac County -Hydro	1 x Class 2 Front pilot 1 x Class 2 Rear pilot
7.	Nacelles	86 units	11.42 m L (Including Nacelles Transport Frames)	3.5-4.0 m W	3.8-4.2 m H	87.1 m.t. One unit per trailer		Yes	-MTO -Frontenac County -Hydro -Other	1 x Class 1 Front pilot 1 x Class 2 Rear pilot

Appendix II: Stantec's Wolfe Island Wind Project – Traffic Study

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Hamilton ON L8W 3N9
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stantec.com



Stantec

April 19, 2007
File: 160960180

Canadian Hydro Developers, Inc.
c/o 190 Collingwood Street
Kingston, ON K7L 3X8

Attention: Rob Miller, P.Eng., Project Engineer

Dear Mr. Miller:

Reference: Wolfe Island Wind Project—Traffic Study

The proposed Wolfe Island Wind Project on Wolfe Island, ON would result in construction traffic using the Ontario Ministry of Transportation (MTO) Wolfe Island Ferry to construct the wind generators and the island-side transmission lines. Construction is scheduled to commence in the summer/autumn of 2007, after obtaining regulatory approvals and financing. Stantec completed a traffic analysis to determine the spare capacity on the ferry to accommodate the construction traffic.

WIND PLANT CONSTRUCTION TRAFFIC DEMAND

The construction of the Project will require approximately 3,090 person-months of labour, including a peak labour force of about 225 people, and an average labour force of roughly 175 people over a seven-month period. The flow of construction labour passenger car traffic would be from Kingston to Wolfe Island in the morning, returning in the late afternoon. Labourers would be expected to car-pool.

In addition, there would be the transportation of construction equipment and materials by truck expected to be delivered predominantly within the first three months of construction, with equipment returning to Kingston at the completion of the project. Canadian Renewable Energy Corporation (CREC) is currently looking at the possibility to source alternate private transportation to the Island for the estimated 460 tractor trailer loads comprised of, for example, re-bar, electrical cable, transformers, etc. The very large turbine components like blades, nacelles, and towers would be moved privately by the manufacturer, Siemens.

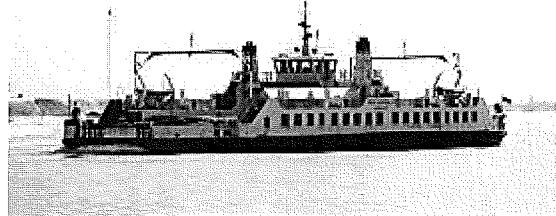
Reference: Wolfe Island Wind Project—Traffic Study

WOLFE ISLAND FERRY SERVICE

The Wolfe Island Ferry runs from the Kingston Terminal located at the intersection of Ontario Street and Barrack Street in downtown Kingston to Marysville (Wolfe Island Village) dock in the summer and Dawson's Point dock in winter on an approximately hourly schedule from 6:15 AM (to Wolfe Island) to 1:20 PM (from Wolfe Island).

The Wolfe Islander III Ferry capacity is as follows:

- 55 cars, end-loading
- Length of car deck—61 metres
- Vehicle height restriction—4.4 metres
- Maximum gross load—as per Highway Traffic Act



IBI Group completed the *Wolfe Island Ferry Service Study* (November 27, 2003) for the MTO examining current ferry usage patterns and establishing future demands for service. The report concluded:

- The total number of vehicles carried per year has been relatively stable from 1980 to 2002—approximately 380,000 to 400,000 vehicles per year
- The existing monthly traffic pattern shows a defined peak in July and August and defined shoulders in May and October
- The ferry service peak periods generally occur weekday mornings to the mainland, weekday afternoons to the island, Saturday morning to the island and Sunday evening to the mainland
- Minor changes could be made to improve access intersections at Kingston and Marysville, but the improvements would not be of sufficient magnitude to significantly impact ferry operations
- During the summer and shoulder months, vehicle volumes are slightly decreasing but passenger volumes are increasing; moderate increases in off-peak demands; and peak spreading during the peak periods and seasons
- Growth in demand was established to range from a low of 0.5% per annum to a high of 1.0% per annum, based on population growth rates for Wolfe Island and the City of Kingston

The MTO provided electronic daily and monthly summaries of trips to and from Wolfe Island by vehicle type for the years 2004, 2005 and 2006, and hardcopy daily traffic logs by vehicle type and trip for the year 2006.

