

Appendix G:

Vascular Plants and Plant Communities Survey

Vascular plants and plant communities of the Amherst Community Wind Farm site, Cumberland County, Nova Scotia, with notes on birds



Mixed forest at proposed site of Turbine 3, Amherst Community Wind Farm.

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for Natural Forces Technologies Inc.

Methods

AC CDC botanists Sean Blaney and David Mazerolle conducted a total of 12.5 hours of fieldwork on foot at the Amherst Community Wind Farm project site in Cumberland County, Nova Scotia on June 9, 2014 (Sean Blaney), and July 2 (David Mazerolle), walking a total of 17.6 km. GPS tracks of site coverage are mapped in Figure 1.

We documented full lists of vascular plant species observed with locations documented for the first observation of each species. Sean Blaney also documented bird species. For provincially rare species (those ranked S3S4 or lower by AC CDC, or Sensitive, May Be At Risk or At Risk by the province; see Appendix 1), we recorded location by GPS and noted abundance, extent of occurrence and habitat. Breeding evidence for birds was recorded using the categories of the Maritimes Breeding Bird Atlas. In addition, Sean Blaney documented plant communities present within the turbine construction footprints, by photograph and by recording dominant species in the canopy, sapling, low shrub/tree seedling and herbaceous strata.

Results and Discussion

I. Vascular Plant Species

We recorded 263 vascular plant taxa (211 native, 52 exotic; Table 1), two of which are of some conservation significance. Site-specific details are given in Table 2, and locations are mapped in Figure 2.

Halberd-Leaved Tearthumb (*Polygonum arifolium*, S2 – Sensitive; Figure 3) is a species of wet deciduous forest and thickets, known from 17 locations in Nova Scotia between Yarmouth and Cumberland Counties, but with the greatest concentration of records being from Cumberland County. There is also an unconfirmed, but likely correct report from Malagawatch, Cape Breton Island. The species is also rare in Prince Edward Island (S2 - Sensitive) and New Brunswick (S3 – Secure).

Wiegand's Sedge (*Carex wiegandii*) is an uncommon sedge of wet, generally acidic swamps and bog margins. It is quite similar to some more common sedges (especially *Carex atlantica* ssp. *atlantica* and *Carex echinata*), and as a result was poorly documented in the province until the past 10 years, when it has been found to be fairly common in peatland margins of the Cape Breton Highlands plateau, and scattered uncommonly on mainland Nova Scotia. It is also uncommon in New Brunswick (S3 – Secure) and rare in Prince Edward Island (S1 – May Be At Risk).

Further visits to the site would yield additional species to those recorded. However, our native species total is fairly large for the size and habitat diversity of the site, indicating relatively complete coverage, and based on the nature and condition of the plant communities present, it is unlikely that many additional provincially rare plant species would be found in the project footprint.

II. Breeding Birds

Sean Blaney recorded 34 species of breeding birds (Table 3) through incidental observations during plant fieldwork on June 9. The mid-day to late afternoon fieldwork meant that bird activity was reduced relative to its maximum around daybreak and thus only a small proportion of the species actually breeding on the site were documented.

Five bird species of conservation significance were noted, with three having legal protection under the Nova Scotia Species at Risk Act: Common Nighthawk (S3B – At Risk; NS Threatened), Olive-sided Flycatcher (S3B – At Risk; NS Threatened), Eastern Wood-Pewee (S3S4B – Sensitive; NS Vulnerable). Other provincially rare species were Yellow-bellied Flycatcher (S3B – Sensitive) and Golden-crowned Kinglet (S4 – Sensitive). Details of these records are given in Table 2, and locations are mapped in Figure 2. All these species are still fairly common to common in Nova Scotia but are of concern because of major population declines.

We also documented an active Osprey nest on the existing powerline at 45.832861, -64.140289.

III. Plant Communities

Notes on plant communities at the proposed turbine construction sites are given in Table 3 and photographs of the proposed turbine sites are given in Figures 4 to 6. None of the plant communities documented within the turbine or road construction footprints are considered provincially rare (AC CDC data, S. Blaney, pers. obs.). Relatively little of the proposed project footprint falls within forest older than 40 years, as a large proportion of the footprint area is either very recent clearcut (within the last one to three years), or is regenerating forest under 20 years old. Part of the footprint of the proposed site of Turbine 3 is within swampy intermediate to mature mixed forest dominated by Red Maple and Red Spruce. The turbine 3 site is on the edge of the most significant remaining forest on property, which extends north and west from the stream just north of the cultivated cropland at the site's south end. The forest along the main stream is especially mature and on somewhat richer soil than the remainder of the site, supporting Sugar Maple (*Acer saccharum*), Eastern Hemlock (*Tsuga canadensis*) and Ostrich Fern (*Matteuccia struthiopteris*), among other species not found elsewhere on the project area. The gently sloping ground to the north of the stream has extensive groundwater seepage, and the path walked by Sean Blaney in this area was entirely swamp forest wetland for about 400 m, again with slightly richer soil than is present over most of the project area.

Additional plant community notes compiled by David Mazerolle, focusing especially on where he entered and left wetlands, are given in Table 5, with noted locations mapped in Figure 7.

Table 1. Vascular plants recorded in the Amherst Community Wind Farm project site, with Nova Scotia S-ranks and General Status (GS) ranks (defined in Appendix 1). Taxonomy follows Kartesz (1999) – *Synthesis of the North American Flora*, CD-ROM. Site status ranks are: x = observed, no status assigned; R = rare; U = uncommon; L = locally common (large population, localized to one or a few areas); F = fairly common; C = common.

Species / Family	Common Name	Site Status	S-rank	GS Rank	ID Comment
Lycopodiaceae	Clubmosses				
<i>Huperzia lucidula</i>	Shining Firmoss	x	S5	Secure	
<i>Lycopodiella inundata</i>	Northern Bog Clubmoss	R	S5	Secure	
<i>Lycopodium annotinum</i>	Stiff Clubmoss	R	S5	Secure	
<i>Lycopodium clavatum</i>	Running Clubmoss	U	S5	Secure	ID refers to the sp. in the broad sense (L. lagopus not excluded)
<i>Lycopodium dendroideum</i>	Round-branched Tree-clubmoss	C	S5	Secure	
<i>Lycopodium obscurum</i>	Flat-branched Tree-clubmoss	R	S4S5	Secure	
Equisetaceae	Horsetails				
<i>Equisetum arvense</i>	Field Horsetail	C	S5	Secure	
<i>Equisetum fluviatile</i>	Water Horsetail	R	S5	Secure	
<i>Equisetum sylvaticum</i>	Woodland Horsetail	F	S5	Secure	
Osmundaceae	Flowering Ferns				
<i>Osmunda cinnamomea</i>	Cinnamon Fern	C	S5	Secure	
<i>Osmunda claytoniana</i>	Interrupted Fern	C	S5	Secure	
Dennstaedtiaceae	Hay-Scented Ferns				
<i>Dennstaedtia punctilobula</i>	Eastern Hay-Scented Fern	L	S5	Secure	
<i>Pteridium aquilinum</i> var. <i>latiusculum</i>	Bracken Fern	L	S5	Secure	
Thelypteridaceae	Marsh Ferns				
<i>Phegopteris connectilis</i>	Northern Beech Fern	R-U	S5	Secure	
<i>Thelypteris noveboracensis</i>	New York Fern	F	S5	Secure	
Dryopteridaceae	Wood Ferns				
<i>Athyrium filix-femina</i> ssp. <i>angustum</i>	Common Lady Fern	U	S5	Secure	
<i>Dryopteris campyloptera</i>	Mountain Wood Fern	R	S5	Secure	
<i>Dryopteris carthusiana</i>	Spinulose Wood Fern	x	S5	Secure	
<i>Dryopteris cristata</i>	Crested Wood Fern	L	S5	Secure	
<i>Dryopteris intermedia</i>	Evergreen Wood Fern	C	S5	Secure	
<i>Gymnocarpium dryopteris</i>	Common Oak Fern	R	S5	Secure	
<i>Matteuccia struthiopteris</i>	Ostrich Fern	x	S5	Secure	
<i>Onoclea sensibilis</i>	Sensitive Fern	C	S5	Secure	
<i>Polystichum acrostichoides</i>	Christmas Fern	x	S5	Secure	
Pinaceae	Pines				
<i>Abies balsamea</i>	Balsam Fir	C	S5	Secure	
<i>Larix laricina</i>	Tamarack	L	S5	Secure	
<i>Picea glauca</i>	White Spruce	C	S5	Secure	
<i>Picea mariana</i>	Black Spruce	C	S5	Secure	
<i>Picea rubens</i>	Red Spruce	C	S5	Secure	

Species / Family	Common Name	Site Status	S-rank	GS Rank	ID Comment
<i>Pinus strobus</i>	Eastern White Pine	U	S5	Secure	
<i>Tsuga canadensis</i>	Eastern Hemlock	R	S4S5	Secure	
Ranunculaceae	Buttercups				
<i>Coptis trifolia</i>	Goldthread	F	S5	Secure	
<i>Ranunculus acris</i>	Common Buttercup	U	SNA	Exotic	
<i>Ranunculus repens</i>	Creeping Buttercup	L	SNA	Exotic	
<i>Thalictrum pubescens</i>	Tall Meadow-Rue	U	S5	Secure	
Betulaceae	Birches				
<i>Alnus incana</i> ssp. <i>rugosa</i>	Speckled Alder	C	S5	Secure	
<i>Alnus viridis</i> ssp. <i>crispa</i>	Green Alder	F	S5	Secure	
<i>Betula alleghaniensis</i>	Yellow Birch	U-F	S5	Secure	
<i>Betula papyrifera</i> var. <i>cordifolia</i>	Heart-leaved Birch	x	S5	Secure	
<i>Betula papyrifera</i> var. <i>papyrifera</i>	Heart-leaved Birch	C	S5	Secure	
<i>Betula populifolia</i>	Gray Birch	C	S5	Secure	
<i>Corylus cornuta</i>	Beaked Hazel	F	S5	Secure	
Caryophyllaceae	Pinks				
<i>Cerastium fontanum</i> ssp. <i>vulgare</i>	Common Chickweed	U	SNA	Exotic	
<i>Moehringia lateriflora</i>	Blunt-leaved Sandwort	R	S5	Secure	
<i>Spergula arvensis</i>	Common Corn Spurrey	R	SNA	Exotic	
<i>Spergularia rubra</i>	Ruby Sandspurrey	R	SNA	Exotic	
<i>Stellaria graminea</i>	Little Starwort	C	SNA	Exotic	
Polygonaceae	Smartweeds				
<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb	R	S2	Sensitive	
<i>Polygonum hydropiper</i>	Marshpepper Smartweed	U	SNA	Exotic	young; ID to sp. probable, not confirmed
<i>Polygonum sagittatum</i>	Arrow-leaved Smartweed	C	S5	Secure	
<i>Rumex acetosella</i>	Sheep Sorrel	L	SNA	Exotic	
<i>Rumex crispus</i>	Curled Dock	R	SNA	Exotic	
Clusiaceae	St. John's-worts				
<i>Hypericum canadense</i>	Canada St John's-wort	U	S5	Secure	
<i>Hypericum mutilum</i>	Dwarf St John's-wort	x	S4S5	Secure	ID refers to the sp. in the broad sense (<i>H. boreale</i> not excluded)
<i>Hypericum perforatum</i>	Common St. John's-wort	C	SNA	Exotic	
<i>Triadenum fraseri</i>	Fraser's Marsh St John's-wort	F	S5	Secure	
Droseraceae	Sundews				
<i>Drosera rotundifolia</i>	Round-leaved Sundew	R	S5	Secure	
Violaceae	Violets				
<i>Viola cucullata</i>	Marsh Blue Violet	R-U	S5	Secure	
<i>Viola macloskeyi</i> ssp. <i>pallens</i>	Small White Violet	F	S5	Secure	
<i>Viola sororia</i>	Woolly Blue Violet	F	S5	Secure	
Cucurbitaceae	Cucumbers				
<i>Echinocystis lobata</i>	Wild Cucumber	R	SNA	Exotic	
Salicaceae	Willows				
<i>Populus tremuloides</i>	Trembling Aspen	L	S5	Secure	

Species / Family	Common Name	Site Status	S-rank	GS Rank	ID Comment
<i>Salix bebbiana</i>	Bebb's Willow	F	S5	Secure	
<i>Salix discolor</i>	Pussy Willow	x	S5	Secure	
<i>Salix humilis</i>	Upland Willow	U	S5	Secure	
<i>Salix pyrifolia</i>	Balsam Willow	x	S5	Secure	
Brassicaceae	Mustards				
<i>Brassica</i> sp.	mustard species	R	[SNA]	[Exotic]	
<i>Cardamine pensylvanica</i>	Pennsylvania Bittercress	x	S5	Secure	
<i>Raphanus raphanistrum</i>	Wild Radish	R	SNA	Exotic	
Ericaceae	Heaths				
<i>Gaultheria hispidula</i>	Creeping Snowberry	C	S5	Secure	
<i>Gaultheria procumbens</i>	Eastern Teaberry	F	S5	Secure	
<i>Gaylussacia baccata</i>	Black Huckleberry	U	S5	Secure	
<i>Kalmia angustifolia</i>	Sheep Laurel	C	S5	Secure	
<i>Kalmia polifolia</i>	Pale Bog Laurel	x	S5	Secure	
<i>Ledum groenlandicum</i>	Common Labrador Tea	C	S5	Secure	
<i>Rhododendron canadense</i>	Rhodora	L	S5	Secure	
<i>Vaccinium angustifolium</i>	Late Lowbush Blueberry	C	S5	Secure	
<i>Vaccinium myrtilloides</i>	Velvet-leaved Blueberry	C	S5	Secure	
Monotropaceae	Indian Pipes				
<i>Monotropa uniflora</i>	Indian Pipe	x	S5	Secure	
Primulaceae	Primroses				
<i>Lysimachia terrestris</i>	Swamp Yellow Loosestrife	U	S5	Secure	
<i>Trientalis borealis</i>	Northern Starflower	C	S5	Secure	
Grossulariaceae	Gooseberries				
<i>Ribes glandulosum</i>	Skunk Currant	F	S5	Secure	
<i>Ribes lacustre</i>	Bristly Black Currant	x	S5	Secure	
Saxifragaceae	Saxifrages				
<i>Chrysosplenium americanum</i>	American Golden Saxifrage	x	S5	Secure	
Rosaceae	Roses				
<i>Amelanchier bartramiana</i>	Bartram's Serviceberry	U	S5	Secure	
<i>Amelanchier</i> sp.	serviceberry species	C		[native]	<i>A. laevis</i> / <i>interior</i> / <i>intermedia</i> (coppery leaves at anthesis)
<i>Fragaria virginiana</i>	Wild Strawberry	C	S5	Secure	
<i>Geum rivale</i>	Water Aven	R	S5	Secure	
<i>Malus pumila</i>	Common Apple	R	SNA	Exotic	
<i>Photinia melanocarpa</i>	Black Chokeberry	x	S5	Secure	
<i>Potentilla norvegica</i> ssp. <i>monspeliensis</i>	Rough Cinquefoil	x	S5	Secure	
<i>Potentilla recta</i>	Sulphur Cinquefoil	U	SNA	Exotic	
<i>Potentilla simplex</i>	Old Field Cinquefoil	F	S5	Secure	
<i>Prunus pensylvanica</i>	Pin Cherry	C	S5	Secure	
<i>Prunus virginiana</i>	Chokecherry	F	S5	Secure	
<i>Rosa nitida</i>	Shining Rose	R	S4	Secure	
<i>Rubus allegheniensis</i>	Alleghaney Blackberry	x	S5	Secure	
<i>Rubus canadensis</i>	Smooth Blackberry	C	S5	Secure	
<i>Rubus hispidus</i>	Bristly Dewberry	C	S5	Secure	

