Appendix A
Results of ACCDC and Associated Screenings

Species of Concern Analysis

Definitions of Rarity Rankings

***Species at Risk Act* - COSEWIC Ranks**	
Endangered	A species facing imminent extirpation or extinction
Threatened	A species likely to become endangered if limited factors are not reversed
Special Concern	A species of concern because of characteristics that make it particularly sensitive to human activities or natural events**.**
Not at risk	A species that has been evaluated and found to be not at risk.
NS Endangered Species Act	
Endangered	A species that faces imminent extinction or extirpation and it listed as an endangered species pursuant to Section 12
Threatened	A species that is likely to become endangered if the factors affecting its vulnerability are not reversed and is listed as a threatened species pursuant to section 12
Vulnerable	A species of special concern due to characteristics that make it particularly sensitive to human activities or natural events and that is listed as a vulnerable species pursuant to section 12
ACCDC Ranks Definitions	
S1	Extremely rare throughout its range in the province (typically five or fewer occurrences or very few remaining individuals). May be especially vulnerable to extirpation.
S2	Rare throughout its range in the province (six to 20 occurrences or few remaining individuals). May be vulnerable to extirpation due to rarity or other factors.
S3	Uncommon throughout its range in the province, or found only in a restricted range, even if abundant at some locations (21 to 100 occurrences).
S4	Usually widespread, fairly common throughout its range in the province, and apparently secure with many occurrences, but the species is of long-term concern, e.g., watch list (100+ occurrences).
S5	Demonstrably widespread, abundant, and secure throughout its range in the province, and essentially ineradicable under present conditions.
SU	Unrankable: Possibly in peril throughout its range in the province, but status uncertain: need more information. Used for new species not previously identified.
SX	Extinct/Extirpated: Believed to be extirpated within the province.
S#S#	Numeric range rank: A range between two consecutive numeric ranks. Denotes uncertainty about the exact rarity of the species, e.g., S1S2.
?	In exact or uncertain: For numeric ranks, denotes uncertainty, e.g., SE? denotes uncertainty of exotic status.
B	Basic rank refers to the breeding population of the element in the province
SE	An exotic established in the province
M	Basic rank refers to the migratory population of the element in the province

NSDNR General Status Ranks	
Undetermined	Species for which insufficient data, information or knowledge is available or reliably evaluate their status.
Blue	No longer in Nova Scotia or extinct in the wild.
Red	Known to be or is thought to be at risk.
Yellow	Sensitive. Species that are not believed to be at risk of immediate extripation or extinction but which may require special attention or protection to prevent them from becoming at risk.
Green	Secure. Species that are not believed to be at risk or sensitive. This category includes some species that have declined in numbers but remain relatively widespread or abundant.

Appendix C - Higgins Species at Risk Table (Short List) Species that are known to occur or may occur within the study area

Common Name	Scientific Name	COSEWIC	NSESA	NSDNR General Status	ACCDC	Habitat	Region	Phenology Window (Plants)
Plants								
Northern Bedstraw	*Galium boreale*			Undetermined	S2	Rich decidous forests and ravines. In fir-birch associations on top of the Cape Breton Plateay. Observed by Schofield et al in a dry un-forested field	CB, observed within 5km of the study area	June-Aug (CB)
Elk Sedge	*Carex garberi*			Red		Wet sandy, gravelly or marshy shores, limestone , seepage areas around bogs. River valleys, calcareous regions, shores and fens, not coastal	Cumberland, Colchester and Hants Counties St. Paul Island CB County, Black River Inv. County	June-Aug (Central)
Stout Wood Reed-Grass	*Cinna arundinacea*			Red		Moist Woodlands, alluvial soils, wet woods, wet meadows, river bottoms	Scattered throughout NS	? (CB)
Blue Cohosh	*Caulophyllum thalictroides*			Red		Deciduous forests, intervale forests, deep rich loam of shady woods	Cambridge Kings County, Kemptown, Colchester County, Inverness, Brooklyn Corner, Hants and Cumberland County	April-early June (Central, CB)
Northern White Cedar	*Thuja occidentalis*			Red		Lakesides, swamps or old pastures, found with Balsam Fir, tamarack in Boreal regions	Digby, Annapolis, Antingonish, Lunenburg, Halifax and Cumberland Counties	All year (Western, Eastern)
Nodding Fescue	*Festuca subverticillata*			Red		Rich deciduous forests, alluvial woods, boreal forests, upland and lowland forests, native forest/woodland	Cape Blomindon, Kings County, Five Mile River in Hants County, Southern Cumberland County	June-early Jul (Central)
Northern Maidenhair-Fern	*Adiantum pedatum*			Red		In fertile or alkaline soils, oak, birch, sugar maple, elm, shady moist soils	Yarmouth to Northern Cape Breton, Meander River Intervale	?? (Western, Central, Eastern, CB)
Proliferous Red Fescue	*Festuca rubra*			Yellow		Pastures, exposed situations in sand and gravel along beaches and in upper zones of salt marshes	Throughout the province	June-Jul (CB)
Lance-Leaf Grape-Fern	*Botrychium lanceolatum*			Yellow		Rich wooded hillsides	Kentville Ravine, Kings County, Colchester and Cumberland Counties, Indian Brook Cheticamp River and Grand Anse in Northern Cape Breton	Jul-Aug (Central, CB)
River Anemone	*Anemone virginiana*			Yellow		Woodland, dry open woods, dry rocky open woods, thickets, river banks, stream sides, calcareous and slatey ledges, shores and thickets	Meander River, Hants County, Colchester and Pictou counties, Northern Cape Breton, Truro area	Early Jul (Central, CB)
Purple False Oats	*Graphephorum melicoides*			Yellow		Gravelly shores and banks especially alkaline areas	Indian Brook, Victoria County, Digby County, Cumberland County to Pictou County	July-Aug (CB)
Yellow-Seed False-Pimpernel	*Lindernia dubia*			Yellow		Sandy pond shores, aquatic, wet areas and muddy areas of streams, drained millponds and gravel pits	Sheffield Mills, Kings County, bottom of Maitland Pond, Lunenburg County, the banks of the River Phillip near Oxford and Wallace River, Cumberland County	Late Jun-Oct (Western, Central)
Halberd-Leaf Tearthumb	*Polygonum arifolium*			Yellow		Thickets, marshy boarders usually under alders, flourishes in the richest alluvial soils	Kings, Colchester and Cumberland counties	Late Jul-Aug (Central)
Acadian Quillwort	*Isoetes acadiensis*			Yellow		Water up to 1 m deep bordering lakes or ponds and occasionally along rivers	Yarmouth County to northern Cape Bretons, Lake Kejimkukik near exist of Grafton Brook	Aug-Oct (West, Central Eastern , CB)
Small-Flower Bitter-Cress	*Cardamine parviflora*			Yellow		Forests, dry woods, shaded or exposed ledges and in sandy soils	The Bay of Fundy from Brier Island to Cape Blomindon and Cape d'Or, Halifax County to Victoria County in Northern Central Cape Breton	April-Aug (West, Central, East, CB)
Marsh Bellflower	*Campanula aparinoides*			Yellow		Damp meadows, swamps, meadows, ditches and river banks	Cumberland and Hants counties to Antingonish County, one location in Cape Breton County	Late Jul-Aug (Central, Eastern, CB)
Pennsylvania Blackberry	*Rubus pensilvanicus*			Yellow		Roadsides, open woodland, thickets, the edges of woods and clearings	Southwestern counties and scattered eastward	June (West, Central, Eastern, CB)
Wood Nettle	*Laportea canadensis*			Yellow		Moist woods, stream banks, alluvial woods of mixed or deciduous trees, floodplains on Cape Breton plateau only the most fertile places	From Coldbrook, Kings County to northwestern Cape Breton	Jul-Sept (Central, Eastern, CB)
Short-Awn Foxtail	*Alopecurus aequalis*			Yellow		Wet meadows, edges of ponds, ditches, muddy edges of rivers and shallow ponds and gravel margins	Top of Cape Blomindon from Cumberland's County to Strahlome and Margaree in Cape Breton	Aug-Sept (Central, Eastern, CB)
Drummond Rockcress	*Arabis drummondii*			Yellow		Slopes not usually in wetlands, rocky woods and moist slopes, dry slopes and talus, occasionally in fertile areas at lower elevations	The head of the Bay of Fundy and northern Cape Breton, Hayfields in Colchester County	May-Jun (Central, CB)
Northern Comandra	*Geocaulon lividum*			Yellow		Moist woods widespread across boreal forest, sterile soils and damp sands in acid or peaty areas	Kingston and Auburn Kings County, Cape Breton and Spicer's Cove Cumberland County	Early May-early Aug (Central, CB)
Yellow Canada Lily	*Lilium canadense*			Yellow		Moist meadows, wood margins, rich moist soils, wet woods , ditches, bogs, meadows and stream banks	Kings and Cumberland counties to Middle River and Margaree in Cape Breton	July (Central, Eastern, CB)
Field Milkwort	*Polygala sanguinea*			Yellow		Moist fields and meadows, poor or acidic fields, damp slopes and open woods or bush	Cumberland, Annapolis, and Kings County	Late June-Oct (Western, Central)
Ebony Sedge	*Carex eburnea*			Yellow		Riparian swamp rocky bluff, ridge tops, calcareous outcrops, top of hills, cliffs and talus slopes, under conifers in calcareous soil	From Cumberland and Hants counties to Antingoinsh and Cape Breton	July-Sept (Central, Eastern)
Invertebrates								
Early Hairstreak	*Erora laetus*			RED		Deciduous woods with beech present	Wentworth Valley and Annapolis Valley	
Monarch	*Danaus plexippus*	Special Concern		YELLOW		Exist primarily where milkweed and wildflowers are present, including abandoned farmland along roadsides and other open spaces where these plants grow	Almost anywhere during the spring migration (going northward). Near larval floodplains during breeding in fall, commonly near Atlantic Coast.	
Hoary Comma	*Polygonia gracilis*			YELLOW		Boreal forests		
Elfin Skimmer	*Nannothemis bella*			YELLOW		Stagnate pools in marshy places		
Prince Baskettail	*Epitheca princeps*			YELLOW		Rivers, streams, lakes, wave washed shores of lakes and slow running streams and rivers		
Zorro Clubtail	*Lanthus parvulus*			YELLOW		Clear streams and brooks		
Greenstripped Darner	*Aeshna verticalis*			YELLOW		Open marshy areas and open fields		
Satyr Anglewing (Comma)	*Polygonia satyrus*			YELLOW		Boreal forests		
Freshwater Mussels								
Squawfoot	*Strophitus undulatus*			RED		Small-medium sized streams and occurring in large rivers in mud, sand or gravel. Rivers and creeks and lakes in all substrates	Cumberland, west Colchester counties, Fundy Coast	