MTO confirmed the following information at a meeting held on March 20, 2007:

April 19, 2007

Rob Miller, P.Eng., Project Engineer

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Reference: Wolfe Island Wind Project—Traffic Study

- There is not only a passenger vehicle capacity of 55 but also a maximum passenger capacity under their Transport Canada license of 339 people including all drivers, passengers, and pedestrians but not crew
- Truck traffic, outside the Tuesday and Friday 6:15 AM Dangerous Goods sailings, are typically straight trucks, not tractor trailers
- MTO staff the ferry 24 hours a day, seven days a week for maintenance and in case of emergencies. Additional sailings outside of the regular schedule have been added previously. There could then be potential issues with noise early in the morning or later at night
- Management of the construction labour force transportation that would increase parking demand at the Kingston or Wolfe Island docks are not reasonable given the high demand that already exists at these facilities. On Wolfe Island, parking demand in Marysville spills over to the adjacent streets and to parking lots within the village such as at the Catholic Church. Parking at the Kingston terminal and Dawson's Point are limited to the dock. At Dawson's Point parking spills onto the shoulders of the adjacent roadway

FERRY CAPACITY FOR LABOURER TRIPS

The 2004, 2005 and 2006 monthly summaries on ferry traffic were reviewed to determine the peak month of travel on the ferry. The truck traffic volumes were converted to passenger car units (pcu's) using a factor of 2.5, i.e. the length of the trucks using the ferry are equivalent to 2.5 passenger cars lengths. The monthly variation in ferry traffic for the years 2004, 2005 and 2006 are illustrated on the attached graphs. As indicated by the IBI report, the peak months are July and August, the shoulder months May and September and the winter months January and February. We selected August 2006, May 2006 and January 2006 to analyze on a trip basis.

The traffic and passenger volumes on the ferry for the trips from Kingston to Wolfe Island for the 6:15 AM, 7:15 AM and 8:30 AM sailings, and for the trips from Wolfe Island to Kingston for the 5:30 PM, 6:30 PM and 7:30 PM sailings were analyzed. MTO confirmed that the Tuesday and Friday 6:15 AM trip to Wolfe Island is for dangerous goods only; no other vehicles are taken on this sailing so these trips were excluded from the analysis (eight trips out of a total of twenty-two weekday trips in August 2006).

The 50th and 85th percentile passenger car units and passengers using the ferry for each sailing during the weekdays and weekends were calculated. In comparing construction traffic to passenger vehicle capacity, it is assumed that the construction labour force would van-pool with a maximum vehicle occupancy of 7 persons (including the driver). The average labour force of 175 people would require 25 vans to transport them to/from Wolfe Island and the peak labour force of 225 people would require 32 vans. The surplus/deficiency for each sailing to accommodate these trips compared to the spare capacity for the 50th and 85th percentile demand was determined to see if the ferry could accommodate the construction vehicles or passengers.

Reference: Wolfe Island Wind Project—Traffic Study

AUGUST 2006—PEAK FERRY DEMAND

The 50th and 85th percentile passenger car units using the ferry for each sailing during the weekdays and weekends in August 2006 are summarized in Table 1 and Table 2, respectively. The 50th and 80th percentile passengers using the ferry are summarized in Table 3 and Table 4. The surplus/deficiency for each sailing to accommodate the labour force is also provided in these tables, i.e., a **negative number** indicates that there is insufficient capacity on that sailing to accommodate the construction vehicles or passengers.