Species / Family	Common Name	Site Status	S-rank	GS Rank	ID Comment
<i>Rubus idaeus</i> ssp. <i>strigosus</i>	Red Raspberry	C	S5	Secure	
<i>Rubus pubescens</i>	Dwarf Red Raspberry	C	S5	Secure	
<i>Sorbus americana</i>	American Mountain Ash	C	S5	Secure	
<i>Spiraea alba</i> var. <i>latifolia</i>	White Meadowsweet	C	S5	Secure	
<i>Spiraea tomentosa</i>	Steeplebush	F	S5	Secure	
Fabaceae	Beans				
<i>Medicago sativa</i>	Alfalfa	R	SNA	Exotic	
<i>Trifolium pratense</i>	Red Clover	U	SNA	Exotic	
<i>Trifolium repens</i>	White Clover	L	SNA	Exotic	
<i>Vicia cracca</i>	Tufted Vetch	L	SNA	Exotic	
Onagraceae	Evening-Primroses				
<i>Chamerion angustifolium</i>	Fireweed	F	S5	Secure	
<i>Circaea alpina</i>	Small Enchanter's Nightshade	x	S5	Secure	
<i>Epilobium ciliatum</i>	Northern Willowherb	U	S5	Secure	
<i>Epilobium leptophyllum</i>	Bog Willowherb	F	S5	Secure	
<i>Epilobium palustre</i>	Marsh Willowherb	x	S5	Secure	young; essentially hairless leaves; ID to sp. probable vs. <i>E. leptophyllum</i>
<i>Oenothera biennis</i>	Common Evening Primrose	U	S5	Secure	young; ID to sp. probable, not confirmed
Cornaceae	Dogwoods				
<i>Cornus canadensis</i>	Bunchberry	C	S5	Secure	
<i>Cornus sericea</i>	Red Osier Dogwood	C	S5	Secure	
Aquifoliaceae	Hollies				
<i>Ilex verticillata</i>	Common Winterberry	L	S5	Secure	
<i>Nemopanthus mucronatus</i>	Mountain Holly	C	S5	Secure	
Rhamnaceae	Buckthorns				
<i>Frangula alnus</i>	Glossy Buckthorn	C	SNA	Exotic	
Aceraceae	Maples				
<i>Acer pensylvanicum</i>	Striped Maple	R	S5	Secure	
<i>Acer rubrum</i>	Red Maple	C	S5	Secure	
<i>Acer saccharum</i>	Sugar Maple	R	S5	Secure	
<i>Acer spicatum</i>	Mountain Maple	R	S5	Secure	
Oxalidaceae	Wood Sorrels				
<i>Oxalis montana</i>	Common Wood Sorrel	C	S5	Secure	
<i>Oxalis stricta</i>	European Wood Sorrel	L	S5	Secure	
Balsaminaceae	Touch-Me-Nots				
<i>Impatiens capensis</i>	Spotted Jewelweed	C	S5	Secure	
Araliaceae	Sarsaparillas				
<i>Aralia hispida</i>	Bristly Sarsaparilla	R	S5	Secure	
<i>Aralia nudicaulis</i>	Wild Sarsaparilla	C	S5	Secure	
Apiaceae	Parsleys				
<i>Hydrocotyle americana</i>	American Marsh Pennywort	x	S5	Secure	
Lamiaceae	Mints				
<i>Galeopsis tetrahit</i>	Common Hemp-nettle	C	SNA	Exotic	

Species / Family	Common Name	Site Status	S-rank	GS Rank	ID Comment
<i>Lycopus uniflorus</i>	Northern Water Horehound	U	S5	Secure	
<i>Mentha sp.</i>	mint species	R	[SNA]	[Exotic]	
<i>Scutellaria galericulata</i>	Marsh Skullcap	U-F	S5	Secure	
<i>Scutellaria lateriflora</i>	Mad-dog Skullcap	F	S5	Secure	
Callitrichaceae	Water-Starworts				
<i>Callitriche sp.</i>	water-starwort species	R		[Secure]	
Plantaginaceae	Plantains				
<i>Plantago major</i>	Common Plantain	L	SNA	Exotic	
Oleaceae	Olives				
<i>Fraxinus americana</i>	White Ash	x	S5	Secure	
Scrophulariaceae	Figworts				
<i>Chelone glabra</i>	White Turtlehead	R	S5	Secure	
<i>Rhinanthus minor</i>	Little Yellow Rattle	R	S5	Secure	
<i>Veronica officinalis</i>	Common Speedwell	L	S5	Exotic	
<i>Veronica scutellata</i>	Marsh Speedwell	x	S5	Secure	
<i>Veronica serpyllifolia</i> ssp. <i>serpyllifolia</i>	Thyme-Leaved Speedwell	R	SNA	Exotic	
Rubiaceae	Bedstraws				
<i>Galium asprellum</i>	Rough Bedstraw	x	S5	Secure	
<i>Galium mollugo</i>	Smooth Bedstraw	C	SNA	Exotic	
<i>Galium palustre</i>	Common Marsh Bedstraw	F	S5	Secure	
<i>Galium trifidum</i> ssp. <i>trifidum</i>	Three-petaled Bedstraw	C	S5	Secure	
<i>Mitchella repens</i>	Partridgeberry	R	S5	Secure	
Caprifoliaceae	Honeysuckles				
<i>Diervilla lonicera</i>	Northern Bush Honeysuckle	R	S5	Secure	
<i>Linnaea borealis</i> ssp. <i>americana</i>	Twinflower	x	S5	Secure	
<i>Lonicera canadensis</i>	Canada Fly Honeysuckle	R-U	S5	Secure	
<i>Sambucus nigra</i> ssp. <i>canadensis</i>	Black Elderberry	x	S5	Secure	
<i>Sambucus racemosa</i>	Red Elderberry	C	S5	Secure	
<i>Viburnum nudum</i> var. <i>cassinoides</i>	Northern Wild Raisin	C	S5	Secure	
Valerianaceae	Valerians				
<i>Valeriana officinalis</i>	Common Valerian	L	SNA	Exotic	
Asteraceae	Asters				
<i>Achillea millefolium</i>	Common Yarrow	C	S5	Secure	
<i>Anaphalis margaritacea</i>	Pearly Everlasting	C	S5	Secure	
<i>Bidens frondosa</i>	Devil's Beggarticks	x	S5	Secure	
<i>Cirsium arvense</i>	Canada Thistle	R	SNA	Exotic	
<i>Doellingeria umbellata</i>	Hairy Flat-top White Aster	C	S5	Secure	
<i>Erechtites hieraciifolia</i>	Eastern Burnweed	R	S5	Secure	
<i>Erigeron annuus</i>	Annual Fleabane	R	S4S5	Secure	
<i>Erigeron strigosus</i>	Rough Fleabane	R	S5	Secure	
<i>Eupatorium maculatum</i>	Spotted Joe-pye-weed	R	S5	Secure	
<i>Eupatorium perfoliatum</i>	Common Boneset	x	S5	Secure	
<i>Eurybia macrophylla</i>	Large-leaved Aster	x	S5	Secure	
<i>Euthamia graminifolia</i>	Grass-leaved Goldenrod	C	S5	Secure	

Species / Family	Common Name	Site Status	S-rank	GS Rank	ID Comment
<i>Gnaphalium uliginosum</i>	Marsh Cudweed	R	SNA	Exotic	
<i>Hieracium caespitosum</i>	Field Hawkweed	C	SNA	Exotic	
<i>Hieracium lachenalii</i>	Common Hawkweed	R	SNA	Exotic	
<i>Hieracium pilosella</i>	Mouse-ear Hawkweed	L	SNA	Exotic	
<i>Hieracium scabrum</i>	Rough Hawkweed	x	S5	Secure	
<i>Hieracium umbellatum/tridentatum</i>	hawkweed species	x	[SNA]	[Exotic]	
<i>Hieracium x floribundum</i>	Smoothish Hawkweed	U	SNA	Exotic	
<i>Lactuca biennis</i>	Tall Blue Lettuce	x	S5	Secure	
<i>Leontodon autumnalis</i>	Fall Dandelion	U	SNA	Exotic	
<i>Leucanthemum vulgare</i>	Oxeye Daisy	R	SNA	Exotic	
<i>Matricaria discoidea</i>	Pineapple Weed	R	SNA	Exotic	
<i>Oclemena acuminata</i>	Whorled Wood Aster	C	S5	Secure	
<i>Prenanthes altissima</i>	Tall Rattlesnakeroot	x	S5	Secure	
<i>Prenanthes trifoliolata</i>	Three-leaved Rattlesnakeroot	C	S5	Secure	
<i>Solidago bicolor</i>	White Goldenrod	C	S5	Secure	
<i>Solidago canadensis</i>	Canada Goldenrod	C	S5	Secure	
<i>Solidago puberula</i>	Downy Goldenrod	C	S5	Secure	
<i>Solidago rugosa</i>	Rough-stemmed Goldenrod	C	S5	Secure	
<i>Solidago uliginosa</i>	Northern Bog Goldenrod	R	S5	Secure	
<i>Symphyotrichum cordifolium</i>	Heart-leaved Aster	F	S4S5	Secure	
<i>Symphyotrichum lateriflorum</i>	Calico Aster	F	S5	Secure	
<i>Symphyotrichum novi-belgii</i>	New York Aster	x	S5	Secure	
<i>Symphyotrichum puniceum</i>	Purple-stemmed Aster	C	S5	Secure	
<i>Taraxacum officinale</i>	Common Dandelion	L	SNA	Exotic	
<i>Tragopogon pratensis</i>	Meadow Goatsbeard	R	SNA	Exotic	
<i>Tripleurospermum maritima</i>	Seashore Chamomile	R	SNA	Exotic	
<i>Tussilago farfara</i>	Coltsfoot	R	SNA	Exotic	
Araceae	Arums				
<i>Arisaema triphyllum</i>	Jack-in-the-pulpit	L	S4S5	Secure	
Juncaceae	Rushes				
<i>Juncus brevicaudatus</i>	Narrow-Panicked Rush	F	S5	Secure	
<i>Juncus effusus</i>	Soft Rush	L	S5	Secure	
<i>Juncus filiformis</i>	Thread Rush	C	S5	Secure	
<i>Juncus tenuis</i>	Slender Rush	C	S5	Secure	
<i>Luzula multiflora</i>	Common Woodrush	F	S5	Secure	
Cyperaceae	Sedges				
<i>Carex arctata</i>	Black Sedge	R	S5	Secure	
<i>Carex brunnescens</i> ssp. <i>sphaerostachya</i>	Brownish Sedge	C	S5	Secure	
<i>Carex canescens</i>	Silvery Sedge	L	S5	Secure	
<i>Carex communis</i>	Fibrous-Root Sedge	x	S5	Secure	
<i>Carex debilis</i> var. <i>rudgei</i>	White-edged Sedge	C	S5	Secure	
<i>Carex disperma</i>	Two-seeded Sedge	x	S5	Secure	
<i>Carex echinata</i>	Star Sedge	U	S5	Secure	

Species / Family	Common Name	Site Status	S-rank	GS Rank	ID Comment
<i>Carex flava</i>	Yellow Sedge	R	S5	Secure	
<i>Carex gynandra</i>	Nodding Sedge	C	S5	Secure	
<i>Carex intumescens</i>	Bladder Sedge	F	S5	Secure	
<i>Carex leptalea</i>	Bristly-stalked Sedge	C	S5	Secure	
<i>Carex leptoneura</i>	Finely-Nerved Sedge	F	S5	Secure	
<i>Carex nigra</i>	Smooth Black Sedge	U	S5	Secure	
<i>Carex novae-angliae</i>	New England Sedge	U	S5	Secure	
<i>Carex projecta</i>	Necklace Sedge	U	S5	Secure	
<i>Carex scoparia</i>	Broom Sedge	F	S5	Secure	
<i>Carex stipata</i>	Awl-fruited Sedge	F	S5	Secure	
<i>Carex trisperma</i> var. <i>trisperma</i>	Three-seeded Sedge	C	S5	Secure	
<i>Carex wiegandii</i>	Wiegand's Sedge	R	S3	Sensitive	
<i>Eleocharis palustris</i>	Common Spikerush	x	S5	Secure	
<i>Eleocharis tenuis</i>	Slender Spikerush	R	S5	Secure	
<i>Eriophorum vaginatum</i>	Tussock Cottongrass	R	S5	Secure	
<i>Eriophorum vaginatum</i> var. <i>spissum</i>	Tussock Cottongrass	x	S5	Secure	
<i>Scirpus atrocinctus</i>	Black-girdled Bulrush	F	S5	Secure	
<i>Scirpus cyperinus</i>	Common Woolly Bulrush	F	S5	Secure	
<i>Scirpus microcarpus</i>	Small-fruited Bulrush	F	S5	Secure	
Poaceae	Grasses				
<i>Agrostis capillaris</i>	Colonial Bent Grass	C	SNA	Exotic	
<i>Agrostis scabra</i>	Rough Bent Grass	x	S5	Secure	
<i>Alopecurus geniculatus</i>	Water Foxtail	R	SNA	Exotic	
<i>Alopecurus pratensis</i>	Meadow Foxtail	R	SNA	Exotic	
<i>Anthoxanthum odoratum</i>	Large Sweet Vernal Grass	C	SNA	Exotic	
<i>Brachyelytrum septentrionale</i>	Northern Shorthusk	F	S5	Secure	
<i>Calamagrostis canadensis</i>	Bluejoint Reed Grass	C	S5	Secure	
<i>Danthonia spicata</i>	Poverty Oat Grass	C	S5	Secure	
<i>Dichanthelium acuminatum</i>	Woolly Panic Grass	R	S5	Secure	
<i>Elymus repens</i>	Quack Grass	R	SNA	Exotic	
<i>Festuca filiformis</i>	Hair Fescue	F	SNA	Exotic	
<i>Festuca heteromalla</i>	Spreading Fescue	R	SNA	Exotic	
<i>Glyceria canadensis</i>	Canada Manna Grass	x	S5	Secure	
<i>Glyceria melicaria</i>	Slender Manna Grass	C	S4	Secure	
<i>Glyceria striata</i>	Fowl Manna Grass	C	S5	Secure	
<i>Hordeum vulgare</i>	Common Barley	R	SNA	Exotic	
<i>Lolium arundinaceum</i>	Tall Fescue	R	SNA	Exotic	
<i>Muhlenbergia uniflora</i>	Bog Muhly	x	S5	Secure	
<i>Phalaris arundinacea</i>	Reed Canary Grass	U	S5	Secure	
<i>Phleum pratense</i>	Common Timothy	L	SNA	Exotic	
<i>Poa compressa</i>	Canada Blue Grass	x	SNA	Exotic	
<i>Poa palustris</i>	Fowl Blue Grass	F	S5	Secure	
<i>Poa pratensis</i>	Kentucky Blue Grass	L	S5	Secure	
Sparganiaceae	Bur-Reeds				
<i>Sparganium</i> sp.	bur-reed species	x	[S5]	[Secure]	

Species / Family	Common Name	Site Status	S-rank	GS Rank	ID Comment
Typhaceae	Cattails				
<i>Typha latifolia</i>	Broad-leaved Cattail	L	S5	Secure	
Liliaceae	Lilies				
<i>Clintonia borealis</i>	Yellow Bluebead Lily	x	S5	Secure	
<i>Maianthemum canadense</i>	Wild Lily-of-The-Valley	C	S5	Secure	
<i>Maianthemum trifolium</i>	Three-leaved False Soloman's Seal	L	S5	Secure	
<i>Medeola virginiana</i>	Indian Cucumber Root	U	S5	Secure	
<i>Streptopus amplexifolius</i>	Clasping-leaved Twisted-stalk	x	S4S5	Secure	
<i>Streptopus lanceolatus</i>	Rose Twisted-stalk	R	S5	Secure	
<i>Trillium cernuum</i>	Nodding Trillium	x	S4	Secure	
<i>Trillium undulatum</i>	Painted Trillium	F	S5	Secure	
Iridaceae	Irises				
<i>Iris versicolor</i>	Harlequin Blue Flag	F	S5	Secure	
<i>Sisyrinchium montanum</i>	Mountain Blue-eyed-grass	R	S5	Secure	
Orchidaceae	Orchids				
<i>Cypripedium acaule</i>	Pink Lady's-Slipper	F	S5	Secure	
<i>Platanthera psycodes</i>	Small Purple Fringed Orchid	R	S4	Secure	young; ID to sp. probable, not confirmed
<i>Platanthera sp.</i>	orchid species			[native]	

Table 2. Provincially rare and/or legally protected species observed during fieldwork at Amherst Community Wind Farm site, with details and locations. Note that locations of birds are approximate and that relevant occupied habitat extends beyond the given points.

Species	Common Name	S-rank	GS Rank	Description	Latitude (start)	Longitude (start)	Latitude (end)	Longitude (end)
<i>Chordeiles minor</i>	Common Nighthawk	S3B	At Risk	two adults in breeding or territorial display/interaction; pair displaying widely over clearcuts in general vicinity of Turbine 3	45.830147	-64.148986		
<i>Contopus cooperi</i>	Olive-sided Flycatcher	S3B	At Risk	singing male in suitable breeding habitat; location uncertainty = 50m	45.834840	-64.145570		
<i>Contopus virens</i>	Eastern Wood-Pewee	S3S4B	Sensitive	singing male in suitable breeding habitat; location uncertainty = 75m	45.831060	-64.138400		
<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher	S3S4B	Sensitive	singing male in suitable breeding habitat	45.835240	-64.146290		
<i>Regulus satrapa</i>	Golden-crowned Kinglet	S4	Sensitive	singing male in suitable breeding habitat	45.837544	-64.146417		
<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb	S2	Sensitive	uncommon in seepy semi-open red maple swamp remnant island in recent clearcut	45.837544	-64.146417	45.837390	-64.146320
<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb	S2	Sensitive	~40 plants in above habitat	45.834870	-64.146894		
<i>Carex wiegandii</i>	Wiegand's Sedge	S3	Sensitive	~35 stems in wet mossy ditch along logging road, at margin of small acidic wetland; site seems to have been altered somewhat by impoundment effect from road	45.840433	-64.151862		

Table 3. List of birds recorded incidentally by Sean Blaney on June 9, 2014 at the Amherst Community Wind Farm site, with breeding evidence recorded following the methods of the Maritimes Breeding Bird Atlas.