Brook Floater (Swollen Wedge Mussel)	*Alasmidonta varicosa*			YELLOW		Rapids or riffles on rocky or gravel substrates and in sandy shoals mostly in small rivers and creeks. High relief streams among boulders in sand. In creeks and small rivers, fast water on substrate of stable gravel or sandy shoals.	From NS and NB to Carolina	
Eastern River Pearl Mussel (E. Pearl Sh	*Margaritifera margaritifera*			YELLOW		Small-medium rivers, on sandy shoals and in pools with overhanging branches	NL and NS	
Rusty Snaketail	*Ophiogomphus rupinsulensis*			RED		Along rivers, low flowing rivers with diverse substratum		
Brook Snaketail	*Ophiogomphus aspersus*			RED		Clear sand bottom streams with intermittent rapids, sand or gravel substrate, small river floodplain forests.		
Fish								
Pearl Dace	*Margariscus margarita*			YELLOW		lakes, cool bog ponds, creeks and cool springs		
Brook Trout (Char)	*Salvelinus fontinalis*			YELLOW		Spring fed springs with many pools and riffles It is found in a range of waters from tiny ponds to large rivers, lakes, and salt water estuaries	Maritime provinces	
Fourspine Stickleback	*Apeltes quadracus*			YELLOW		Near shore marine species, some inland species occur	Atlantic provinces and Quebec	
Reptiles								
Wood Turtle	*Clemmys insculpta*	Special Concern	Vulnerable	YELLOW	S3	Has been observed within 5km of the study area. It is associated with moving water, frequents streams creeks and rivers. It occupies a great variety of habitats including forests, riparian areas with open canopy. It prefers moderate current, clear streams and drainages. It over winters in water spends it string and fall in or near water and summers on ground	North Central NS	
Birds								
Boreal Chickadee	*Poecile hudsonica*			Green	S3S4	Confirmed breeding by Taylor within 5km of the study area		
Vesper Sparrow	*Pooecetes gramineus*			Yellow	S2S3B	Observed by Taylor as probable breeding within 5km of the study area		
Peregrine Falcon	*Falco peregrinus*	Threatened	Threatened	RED		Lake shores, river valleys, river mouths, urban areas, and open fields	around the Bay of Fundy, Minas Basin, Cumberland, Colchester, Hants, Kings, Victoria and	
Black-crowned Night-Heron	*Nycticorax nycticorax*			YELLOW		Shallow cattail and bulrush marshes, lakeshores and along slow rivers	Migratory in all counties south and including Cumberland, Colchester and Halifax to Yarmouth County	
Brant	*Branta bernicla*			YELLOW		Coastal bays, estuaries, shorelines and agricultural fields	Year round resident in Digby County, migratory in Yarmouth, Shelburne, Pictou Colchester, Cumberland and Kings and Hants counties, along the coast	
Northern Goshawk	*Accipiter gentilis*			YELLOW		Woodlots, forested areas	Scattered throughout NS	
Semipalmated Sandpiper	*Calidris pusilla*			YELLOW		Coastal mudflats, beaches and shorelines, spits and pond shores	Migratory along coast in NS	
Long-eared Owl	*Asio otus*			YELLOW		Breeds in dense coniferous mixed and riparian forests and areas with tall shrubs. In winter in woodlots dense riparian woodlands and hedgerows isolated tree groves in meadows fields cemeteries farmyards or parks	NS	
Short-eared Owl	*Asio flammeus*	Special Concern		YELLOW		Open areas, including grasslands, wet meadows, marshes, fields, airports, forest clearings, muskegs and open bogs	NS	
Purple Martin	*Progne subis*			YELLOW		Semi-open areas including gardens and fields, almost always near water	NS	
Eastern Bluebird	*Sialia sialis*	Not at risk		YELLOW		Cropland fence lines, meadows, fallow and abandoned fields, pastures, forest clearings and edges, golf courses large lawns and commentaries	North and central NS breeding, migratory in southern NS	
Ipswich Sparrow	*Passerculus sandwichensis*			YELLOW		Breeds in agricultural fields, moist sedge and grass meadow, pastures, salt marshes, beaches, dunes, bogs and fens locally in forest clearings. In migration and winter they are found along shorelines, in weedy fields and in overgrown gardens	NS	
Bobolink	*Dolichonyx oryzivorus*			YELLOW	S3B	Confirmed breeding by Taylor within 5km of the study area. Occurs in tall grassy meadows and ditches, hayfields and some croplands; increasingly uses coastal meadowlands and sand dunes with wax myrtle and other low growth	NS	
Common Tern	*Sterna hirundo*			YELLOW		Breeds in natural and human-made islands, breakwaters and beaches. In migration in large lakes, open wetlands and slow-moving rivers	On coastal regions in NS	
Fisher	*Martes pennanti*			YELLOW		Mixed forest	Throughout NS, Mostly in Cumberland, Colchester and Pictou Counties	
Hoary Bat	*Lasiurus cinereus*			YELLOW		Trees along floodplains wooded areas, hang in trees	NS	
Red Bat	*Lasiurus borealis*			YELLOW		Large mature deciduous forest, normally roost in trees occasionally in caves	NS (not CB)	
Silver-haired Bat	*Lasionycteris noctivagans*			YELLOW		Caves, cliff faces, coniferous and deciduous forest, and buildings	NS (not CB)	

Appendix B
Heritage Resource Permit

A2006NS34

Permit No. .....

NOVA SCOTIA
Tourism and Culture

Nova Scotia Museum
Special Places Protection Act,
R.S.N.S. 1989

Application for
Heritage Research Permit
(Archaeology)

(Original becomes Permit when approved by the Executive Director of the Nova Scotia Museum)

The undersigned April MacIntyre

of c/o 6519 Oak Street, Halifax, NS B3L 1H6

representing (institution) Davis Archaeological Consultants Limited

hereby applies for a permit under Section 8 of the Special Places Protection Act to carry out archaeological investigations during the period:

from 1 May 2006 to 31 December 2006

at Higgins Mountain Wind Farm

general location Westchester Station, Cumberland County

specific location(s) (cite Borden numbers and UTM designations where appropriate

.....

.....

and as described separately in accordance with the attached Project Description. Please refer to the appropriate Archaeological Heritage Research Permit Guidelines for the appropriate Project Description format.

I certify that I am familiar with the provisions of the Special Places Protection Act of Nova Scotia, and that I will abide by the terms and conditions listed in the Heritage Research Permit Guidelines for the category (check one).

- ○ Category A - Archaeological Reconnaissance
- ○ Category B - Archaeological Research
- ◉ Category C - Archaeological Resource Impact Assessment

Signature of applicant April MacIntyre **Date** 20 April 2006

Approved:
Executive Director Bill Gealey **Date** May 1/06

NOVA SCOTIA
Tourism, Culture and Heritage
Heritage Division

1747 Summer Street
Halifax, Nova Scotia
B3H 3A6

www.gov.ns.ca

In Reply Please Quote Our File Number:

April 12, 2005

COPY

Ms. April MacIntyre
Davis Archaeological Consultants
c/o 6519 Oak Street
Halifax, NS B3L 1H6

Dear Ms. MacIntyre:

RE: Heritage Research Permit
A2005NS09 – Cobequid Hills Turbines

We have received and reviewed your report on work conducted under the terms of Heritage Research Permit (A2005NS09) for an Archaeological Resource Impact Assessment of the Cobequid Hills Turbines

The report contains the findings of a documentary research phase to assess the archaeological potential for the sites of three proposed wind turbine generation facilities. Based on the research findings, the author recommends that all three projects undergo field assessments.

Staff concur with recommendation. As per your request, a copy of this letter will be sent to Ms. Lori Williams, CBCL Ltd.

If you have any questions, please let me know.

Sincerely,

Robert Ogilvie
Manager, Special Places

c. [redacted]
David Christianson, Nova Scotia Museum
Stephen Powell, Nova Scotia Museum

NOVA SCOTIA
Tourism and Culture

Nova Scotia Museum
Special Places Protection Act,
R.S.N.S. 1989

Application for
Heritage Research Permit
(Archaeology)

(Original becomes Permit when approved by the Executive Director of the Nova Scotia Museum)

Permit No. A2005NS09

The undersigned April D. MacIntyre

of c/o 6519 Oak Street, Halifax, Nova Scotia B3L 1H6

representing (institution) Davis Archaeological Consultants Limited

hereby applies for a permit under Section 8 of the Special Places Protection Act to carry out archaeological investigations during the period:

from 10 March 2005 to 31 December 2005

at Cobequid Hills Turbines

general location Colchester and Cumberland Counties

specific location(s) (cite Borden numbers and UTM designations where appropriate

Springhill E 420617.019673 N5051022.86302; Higgins Mountain E451801.82232 N 5048009.82971; Londonderry E447513.818875 N5036094.766

and as described separately in accordance with the attached Project Description. Please refer to the appropriate Archaeological Heritage Research Permit Guidelines for the appropriate Project Description format.

I certify that I am familiar with the provisions of the Special Places Protection Act of Nova Scotia, and that I will abide by the terms and conditions listed in the Heritage Research Permit Guidelines for the category (check one).

- ○ Category A - Archaeological Reconnaissance
- ○ Category B - Archaeological Research
- ⊙ Category C - Archaeological Resource Impact Assessment

Signature of applicant April D. MacIntyre **Date** 10 March 2005

Approved:

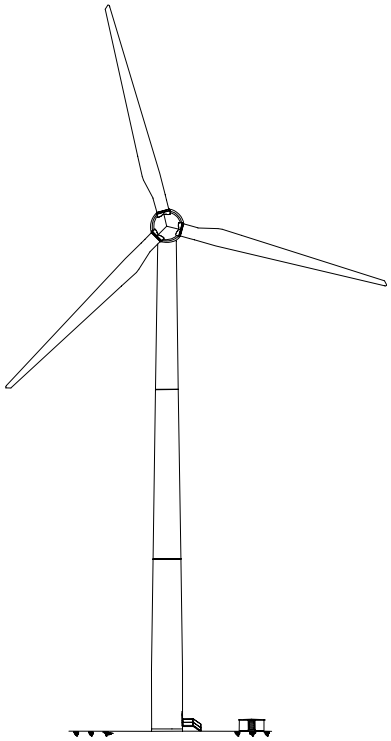
Executive Director Bill Freeman **Date** 16 March 2005

Appendix C
Vensys 62 Technical Description

Vensys 62

1200 kW/ 69 m hub height

Technical Description



VENSYS
Energiesysteme GmbH & Co. KG
Altenkesseler Str. 17 / D2
66115 Saarbrücken
Tel. 0681 / 302 - 6120
Fax 0681 / 302 – 6121

Table of Contents

1. Subject to Change

The following technical description of the VENSYS 62 wind energy converter (WEC) was updated November 2002. Future product development may result in differences in actual versus theoretical specifications and operating data. As such, this document may be subject to change.

2. General Information

The Vensys 62 is a gearless wind energy converter and is equipped with a three-blade rotor, pitch control with a rated output of 1,200 kW. This converter generates electric current that is fed directly into the public grid. Optimum aerodynamic rotor efficiency, at every wind speed, is achieved by using variable speed technology. The 62m rotor diameter and 69m hub height result in an overall height of approximately 100m.

Highlights

Highly efficient multipole generator

- Direct coupling of the multipole generator to the rotor
  - No gearbox required
  - Practical application of advanced technologies

- Synchronous generator with permanent magnet excitation
  - High efficiency, particularly at partial load
  - No energy losses because of an external excitation
  - No sliprings for external excitation needed

- External runner concept (rotor rotates about the stator)
  - Compact design, small generator diameter
  - Light-weight generator

- passive air-cooling system
  - Highly efficient cooling without any additional energy

Blade pitch system and safety system

- Blade pitch system with synchronous belts
  - Lubrication not required
  - Minimum play in blade drive tracks
  - Minimum wear
  - Maintenance free

- Double-layer capacitor for emergency re-pitching
  - No heavy lead-gel accumulators required
  - Brushless pitch motor
  - Increased lifetime
  - Maintenance free