Table 1
Passenger Vehicle Units per Sailing and Spare Capacity, August 2006
Weekdays

Sailing	50 TH Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)		85 th Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)	
			Average Labour Force	Peak Labour Force			Average Labour Force	Peak Labour Force
To Wolfe Island								
6:15 AM	5	50	25	18	7	48	23	16
7:15 AM	30	25	0	-7	40	15	-10	-17
8:30 AM	44	11	-14	-21	54	1	-24	-31
To Kingston								
5:30 PM	47	8	-17	-24	54	1	-24	-32
6:30 PM	36	19	-6	-13	42	13	-12	-19
7:30 PM	24	31	6	-1	42	13	-12	-19

Note: Average Labour Force Demand (pcu)—25 vans; Peak Labour Force Demand (pcu)—32 vans

Reference: Wolfe Island Wind Project—Traffic Study

Table 2
Passenger Vehicle Units per Sailing and Spare Capacity, August 2006
Weekends

Sailing	50 TH Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)		85 th Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)	
			Average Labour Force	Peak Labour Force			Average Labour Force	Peak Labour Force
To Wolfe Island								
6:15 AM	3	52	27	20	9	46	21	14
7:15 AM	16	39	14	18	18	37	12	5
8:30 AM	33	22	-3	-10	49	6	-19	-26
To Kingston								
5:30 PM	50	5	-20	-27	57	0	-25	-32
6:30 PM	41	14	-11	-18	52	3	-22	-29
7:30 PM	40	15	-10	-17	55	0	-25	-32

Note: Average Labour Force Demand (pcu)—25 vans; Peak Labour Force Demand (pcu)—32 vans

Table 3
Passengers per Sailing and Spare Capacity, August 2006
Weekdays

Sailing	50 TH Percentile Demand	Spare Capacity	Surplus (+) / Deficiency (-)		85 th Percentile Demand	Spare Capacity	Surplus (+) / Deficiency (-)	
			Average Labour Force	Peak Labour Force			Average Labour Force	Peak Labour Force
To Wolfe Island								
6:15 AM	7	323	148	98	11	319	144	94
7:15 AM	50	280	105	55	65	265	90	40
8:30 AM	86	244	69	19	118	212	37	-13
To Kingston								
6:30 PM	77	253	78	28	111	219	44	-6
7:30 PM	55	275	100	50	91	239	64	14
8:30 PM	49	281	106	56	74	256	81	31

Note: Average Labour Force Demand —175 passengers; Peak Labour Force Demand —225 passengers

Reference: Wolfe Island Wind Project—Traffic Study

Table 4
Passengers per Sailing and Spare Capacity, August 2006
 Weekends

Sailing	50 TH Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)		85 th Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)	
			Average Labour Force	Peak Labour Force			Average Labour Force	Peak Labour Force
To Wolfe Island								
6:15 AM	5	325	150	100	15	315	140	90
7:15 AM	26	304	129	79	32	298	123	73
8:30 AM	55	275	100	50	84	246	71	21
To Kingston								
6:30 PM	165	165	-10	-60	253	77	-98	-148
7:30 PM	130	200	25	-25	179	151	-24	-74
8:30 PM	139	191	16	-34	196	134	-41	-91

Note: Average Labour Force Demand —175 passengers; Peak Labour Force Demand —225 passengers

The August passenger vehicle capacity is more critical than the passenger capacity of the ferry. During the weekday summer peak demand for the ferry, the Wolfe Island Wind Farm Project average and peak labour force could be transportation from Kingston to Wolfe Island on the Wolfe Island ferry during the 6:15 AM sailing. On Tuesdays and Fridays, when the 6:15 AM sailing is only available for Dangerous Goods, the labour force could be accommodated by the combination of the 7:15 and 8:15 AM sailings. From Wolfe Island to Kingston, the labour force would have to be accommodated by the combination of the 6:30 and 7:30 PM sailings half of the time. During some peak weekdays, it would be difficult to accommodate any of the labour force trips given that the 85th percentile weekday demand meets the capacity of the ferry during August.