Species	Common Name	S-rank	GS Rank	obACTIV
<i>Chordeiles minor</i>	Common Nighthawk	S3B	At Risk	two adults in breeding or territorial display/interaction
<i>Contopus cooperi</i>	Olive-sided Flycatcher	S3B	At Risk	singing male in suitable breeding habitat
<i>Contopus virens</i>	Eastern Wood-Pewee	S3S4B	Sensitive	singing male in suitable breeding habitat
<i>Empidonax flaviventris</i>	Yellow-bellied Flycatcher	S3S4B	Sensitive	singing male in suitable breeding habitat
<i>Regulus satrapa</i>	Golden-crowned Kinglet	S4	Sensitive	singing male in suitable breeding habitat
<i>Turdus migratorius</i>	American Robin	S5B	Secure	agitated behaviour
<i>Dendroica magnolia</i>	Magnolia Warbler	S5B	Secure	two adults in breeding or territorial display/interaction
<i>Junco hyemalis</i>	Dark-eyed Junco	S4S5	Secure	flightless or dependent young; very early, well-fledged young
<i>Picoides villosus</i>	Hairy Woodpecker	S5	Secure	adult in suitable breeding habitat
<i>Corvus brachyrhynchos</i>	American Crow	S5	Secure	adult in suitable breeding habitat
<i>Corvus corax</i>	Common Raven	S5	Secure	adult in suitable breeding habitat
<i>Carduelis tristis</i>	American Goldfinch	S5	Secure	adult in suitable breeding habitat
<i>Pandion haliaetus</i>	Osprey	S5B	Secure	adults entering active nest
<i>Cyanocitta cristata</i>	Blue Jay	S5	Secure	pair in suitable breeding habitat
<i>Bombycilla cedrorum</i>	Cedar Waxwing	S5B	Secure	pair in suitable breeding habitat
<i>Zonotrichia albicollis</i>	White-throated Sparrow	S5B	Secure	pair in suitable breeding habitat
<i>Melospiza melodia</i>	Song Sparrow	S5B	Secure	singing male in suitable breeding habitat
<i>Seiurus aurocapilla</i>	Ovenbird	S5B	Secure	singing male in suitable breeding habitat
<i>Empidonax alnorum</i>	Alder Flycatcher	S5B	Secure	singing male in suitable breeding habitat
<i>Sitta canadensis</i>	Red-breasted Nuthatch	S4S5	Secure	singing male in suitable breeding habitat
<i>Catharus ustulatus</i>	Swainson's Thrush	S4S5B	Secure	singing male in suitable breeding habitat
<i>Catharus guttatus</i>	Hermit Thrush	S5B	Secure	singing male in suitable breeding habitat
<i>Vireo solitarius</i>	Blue-headed Vireo	S5B	Secure	singing male in suitable breeding habitat
<i>Vireo olivaceus</i>	Red-eyed Vireo	S5B	Secure	singing male in suitable breeding habitat
<i>Vermivora ruficapilla</i>	Nashville Warbler	S5B	Secure	singing male in suitable breeding habitat
<i>Parula americana</i>	Northern Parula	S5B	Secure	singing male in suitable breeding habitat
<i>Dendroica coronata</i>	Yellow-rumped Warbler	S5B	Secure	singing male in suitable breeding habitat
<i>Dendroica virens</i>	Black-throated Green Warbler	S4S5B	Secure	singing male in suitable breeding habitat
<i>Dendroica fusca</i>	Blackburnian Warbler	S4B	Secure	singing male in suitable breeding habitat
<i>Dendroica palmarum</i>	Palm Warbler	S5B	Secure	singing male in suitable breeding habitat
<i>Mniotilta varia</i>	Black-and-White Warbler	S4S5B	Secure	singing male in suitable breeding habitat
<i>Geothlypis trichas</i>	Common Yellowthroat	S5B	Secure	singing male in suitable breeding habitat
<i>Junco hyemalis</i>	Dark-eyed Junco	S4S5	Secure	singing male in suitable breeding habitat
<i>Carpodacus purpureus</i>	Purple Finch	S4S5	Secure	singing male in suitable breeding habitat

Table 4. Locations, site community descriptions and dominant understory flora of proposed turbine locations at the Amherst Community Wind Farm site. For Turbine 2, location a) is originally proposed site (flooded by beavers); location b) is nearest adjacent upland site.

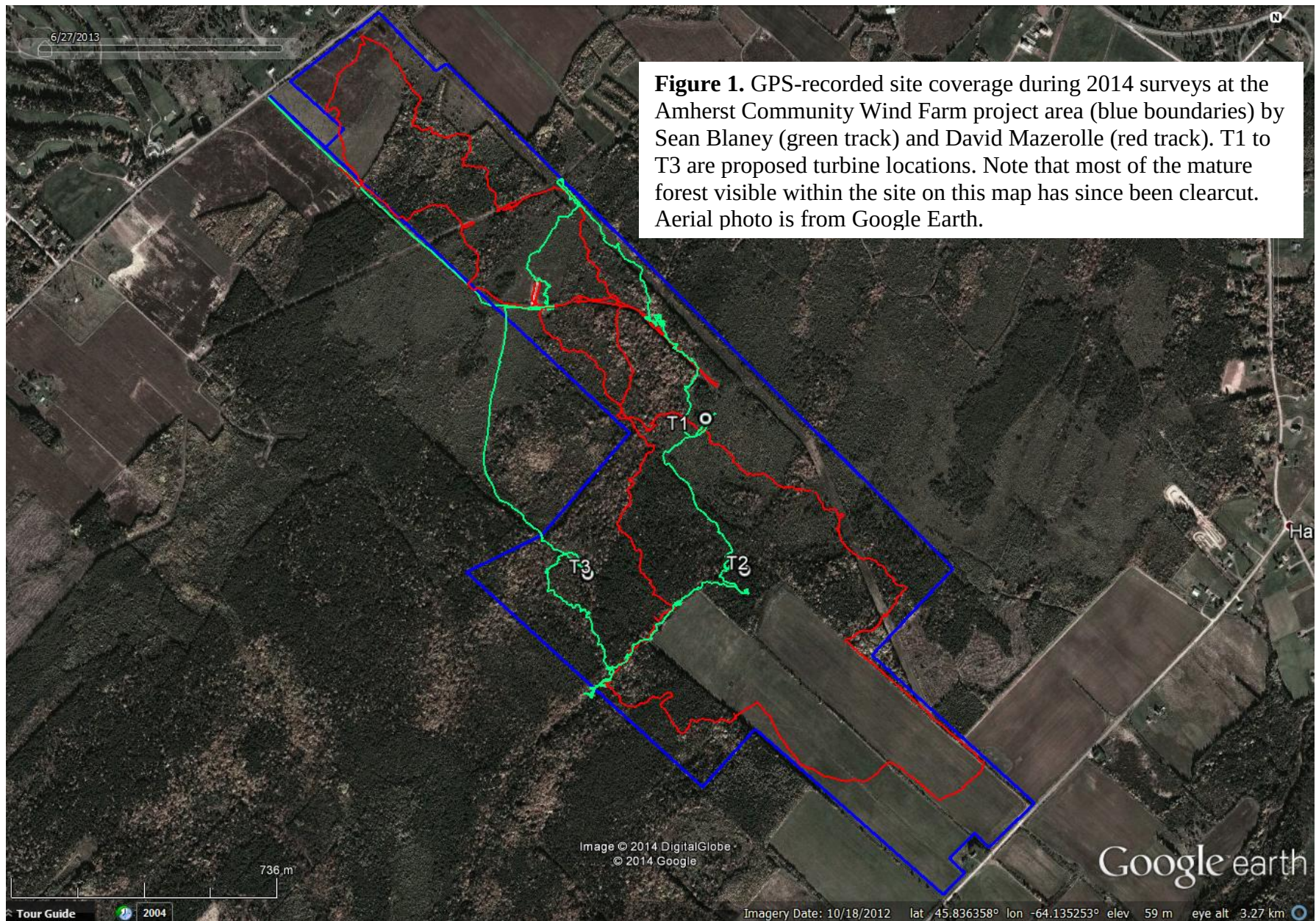
Turbine #	Latitude	Longitude	Site Description	Dominant Understory Species
01	45.8351674	-64.1447673	Approximately 15 year old black spruce and/or red spruce plantation on clearcut site. Acidic heathy site with slight peat accumulation in some wetter areas but predominantly upland. Natural regeneration dominated by gray and white Birch.	<i>Shrub cover 85% (Kalmia angustifolia, Vaccinium angustifolium, Vaccinium myrtilloides, Nemopanthus mucronatus, Viburnum nudum var. cassinoides, Betula populifolia (saplings), Betula papyrifera (saplings). Herb cover – Cornus canadensis, Gaultheria hispidula</i>
02	a) 45.83135 b)45.830769	a) -64.14336 b) -64.14332	Recent clearcut heavily covered by remaining branches and having very little live plant matter visible	Very little visible during survey.
03	45.49554	-63.11373	Turbine footprint crosses boundary of two community types: To north - Intermediate to mature (50 to 70 years old) seepy red maple and red spruce-dominated mixed forest swamp, with a small stream flowing through. To south – intermediate-aged (about 40-50 years old) red spruce-dominated upland forest.	To north – diverse understory, dominated by <i>Osmunda claytoniana, Dryopteris campyloptera, Dryopteris intermedia, Aralia nudicaulis, Maianthemum canadense, Trientalis borealis</i> . To south – limited shrub & herbaceous understory due to dense spruce canopy. Patchy dominance of <i>Pleurozium schreberi</i> .

Table 5. Plant community notes from areas outside of proposed turbine footprints, mostly compiled by David Mazerolle. Locations are mapped in Figure 7.

#	Habitat / Plant Community notes	Latitude (start)	Longitude (start)	Latitude (end)	Longitude (end)
1	Old field	45.841045	-64.157174		
2	Immature mixed woods, <i>Acer rubrum</i> / <i>Abies balsamea</i> / <i>Picea glauca</i> / <i>Betula papyrifera</i> , avg dbh ~10cm	45.842591	-64.155323		
3	Forested wetland; Wet coniferous woods with seepage and shallow peat accumulation; <i>Picea mariana</i> common; understory dominated by Ericaceous shrubs; some selective cutting and pre-commercial thinning	45.842406	-64.154895	45.842350	-64.154680
4	Out of young shrubby woods and into immature mixed woods; selective cutting	45.841741	-64.153427		
5	Recent clear cutting along rd	45.840367	-64.152219		
6	Open wetland corridor adjacent and parallel to rd	45.840930	-64.150224		
7	Exiting acidic ericaceous shrub-dominated wet/dry mosaic	45.839720	-64.149340		
8	Young regenerating <i>Picea mariana</i> / <i>Abies balsamea</i> with dense ericaceous shrub layer	45.839361	-64.148971		
9	Very recent cutting	45.839100	-64.149020		
10	Entering wetland/upland mosaic; <i>Sphagnum</i> patches covering only ~25 percent	45.837720	-64.147990		
11	Clear-cut <i>Acer rubrum</i> forested wetland	45.837720	-64.147990		
12	Out of clear cut/ into wet immature mixed <i>Acer rubrum</i> -dominated woods	45.836227	-64.147469		
13	Reaching wetland edge but heading back in	45.835210	-64.147970		
14	Back into clear cut	45.835101	-64.147168		
15	Out of very recent clear cut	45.835176	-64.145628		
16	young regenerating <i>Picea mariana</i> / <i>Acer rubrum</i> / <i>Betula papyrifera</i> with dense ericaceous shrub layer	45.834970	-64.145200		

#	Habitat / Plant Community notes	Latitude (start)	Longitude (start)	Latitude (end)	Longitude (end)
17	Heathy wet/dry mosaic	45.834520	-64.144550	45.833720	-64.143070
18	Into wetland	45.833720	-64.143070		
19	Pocket of mature <i>Acer rubrum</i> / <i>Betula alleghaniensis</i> / <i>Abies balsamea</i> swamp	45.833362	-64.141503		
20	<i>Picea mariana</i> swamp	45.833222	-64.140778		
21	Out of wetland and into fairly dry clear cut	45.831886	-64.139699		
22	Back into wetland	45.831206	-64.138189		
23	Out of wetland	45.829966	-64.138567		
24	Mature <i>Picea mariana</i> / <i>Acer rubrum</i> / <i>Abies balsamea</i> ; mainly gentle slope swamp with some areas more likely small shallow basin swamps; >60% Sphagnum cover; avg dbh 20-30 cm	45.827560	-64.144100		
25	Transition to upland	45.827900	-64.147590		
26	Nice mature <i>Acer saccharum</i> / <i>Acer rubrum</i> / <i>Betula alleghaniensis</i> / <i>Picea</i> sp. on stream valley slopes; some trees with dbh to 40cm	45.828491	-64.148442		
27	Intermediate to mature <i>Picea mariana</i> / <i>Acer rubrum</i> / <i>Picea glauca</i>	45.830381	-64.145905		
28	Forested wetland; <i>Picea mariana</i> / <i>Acer rubrum</i> swamp; wet/dry mosaic	45.830381	-64.145905		
29	Small unmarked brook and fairly wide seepage corridor	45.832279	-64.147819		
30	Clear-cut <i>Acer rubrum</i> / <i>Picea mariana</i> swamp	45.832730	-64.147830	45.833431	-64.147586
31	Wetland	45.832730	-64.147830	45.835579	-64.148043
32	Transition to upland	45.835579	-64.148043		
33	Into heathy regenerating wet/dry mosaic	45.837440	-64.150640		
34	Out of wetland	45.837800	-64.150760		
35	Wet clear-cut swamp	45.838555	-64.153333		
36	Into heathy wet/dry mosaic	45.839240	-64.152980		

#	Habitat / Plant Community notes	Latitude (start)	Longitude (start)	Latitude (end)	Longitude (end)
37	Transition to upland	45.840234	-64.153833		
38	Very seepy, shallowly sloped mixed forest swamp; mostly followed small, unmarked stream in this zone; upland beyond the end	45.828830	-64.148320	45.832140	-64.150660



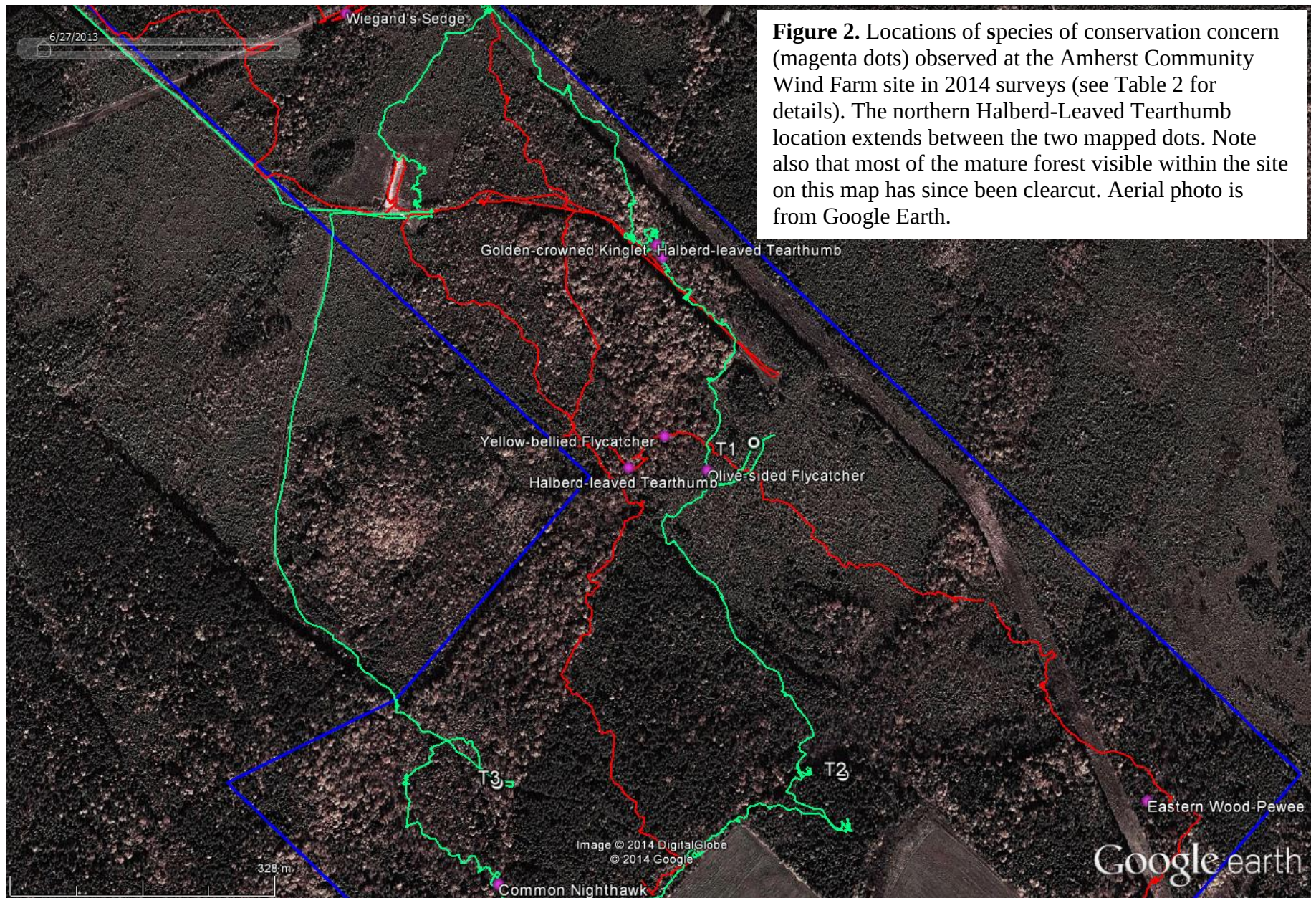




Figure 3. Halberd-Leaved Tearthumb (*Polygonum arifolium*, S2 – Sensitive) seedlings at the Amherst Community Wind Farm site. We found two locations in remnant patches of seepy red maple-dominated swamp forest within a large, recent clearcut to the north of the proposed site of Turbine 1.