3. Design Towerhead

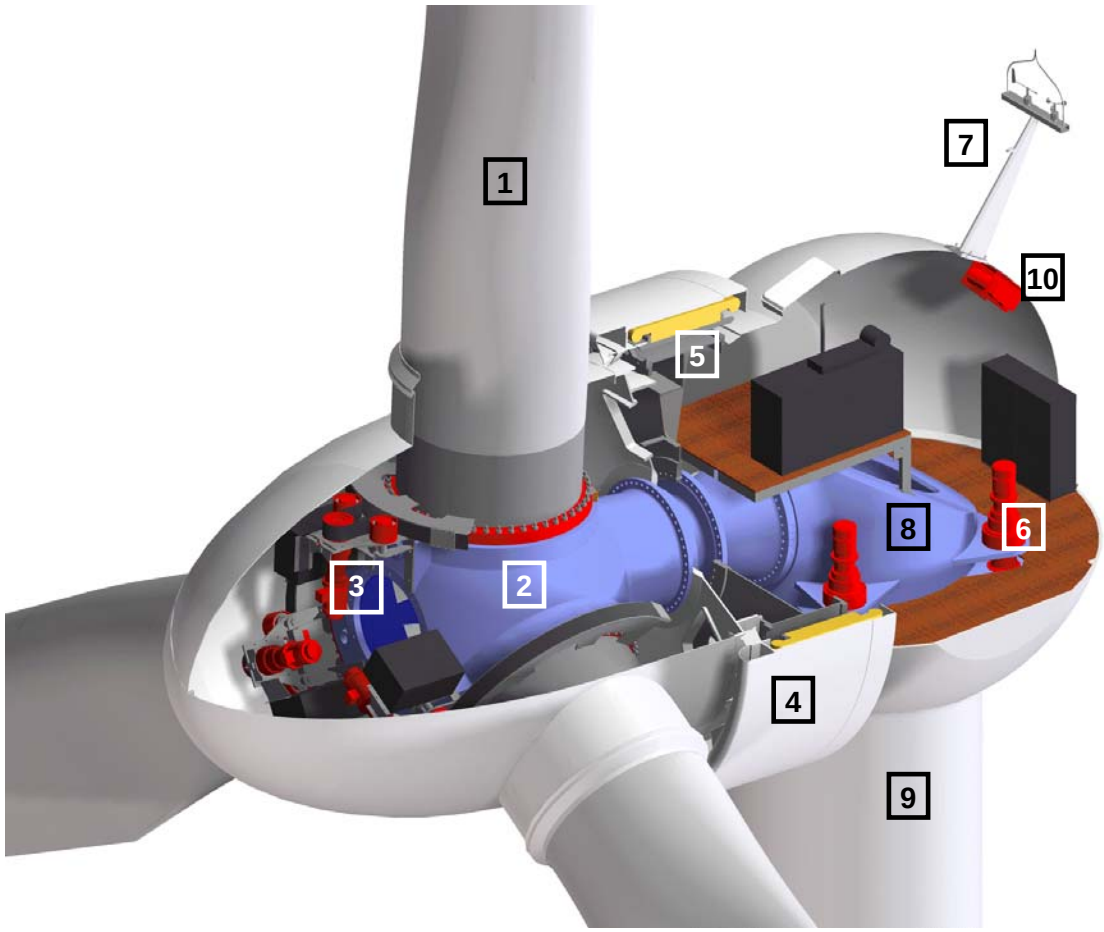


Figure 1: VENSYS Tower Head

1	Rotor Blade	6	Yawing System
2	Casted Hub	7	Wind Measurement System
3	Blade Pitch System	8	Machine Base
4	Generator Rotor	9	Tower
5	Generator Stator	10	Auxiliary Winch

4. Rotor

The VENSYS 62 aerodynamic rotor blades convert translational air motion into a motion of the rotor. This motion is initiated by aerodynamic lift forces.

The WIND ENERGY CONVERTER has a three-bladed rotor that is equipped with active blade adjustment (pitch) technology. The LM Glasfiber A/S manufactured rotor blades (LM 29.1P) are made of reinforced fibreglass, have a rotor diameter of 62 m, and a swept area of 3019 m^2. The blades posses integrated lightning protection. Potential lightning strikes will be conducted from the rotor blade through the tower to the foundation via a spark gap.

Each rotor blade has a pitch bearing that connects the blade to the casted hub. The rotor blades will be automatically pitched according to the wind speed and power output. For maintenance, the rotor can be locked. The rotor is connected to an axle pin by tapered roller bearings. The axle pin itself is affixed to the machine base.

5. Multipole Synchronous Generator

The generator converts the rotational energy of the rotor into electrical energy. It is a multipole synchronous generator with permanent magnet excitation. The turbine rotor drives the generator rotor directly (i.e. no gearbox).

The generator consists of the following components:
- Generator stator with three-phase winding
- Generator rotor with permanent magnets

The generator is fully maintenance and wearfree.

Generator Stator

The generator stator is a welded structure that acts as the supporting structure for the stator core and the three-phase winding.

The supporting structure consists of separate segmental core blanks. To avoid wakes the core blanks are insulated against each other. After insertion of the three-phase winding the stator will be impregnated with high-quality insulating resin. In the back of the stator core cooling fins are punched to increase surface area and heat emission. The patented, passive air-cooling system directs airflow with an air duct directly along the outside of the stator core. This air-cooling system provides the advantage of encapsulating the active electrical components thereby minimizing coil corrosion.

Increasing wind speeds result in increased power generation as well as increased heat production. This heat build up must be cooled away to avoid overheating of the generator. However, the maximum cooling effect is achieved just at high wind speeds. This self-cooling turbine eliminates the need for active fans and pumps.

Generator Rotor

The rotor of the Vensys 62 is placed outside the stator. The use of permanent magnets in combination with the external rotor results in a smaller generator and a smaller external diameter than traditional turbines. Figure 2 compares both technologies. The diameter of the air gap is the same, this means about identical power output for both versions.

The Vensys 62 external rotor is only a few millimetres larger than the air gap diameter while the standard design protrudes to the package height (3) and to the stator supporting structure (2) over the air gap. Generators with smaller external diameter have the advantages of being lighter and easier to transport.

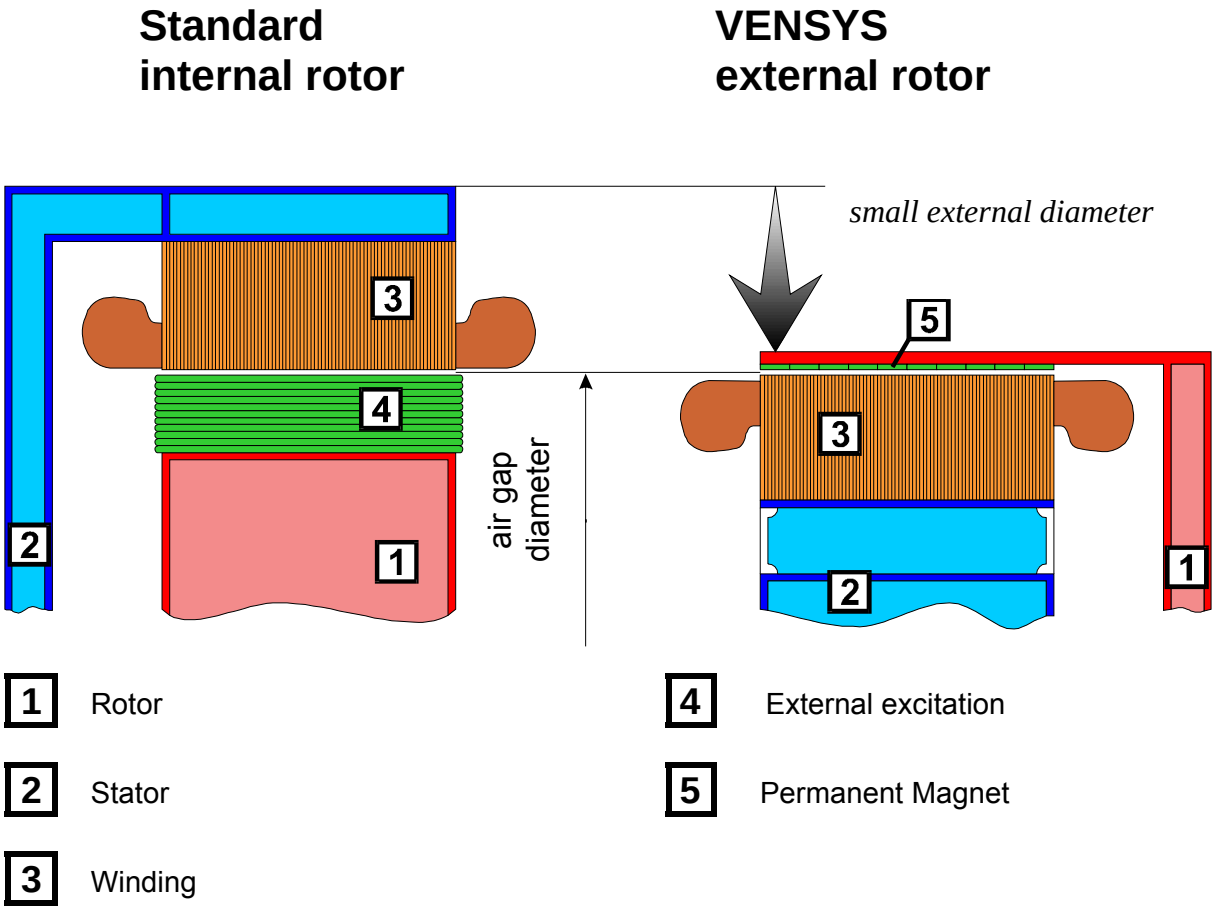


Figure 2: Advantages of VENSYS external rotor

The generator rotor is directly driven by the turbine rotor. By using a direct driven multi-poled synchronous generator the conventional main gear is omitted and many advantages recognized. Gearboxes have been traditionally, particularly on today's megawatt class turbines, sensitive to overloading and premature failure.

Gearboxes are noisy which necessitates expensive noise insulation measures. Gearless units do not require gear oil servicing nor do they produce leaks. Furthermore, there are no gear losses which is a great advantage particularly at partial load. As such, these advantages will result in lower insurance costs, increased turbine lifetime, and lower overall operating and maintenance costs.

6. Frequency Converter

The connection to the public grid is done by a frequency converter system and a transformer. Both components are situated inside the wind turbine so an additional separated transformer, typical for conventional turbines, is not necessary. The frequency converter, has been specially designed for the use together with synchronous generators. It allows a complete separation of the generator operation from the grid conditions. So variable speed operation of generator, in a speed range of 11 to 20 rpm. This provides a better energy yield at partial load. At rated load and above the stuctural loads on the turbine are reduced by this technology.

At the generator output, diode rectifiers are used to voltage peaks (du/dt loads) in the generator windings. The generated direct current is conducted by the tower cable to the control mechanism situated at the base of the tower where the final DC/AC transformation is done. The tower cables are not loaden HF current and as such do not require protection. In addition, two IGBT sets are used on the lower platform to reduce harmonics. This eliminates the use of additional filters.