If the van-pooling accommodated only 5 people per vehicle, the 6:15 AM sailing could accommodate the 35 passenger vehicles for the average labour force, and 45 passenger vehicles for the peak labour force at the 50th and 85th percentile demand levels. However, the return trip in the afternoon would require more than 2 sailings.

MAY 2006—SHOULDER FERRY DEMAND

The 50th and 85th percentile passenger vehicle units and passengers using the ferry for each sailing during the weekdays and weekends in May 2006 are summarized in Table 5 through Table 8, respectively. The surplus/deficiency for each sailing to accommodate the labour force van-pooling trips is also provided in the tables, i.e., a **negative number** indicates that there is insufficient capacity on that sailing to accommodate the construction vehicles or passengers.

Reference: Wolfe Island Wind Project—Traffic Study

Table 5
Passenger Vehicles Units per Sailing and Spare Capacity, May 2006
 Weekdays

Sailing	50 TH Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)		85 th Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)	
			Average Labour Force	Peak Labour Force			Average Labour Force	Peak Labour Force
To Wolfe Island								
6:15 AM	9	46	21	14	10	45	20	13
7:15 AM	32	23	-2	-9	44	11	-14	-21
8:30 AM	40	15	-10	-17	49	6	-19	-26
To Kingston								
5:30 PM	34	21	-4	-11	42	13	-12	-19
6:30 PM	24	31	6	-1	33	22	-3	-10
7:30 PM	15	40	15	8	26	29	4	-3

Note: Average Labour Force Demand (pcu)—25 vans; Peak Labour Force Demand (pcu)—32 vans

Table 6
Passenger Vehicles Units per Sailing and Spare Capacity, May 2006
 Weekends

Sailing	50 TH Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)		85 th Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)	
			Average Labour Force	Peak Labour Force			Average Labour Force	Peak Labour Force
To Wolfe Island								
6:15 AM	6	49	24	17	7	48	23	14
7:15 AM	19	36	11	4	23	32	7	0
8:30 AM	23	32	7	0	28	27	2	-5
To Kingston								
5:30 PM	42	13	-12	-19	49	6	-19	-26
6:30 PM	32	23	-2	-9	39	16	-9	-16
7:30 PM	28	27	2	-5	34	21	-4	-11

Note: Average Labour Force Demand (pcu)—25 vans; Peak Labour Force Demand (pcu)—32 vans

Reference: Wolfe Island Wind Project—Traffic Study

Table 7
Passengers per Sailing and Spare Capacity, May 2006
 Weekdays

Sailing	50 TH Percentile Demand	Spare Capacity	Surplus (+) / Deficiency (-)		85 th Percentile Demand	Spare Capacity	Surplus (+) / Deficiency (-)	
			Average Labour Force	Peak Labour Force			Average Labour Force	Peak Labour Force
To Wolfe Island								
6:15 AM	12	318	143	93	18	312	137	13
7:15 AM	42	288	113	63	66	264	89	-21
8:30 AM	68	262	87	37	89	241	66	-26
To Kingston								
6:30 PM	53	277	102	52	68	262	87	37
7:30 PM	35	295	120	70	56	274	99	49
8:30 PM	21	309	134	84	40	290	115	65

Note: Average Labour Force Demand —175 passengers; Peak Labour Force Demand —225 passengers

Table 8
Passengers per Sailing and Spare Capacity, May 2006
 Weekends

Sailing	50 TH Percentile Demand	Spare Capacity	Surplus (+) / Deficiency (-)		85 th Percentile Demand	Spare Capacity	Surplus (+) / Deficiency (-)	
			Average Labour Force	Peak Labour Force			Average Labour Force	Peak Labour Force
To Wolfe Island								
6:15 AM	9	321	146	96	11	319	144	94
7:15 AM	24	306	131	81	30	300	125	75
8:30 AM	58	272	97	47	82	248	73	25
To Kingston								
6:30 PM	81	249	74	24	110	220	45	-5
7:30 PM	56	274	99	49	65	265	90	40
8:30 PM	29	301	126	76	39	291	116	66