Figure 4. Proposed turbine site T1, a fairly open, approximately 15 year old Black and/or Red Spruce plantation in a clearcut with some natural regeneration.



Figure 5. Location near proposed turbine site T2, which beavers had flooded. The site photographed above, in a recent clearcut heavily covered by remaining branches and having very little live plant matter visible, was in an adjacent area to the initially proposed turbine site T2.



Figure 6. Proposed turbine site T3, showing intermediate-mature, seepy mixed forest in foreground and younger red spruce – balsam fir upland forest in background. The small stream is flowing across the centre portion of the photograph.

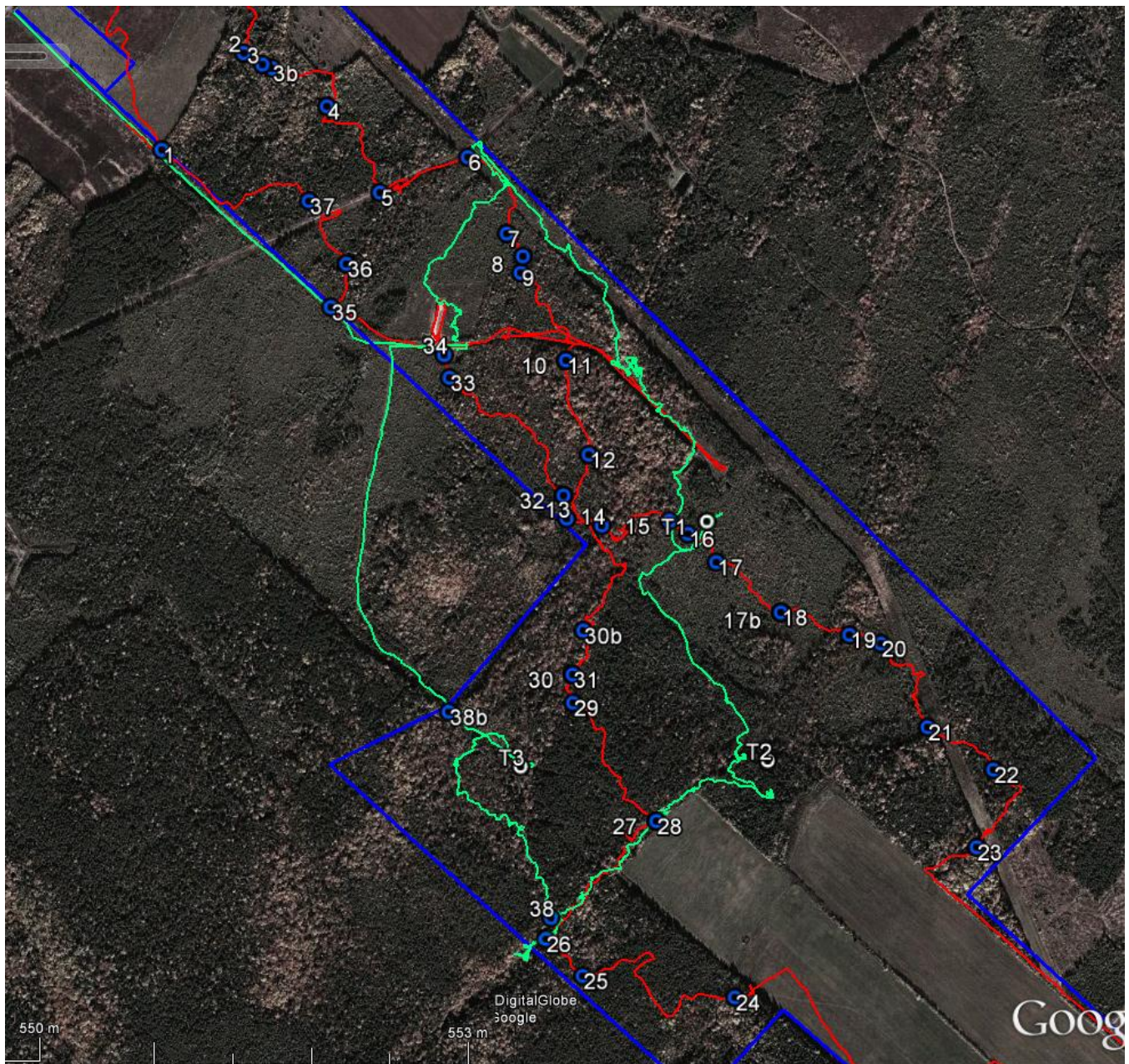


Figure 7. Locations documented in plant community notes for the Amherst Community Wind Farm site, compiled primarily by David Mazerolle and listed in Table 5.

Appendix 1. Definitions of Atlantic Canada Conservation Data Centre (AC CDC) provincial ranks (S-ranks) and Nova Scotia Department of Natural Resources General Status Ranks. Both sets of ranks were developed through the consensus of the Nova Scotia Flora Ranking Committee, cooperatively led by Nova Scotia Department of Natural Resources and AC CDC. The ranks reflect the best understanding of plant status at the time of ranking, but are subject to revision as new information becomes available.

Definitions of provincial (subnational) ranks (S-ranks):

- S1 Extremely rare throughout its range in the province (typically 5 or fewer occurrences or very few remaining individuals). May be especially vulnerable to extirpation.
- S Rare throughout its range in the province (usually 6 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 (usually 21 to 100 occurrences), or found only in a restricted range, even if abundant in at some locations.
- S Usually widespread, fairly common throughout its range in the province (usually 100+ occurrences), and apparently secure, but the element is of long-term concern.
- S5 Demonstrably widespread, abundant, and secure throughout its range in the province, and essentially ineradicable under present conditions (100+ occurrences).
- S#S# Numeric range rank: A range between two consecutive numeric ranks. Denotes range of uncertainty about the exact rarity of the Element (e.g., S1S2).
- SNA Conservation status not applicable: The taxon is exotic, its occurrence in the jurisdiction is not confirmed, or it is a hybrid without conservation value.
- ? Is used as a qualifier indicating uncertainty: for numeric ranks, denotes inexactness, e.g., SE? denotes uncertainty of exotic status. (The ? qualifies the character immediately preceding it in the SRANK).

Definitions of National General Status Ranks (from *Wild Species: the General Status Program in Canada*, Lisa Twolan and Simon Nadeau, 2004, Canadian Wildlife Service, Ottawa)

- *Extirpated*: species that have disappeared from (or are no longer present in) a given geographic area but which occur in other areas
- *Extinct*: species that are extirpated worldwide (i.e., they no longer exist anywhere)
- *At Risk*: species for which a formal detailed risk assessment (COSEWIC assessment or provincial or territorial equivalent) has been completed, and which have been determined to be at risk of extirpation or extinction (i.e., Endangered) or are likely to become at risk of extirpation or extinction if limiting factors are not reversed (i.e., Threatened)
- *May Be At Risk*: species that may be at risk of extirpation or extinction and are, therefore, candidates for a detailed risk assessment by COSEWIC or the provincial or territorial equivalent
- *Sensitive*: species that are believed to not be at risk of extirpation or extinction but which may require special attention or protection to prevent them from becoming at risk
- *Secure*: species that are believed to not belong in the categories At Risk, May Be At Risk, Extirpated, Extinct, Accidental, or Exotic. This category includes some species that show a declining trend in numbers in Canada but which remain relatively widespread or abundant.
- *Undetermined*: species for which insufficient data, information, or knowledge is available with which to reliably evaluate their general status
- *Not Assessed*: species that are known or believed to be present in the geographic area in Canada to which the general status rank applies but which have not yet been assessed

- *Exotic*: species that have been moved beyond their natural range as a result of human activity. In the *Wild Species 2005* report, exotic species have been purposefully excluded from all other categories.
- *Accidental*: species occurring infrequently and unpredictably outside their usual range

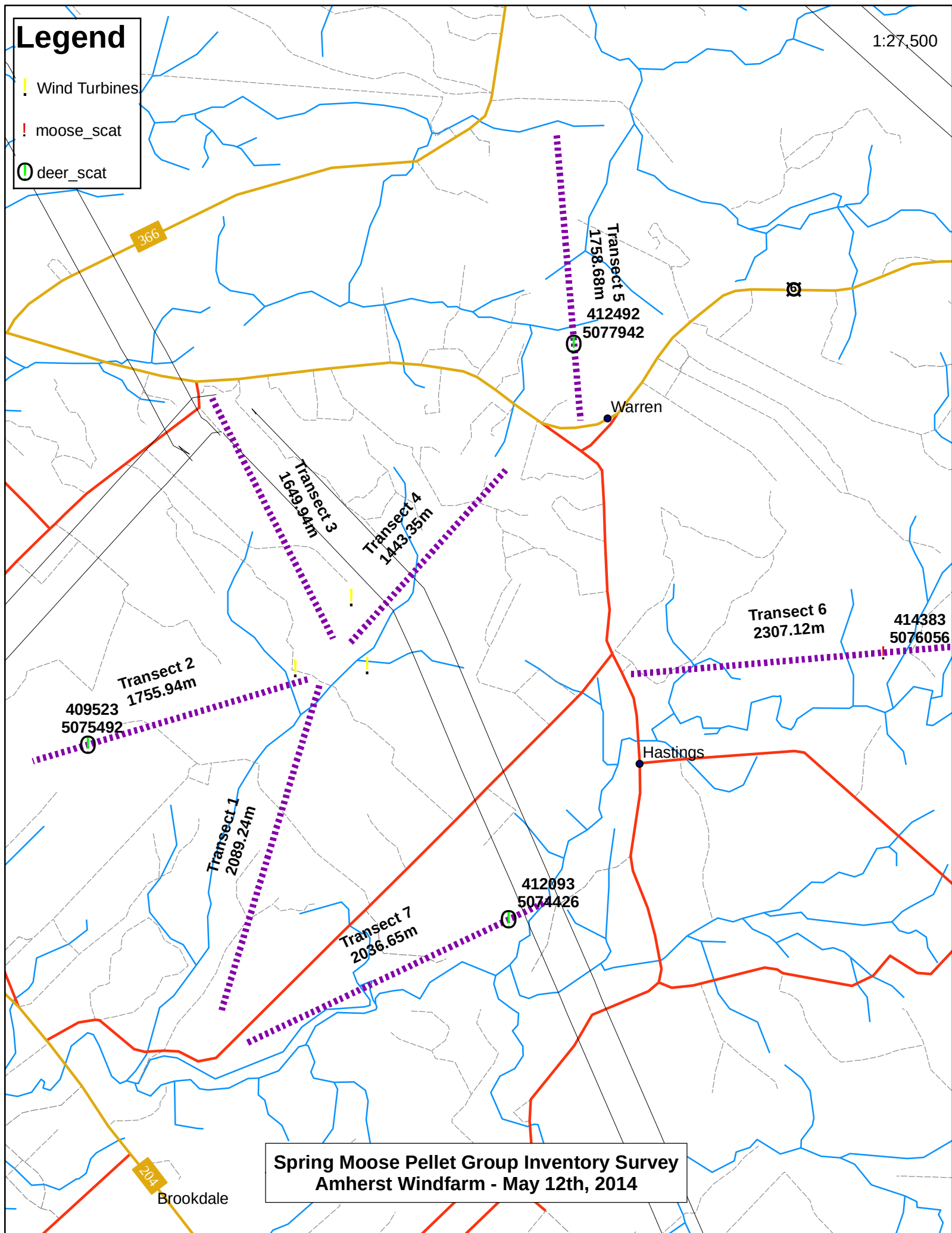
Appendix H:

Moose Track and Pellet Group Inventory Surveys

Legend

- Wind Turbines
- moose_scats
- deer_scats

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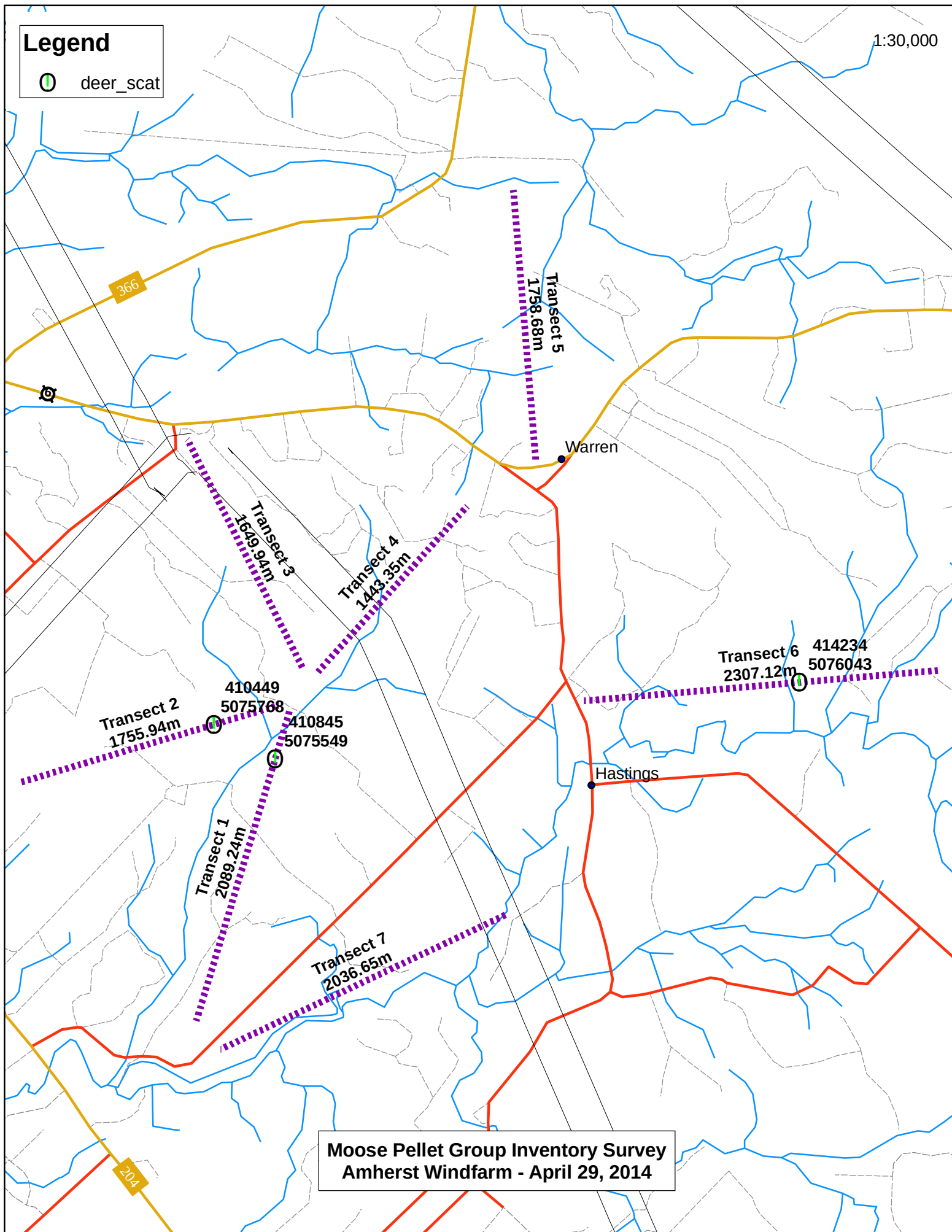