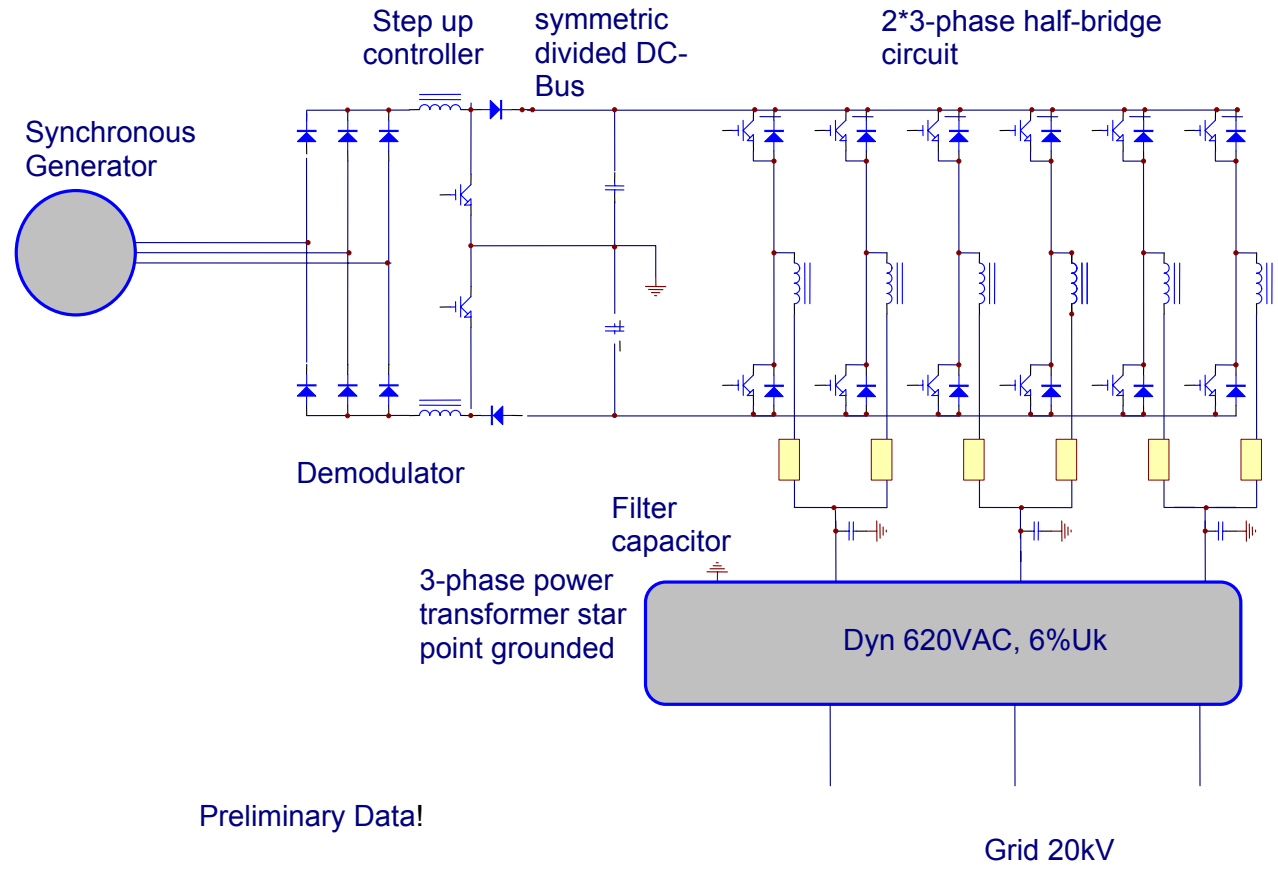


Figure 3: design converter system

This converter system provides the following advantages:

- no torque peaks in case of grid failure
- 50 Hz or 60 Hz line frequency without hardware modification
- No HF-loading of tower cable
- 2 IGBT sets to reduce harmonics
- High variable speed range 11-20 rpm
- Grid connection without contactor, no current peak
- insensitive to grid failure
- High efficiency with diode rectifiers
- Adjustable cos φ
- Power factor control for stabilisation of grid is possible even when the wind energy converter is stopped
- Complies with new EON-directive

7. Blade pitch and brake system

The blade-pitch system of the VENSYS 62 allows each blade to pitch independently. This provides power control and aerodynamic braking capabilities for the WIND ENERGY CONVERTER. At rated wind speed and above the power input of the rotor will be limited by the pitch system to 1,200 kW. This feature avoids overloading of generator and converter system. The controller monitors power output, blade pitch angles and wind conditions as well as variable speed operation to ensure optimal operating performance.

The three blade pitch mechanism of the turbine also serves as a rotor brake. Moving the rotor blades into feathering position reduces the rotor torque and acts as a brake. The blade pitch mechanism consists of three independent electrical drive trains with energy storage and a synchronous belt power train. Each drive train consists of a three phase brushless motor, a converter, a power supply unit, a position sensor and a capacitance storage system.

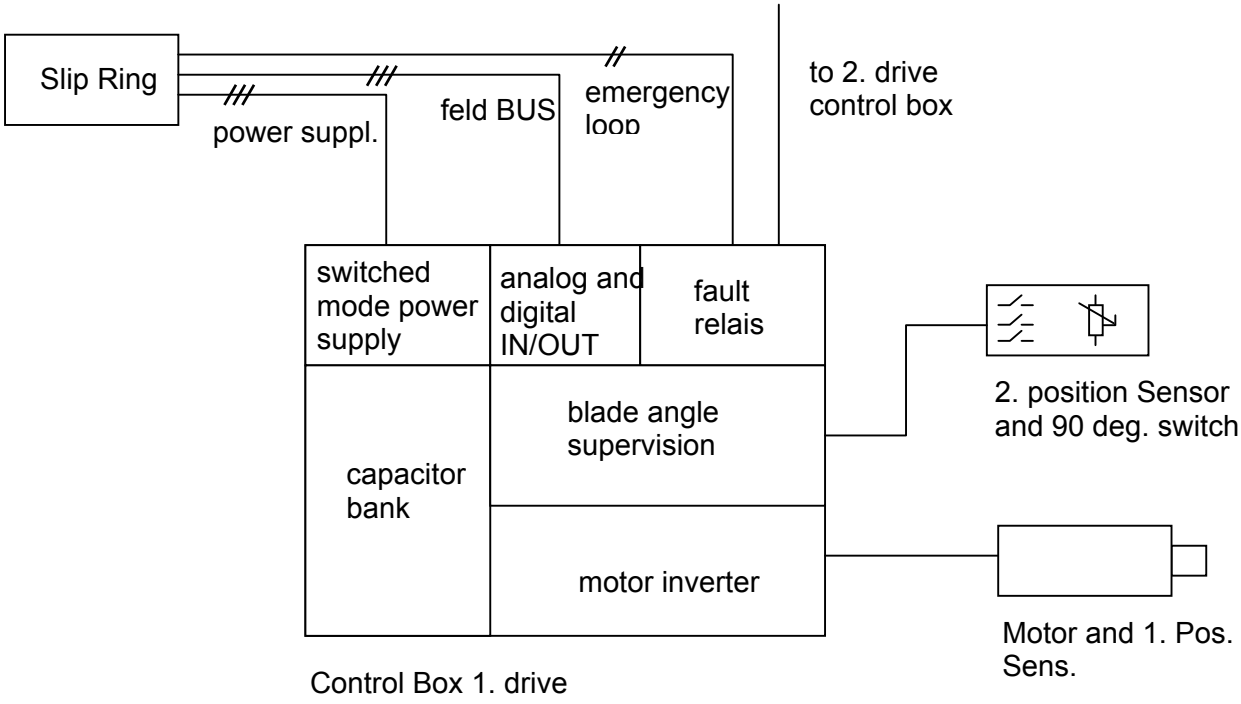


Figure 4: DP Chart pitch drive

The capacitors eliminate the need for heavy lead accumulators. All signals are transmitted by a DC-isolated PROFIBUS port, which is protected against overvoltage. Unique to the VENSYS 62 is the synchronous belt transmission between the drive motor and rotor blade. This connection is insensitive to shock loading because, as opposed to gear transmission, several teeth are always in contact. The synchronous belt does not require lubrication and is insensitive to moisture and dirt.

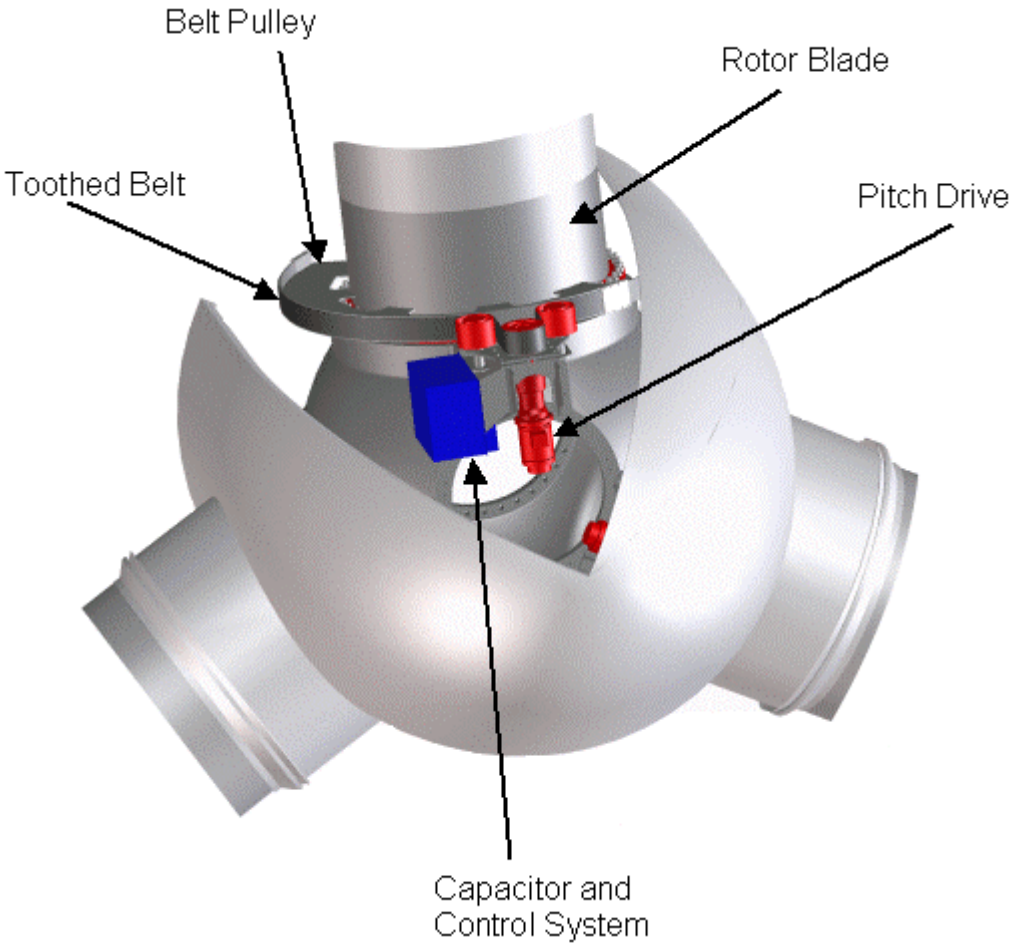


Figure 5: Pitch System

8. Nacelle Design

The nacelle has to transmit all static and dynamic loads of the rotor and the generator to the tower. In addition, the nacelle houses the control cabinets, tha hoisting crane, the yawing system, and supports the wind monitoring system (anemometer). Essentially, the housing consists of 3 parts: (1) a casted part for transmission, (2) a walkable base platform, and (3) a shell made of reinforced fibreglass.

9. Yawing System

The yawing system aligns the rotor with the wind direction, which is given by a wind vane installed on top of the nacelle. This wind data provides the basis for yaw corrections via electrical operated azimuth motors. These yaw motors are geared to the external teeth of the yaw bearing between the tower and the cast machine base.

10. Control System

The VENSYS 62 has a microprocessor based control unit that independently adjusts and controls the turbine's operating parameters. As such, outside data entry or control is not required.

The control unit uses sensors to retrieve information about external conditions (wind speed, wind direction) and all operating parameters of the wind energy converter (power, rotor speed, blade pitch). Basing on this data, the plant management controls the turbine to optimise power yield and to ensure safe turbine operation.

At partial load the rotor speed is adjusted by modifying the generator outputAt rated load and above the nominal power capacity is achieved with blade pitch adjustment. As such, gusts can be converted into an increased rotational speed rather than increasing torque. The latter behaviour is typical for conventional fixed speed technology. The VENSYS 62 is able to "absorb" wind speed changes and act as an energy cache memory.

The turbine operates in a wind speed range of 3 m/s to 25 m/s. The wind turbine automatically stops operating outside this velocity range.

External monitoring of the operating performance of the turbine is possible by a PC modem and a telephone connection. All operating data, records and turbine conditions can be calculated and logged.

11. Tower

The steel tower supports the nacelle and the rotor and transfers of the turbine into the foundation.

The tower consists of three segments held together by screw flange connections. It is connected to the foundation by the foundation insert. The yaw bearing is screwed directly on the top tower flange. The control cabinet, converter, transformer and the medium voltage switchgear are mounted at the tower base. The tower is 69m high, has a base diameter of 4.2 m and a top diameter of 2.5 m. The tower is equipped with an internal cat ladder c/w a fall guardrail. Relax or safety platforms are installed at regular distances in the tower. The top platform has a cat ladder allowing access to the nacelle. The tower and the nacelle are lighted.