Note: Average Labour Force Demand —175 passengers; Peak Labour Force Demand —225 passengers

As in August, the May passenger vehicle capacity is more critical than the passenger capacity of the ferry. During the weekday shoulder peak demand for the ferry, the Wolfe Island Wind Farm Project average and peak labour force could be transportation from Kingston to Wolfe Island on the Wolfe Island ferry during the 6:15 AM sailing. On Tuesdays and Fridays, when the 6:15 AM sailing is only available for Dangerous Goods, the labour force could be

Reference: Wolfe Island Wind Project—Traffic Study

accommodated by the combination of the 7:15 AM sailing. From Wolfe Island to Kingston, the labour force could be accommodated by the combination of the 6:30 and 7:30 PM sailings.

If the van-pooling accommodated only 5 people per vehicle, the 6:15 AM sailing could accommodate the 35 passenger vehicles for the average labour force, and 45 passenger vehicles for the peak labour force at the 50th and 85th percentile demand levels. However, the return trip in the afternoon would require 2 sailings at the 50th percentile demand levels and 3 sailings at the 85th percentile demand levels.

JANUARY 2006—WINTER FERRY DEMAND

The 50th and 85th percentile passenger vehicle units and passengers using the ferry for each sailing during the weekdays and weekends in January 2006 are summarized in Table 9 and Table 12, respectively. The surplus/deficiency for each sailing to accommodate the labour force van-pooling trips is also provided in the tables.

Table 9
Passenger Vehicle Units per Sailing and Spare Capacity, January 2006
 Weekdays

Sailing	50 TH Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)		85 th Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)	
			Average Labour Force	Peak Labour Force			Average Labour Force	Peak Labour Force
To Wolfe Island								
6:15 AM	6	49	24	17	9	46	21	14
7:15 AM	23	32	7	0	27	28	3	-4
8:30 AM	23	32	7	0	32	23	-2	-9
To Kingston								
5:30 PM	22	33	8	1	29	26	1	-6
6:30 PM	16	39	14	7	21	34	9	2
7:30 PM	12	43	18	11	17	38	13	6

Note: Average Labour Force Demand (pcu)—25 vans; Peak Labour Force Demand (pcu)—32 vans

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Reference: Wolfe Island Wind Project—Traffic Study

Table 10
Passenger Vehicle Units per Sailing and Spare Capacity, January 2006
Weekends

Sailing	50 TH Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)		85 th Percentile Demand (pcu)	Spare Capacity (pcu)	Surplus (+) / Deficiency (-) (pcu)	
			Average Labour Force	Peak Labour Force			Average Labour Force	Peak Labour Force
To Wolfe Island								
6:15 AM	2	53	28	21	4	51	26	19
7:15 AM	9	46	21	14	14	41	16	9
8:30 AM	14	41	16	6	25	30	5	-2
To Kingston								
5:30 PM	16	39	14	7	22	33	8	1
6:30 PM	16	39	14	7	29	26	1	-6
7:30 PM	15	40	15	8	18	37	12	5

Notes: Average Labour Force Demand (pcu)—25 vans; Peak Labour Force Demand (pcu)—32 vans

Table 11
Passengers per Sailing and Spare Capacity, January 2006
Weekdays

Sailing	50 TH Percentile Demand	Spare Capacity	Surplus (+) / Deficiency (-)		85 th Percentile Demand	Spare Capacity	Surplus (+) / Deficiency (-)	
			Average Labour Force	Peak Labour Force			Average Labour Force	Peak Labour Force
To Wolfe Island								
6:15 AM	8	322	147	97	14	316	141	91
7:15 AM	33	297	122	72	45	285	110	60
8:30 AM	40	290	115	65	50	280	105	55
To Kingston								
5:30 PM	46	284	109	59	61	269	94	44
6:30 PM	33	297	122	72	47	283	108	58
7:30 PM	24	306	131	81	31	299	124	74

Note: Average Labour Force Demand —175 passengers; Peak Labour Force Demand —225 passengers