Spring Moose Pellet Group Inventory Survey
Amherst Windfarm - May 12th, 2014

Legend

 deer scat

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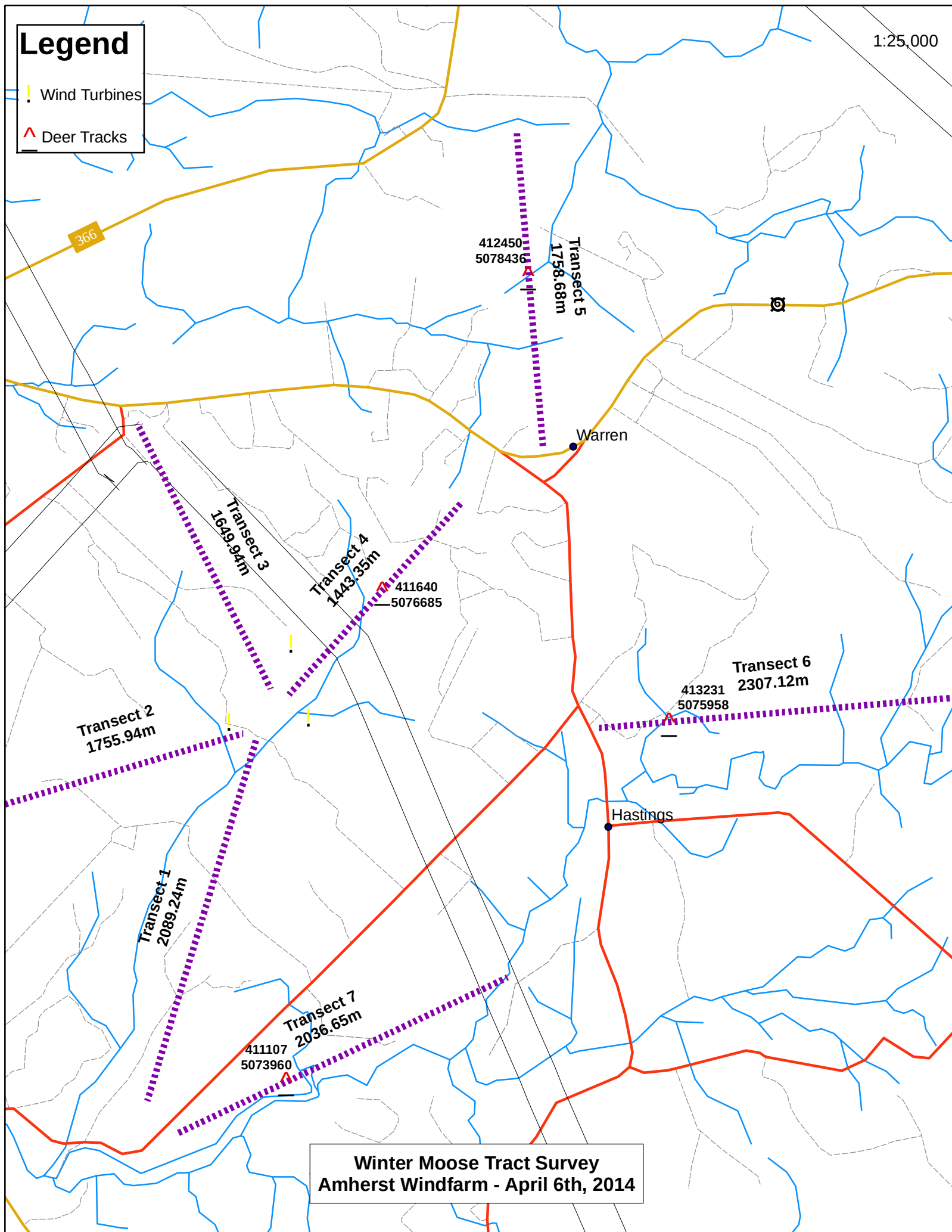
Moose Pellet Group Inventory Survey
Amherst Windfarm - April 29, 2014

Legend

Wind Turbines

Deer Tracks

1:25,000



Legend

Wind Turbines

Deer Tracks

1:25,000

366

412391
5079153

Transect 5
1758.68m

Warren

Transect 3
1649.94m

Transect 4
1443.35m

Transect 2
1755.94m

410356
5075740

Transect 1
2089.24m

Transect 6
2307.12m

Hastings

412225
5074488

Transect 7
2036.65m

204

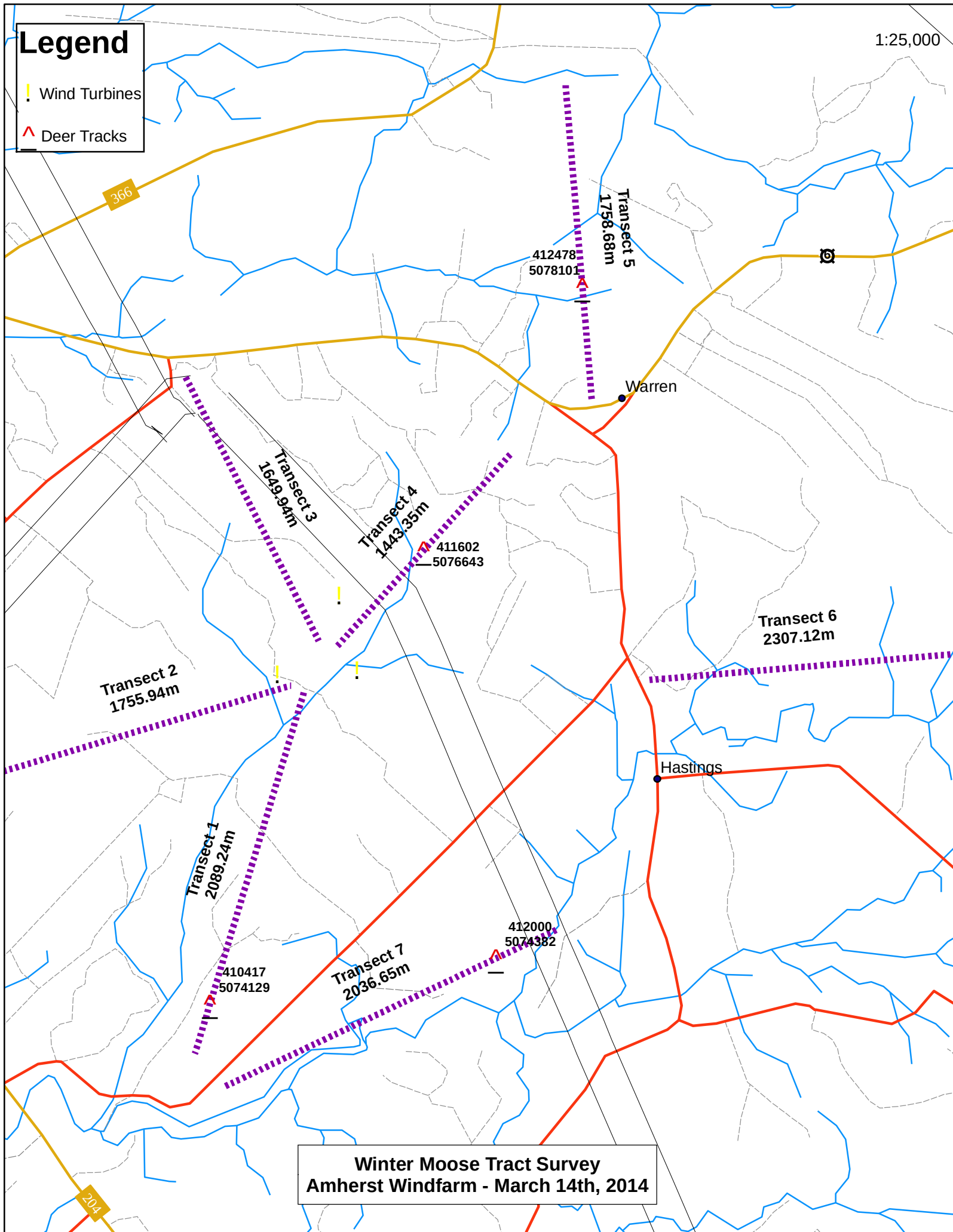
Winter Moose Tract Survey
Amherst Windfarm - March 26th, 2014

Legend

Wind Turbines

Deer Tracks

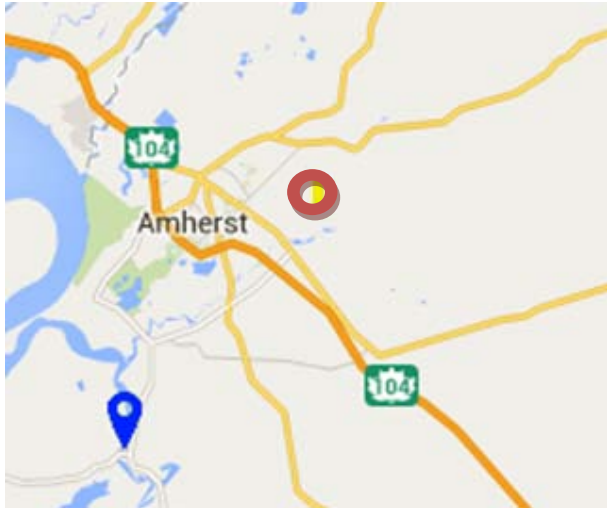
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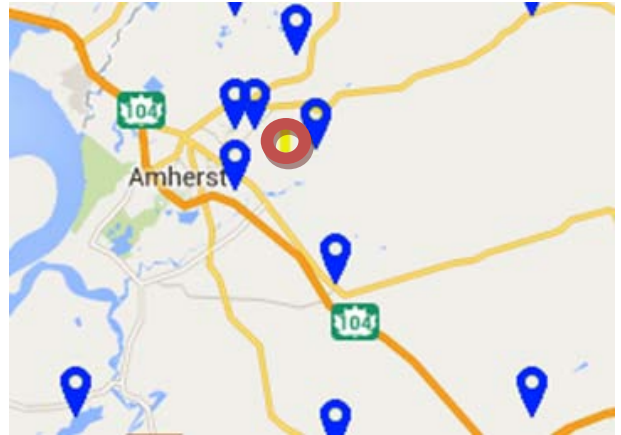
Winter Moose Tract Survey
Amherst Windfarm - March 14th, 2014

Reported moose sightings to DNR by year.

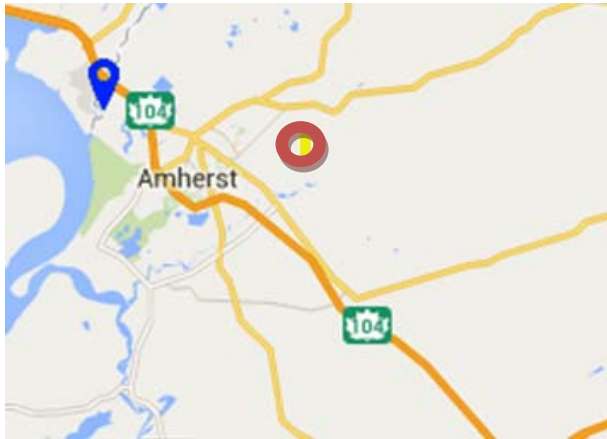
2009



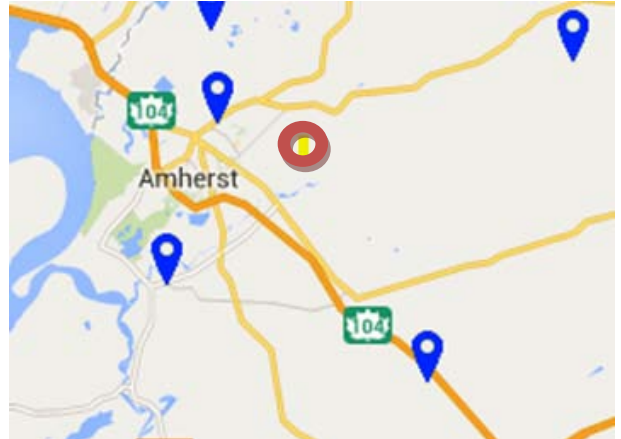
2010



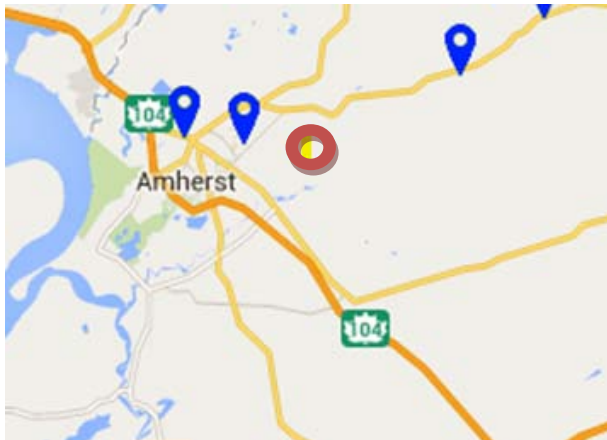
2011



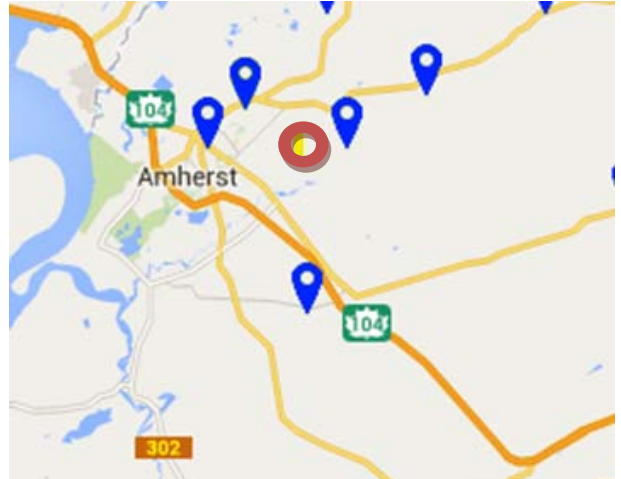
2012



2013



2014



Appendix I:

Noise Impact Assessment

Amherst Community Wind Farm Noise Impact Assessment Report December 2014



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** The WindPRO v2.9, Decibel Module Calculation Results for Enercon E-92 2.3 MW @ 98m Hub Height. To review General Specification for the Enercon E-92 2.3 MW please contact:

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- Annex A: Site Layout Map
Annex B: WindPRO v2.9, Decibel Module Calculation Results – Enercon E-92 2.3 MW.

I. Introduction

Natural Forces Wind Inc. has undertaken a noise impact assessment for the proposed Amherst Community Wind Farm site to assess the impact of the wind farm's sound emissions on the surrounding points of immission. Details outlining the project, noise receptors, prediction methodology and assumptions made for the assessment are included in this report and the WindPRO results for the turbine supplied in located in the annexes. The Land Use By-law for Municipality of Cumberland County does not state any restrictions pertaining to sound pressure levels relating to wind turbines activities. Therefore, the *Ontario Noise Guidelines for Wind Farms* will be used during this assessment as a guideline regarding acceptable noise emission from the proposed Amherst Wind Farm.

The noise analysis was conducted using the ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation model within the Decibel module of the software package, WindPRO version 2.9.

2. General Description of Project Site and Surrounds

The proposed Amherst Community Wind Farm consists of a maximum of 3 wind turbine generators (WTG) located in the Municipality of Cumberland County, Nova Scotia. Currently, Enercon E-92 2.0 MW wind turbines are being considered for the project and therefore were used to calculate predicted sound pressure levels, however if the turbine type was to change, a new noise assessment would be conducted. The project site is situated approximately 5 kilometers east of Amherst between Pumping Station Road and John Black Road. A map of the site is included in Annex A.

The predominant noise sources in the area are from road traffic along Pumping Station Road and John Black Road. Farming activities during the summer months may also contribute to local noise.

3. Noise Guidelines for Wind Farm

3.1. Provincial and Municipal Noise Guidelines

As previously mentioned, the Municipality of Cumberland County does not include any restrictions concerning acceptable sound pressure levels being emitted from wind turbines.

The province of Nova Scotia does not have any guidelines or written restrictions for acceptable sound pressure levels, but adheres to the guidelines outlined in Ontario's *Noise Guidelines for Wind Farms*.

3.2. Ontario Provincial Noise Guidelines

For the proposed Amherst Community Wind Farm, the *Ontario Noise Guidelines for Wind Farms* was used as a general guideline. The guidelines describe receptors in rural environments as Class 3. The sound level limits established for this class of receptors is demonstrated in Table I for wind turbines at different wind speeds.

Table I - Summary of sound level limits for wind turbines (Ministry of the Environment, 2008).

Wind Speed (m/s) at 10 m height	4	5	6	7	8	9	10
Wind Turbine Sound Level Limits Class 3 Area, dB(A)	40.0	40.0	40.0	43.0	45.0	49.0	51.0

To ensure a conservative assessment of the sound level limits emitted by the proposed Amherst Community Wind Farm, a general limit of 40 dB(A) was used for wind speeds ranging between and including 4 and 12 m/s.

The noise assessment used the height above grade at the centre of the receptors of 4.5 m as proposed by the guideline for single and two story dwellings.

4. Description of Receptors

The Ontario guidelines requires the noise assessment to consider all receptors within a 2,000 meter radius of the WTGs, for the purpose of this report a conservative radius of 2,500 meters has been used. The 314 points of reception taken into consideration for this noise impact assessment are residential buildings and/or seasonal camps located within 2,500 metres (m) of the nearest proposed WTG. The receptors are located at dwellings along Pumping Station Road, John Black Road, D'Orsay Road, Fox Ranch Road, Hastings Road and other areas within 2,500 meters from the WTGs.

Details of receptor locations and distances to nearest WTG are detailed in Table 2. The receptor IDs included in Table 2 corresponds with the WindPRO generated map included in Annex B.

Table 2 - Description of receptors.