Inside the tower there are also power and signal cables. The signal cables are trouble-free optical fibre. The cables hang in the upper section to allow the yawing of the nacelle and after several yaw rotations the wind energy converter will automatically untwist the cables. The foot of the tower is accessible from outside by a stair and a door.

12. Foundations

The foundations secure or stabilize the turbine. It is designed as so-called raft or floating foundation. The rotor loads are transferred by the tower and the tower section to the foundation. The foundation section is a short steel tube which is integrated in the foundation. The upper layer of the steel reinforcement at the concrete runs through radial holes in the foundation section.

13. Technical Data

Rotor	Diameter	62 m
	Swept area	3019 m^2
	Speed range	11 – 20 min^{-1}
	Number of blades	3
	Blade type	LM 29.1 P or similar
	Power control	Pitch
	Brakes	Blade pitch triple-redundant

Tower	Type	Steel tube
	Hub height	69 m

Operating Data	Cut-in wind speed	3 m/s
	Rated wind speed	12 m/s
	Cut-out wind speed	25 m/s
	Survival wind speed	59,7 m/s
	Noise emission	Not available yet
	Measured power curve	Not available yet

Generator	Type	Multipole synchronous generator, permanent magnet excited
	Design	Direct drive
	Rated power	1,200 kW
	Rated voltage	Y 700 V
	Insulation category	F

Yawing System	Design concept	Electrical drive motor
	Rate of movement	0,5 °/sec

Gearbox	Type	Gearless

Brake System	Prime brake system	Blade pitch triple-redundant
	Holding brake	Anchor locking

Transformer	Type	Casting resin transformer 1,250 kVA
	Input voltage	620 V
	Output voltage	20 kV

Control System	Functionality	Microprocessor controlled remote monitoring

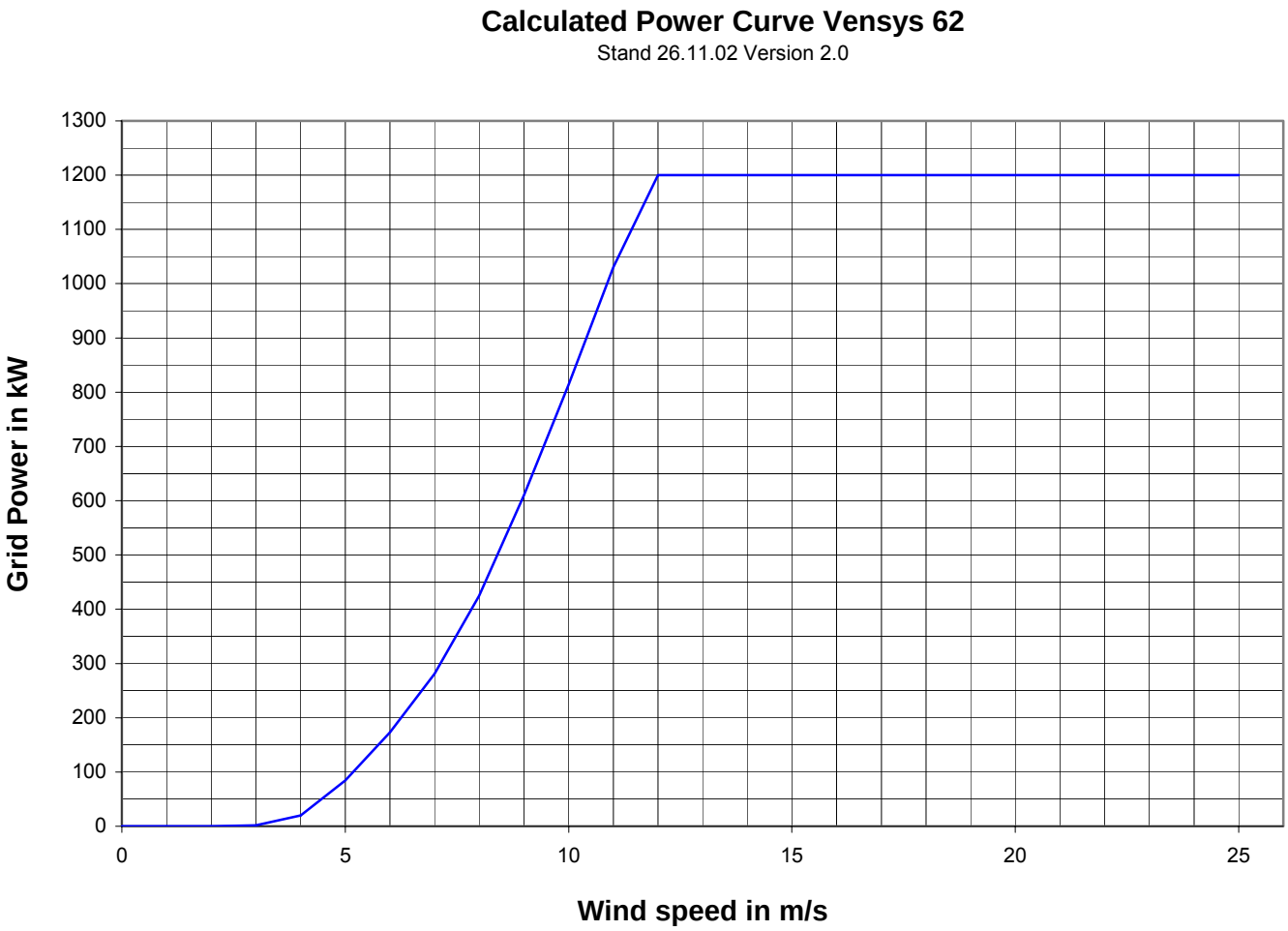
Masses	Rotor	31,000 kg
	Nacelle (excl. rotor)	50,000 kg
	Tower	96,000 kg
	Total mass	177,000 kg

14. Calculated Power Curve Vensys 62

v_N in m/s	P_{Grid} in kW
0	0
1	0
2	0
3	12
4	39
5	92
6	171
7	278
8	414
9	579
10	762
11	963
12	1200

v_N in m/s	P_{Grid} in kW
13	1200
14	1200
15	1200
16	1200
17	1200
18	1200
19	1200
20	1200
21	1200
23	1200
24	1200
25	1200

V_N = wind speed at hub height
P_{Grid} = grid power



15. Calculated Annual Energy Yield

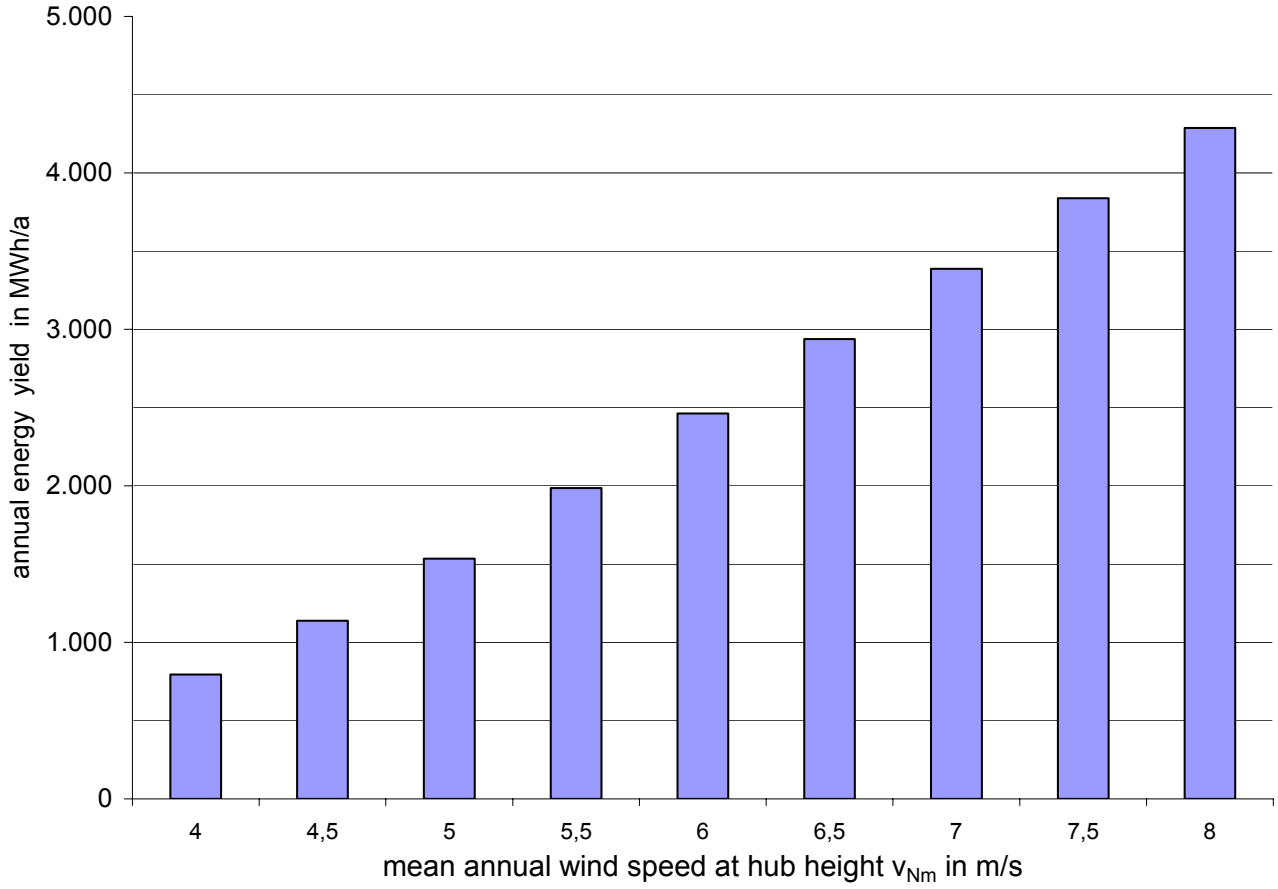
V_{Nm} in m/s	Calulated annual energy yield in MWh
4	753
4,5	1.114
5	1.532
5,5	1.997
6	2.479
6,5	2.968
7	3.455
7,5	3.914
8	4.360