Reference: Wolfe Island Wind Project—Traffic Study

Table 12
Passengers per Sailing and Spare Capacity, January 2006
Weekends

Sailing	50 TH Percentile Demand	Spare Capacity	Surplus (+) / Deficiency (-)		85 th Percentile Demand	Spare Capacity	Surplus (+) / Deficiency (-)	
			Average Labour Force	Peak Labour Force			Average Labour Force	Peak Labour Force
To Wolfe Island								
6:15 AM	3	327	152	102	4	326	151	101
7:15 AM	11	319	144	94	21	289	114	64
8:30 AM	27	303	128	78	39	291	116	66
To Kingston								
5:30 PM	34	296	121	71	49	281	106	56
6:30 PM	33	297	122	72	52	278	103	53
7:30 PM	30	300	125	75	38	292	117	67

Note: Average Labour Force Demand —175 passengers; Peak Labour Force Demand —225 passengers

As in August and May, the January passenger vehicle capacity is more critical than the passenger capacity of the ferry. During the weekday winter peak demand for the ferry, the Wolfe Island Wind Farm Project average and peak labour force could be transportation from Kingston to Wolfe Island on the Wolfe Island ferry during the 6:15 AM sailing. On Tuesdays and Fridays, when the 6:15 AM sailing is only available for Dangerous Goods, the labour force could be accommodated by the 7:15 AM sailing. From Wolfe Island to Kingston, the labour force could be, again, accommodated by one of the afternoon sailings.

If the van-pooling accommodated only 5 people per vehicle, the 6:15 AM sailing could accommodate the 35 passenger vehicles for the average labour force, and 45 passenger vehicles for the peak labour force at the 50th and 85th percentile demand levels. However, the return trip in the afternoon would require 2 sailings at the 50th and 85th percentile demand levels.

TRAFFIC MANAGEMENT DURING CONSTRUCTION

Other techniques to manage the construction traffic demand could be considered. One example is the restriction of construction traffic on the ferry during peak periods such as the Friday before or Monday after a statutory holiday weekend. The contractor should be advised that car/van pooling will be required if the Wolfe Island ferry is to be used to transport the construction labour force. Other strategies that may be considered include busing, work camps, pedestrian-access only, charter ferry service, additional pre- 6:15 AM ferry sailing, various hours and staggered shift work, etc.

CONCLUSIONS AND RECOMMENDATIONS

The passenger vehicle capacity of the Wolfe Island Ferry is more critical than the passenger capacity. The Wolfe Island Ferry can generally accommodate the labour force construction

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Reference: Wolfe Island Wind Project—Traffic Study

traffic associated with the Wolfe Island Wind Project on one or two sailings if van-pooling is employed accommodating 5 to 7 passengers per vehicle. The exception to this is during peak summer months for the trips from Wolfe Island to Kingston in the afternoon. When demand approaches the 85th percentile level, three or more sailings may be required to accommodate the labour force. There is currently no spare capacity during the summer weekends in the afternoon at the 85th percentile demand level.

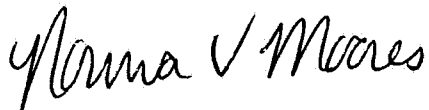
The bidding contractors should be advised that:

- Car/van pooling or buses will be required if the Wolfe Island ferry is to be used to transport the construction labour force
- Arrangements for a private parking area not located at the ferry terminals to allow for car/van pooling or bus pick-up/drop-off will be necessary
- During the peak summer months, two or more sailings will be required to return to Kingston in the afternoon/evening, and summer weekends have no spare capacity to accommodate the construction labour force
- Other strategies as an alternative to using the ferry may be more convenient or cost effective and may be proposed by the Contractor

Please contact me if you have any questions regarding our analysis.

Sincerely,

STANTEC CONSULTING LTD.



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Attachment: Year 2004, 2005 and 2006 Monthly Variations in Ferry Traffic Graphs

c. Kara Hearne, Stantec, Guelph