Point of Reception ID	Location (UTM Zone 20, NAD 83)		Distance from receptor to: (meters)		
	Easting	Northing	Wind Turbine 1	Wind Turbine 2	Wind Turbine 3
A	410687	5077694	1472	1924	1636
B	412917	5075407	2000	1816	2259
C	412770	5077450	2016	2293	2449
D	411637	5077534	1348	1775	1719
E	412772	5077381	1979	2246	2412
F	412548	5077384	1799	2093	2230
G	411522	5074857	1486	1039	1426
H	410752	5077687	1447	1902	1628
I	410886	5077728	1459	1919	1674
J	409985	5078587	2565	2996	2642
K	411218	5077847	1562	2021	1847
L	412545	5077331	1764	2051	2197
M	412672	5076299	1550	1593	1933
N	411712	5077716	1545	1971	1914
O	408873	5077294	2464	2709	2250
P	408859	5074597	2825	2600	2393
Q	412869	5077709	2252	2549	2682
R	412802	5075612	1811	1666	2096
S	412515	5077219	1675	1950	2109
T	410620	5077696	1495	1943	1642
U	412931	5075350	2038	1844	2290
V	409450	5077924	2339	2700	2276
W	411964	5077748	1685	2086	2078
X	411426	5077867	1608	2059	1929
Y	410833	5077687	1429	1887	1630
Z	411651	5077709	1516	1948	1878

Point of Reception ID	Location (UTM Zone 20, NAD 83)		Distance from receptor to: (meters)		
	Easting	Northing	Wind Turbine 1	Wind Turbine 2	Wind Turbine 3
AA	412356	5075531	1448	1242	1687
AB	410362	5077647	1557	1983	1636
AC	413531	5075487	2539	2405	2835
AD	409342	5076720	1832	2017	1559
AE	412583	5075822	1534	1433	1844
AF	411398	5077908	1643	2096	1958
AG	412629	5077251	1788	2053	2222
AH	408937	5076375	2187	2280	1844
AI	411274	5077854	1573	2031	1869
AJ	408809	5077359	2549	2798	2339
AK	411218	5077771	1486	1945	1774
AL	409789	5073827	2799	2419	2432
AM	411056	5077731	1445	1906	1699
AN	409952	5077647	1793	2179	1779
AO	411435	5077793	1537	1987	1863
AP	412657	5076391	1538	1609	1932
AQ	411822	5074852	1598	1184	1612
AR	411931	5077767	1686	2091	2074
AS	412980	5077625	2289	2566	2722
AT	412722	5076231	1601	1623	1975
AU	411337	5077903	1629	2084	1934
AV	409973	5077612	1753	2138	1738
AW	412848	5075349	1965	1764	2211
AX	410575	5077689	1504	1949	1640
AY	412716	5075955	1628	1571	1965
AZ	410809	5077676	1423	1880	1618
BA	409819	5077307	1654	1991	1559
BB	412854	5075234	2028	1804	2256
BC	410573	5078822	2593	3050	2769
BD	411281	5077776	1496	1953	1796
BE	411755	5074975	1458	1045	1475
BF	409573	5077673	2078	2428	2000
BG	412840	5075082	2099	1847	2303
BH	411385	5077782	1517	1969	1835
BI	412181	5075412	1374	1111	1567
BJ	409564	5077151	1781	2066	1615
BK	409521	5077076	1784	2053	1598
BL	411829	5075161	1330	951	1401

Point of Reception ID	Location (UTM Zone 20, NAD 83)		Distance from receptor to: (meters)		
	Easting	Northing	Wind Turbine 1	Wind Turbine 2	Wind Turbine 3
BM	409821	5077822	2011	2397	1995
BN	412926	5075138	2139	1905	2359
BO	411328	5077855	1581	2036	1886
BP	412716	5077559	2039	2335	2470
BQ	409280	5073978	2954	2630	2550
BR	412052	5077442	1482	1850	1897
BS	411061	5077829	1542	2004	1796
BT	412655	5076219	1535	1555	1908
BU	409819	5073832	2780	2398	2415
BV	413605	5075505	2604	2476	2904
BW	412682	5077344	1884	2156	2317
BX	410520	5078801	2584	3040	2752
BY	410203	5073611	2830	2410	2509
BZ	409689	5077214	1706	2015	1571
CA	412647	5076460	1535	1625	1935
CB	410561	5077786	1600	2046	1738
CC	410282	5077768	1702	2126	1773
CD	410532	5077683	1515	1956	1639
CE	412639	5077501	1942	2240	2373
CF	408957	5076550	2181	2309	1863
CG	410871	5077619	1354	1814	1564
CH	409864	5077809	1974	2363	1963
CI	410056	5078619	2563	2999	2653
CJ	411620	5074792	1577	1137	1535
CK	410139	5073616	2847	2431	2519
CL	413559	5075468	2571	2436	2867
CM	412846	5075215	2031	1803	2256
CN	409496	5077941	2319	2684	2264
CO	413083	5075431	2140	1973	2412
CP	412040	5077678	1666	2054	2068
CQ	410988	5077728	1446	1908	1685
CR	409723	5077872	2113	2494	2086
CS	410429	5077688	1562	1996	1661
CT	410008	5077764	1849	2249	1861
CU	410131	5078630	2543	2983	2645
CV	411555	5077917	1686	2129	2023
CW	409514	5077056	1782	2046	1591
CX	412671	5076075	1564	1541	1917

Point of Reception ID	Location (UTM Zone 20, NAD 83)		Distance from receptor to: (meters)		
	Easting	Northing	Wind Turbine 1	Wind Turbine 2	Wind Turbine 3
CY	411191	5077777	1491	1950	1773
CZ	413150	5077878	2577	2865	3008
DA	411129	5077856	1568	2029	1836
DB	409209	5076469	1922	2044	1598
DC	412591	5077280	1773	2046	2206
DD	412888	5077758	2298	2598	2728
DE	410214	5077780	1747	2166	1804
DF	410075	5073646	2842	2432	2507
DG	409777	5077617	1891	2256	1839
DH	412653	5076088	1544	1525	1899
DI	411499	5077845	1602	2048	1935
DJ	412983	5078023	2544	2861	2971
DK	409292	5076881	1924	2136	1677
DL	410501	5077760	1598	2039	1720
DM	409648	5073801	2891	2522	2514
DN	412013	5077394	1420	1789	1835
DO	412938	5075690	1912	1793	2215
DP	412810	5077685	2191	2492	2621
DQ	410251	5077632	1602	2017	1652
DR	410048	5077769	1829	2233	1850
DS	412838	5075164	2051	1814	2268
DT	412752	5075742	1719	1604	2023
DU	412809	5075941	1722	1663	2058
DV	412727	5075907	1650	1579	1979
DW	412556	5075942	1475	1411	1806
DX	412602	5075989	1510	1461	1849
DY	412665	5076029	1565	1528	1911
DZ	411436	5074795	1526	1071	1436
EA	411323	5074711	1590	1129	1463
EB	411343	5074557	1745	1285	1613
EC	411223	5074585	1706	1244	1547
ED	411200	5074416	1874	1412	1702
EE	411046	5074410	1880	1421	1675
EF	410991	5074359	1933	1477	1716
EG	410962	5074302	1992	1537	1769
EH	410847	5074207	2099	1648	1854
EI	410735	5074078	2244	1798	1981
EJ	410669	5074028	2305	1862	2033

Point of Reception ID	Location (UTM Zone 20, NAD 83)		Distance from receptor to: (meters)		
	Easting	Northing	Wind Turbine 1	Wind Turbine 2	Wind Turbine 3
EK	410614	5073961	2382	1941	2103
EL	410502	5073855	2511	2076	2218
EM	410440	5073776	2603	2170	2304
EN	410381	5073715	2678	2248	2374
EO	410338	5073669	2734	2306	2426
EP	410299	5073643	2770	2344	2458
EQ	410268	5073611	2810	2385	2496
ER	410183	5073596	2851	2432	2528
ES	410112	5073628	2845	2432	2514
ET	409024	5074298	2892	2619	2469
EU	408806	5076791	2370	2535	2081
EV	408762	5076595	2380	2508	2063
EW	408811	5076539	2325	2445	2001
EX	408876	5076594	2267	2400	1953
EY	408902	5076567	2237	2367	1920
EZ	408851	5076499	2281	2395	1953
FA	408876	5076468	2253	2363	1922
FB	408823	5076389	2301	2394	1959
FC	409006	5076580	2136	2272	1824
FD	409036	5076615	2111	2256	1806
FE	408848	5077333	2503	2751	2293
FF	408816	5077274	2508	2746	2287
FG	408790	5077254	2524	2758	2299
FH	408765	5077234	2540	2769	2310
FI	408854	5077222	2453	2687	2228
FJ	408834	5077189	2459	2687	2228
FK	408784	5077149	2491	2710	2251
FL	408889	5077170	2401	2630	2171
FM	408899	5077029	2343	2552	2093
FN	408906	5077257	2419	2661	2202
FO	408933	5077225	2381	2621	2162
FP	408968	5077195	2337	2575	2117
FQ	408987	5077171	2310	2546	2088
FR	408982	5077077	2281	2503	2044
FS	408965	5077052	2288	2505	2046
FT	409085	5077090	2189	2421	1962
FU	409119	5077060	2147	2376	1917
FV	409165	5076994	2080	2303	1844

Point of Reception ID	Location (UTM Zone 20, NAD 83)		Distance from receptor to: (meters)		
	Easting	Northing	Wind Turbine 1	Wind Turbine 2	Wind Turbine 3
FW	409080	5076943	2144	2352	1893
FX	409096	5076843	2101	2292	1834
FY	409023	5076890	2184	2378	1920
FZ	409149	5076893	2064	2267	1809
GA	409213	5076950	2021	2239	1780
GB	409262	5076909	1961	2176	1717
GC	409201	5076822	1994	2188	1730
GD	409617	5077923	2222	2597	2183
GE	409763	5077549	1854	2211	1789
GF	409784	5077492	1800	2154	1730
GG	409801	5077452	1761	2112	1688
GH	409838	5077414	1708	2059	1636
GI	409894	5077483	1713	2078	1664
GJ	409861	5077504	1752	2115	1699
GK	409887	5077667	1851	2232	1827
GL	409938	5077562	1739	2116	1710
GM	410012	5077627	1739	2130	1735
GN	409988	5077526	1679	2058	1655
GO	410074	5077535	1629	2019	1625
GP	409927	5077710	1857	2245	1847
GQ	410091	5077651	1709	2109	1725
GR	410175	5077737	1731	2144	1775
GS	410244	5077747	1703	2123	1763
GT	410304	5077752	1677	2103	1752
GU	410219	5077668	1649	2063	1696
GV	410242	5077624	1600	2013	1647
GW	411329	5077781	1507	1962	1815
GX	411616	5077845	1634	2071	1983
GY	411648	5077836	1635	2070	1989
GZ	412916	5077837	2370	2676	2799
HA	412949	5077888	2429	2736	2857
HB	412979	5077927	2477	2785	2905
HC	412665	5077213	1799	2053	2232
HD	412710	5077128	1796	2031	2229
HE	412732	5077070	1790	2012	2221
HF	412619	5076996	1656	1877	2087
HG	412763	5076976	1779	1980	2208
HH	412634	5076917	1638	1841	2067

Point of Reception ID	Location (UTM Zone 20, NAD 83)		Distance from receptor to: (meters)		
	Easting	Northing	Wind Turbine 1	Wind Turbine 2	Wind Turbine 3
HI	412751	5076885	1735	1919	2161
HJ	412621	5076849	1601	1791	2027
HK	412751	5076815	1712	1881	2135
HL	412612	5076785	1571	1748	1995
HM	412607	5076709	1543	1703	1964
HN	412606	5076659	1530	1677	1947
HO	412613	5076560	1516	1636	1925
HP	412961	5074234	2757	2412	2864
HQ	412627	5076481	1517	1615	1920
HR	412861	5073989	2883	2511	2954
HS	413071	5074350	2749	2423	2879
HT	412749	5076324	1627	1674	2013
HU	413229	5075453	2266	2112	2548
HV	409888	5077361	1635	1986	1564
HW	413009	5074477	2615	2297	2755
HX	410404	5077677	1564	1995	1655
HY	410466	5077689	1547	1984	1655
HZ	408680	5076222	2443	2501	2080
IA	408648	5076184	2476	2527	2110
IB	408619	5076158	2506	2553	2137
IC	408593	5076117	2535	2573	2162
ID	408550	5076083	2580	2613	2204
IE	408425	5075931	2721	2727	2333
IF	408403	5075924	2743	2749	2355
IG	408566	5075990	2573	2589	2189
IH	408572	5075967	2570	2582	2184
II	408553	5075947	2592	2600	2204
IJ	408424	5075815	2739	2726	2343
IK	408401	5075793	2766	2749	2368
IL	408389	5075769	2782	2762	2383
IM	408453	5075840	2706	2697	2311
IN	408437	5075832	2723	2713	2328
IO	408864	5076443	2263	2368	1929
IP	408708	5076635	2439	2572	2126
IQ	408926	5076353	2197	2285	1851
IR	408670	5076609	2473	2600	2155
IS	408683	5076628	2463	2594	2148
IT	408617	5076701	2539	2680	2231

Point of Reception ID	Location (UTM Zone 20, NAD 83)		Distance from receptor to: (meters)		
	Easting	Northing	Wind Turbine 1	Wind Turbine 2	Wind Turbine 3
IU	408572	5076771	2595	2745	2295
IV	408540	5076735	2620	2763	2315
IW	408677	5076803	2499	2659	2206
IX	408645	5076834	2536	2700	2247
IY	408583	5076908	2614	2785	2331
IZ	408971	5076639	2179	2325	1875
JA	409016	5076651	2137	2288	1836
JB	408928	5076992	2304	2509	2051
JC	410435	5078635	2445	2898	2596
JD	411332	5078365	2088	2545	2377
JE	411342	5078397	2120	2577	2411
JF	413544	5075493	2549	2417	2847
JG	413205	5075446	2247	2090	2527
JH	410460	5073823	2552	2119	2255
JI	410234	5073606	2825	2403	2508
JJ	410171	5073620	2832	2414	2508
JK	410079	5073674	2814	2405	2479
JL	409784	5073681	2930	2544	2568
JM	409799	5073696	2910	2523	2549
JN	409810	5073852	2767	2387	2400
JO	409707	5073761	2896	2520	2525
JP	409624	5073854	2858	2494	2478
JQ	409638	5073866	2840	2476	2461
JR	409477	5073946	2862	2517	2469
JS	409397	5073956	2901	2564	2503
JT	409033	5074316	2873	2601	2449
JU	409241	5076446	1888	2007	1562
JV	410583	5077810	1615	2062	1759
JW	410806	5077700	1447	1904	1642
JX	410799	5077727	1475	1932	1669
JY	410836	5077708	1448	1907	1651
JZ	411084	5077830	1542	2004	1801
KA	411343	5077856	1584	2038	1891
KB	411351	5077763	1493	1946	1806
KC	411559	5077890	1661	2103	2000
KD	411573	5077865	1640	2081	1983
KE	411583	5077836	1615	2055	1961
KF	411645	5077877	1673	2109	2025

Point of Reception ID	Location (UTM Zone 20, NAD 83)		Distance from receptor to: (meters)		
	Easting	Northing	Wind Turbine 1	Wind Turbine 2	Wind Turbine 3
KG	411628	5077731	1529	1963	1887
KH	411682	5077731	1548	1977	1912
KI	412061	5077716	1709	2097	2110
KJ	412836	5077338	2010	2264	2444
KK	412749	5076218	1628	1646	2001
KL	412462	5075862	1406	1312	1719
KM	412490	5075869	1431	1341	1746
KN	412775	5075725	1746	1628	2048
KO	412808	5075957	1718	1663	2057
KP	412854	5075174	2059	1825	2279
KQ	412847	5075131	2077	1834	2290
KR	412833	5075144	2058	1816	2271
KS	411782	5074810	1619	1197	1618
KT	412319	5075502	1432	1213	1661
KU	411597	5074808	1554	1113	1509
KV	411500	5074910	1429	982	1370
KW	411473	5074877	1454	1003	1383
KX	411438	5074808	1513	1059	1426
KY	411474	5074807	1522	1070	1444
KZ	410737	5074093	2229	1783	1966
LA	412703	5075931	1621	1556	1953
LB	411232	5074559	1733	1271	1574

5. Description of Sources

5.1. Turbine Locations

A map of the project area with the proposed WTG layout is illustrated in Annex A. The existing Amherst Wind Farm, located on the Tantramar Marsh is approximately 7.5 kilometers North West of the proposed Amherst Community Windy Farm. There are no existing or proposed wind farms within 5 kilometers of the project; therefore it is unlikely any cumulative noise effects will occur. At the request of Nova Scotia Environment, Natural Forces may undertake post construction noise monitoring if deemed necessary. UTM coordinates of the WTGs are given below in Table 3. WTG ID numbers included in Table 3 correspond with the labels to the WindPRO generated map included Annex B.

Table 3 - Coordinates of proposed turbine locations.

WTG ID Number	Proposed WTG Location (UTM Zone 20, NAD 83)	
	Easting	Northing
1	411,122 m E	5,076,288 m N
2	411,150 m E	5,075,827 m N
3	410,754 m E	5,076,059 m N

5.2. Turbine Types

The model of WTGs being considered for the proposed wind farm is the Enercon E-92 2.0 MW. Because the WTGs will be de-rated Enercon E-92 turbines from their maximum capacity of 2.3 MW to 2.0 MW, this assessment uses E-92 2.3 MW turbines to model the noise impact on nearby receptors. This will produce conservative results as the noise values produced by the 2.3 MW WTG will be slightly louder than the 2.0 MW WTG.