reference yield* : 2.751 MWh/a

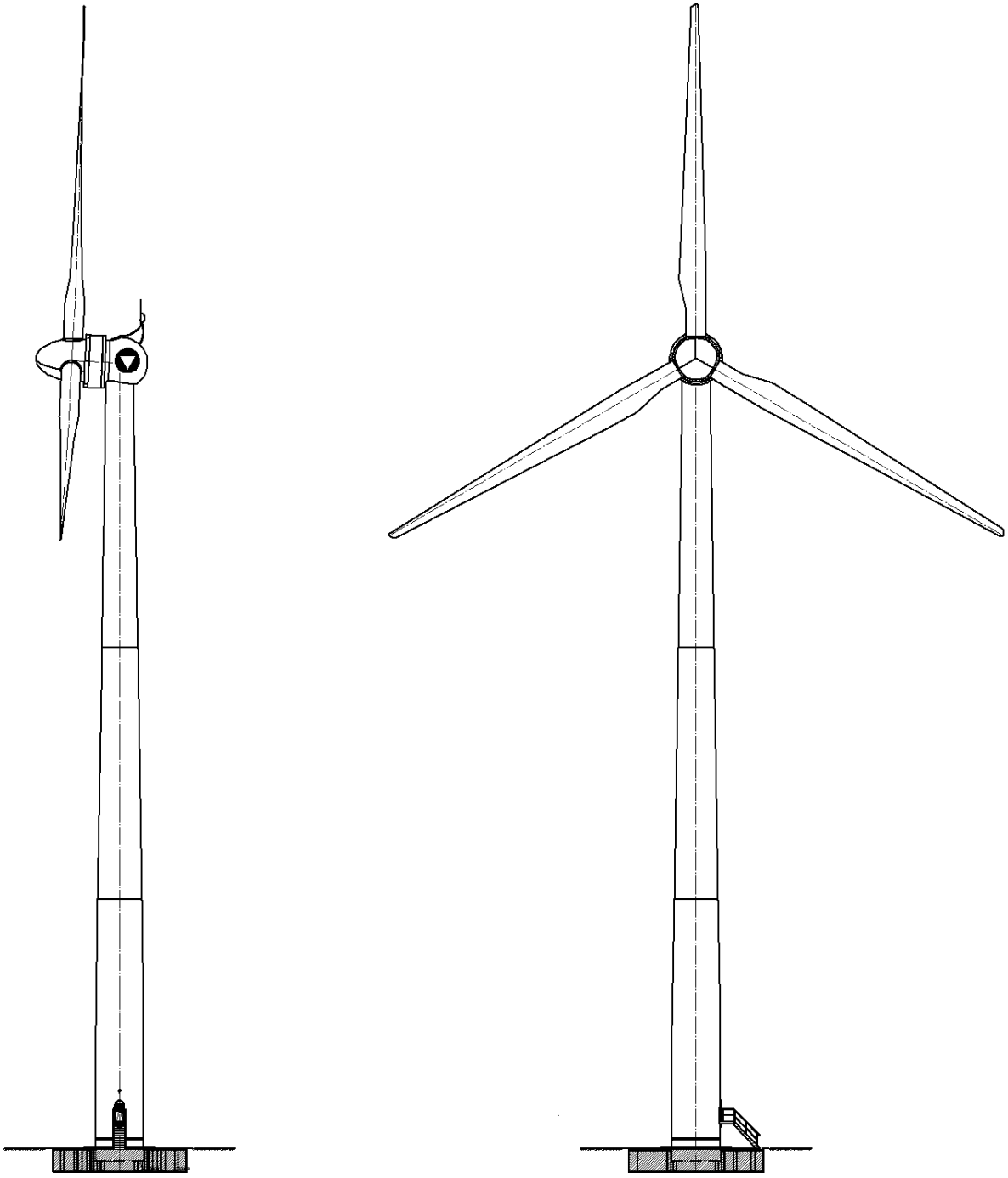
*Mean annual wind speed of 5.5 m/s at a height of 30 m and a roughness height of 0.1m

V_{Nm} = mean annual wind speed at hub height
Roughness height: 0.1 m
Air density: 1.225 kg/m^3

Calculated Annual Energy Yield for different $v(h_N)$
Rayleigh distribution rectifier



16. Front and Side View of Vensys 62

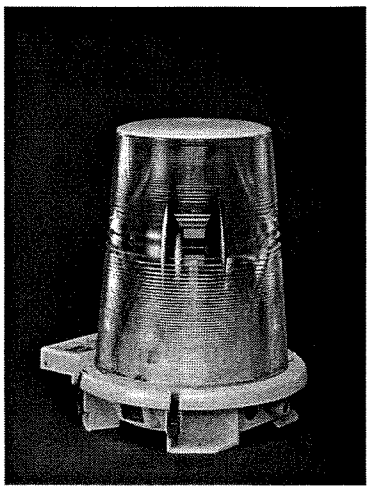


Hub height: 69 m
Rotor diameter: 62 m
Rated output: 1,200 kW

L303-864/865 & L303-885/866 MEDIUM INTENSITY RED/WHITE FLASHING STROBE OBSTRUCTION LIGHT

Key features
- High reliability with long life time, low cost of ownership and low power consumption
- Effective intensity 20.000 candela white day mode and 2.000 candela red night mode
- Uses Orga special technology for the ignition of xenon lamps control for long lamp life and very low UV and ozone generation
- Internal Photocells for automatic day/night intensity control
- Integrated red filter for white/red light colour change between day and night time
- Orga Strobeline™ cable wiring system configuration combines power and control wires into a single protected cable
- Lightweight and easy to install
- Level indicators provided to help with correct installation

Standards
- *Certified to:*
  Federal Aviation Administration AC 150 5345/43E Type L864/L865 & L885/866 obstacle light
- ICAO Annex 14 Volume 1, Third edition, July 1999, Chapter 6, Medium Intensity, Type A/B obstacle light
- *Approved by:*
  STNA of France
  DGAC of Mexico



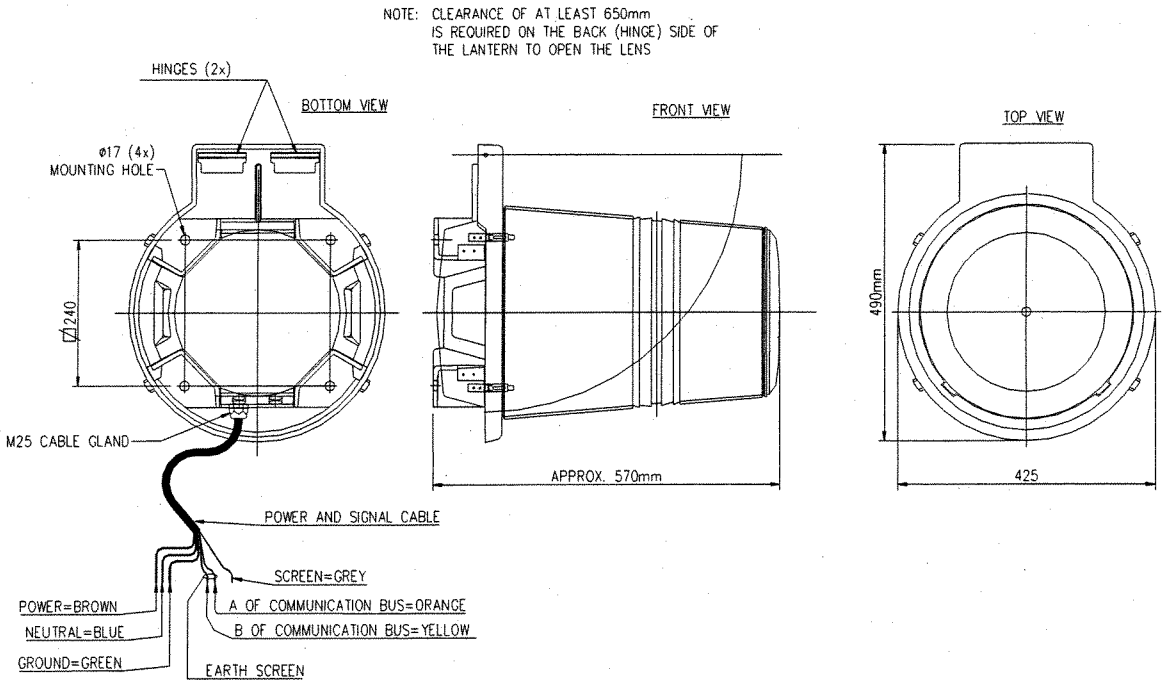
Optical characteristics
- 20/40 (L864/865) flashes per minute (factory set as per table)
- 60/60 (L885/866) flashes per minute (factory set as per table)
- Automatic day/night intensity control by internal photocells
- Lens colour: Clear
- Internal red filter for night time operation
- Horizontal beam pattern 360°
- Vertical beam pattern 3°
- High accuracy Fresnel lens

Electrical characteristics
- 110 – 240 V_{AC} (±10%) 50/60 Hz operating voltage
- Power consumption (see table)
- Safety switches to disconnect power and discharge capacitors when unit opened
- A high voltage warning LED is provided
- Light "fail" remote monitoring output
- Failure indication LED
- Supplied with an Orga Strobeline™ combined power and data connection cable
- Two stage over voltage protection

Physical characteristics
- Polyurethane body
- IP67 degree of ingress protection (by design)
- Operating temperature range -55°C to +55°C
- Height 570 mm, diameter 425 mm
- Mounting holes at 240 x 240 mm
- Weight (excluding packaging) 12 kg
- Shipping dimensions: 700x550x750 mm / 16 kg

System Design, Control and Monitoring
- Combine L303-864/865 / L303-885/866 medium intensity lights with L1000 high intensity lights or L810 low intensity lights for optimum system design
- Connect L1000 high intensity, L303 & L350 medium intensity and L810 low intensity lights to a single CIP200 control unit
- Local and remote monitoring facilities provided by CIP200 or CIP100 controller
- No-Wire multiple system flash character synchronisation option with the GPS020
- Catenary crossing system configuration options available

Type numbering		Additional information						
L303-	Extension	Flashes per minute			Power consumption (W)			Comment
		Day	Twilight	Night	Day	Twi	Night	
L303-864/865		40	40	20	90	90	50	Standard configuration
L303-864/865	D	40	40	20	90	90	50	Dual Lighting operation, according to FAA standards
L303-885/866		60	60	60	135	135	75	Standard configuration
L303-885/866	D	60	60	60	135	135	75	Dual Lighting operation, according to FAA standards
	EMC							Additional EMC protection



Appendix D
Results of Water Sampling

Your Project #: 061218

Attention: Lori Williams
CBCL Limited
1489 Hollis St
PO Box 606
Halifax, NS
B3J 2R7

Report Date: 2006/05/23

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A645159
Received: 2006/05/15, 13:40

Sample Matrix: Water
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Carbonate, Bicarbonate and Hydroxide	2	N/A	2006/05/16		
Alkalinity (1)	2	N/A	2006/05/18	2015_1_2	Based on EPA310.2
Chloride	2	N/A	2006/05/18	2045_1_2	Based on SM4500-Cl-
Colour	2	N/A	2006/05/18	2156_1_1	Based on EPA110.2
Conductance - water	2	N/A	2006/05/17	1013_1_2	Based on SM2510B
Hardness (calculated as CaCO3)	2	N/A	2006/05/16		
Total metals in water OES	2	N/A	2006/05/17	SOP 3120_2_1	Based on EPA200.7
Ion Balance (% Difference)	2	N/A	2006/05/16		
Anion and Cation Sum	2	N/A	2006/05/16		
Nitrogen Ammonia - water	2	N/A	2006/05/17	2105_1_2	Based on USEPA 350.1
Nitrogen - Nitrate + Nitrite (1)	2	N/A	2006/05/18	2115_1_2	Based on EPA 353.1
pH (1)	2	N/A	2006/05/17	1007_1_1/1011_1_2	Based on EPA150.1
Phosphorus - ortho (1)	2	N/A	2006/05/18	2165_1_1	Based on USEPA 365.1
Sat. pH and Langelier Index (@ 20C)	2	N/A	2006/05/16		
Sat. pH and Langelier Index (@ 4C)	2	N/A	2006/05/16		
Reactive Silica (1)	2	N/A	2006/05/18	2185_1_1	Based on EPA 366.0
Sulphate (1)	2	N/A	2006/05/18	4065_1_2	Based on EPA 375.4
Total Dissolved Solids (TDS calc)	2	N/A	2006/05/16		
Organic carbon - Total (TOC) (1)	2	N/A	2006/05/17	2020_1_3	Based on SM 5310C
Turbidity (1)	2	N/A	2006/05/19	1040_2_4	based on EPA 180.1

(1) SCC/CAEAL

../2

Your Project #: 061218

Attention: Lori Williams
CBCL Limited
1489 Hollis St
PO Box 606
Halifax, NS
B3J 2R7

Report Date: 2006/05/23

CERTIFICATE OF ANALYSIS

-2-

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

MARIE MCNAIR, Project Manager
Email: marie.mcnair.reports@maxxamanalytics.com
Phone# (902) 420-0203

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. SCC and CAEAL have approved this reporting process and electronic report format.