This model utilizes horizontal axis, upwind, 3-bladed, and a microprocessor pitch control system. Table 4 - Enercon E-92 2.3 MW turbine characteristics below outlines their main characteristics.

Table 4 - Enercon E-92 2.3 MW turbine characteristics. (Enercon, 2012)

WTG Type	Rotor Diameter (m)	Hub Height (m)	Rated Output (MW)
E-92 2.3	92.0	98	2.3

5.3. Power Curve Data

The power curve for the E-92 2.3 MW WTGs at Noise Mode 0 and with an air density of 1.225 kg/m³ is shown below in Figure I.

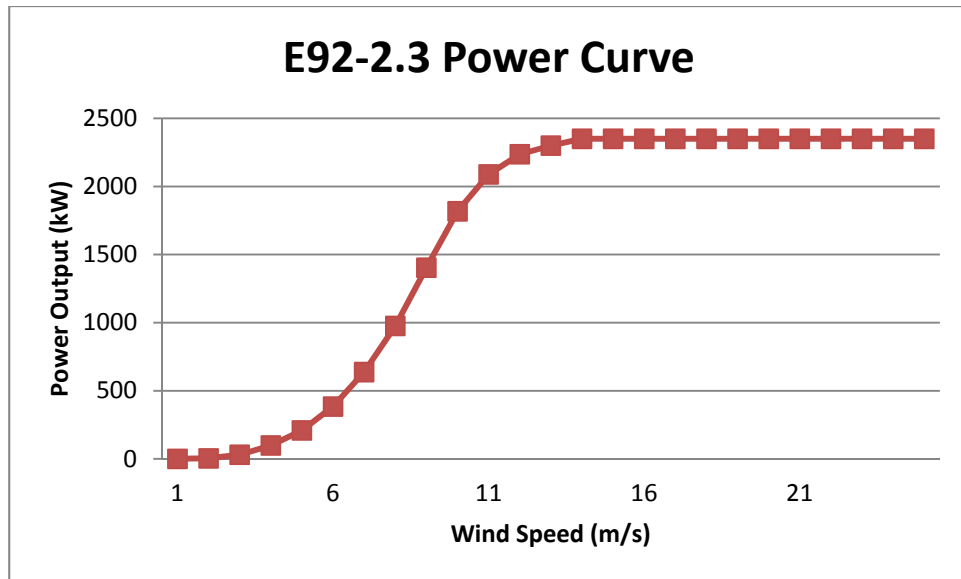


Figure I – Power curve for the Enercon E-92 2.3.

6. Wind Turbine Noise Emission Rating

The noise emission data for the Enercon E-92 2.3 WTG, shown in Table 5 below, was provided by Enercon Canada (2012). The Sound Pressure Levels (SPL) were measured to IEC 61400-11 standards, which stipulate measurements at a height of 10m above ground level (a.g.l.) with an air density of 1.225 kg/m³ that is taken to be representative of the project area. Where data is shown as 'N/A', WindPRO has extrapolated octave band data to generate appropriate Sound Pressure Level values in order to complete the calculation. These source noise levels are incorporated in the prediction calculations referenced in Section 7.

Table 5 - Enercon E-92 2.3 MW noise emission data for 98m hub height.

Wind speed at 10m a.g.l. (m/s)	SPL (LWA) (dB(A) re 10 ⁻¹² Watts)	Octave Band Centre Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
4	97.6	79.2	86.2	89.6	92.2	92.2	89.1	84.3	74.8
5	99.9	81.5	88.5	91.9	94.5	94.3	91.4	86.6	77.1
6	102.2	83.8	90.8	84.2	96.8	96.6	93.7	88.9	79.4
7	103.4	85.0	92.0	95.4	98.0	97.8	94.9	90.1	80.6
8	104.4	86.0	93.0	96.4	99.0	98.8	95.9	91.1	81.6
9	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
10	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
11	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
12	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2

7. Impact Assessment

7.1. Prediction Methodology

The SPL was calculated at each point of reception (listed in Table 2) using the Decibel module of WindPRO v.2.9 which uses the ISO 9613-2 model “Attenuation of sound during propagation outdoors, Part 2: A general method of calculation”. The calculations were performed using the Enercon E-92 2.3 MW wind turbine generators with a hub height of 98 m. A global ground attenuation of 0.0 was used to represent a ‘worst case scenario’ that produces results that are unaffected by sound absorption from topographical characteristics such as trees, grass, etc.

As another conservative measure, downwind propagation has been assumed to occur simultaneously in all directions and from all wind turbines. Furthermore, no attenuation from topographical shielding (other buildings, barns, trees etc.) has been considered between the turbines and receptors. Noise propagation in an upwind direction will result in a significant reduction of noise levels at any receptor located upwind.

No correction for special audible characteristics such as clearly audible tones, impulses or modulation of sound levels has been made. These are not common characteristics of modern wind turbine generators (WTG) in a well designed wind farm. It is habitual that WTG manufacturers guarantee the absence of tonal noise produced by the WTG. Furthermore, impulses and modulation of sound levels from the wind farm under normal conditions would not be of a level to necessitate the application of any penalty.

A full list of parameters assumed for the predictions is provided in Annex B.

7.2. Results of Noise Predictions

The results of the noise prediction model at each point of reception, as summarized in Table 6, prove compliance with the Ontario *Noise Guidelines for Wind Farms* and the 40 dB(A) conservative SPL emission limit. The table demonstrates the loudest noise levels for any wind speed modelled between and including 4 to 12 m/s. As the guideline requirements have been exceeded, it was deemed unnecessary to conduct noise monitoring to establish background noise levels.

The receptor with the highest perceived noise level was receptor BL, which received a worst case scenario emission of 37.3 dB(A) from the Enercon E-92 2.3 MW machine, at a 98 m hub heights.

The modelled noise results at a wind speed of 9 m/s, approximately the ‘noisiest’ operational speed of an Enercon E92 2.3 MW wind turbine is mapped in Annexe B. The receptor ID labels on the contour plot correspond with the WindPRO ID listed in Table 2.

The WindPRO software generated a noise contour map for the Enercon E-92 2.3 with a 98 m hub height, and can be found in Annex B.

Table 6 - Wind turbine noise impact assessment summary.

Point of Reception ID	Max Sound Level from WTG [dB(A)]	Compliance with Ontario Guidelines	Compliance with 40 dB(A) noise level (Yes/No)
A	33.4	Yes	Yes
B	31.1	Yes	Yes
C	29.8	Yes	Yes
D	33.9	Yes	Yes
E	30.1	Yes	Yes
F	31.1	Yes	Yes
G	36.4	Yes	Yes
H	33.5	Yes	Yes
I	33.4	Yes	Yes
J	27.4	Yes	Yes
K	32.5	Yes	Yes
L	31.3	Yes	Yes
M	33.3	Yes	Yes
N	32.5	Yes	Yes
O	28.7	Yes	Yes
P	28	Yes	Yes
Q	28.6	Yes	Yes
R	32.2	Yes	Yes
S	31.8	Yes	Yes
T	33.3	Yes	Yes
U	30.9	Yes	Yes
V	28.8	Yes	Yes
W	31.6	Yes	Yes
X	32.2	Yes	Yes
Y	33.6	Yes	Yes
Z	32.7	Yes	Yes
AA	35.1	Yes	Yes
AB	33.1	Yes	Yes
AC	28.1	Yes	Yes
AD	32.6	Yes	Yes
AE	33.9	Yes	Yes
AF	31.9	Yes	Yes
AG	31.2	Yes	Yes
AH	30.7	Yes	Yes
AI	32.4	Yes	Yes
AJ	28.2	Yes	Yes
AK	33	Yes	Yes

Point of Reception ID	Max Sound Level from WTG [dB(A)]	Compliance with Ontario Guidelines	Compliance with 40 dB(A) noise level (Yes/No)
AL	28.3	Yes	Yes
AM	33.4	Yes	Yes
AN	31.8	Yes	Yes
AO	32.6	Yes	Yes
AP	33.3	Yes	Yes
AQ	35.1	Yes	Yes
AR	31.6	Yes	Yes
AS	28.4	Yes	Yes
AT	33	Yes	Yes
AU	32	Yes	Yes
AV	32	Yes	Yes
AW	31.4	Yes	Yes
AX	33.3	Yes	Yes
AY	33.1	Yes	Yes
AZ	33.7	Yes	Yes
BA	33	Yes	Yes
BB	31.1	Yes	Yes
BC	27.1	Yes	Yes
BD	32.9	Yes	Yes
BE	36.3	Yes	Yes
BF	30.3	Yes	Yes
BG	30.8	Yes	Yes
BH	32.8	Yes	Yes
BI	36	Yes	Yes
BJ	32.4	Yes	Yes
BK	32.5	Yes	Yes
BL	37.3	Yes	Yes
BM	30.5	Yes	Yes
BN	30.5	Yes	Yes
BO	32.4	Yes	Yes
BP	29.7	Yes	Yes
BQ	27.5	Yes	Yes
BR	33	Yes	Yes
BS	32.7	Yes	Yes
BT	33.4	Yes	Yes
BU	28.4	Yes	Yes
BV	27.7	Yes	Yes
BW	30.6	Yes	Yes

Point of Reception ID	Max Sound Level from WTG [dB(A)]	Compliance with Ontario Guidelines	Compliance with 40 dB(A) noise level (Yes/No)
BX	27.1	Yes	Yes
BY	28.1	Yes	Yes
BZ	32.8	Yes	Yes
CA	33.2	Yes	Yes
CB	32.6	Yes	Yes
CC	32.1	Yes	Yes
CD	33.2	Yes	Yes
CE	30.2	Yes	Yes
CF	30.6	Yes	Yes
CG	34.2	Yes	Yes
CH	30.7	Yes	Yes
CI	27.4	Yes	Yes
CJ	35.5	Yes	Yes
CK	28	Yes	Yes
CL	27.9	Yes	Yes
CM	31.1	Yes	Yes
CN	28.9	Yes	Yes
CO	30.2	Yes	Yes
CP	31.8	Yes	Yes
CQ	33.4	Yes	Yes
CR	29.9	Yes	Yes
CS	33	Yes	Yes
CT	31.4	Yes	Yes
CU	27.4	Yes	Yes
CV	31.6	Yes	Yes
CW	32.5	Yes	Yes
CX	33.4	Yes	Yes
CY	33	Yes	Yes
CZ	27	Yes	Yes
DA	32.5	Yes	Yes
DB	32.2	Yes	Yes
DC	31.2	Yes	Yes
DD	28.3	Yes	Yes
DE	31.9	Yes	Yes
DF	28.1	Yes	Yes
DG	31.3	Yes	Yes
DH	33.5	Yes	Yes
DI	32.2	Yes	Yes

Point of Reception ID	Max Sound Level from WTG [dB(A)]	Compliance with Ontario Guidelines	Compliance with 40 dB(A) noise level (Yes/No)
DJ	27.1	Yes	Yes
DK	31.8	Yes	Yes
DL	32.6	Yes	Yes
DM	27.8	Yes	Yes
DN	33.4	Yes	Yes
DO	31.4	Yes	Yes
DP	28.9	Yes	Yes
DQ	32.8	Yes	Yes
DR	31.4	Yes	Yes
DS	31	Yes	Yes
DT	32.6	Yes	Yes
DU	32.4	Yes	Yes
DV	33	Yes	Yes
DW	34.2	Yes	Yes
DX	33.9	Yes	Yes
DY	33.4	Yes	Yes
DZ	36.1	Yes	Yes
EA	35.7	Yes	Yes
EB	34.4	Yes	Yes
EC	34.8	Yes	Yes
ED	33.5	Yes	Yes
EE	33.6	Yes	Yes
EF	33.2	Yes	Yes
EG	32.8	Yes	Yes
EH	32.1	Yes	Yes
EI	31.2	Yes	Yes
EJ	30.9	Yes	Yes
EK	30.4	Yes	Yes
EL	29.7	Yes	Yes
EM	29.2	Yes	Yes
EN	28.9	Yes	Yes
EO	28.6	Yes	Yes
EP	28.4	Yes	Yes
EQ	28.2	Yes	Yes
ER	28	Yes	Yes
ES	28	Yes	Yes
ET	27.7	Yes	Yes
EU	29.4	Yes	Yes

Point of Reception ID	Max Sound Level from WTG [dB(A)]	Compliance with Ontario Guidelines	Compliance with 40 dB(A) noise level (Yes/No)
EV	29.5	Yes	Yes
EW	29.8	Yes	Yes
EX	30.1	Yes	Yes
EY	30.3	Yes	Yes
EZ	30.1	Yes	Yes
FA	30.3	Yes	Yes
FB	30	Yes	Yes
FC	30.8	Yes	Yes
FD	31	Yes	Yes
FE	28.5	Yes	Yes
FF	28.5	Yes	Yes
FG	28.4	Yes	Yes
FH	28.3	Yes	Yes
FI	28.8	Yes	Yes
FJ	28.7	Yes	Yes
FK	28.6	Yes	Yes
FL	29	Yes	Yes
FM	29.4	Yes	Yes
FN	28.9	Yes	Yes
FO	29.1	Yes	Yes
FP	29.3	Yes	Yes
FQ	29.5	Yes	Yes
FR	29.7	Yes	Yes
FS	29.7	Yes	Yes
FT	30.2	Yes	Yes
FU	30.4	Yes	Yes
FV	30.8	Yes	Yes
FW	30.5	Yes	Yes
FX	30.8	Yes	Yes
FY	30.4	Yes	Yes
FZ	31	Yes	Yes
GA	31.2	Yes	Yes
GB	31.6	Yes	Yes
GC	31.5	Yes	Yes
GD	29.4	Yes	Yes
GE	31.6	Yes	Yes
GF	31.9	Yes	Yes
GG	32.2	Yes	Yes

Point of Reception ID	Max Sound Level from WTG [dB(A)]	Compliance with Ontario Guidelines	Compliance with 40 dB(A) noise level (Yes/No)
GH	32.5	Yes	Yes
GI	32.4	Yes	Yes
GJ	32.2	Yes	Yes
GK	31.5	Yes	Yes
GL	32.2	Yes	Yes
GM	32.1	Yes	Yes
GN	32.6	Yes	Yes
GO	32.8	Yes	Yes
GP	31.4	Yes	Yes
GQ	32.2	Yes	Yes
GR	32	Yes	Yes
GS	32.1	Yes	Yes
GT	32.3	Yes	Yes
GU	32.5	Yes	Yes
GV	32.9	Yes	Yes
GW	32.9	Yes	Yes
GX	32	Yes	Yes
GY	32	Yes	Yes
GZ	28	Yes	Yes
HA	27.7	Yes	Yes
HB	27.5	Yes	Yes
HC	31.1	Yes	Yes
HD	31.2	Yes	Yes
HE	31.2	Yes	Yes
HF	32.1	Yes	Yes
HG	31.3	Yes	Yes
HH	32.2	Yes	Yes
HI	31.6	Yes	Yes
HJ	32.5	Yes	Yes
HK	31.8	Yes	Yes
HL	32.7	Yes	Yes
HM	33	Yes	Yes
HN	33.1	Yes	Yes
HO	33.3	Yes	Yes
HP	27.7	Yes	Yes
HQ	33.3	Yes	Yes
HR	27.2	Yes	Yes
HS	27.7	Yes	Yes

Point of Reception ID	Max Sound Level from WTG [dB(A)]	Compliance with Ontario Guidelines	Compliance with 40 dB(A) noise level (Yes/No)
HT	32.7	Yes	Yes
HU	29.5	Yes	Yes
HV	33	Yes	Yes
HW	28.3	Yes	Yes
HX	33	Yes	Yes
HY	33	Yes	Yes
HZ	29.4	Yes	Yes
IA	29.2	Yes	Yes
IB	29.1	Yes	Yes
IC	28.9	Yes	Yes
ID	28.7	Yes	Yes
IE	28.1	Yes	Yes
IF	28	Yes	Yes
IG	28.8	Yes	Yes
IH	28.8	Yes	Yes
II	28.7	Yes	Yes
IJ	28	Yes	Yes
IK	27.9	Yes	Yes
IL	27.8	Yes	Yes
IM	28.2	Yes	Yes
IN	28.1	Yes	Yes
IO	30.2	Yes	Yes
IP	29.2	Yes	Yes
IQ	30.6	Yes	Yes
IR	29	Yes	Yes
IS	29	Yes	Yes
IT	28.6	Yes	Yes
IU	28.3	Yes	Yes
IV	28.2	Yes	Yes
IW	28.8	Yes	Yes
IX	28.6	Yes	Yes
IY	28.2	Yes	Yes
IZ	30.6	Yes	Yes
JA	30.8	Yes	Yes
JB	29.6	Yes	Yes
JC	27.8	Yes	Yes
JD	29.4	Yes	Yes
JE	29.2	Yes	Yes

Point of Reception ID	Max Sound Level from WTG [dB(A)]	Compliance with Ontario Guidelines	Compliance with 40 dB(A) noise level (Yes/No)
JF	28	Yes	Yes
JG	29.6	Yes	Yes
JH	29.5	Yes	Yes
JI	28.1	Yes	Yes
JJ	28.1	Yes	Yes
JK	28.2	Yes	Yes
JL	27.6	Yes	Yes
JM	27.7	Yes	Yes
JN	28.4	Yes	Yes
JO	27.8	Yes	Yes
JP	28	Yes	Yes
JQ	28.1	Yes	Yes
JR	27.9	Yes	Yes
JS	27.8	Yes	Yes
JT	27.8	Yes	Yes
JU	32.5	Yes	Yes
JV	32.5	Yes	Yes
JW	33.5	Yes	Yes
JX	33.3	Yes	Yes
JY	33.5	Yes	Yes
JZ	32.7	Yes	Yes
KA	32.3	Yes	Yes
KB	32.9	Yes	Yes
KC	31.8	Yes	Yes
KD	31.9	Yes	Yes
KE	32.1	Yes	Yes
KF	31.7	Yes	Yes
KG	32.6	Yes	Yes
KH	32.5	Yes	Yes
KI	31.5	Yes	Yes
KJ	29.9	Yes	Yes
KK	32.8	Yes	Yes
KL	34.8	Yes	Yes
KM	34.6	Yes	Yes
KN	32.5	Yes	Yes
KO	32.4	Yes	Yes
KP	31	Yes	Yes
KQ	30.9	Yes	Yes

Point of Reception ID	Max Sound Level from WTG [dB(A)]	Compliance with Ontario Guidelines	Compliance with 40 dB(A) noise level (Yes/No)
KR	31	Yes	Yes
KS	35	Yes	Yes
KT	35.3	Yes	Yes
KU	35.7	Yes	Yes
KV	36.9	Yes	Yes
KW	36.7	Yes	Yes
KX	36.2	Yes	Yes
KY	36.1	Yes	Yes
KZ	31.3	Yes	Yes
LA	33.1	Yes	Yes
LB	34.6	Yes	Yes

8. Conclusions and Recommendations

Natural Forces Wind Inc. has completed a thorough assessment to evaluate the noise impact of the proposed Amherst Community Wind Farm on the identified noise receptors located within 2,500 meters of a proposed WTG. Based on the parameters used to run the WindPRO noise prediction model, it has been shown that the predicted Sound Pressure Levels emitted by all three of the proposed WTGs using conservative assumptions are less than 40 dB(A), thus demonstrating compliance with the *Ontario Noise Guidelines for Wind Farms*. As a result of this study, no noise mitigation strategies have been deemed necessary.