Total cover pages: 2

Maxxam Job #: A645159
Report Date: 2006/05/23

CBCL Limited
Client Project #: 061218
Project name:
Sampler Initials:

ATLANTIC RCAP TOTAL METALS IN WATER (WATER)

Maxxam ID		M03293	M03299		
Sampling Date		2006/05/12	2006/05/12		
	Units	**SAMPLE 1-TRIBUTARY TO ROARING RIVER**	**SAMPLE 2-ROARING RIVER**	**RDL**	**QC Batch**
INORGANICS					
Total Alkalinity (Total as CaCO3)	mg/L	<5	<5	5	972891
Dissolved Chloride (Cl)	mg/L	3	3	1	972892
Colour	TCU	6	<5	5	972895
Hardness (CaCO3)	mg/L	3	7	1	971277
Nitrate + Nitrite	mg/L	<0.05	0.23	0.05	973108
Nitrogen (Ammonia Nitrogen)	mg/L	<0.05	<0.05	0.05	972001
Total Organic Carbon (C)	mg/L	1.7	1.3	0.5	972443
Orthophosphate (P)	mg/L	<0.01	<0.01	0.01	972896
pH	pH	6.00	6.27	N/A	972266
Reactive Silica (SiO2)	mg/L	4.9	6.5	0.5	972894
Dissolved Sulphate (SO4)	mg/L	<2	2	2	972893
Turbidity	NTU	0.2	<0.1	0.1	973856
Conductivity	uS/cm	18	26	1	972285
RCAP CALCULATIONS					
Anion Sum	me/L	0.0784	0.146	N/A	971283
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	<1	<1	1	971272
Calculated TDS	mg/L	6	11	1	971292
Carb. Alkalinity (calc. as CaCO3)	mg/L	<1	<1	1	971272
Cation Sum	me/L	0.162	0.243	N/A	971283
Ion Balance (% Difference)	%	34.8	24.8	N/A	971281
Langelier Index (@ 20C)	N/A	NC	NC	N/A	971287
Langelier Index (@ 4C)	N/A	NC	NC	N/A	971290
Saturation pH (@ 20C)	N/A	NC	NC	N/A	971287
Saturation pH (@ 4C)	N/A	NC	NC	N/A	971290
Elements (ICP-OES)					
Total Calcium (Ca)	mg/L	0.8	1.8	0.1	972194
Total Copper (Cu)	mg/L	<0.01	<0.01	0.01	972194
Total Iron (Fe)	mg/L	0.04	<0.02	0.02	972194
Total Magnesium (Mg)	mg/L	0.3	0.5	0.1	972194
Total Manganese (Mn)	mg/L	0.01	<0.01	0.01	972194

NC = Non-calculable
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Maxxam Job #: A645159
Report Date: 2006/05/23

CBCL Limited
Client Project #: 061218
Project name:
Sampler Initials:

ATLANTIC RCAP TOTAL METALS IN WATER (WATER)

Maxxam ID		M03293	M03299		
Sampling Date		2006/05/12	2006/05/12		
	Units	**SAMPLE 1-TRIBUTARY TO ROARING RIVER**	**SAMPLE 2-ROARING RIVER**	**RDL**	**QC Batch**
Total Potassium (K)	mg/L	0.3	0.3	0.1	972194
Total Sodium (Na)	mg/L	2.0	2.3	0.1	972194
Total Zinc (Zn)	mg/L	<0.05	<0.05	0.05	972194

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Maxxam Job #: A645159
Report Date: 2006/05/23

CBCL Limited
Client Project #: 061218
Project name:
Sampler Initials:

GENERAL COMMENTS

Sample M03293-01: RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Sample M03299-01: RCAp Ion Balance acceptable. Anion/cation agreement within 0.2 meq/L.

Results relate only to the items tested.

200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

CBCL Limited
Attention: Lori Williams
Client Project #: 061218
P.O. #:
Project name:

Quality Assurance Report

Maxxam Job Number: DA645159

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
972001	MCN	MATRIX SPIKE	Nitrogen (Ammonia Nitrogen)	2006/05/17		98	%	80 - 120
		QC STANDARD	Nitrogen (Ammonia Nitrogen)	2006/05/17		102	%	80 - 120
		Spiked Blank	Nitrogen (Ammonia Nitrogen)	2006/05/17		99	%	80 - 120
		Method Blank	Nitrogen (Ammonia Nitrogen)	2006/05/17	<0.05		mg/L	
		RPD	Nitrogen (Ammonia Nitrogen)	2006/05/17	NC		%	25
972194	MLB	MATRIX SPIKE	Total Calcium (Ca)	2006/05/17		95	%	80 - 120
			Total Copper (Cu)	2006/05/17		95	%	80 - 120
			Total Iron (Fe)	2006/05/17		79 (1)	%	80 - 120
			Total Magnesium (Mg)	2006/05/17		97	%	80 - 120
			Total Manganese (Mn)	2006/05/17		94	%	80 - 120
			Total Potassium (K)	2006/05/17		97	%	80 - 120
			Total Sodium (Na)	2006/05/17		98	%	80 - 120
			Total Zinc (Zn)	2006/05/17		90	%	80 - 120
		QC STANDARD	Total Calcium (Ca)	2006/05/17		109	%	80 - 120
			Total Copper (Cu)	2006/05/17		112	%	80 - 120
			Total Iron (Fe)	2006/05/17		102	%	80 - 120
			Total Magnesium (Mg)	2006/05/17		104	%	80 - 120
			Total Manganese (Mn)	2006/05/17		103	%	80 - 120
			Total Potassium (K)	2006/05/17		102	%	80 - 120
			Total Sodium (Na)	2006/05/17		108	%	80 - 120
			Total Zinc (Zn)	2006/05/17		102	%	80 - 120
		Spiked Blank	Total Calcium (Ca)	2006/05/17		101	%	80 - 120
			Total Copper (Cu)	2006/05/17		95	%	80 - 120
			Total Iron (Fe)	2006/05/17		93	%	80 - 120
			Total Magnesium (Mg)	2006/05/17		100	%	80 - 120
			Total Manganese (Mn)	2006/05/17		94	%	80 - 120
			Total Potassium (K)	2006/05/17		97	%	80 - 120
			Total Sodium (Na)	2006/05/17		100	%	80 - 120
			Total Zinc (Zn)	2006/05/17		90	%	80 - 120
		Method Blank	Total Calcium (Ca)	2006/05/17	<0.1		mg/L	
			Total Copper (Cu)	2006/05/17	<0.01		mg/L	
			Total Iron (Fe)	2006/05/17	<0.02		mg/L	
			Total Magnesium (Mg)	2006/05/17	<0.1		mg/L	
			Total Manganese (Mn)	2006/05/17	<0.01		mg/L	
			Total Potassium (K)	2006/05/17	<0.1		mg/L	
			Total Sodium (Na)	2006/05/17	<0.1		mg/L	
			Total Zinc (Zn)	2006/05/17	<0.05		mg/L	
		RPD	Total Calcium (Ca)	2006/05/17	1.7		%	25
			Total Magnesium (Mg)	2006/05/17	1.6		%	25
			Total Potassium (K)	2006/05/17	3.8		%	25
			Total Sodium (Na)	2006/05/17	1.7		%	25
972266	ARS	QC STANDARD	pH	2006/05/17		101	%	80 - 120
		Method Blank	pH	2006/05/17	5.55		pH	
972285	ARS	QC STANDARD	Conductivity	2006/05/17		103	%	80 - 120
		Method Blank	Conductivity	2006/05/17	0.58		uS/cm	
		RPD	Conductivity	2006/05/17	1.8		%	25
972443	CRA	MATRIX SPIKE	Total Organic Carbon (C)	2006/05/17		95	%	75 - 125
		QC STANDARD	Total Organic Carbon (C)	2006/05/17		95	%	80 - 120
		Spiked Blank	Total Organic Carbon (C)	2006/05/17		108	%	75 - 125
		Method Blank	Total Organic Carbon (C)	2006/05/17	<0.5		mg/L	
		RPD	Total Organic Carbon (C)	2006/05/17	NC		%	25
972891	JMN	MATRIX SPIKE	Total Alkalinity (Total as CaCO3)	2006/05/18		NC	%	80 - 120
		QC STANDARD	Total Alkalinity (Total as CaCO3)	2006/05/18		102	%	80 - 120
		Spiked Blank	Total Alkalinity (Total as CaCO3)	2006/05/18		100	%	80 - 120
		Method Blank	Total Alkalinity (Total as CaCO3)	2006/05/18	<5		mg/L	
		RPD	Total Alkalinity (Total as CaCO3)	2006/05/18	0.9		%	25

200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

CBCL Limited
Attention: Lori Williams
Client Project #: 061218
P.O. #:
Project name:

Quality Assurance Report (Continued)

Maxxam Job Number: DA645159

QA/QC Batch Num	Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
972892	JMN	MATRIX SPIKE	Dissolved Chloride (Cl)	2006/05/18		NC	%	80 - 120
		QC STANDARD	Dissolved Chloride (Cl)	2006/05/18		104	%	80 - 120
		Spiked Blank	Dissolved Chloride (Cl)	2006/05/18		103	%	80 - 120
		Method Blank	Dissolved Chloride (Cl)	2006/05/18	<1		mg/L	
		RPD	Dissolved Chloride (Cl)	2006/05/18	0.7		%	25
972893	JMN	MATRIX SPIKE	Dissolved Sulphate (SO4)	2006/05/18		112	%	80 - 120
		QC STANDARD	Dissolved Sulphate (SO4)	2006/05/18		105	%	80 - 120
		Spiked Blank	Dissolved Sulphate (SO4)	2006/05/18		106	%	80 - 120
		Method Blank	Dissolved Sulphate (SO4)	2006/05/18	<2		mg/L	
		RPD	Dissolved Sulphate (SO4)	2006/05/18	0.06		%	25
972894	JMN	MATRIX SPIKE	Reactive Silica (SiO2)	2006/05/18		97	%	80 - 120
		QC STANDARD	Reactive Silica (SiO2)	2006/05/18		105	%	75 - 125
		Spiked Blank	Reactive Silica (SiO2)	2006/05/18		100	%	80 - 120
		Method Blank	Reactive Silica (SiO2)	2006/05/18	<0.5		mg/L	
		RPD	Reactive Silica (SiO2)	2006/05/18	2.5		%	25
972895	JMN	QC STANDARD	Colour	2006/05/18		104	%	80 - 120
		Method Blank	Colour	2006/05/18	<5		TCU	
		RPD	Colour	2006/05/18	NC		%	25
972896	JMN	MATRIX SPIKE	Orthophosphate (P)	2006/05/18		93	%	80 - 120
		QC STANDARD	Orthophosphate (P)	2006/05/18		103	%	80 - 120
		Spiked Blank	Orthophosphate (P)	2006/05/18		106	%	80 - 120
		Method Blank	Orthophosphate (P)	2006/05/18	<0.01		mg/L	
		RPD	Orthophosphate (P)	2006/05/18	NC		%	25
973108	MCN	MATRIX SPIKE	Nitrate + Nitrite	2006/05/18		103	%	80 - 120
		QC STANDARD	Nitrate + Nitrite	2006/05/18		98	%	80 - 120
		Spiked Blank	Nitrate + Nitrite	2006/05/18		99	%	80 - 120
		Method Blank	Nitrate + Nitrite	2006/05/18	<0.05		mg/L	
		RPD	Nitrate + Nitrite	2006/05/18	1.9		%	25
973856	ARS	QC STANDARD	Turbidity	2006/05/19		97	%	80 - 120
		Method Blank	Turbidity	2006/05/19	<0.1		NTU	
		RPD	Turbidity	2006/05/19	14.6		%	25

NC = Non-calculable
RPD = Relative Percent Difference
QC Standard = Quality Control Standard
SPIKE = Fortified sample
(1)

200 Bluewater Rd, Suite 105, Bedford, Nova Scotia Canada B4B 1G9 Tel:902-420-0203 Toll-free:800-565-7227 Fax:902-420-8612 www.maxxamanalytics.com

Appendix E
Registration of Higgins Family Cemetery

MARITIME ARCHAEOLOGICAL RESOURCE INVENTORY

Date Form Filled Out (YYYY/MM/DD)
2006/05/09

NB ○ NS ◉ PEI ○

A. SITE NAME, LOCATION AND ACCESS

A1 SUGGESTED SITE NAME Higgins Family Cemetery

A2 TEMPORARY SITE NUMBER A2006NS34

A3 PERMIT/LICENSE NUMBER A2006NS34-01

A4 PERMIT/LICENSE TYPE Category C

A5 WHEN DID YOU GATHER THE INFORMATION FOR THIS REPORT ?

2006/05/04 through 2006/05/09

A6 ADDITIONAL INFORMATION AND/OR RESOURCES:

	Submitted	Available
Video Footage		
Maps / Plans	■	
Still Photos	■	
Drawings		
Archival Information		
Artifacts		
Articles		
Contacts		

Other

A7 ACTIVITY

a)	Surface collecting	
b)	Surface recording	■
c)	Site Revisit	
b)	Subsurface testing	
c)	Extensive excavation	
d)	Monitoring	
e)	Surveillance	

A8 COUNTY Cumberland

A9 LOCATION DESCRIPTION

Located on east side of Higgins Mountain Road, approximately 5 m from the roadway in a low bush blueberry field.

A10 LOCATION ACCESS

From Truro, travel northward on the Cobequid Pass to exit 8. Turning at exit 8, travel eastward along Collingwood Road approximately 5.5 km to the Valley Road (on the right). Travel Valley Road approximately 1.7 km to Higgins Mountain Road (on the right or south). The cemetery is located approximately 3.0 km from the junction of Valley Road and Higgins Mountain Road, on the east side of Higgins Mountain Road.

A11 SITE LOCATION MAP NUMBER 11E12 (Attach photocopied section of NTS 1:50000 scale map and indicate the site location. Make sure that the map number is indicated. eg. 21H16).

Borden No. _____

A12 **SITE ACCESS MAP NUMBER** 11E12 (Attach photocopied section of a larger scale map and show your access route to the site location. Make sure that the map number and scale is indicated) Scale: _____

A13 **SITE POSITION**

UTM (eg. 20TKE 1447 5362) Zone 20T E 451162 N 5049315

Latitude 45 ° 35 ' . 740 N Longitude 63 ° 37 ' 570 W

A14 **METHOD(S) OF DETERMINING LOCATION** and/or position.

Projection UTM Datum NAD83

GPS	estimated error <10 m	■	
Differential GPS			
Map (scale =1: _____)			
Aerial Photo (scale =1: _____)			
Total Station			
Estimate from description			
Other (please specify) _____			

A15 **SITE ELEVATION**

Elevation 290 m. (A.S.L.) to 300 m. (A.S.L.)

A16 **METHOD(S) OF DETERMINING ELEVATION**

Projection UTM Datum NAD83

GPS		■	
Differential GPS			
Map (scale =1: _____)			
Aerial Photo (scale =1: _____)			
Total Station			
Geodetic Marker (# _____)			
Estimate from description			

Other (please specify) _____

A17 **OTHER MAP(S)** _____

A18 **AERIAL PHOTO NUMBER(S)** _____

A19 **PROPERTY IDENTIFIER NUMBER(S)** _____

A20 **PROPERTY TYPE** Private ___ Federal Crown ___ Provincial Crown ___ First Nation Land ___ Unknown ■

A21 **NEAREST FIRST NATION COMMUNITY** (if applicable) N/A

Contacted ? Yes ___ No ___

B. SITE ENVIRONMENT

B1 **NATURAL REGION # (Provincial)** 581 **NATURAL REGION # (Federal)** _____

B2 **HABITAT DESCRIPTION** (please check those appropriate)

Offshore
- 1.1 Open Water ___
- 1.2 Benthic ___

Coastal
- 2.1 Rocky Shore ___
- 2.2 Boulder/Cobble Shore ___
- 2.3 Sandy Shore ___
- 2.4 Mud Flat ___
- 2.5 Tidal Marsh ___
- 2.6 Dune System ___

Terrestrial Unforested
- 5.1 Barren ■
- 5.2 Oldfield ___
- 5.3 Cliff and Bank ___
- 5.4 Talus Slope ___
- 5.5 Cave ___

Freshwater
- 3.1 Open-Water Lotic (Rivers and Streams) ___
- 3.2 Open-Water Lentic (Lakes and Ponds) ___
- 3.3 Bottom Lotic (Rivers and Streams) ___
- 3.4 Bottom Lentic (Lakes and Ponds) ___
- 3.5 Water's Edge Lotic (Rivers and Streams) ___
- 3.6 Water's Edge Lentic (Lakes and Ponds) ___

Freshwater Wetland
- 4.1 Bog ___
- 4.2 Fen ___
- 4.3 Swamp ___
- 4.4 Freshwater Marsh (Inland) ___

Forests
- 6.1 Hardwood Forest ___
- 6.2 Softwood Forest ___
- 6.3 Mixedwood Forest ___

Additional Habitat Description Low bush blueberry field currently under cultivation.

C. SITE DESCRIPTION

C1 Period

Palaeo-Indian (> 9000 BP)		Contact (1500 - 1604)	
Early/Middle Archaic (9000 - 6000 BP)		Colonial (1604 - 1867)	
Late Archaic (6000 - 3000 BP)		Early Post-Confederation (1867 to 1950)	■
Maritime Woodland (3000 - 500 BP)		Other	

Basis of identification

Three burials indicated on gravestone marker dating between 1875 and 1882.

C2 TRADITION

Palaeo-Indian		Middle/Late Woodland		Jamaican Maroon	
Early/Middle Maritime Archaic		Maliseet		Planter	
Laurentian Archaic		Mi'kmaq		Loyalist	
Shield Archaic		Passamaquody		Black Loyalist	
Late Maritime Archaic		British		German	
Susquehanna		French		Irish	
Early Maritime Woodland		Acadian		Unspecified	■
		Scottish			

Other

C6 SITE FUNCTION

Aeroplane		General Activity		Religious/Sacred	
Agricultural		Hunting & Gathering		Residence	
Commercial		Manufacturing		Settlement	
Construction		Military		Transportation	
Extractive		Mining		Undetermined	
Fishing		Miscellaneous		Vessel	
Forestry					

Other: Burial

C7 GENERAL SITE DESCRIPTION

Site is marked with a single gravestone marker for Elizabeth Higgins (d. 19 Sept. 1875, aged 23 yrs., daughter of Joshua Higgins); Joshua Higgins (d. 18 Jan. 1878, aged 66 yrs.); and Joshua Higgins (d. 13 Oct. 1882, aged 73 yrs.). A double and two single burial plots can be seen immediately east of the marker. At least three other burials are visible east of this, one which appears to be marked with a field stone head marker.

C8 OBSERVED SITE DIMENSIONS Length 20 m Width 20 m

C9 ESTIMATED SITE DIMENSIONS Length ? m Width ? m

C10 DISTANCE TO WATER 1200 m

C11 ORIENTATION TO WATER Perpendicular ___ Parallel ___ Not applicable ■

C12 DESTRUCTIVE AGENTS

	High		Medium		Low	
a *Natural*	Existing	Future	Existing	Future	Existing	Future
Marine Erosion						
Lacustrine Erosion						
Vegetation Growth						
Bioturbation						
b *Cultural*	Existing	Future	Existing	Future	Existing	Future
Agriculture						
Construction						
Transportation						
Forestry						
Mining/Quarrying						
Dam/reservoir						
Vandalism						
Site Visitation						
Military						
Other						

BASIS OF ASSESSMENT

Ground cover is under cultivation but there does not appear to be any threat of impact to the burials. The cemetery is located approximately 765 metres south of a proposed wind turbine, and is well outside the impact area.

D REPORTER INFORMATION

D1 REPORTER'S NAME April MacIntyre

D2 MAILING ADDRESS c/o 6519 Oak Street Halifax, NS **D3 POSTAL CODE** B3L 1H6

D4 PHONE (H) (902) 422-0801 **D5 PHONE (W)** (902) 402-4441

D6 FAX (902) 444-2854 **D7 E-MAIL** darch@eastlink.ca

D8 AFFILIATION Davis Archaeological Consultants Limited

D9 HOW DID YOU FIND THE SITE?

Chance Find		Field Survey	■	Local Contacts	
Map Or Chart		Historical Research		Existing Site Records	

Comments

This cemetery is not recorded on historic maps and no information was found in historic documents during the initial desktop study for this area (see DAC report, 2005 Heritage Research Permit A2005NS09).

D10 CONTACT'S NAME

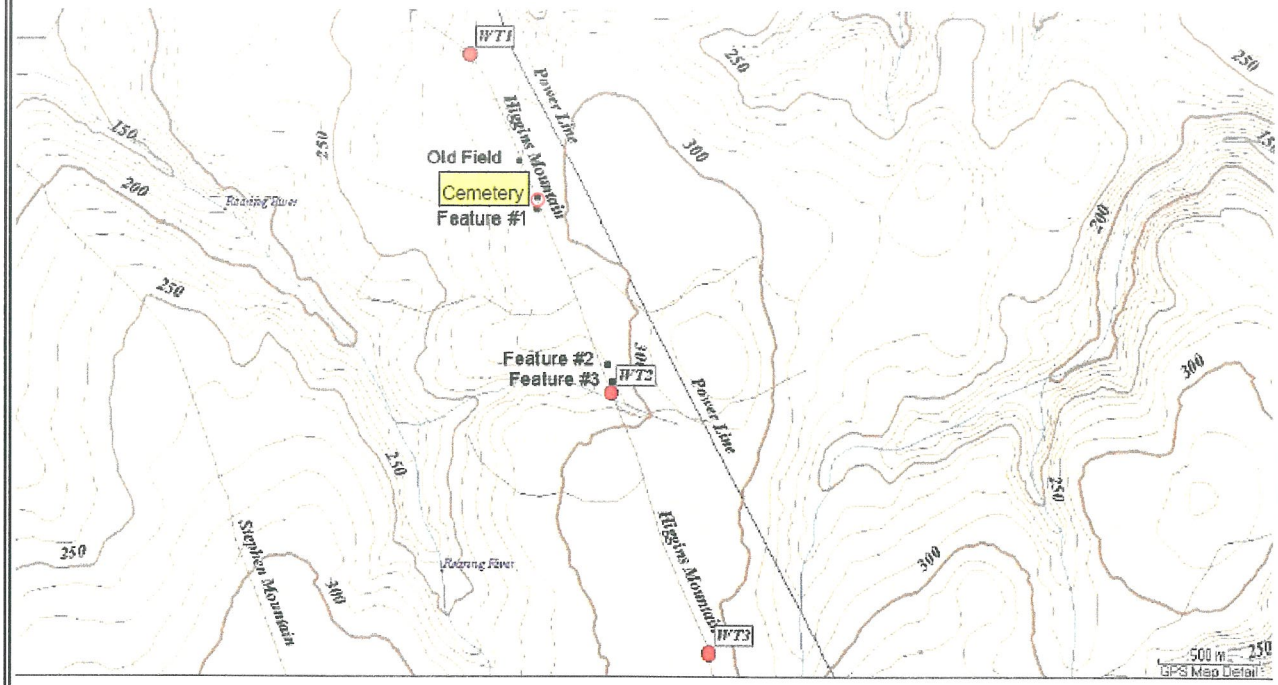
D11 MAILING ADDRESS

D12 POSTAL CODE

D13 PHONE (H) **D14 PHONE (W)**

E **SITE PLAN**

Please provide a drawing or sketch of the site, indicating prominent features, the orientation of the site and overall dimension, including artifact scatter fields. Relate the location of features in the Site Plan with features identified in the Site Access Map. Note the direction of true North and the scale of the plan.



Extent of Site/Étendue du Site ——•——•——•——

Building/Édifice ■

Foundation/Fondation □

Road/Chemin ═══ ═ ═ ═

Trail/Sentir — — — — —

Railway/Voie Ferrée ┼┼┼┼┼┼┼┼┼┼┼┼

Fence/Cloture —X—X—X—X—

River-Creek/Riviére-Ruisseau

Steep Rise/Pente Abrupte

1:50,000 Map No./Carte No. _____

True/Vrai [ ]

Magnetic/Magnetique [ ]

Date _____

Scale/Echelle 1cm=____m.