9. References

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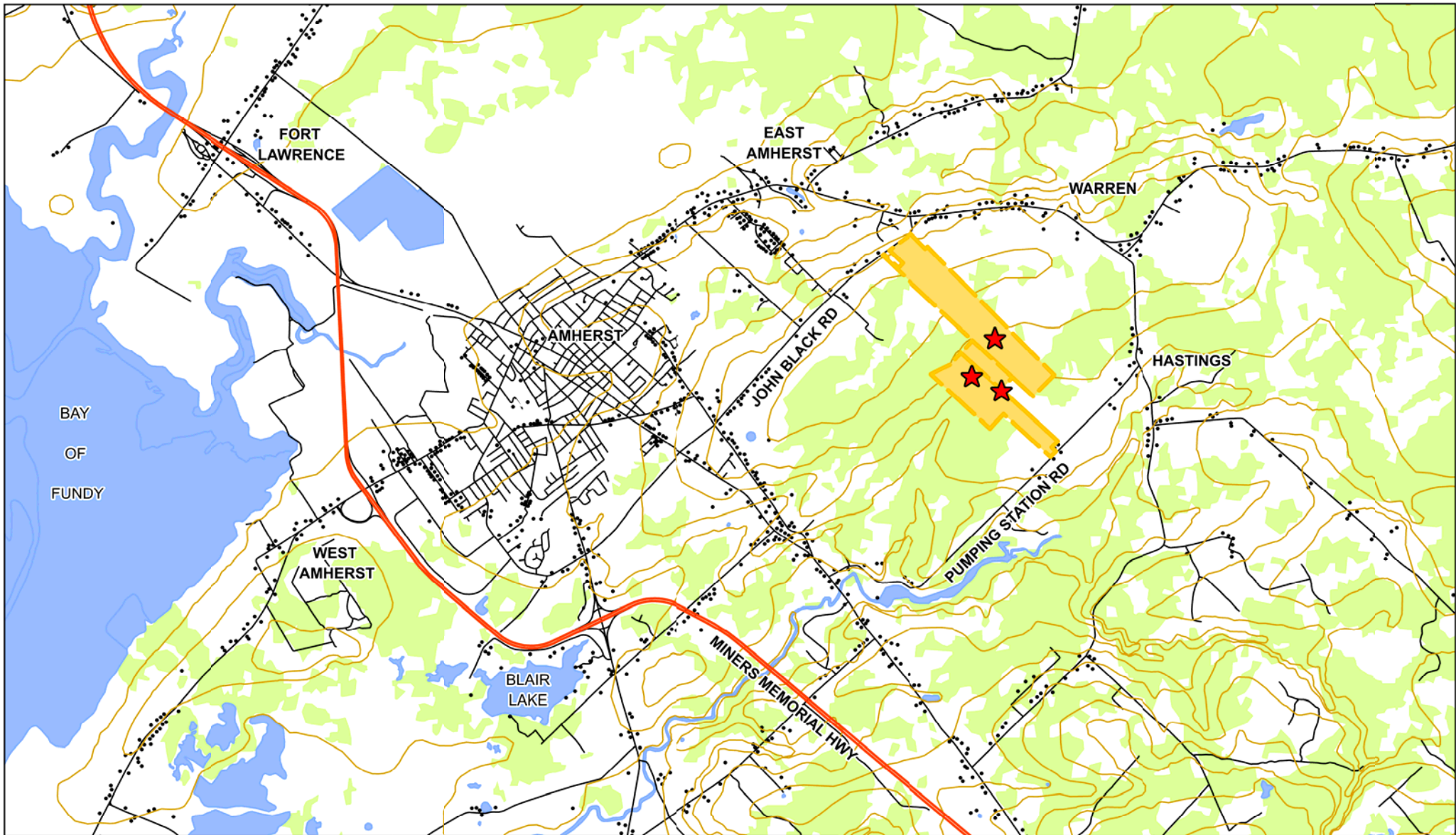
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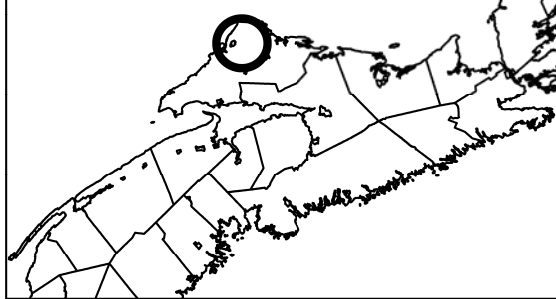
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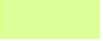
ANNEX A

Site Layout Map



LOCATION OF AMHERST
COMMUNITY WIND FARM



- | | | | |
|---|-------------------|--|--------|
|  | Proposed Turbines |  | Road |
|  | Highway |  | Water |
|  | Project Area |  | Forest |
|  | Elevation Contour | | |
|  | Building | | |

LEGEND

SCALE 1 : 60,000

FIGURE Figure 2-4

TITLE General Overview

1205 - 1801 HOLLIS STREET
HALIFAX, NOVA SCOTIA B3J 3N4
TEL: 902 422 9663
FAX 902 422 9780
WWW.NATURALFORCES.CA

November 19, 2014



ANNEX B

WindPRO v2.8, Decibel Module Calculation Results

Enercon E-92 2.3 MW @ 98m Hub Height

Project:

AMR_WindPro final location 141204

Printed/Page

04/12/2014 3:18 PM / 1

Licensed user:

Natural Forces Wind Inc

1791 Barrington Street Suite 1030

CA-HALIFAX, Nova Scotia B3J 3L1

902 422 9663

Amy / apellerin@naturalforges.ca

Calculated:

04/12/2014 3:18 PM/2.9.269

DECIBEL - Main Result**Calculation:** Amherst Noise Assessment**Noise calculation model:**

ISO 9613-2 General

Wind speed:

4.0 m/s - 12.0 m/s, step 1.0 m/s

Ground attenuation:

None

Meteorological coefficient, C0:

0.0 dB

Type of demand in calculation:

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

Noise values in calculation:

All noise values are mean values (Lwa) (Normal)

Pure tones:

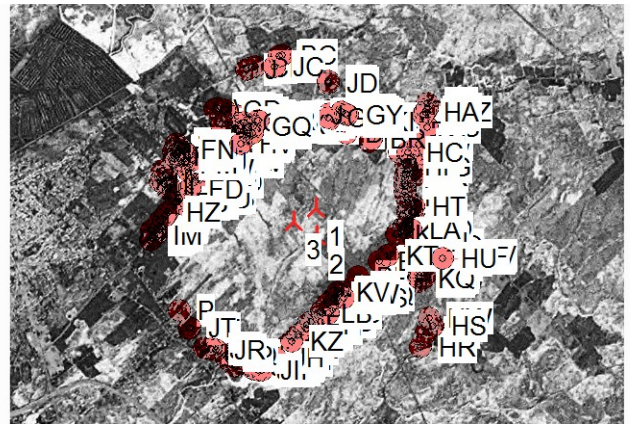
Pure and Impulse tone penalty are added to WTG source noise

Height above ground level, when no value in NSA object:

4.5 m Don't allow override of model height with height from NSA object

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0.0 dB(A)



Scale 1:125,000

New WTG

Noise sensitive area

WTGs

UTM (north)-NAD83 (US+CA) Zone: 20				WTG type			Noise data											
	East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Creator	Name		First wind speed [m/s]	LwaRef [dB(A)]	Last wind speed [m/s]	LwaRef [dB(A)]	Pure tones
				[m]				[kW]	[m]	[m]								
1	411,122	5,076,288	60.4	ENERCON E-92 2,3 MW 2300 ...	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	98.0	EMD	Level 0 - calculated - Op.Mode I - 03/2012		4.0	97.6	12.0	105.0	0 dB g
2	411,150	5,075,827	56.1	ENERCON E-92 2,3 MW 2300 ...	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	98.0	EMD	Level 0 - calculated - Op.Mode I - 03/2012		4.0	97.6	12.0	105.0	0 dB g
3	410,754	5,076,059	65.1	ENERCON E-92 2,3 MW 2300 ...	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	98.0	EMD	Level 0 - calculated - Op.Mode I - 03/2012		4.0	97.6	12.0	105.0	0 dB g

h) Generic octave distribution used

g) Data calculated from data for other wind speed (uncertain)

Calculation Results**Sound Level****Noise sensitive area**

		UTM (north)-NAD83 (US+CA) Zone: 20				Demands		Sound Level		Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs [dB(A)]	Distance to noise demand [m]	Noise	Distance	All
[m]												
A	Noise sensitive point: User defined (1)	410,687	5,077,694	58.4	4.5	40.0	600	33.4	728	Yes	Yes	Yes
B	Noise sensitive point: User defined (2)	412,917	5,075,407	34.6	4.5	40.0	600	31.1	1,079	Yes	Yes	Yes
C	Noise sensitive point: User defined (3)	412,770	5,077,450	74.5	4.5	40.0	600	29.8	1,299	Yes	Yes	Yes
D	Noise sensitive point: User defined (4)	411,637	5,077,534	68.5	4.5	40.0	600	33.9	643	Yes	Yes	Yes
E	Noise sensitive point: User defined (5)	412,772	5,077,381	73.6	4.5	40.0	600	30.1	1,260	Yes	Yes	Yes
F	Noise sensitive point: User defined (6)	412,548	5,077,384	70.0	4.5	40.0	600	31.1	1,084	Yes	Yes	Yes
G	Noise sensitive point: User defined (7)	411,522	5,074,857	50.8	4.5	40.0	600	36.4	338	Yes	Yes	Yes
H	Noise sensitive point: User defined (8)	410,752	5,077,687	60.1	4.5	40.0	600	33.5	708	Yes	Yes	Yes
I	Noise sensitive point: User defined (9)	410,886	5,077,728	60.8	4.5	40.0	600	33.4	729	Yes	Yes	Yes
J	Noise sensitive point: User defined (10)	409,985	5,078,587	37.8	4.5	40.0	600	27.4	1,797	Yes	Yes	Yes
K	Noise sensitive point: User defined (11)	411,218	5,077,847	54.8	4.5	40.0	600	32.5	846	Yes	Yes	Yes
L	Noise sensitive point: User defined (12)	412,545	5,077,331	70.0	4.5	40.0	600	31.3	1,048	Yes	Yes	Yes
M	Noise sensitive point: User defined (13)	412,672	5,076,299	60.0	4.5	40.0	600	33.3	760	Yes	Yes	Yes
N	Noise sensitive point: User defined (14)	411,712	5,077,716	58.4	4.5	40.0	600	32.5	839	Yes	Yes	Yes
O	Noise sensitive point: User defined (15)	408,873	5,077,294	35.0	4.5	40.0	600	28.7	1,522	Yes	Yes	Yes
P	Noise sensitive point: User defined (16)	408,859	5,074,597	46.1	4.5	40.0	600	28.0	1,663	Yes	Yes	Yes
Q	Noise sensitive point: User defined (17)	412,869	5,077,709	75.0	4.5	40.0	600	28.6	1,538	Yes	Yes	Yes
R	Noise sensitive point: User defined (18)	412,802	5,075,612	34.8	4.5	40.0	600	32.2	917	Yes	Yes	Yes
S	Noise sensitive point: User defined (19)	412,515	5,077,219	70.0	4.5	40.0	600	31.8	957	Yes	Yes	Yes
T	Noise sensitive point: User defined (20)	410,620	5,077,696	56.3	4.5	40.0	600	33.3	746	Yes	Yes	Yes
U	Noise sensitive point: User defined (21)	412,931	5,075,350	35.0	4.5	40.0	600	30.9	1,110	Yes	Yes	Yes

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Project:

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DECIBEL - Main Result**Calculation: Amherst Noise Assessment**

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Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20				Demands		Sound Level		Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Distance to noise demand	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]	[m]			
	V Noise sensitive point: User defined (22)	409,450	5,077,924	30.4	4.5	40.0	600	28.8	1,501	Yes	Yes	Yes
	W Noise sensitive point: User defined (23)	411,964	5,077,748	58.3	4.5	40.0	600	31.6	980	Yes	Yes	Yes
	X Noise sensitive point: User defined (24)	411,426	5,077,867	51.3	4.5	40.0	600	32.2	898	Yes	Yes	Yes
	Y Noise sensitive point: User defined (25)	410,833	5,077,687	62.7	4.5	40.0	600	33.6	694	Yes	Yes	Yes
	Z Noise sensitive point: User defined (26)	411,651	5,077,709	57.7	4.5	40.0	600	32.7	811	Yes	Yes	Yes
	AA Noise sensitive point: User defined (27)	412,356	5,075,531	51.1	4.5	40.0	600	35.1	507	Yes	Yes	Yes
	AB Noise sensitive point: User defined (28)	410,362	5,077,647	53.7	4.5	40.0	600	33.1	784	Yes	Yes	Yes
	AC Noise sensitive point: User defined (29)	413,531	5,075,487	40.0	4.5	40.0	600	28.1	1,656	Yes	Yes	Yes
	AD Noise sensitive point: User defined (30)	409,342	5,076,720	70.0	4.5	40.0	600	32.6	841	Yes	Yes	Yes
	AE Noise sensitive point: User defined (31)	412,583	5,075,822	48.5	4.5	40.0	600	33.9	666	Yes	Yes	Yes
	AF Noise sensitive point: User defined (32)	411,398	5,077,908	47.0	4.5	40.0	600	31.9	933	Yes	Yes	Yes
	AG Noise sensitive point: User defined (33)	412,629	5,077,251	70.0	4.5	40.0	600	31.2	1,068	Yes	Yes	Yes
	AH Noise sensitive point: User defined (34)	408,937	5,076,375	64.2	4.5	40.0	600	30.7	1,136	Yes	Yes	Yes
	AI Noise sensitive point: User defined (35)	411,274	5,077,854	54.3	4.5	40.0	600	32.4	860	Yes	Yes	Yes
	AJ Noise sensitive point: User defined (36)	408,809	5,077,359	33.8	4.5	40.0	600	28.2	1,610	Yes	Yes	Yes
	AK Noise sensitive point: User defined (37)	411,218	5,077,771	60.2	4.5	40.0	600	33.0	771	Yes	Yes	Yes
	AL Noise sensitive point: User defined (38)	409,789	5,073,827	32.0	4.5	40.0	600	28.3	1,622	Yes	Yes	Yes
	AM Noise sensitive point: User defined (39)	411,056	5,077,731	61.9	4.5	40.0	600	33.4	723	Yes	Yes	Yes
	AN Noise sensitive point: User defined (40)	409,952	5,077,647	42.9	4.5	40.0	600	31.8	979	Yes	Yes	Yes
	AO Noise sensitive point: User defined (41)	411,435	5,077,793	56.2	4.5	40.0	600	32.6	828	Yes	Yes	Yes
	AP Noise sensitive point: User defined (42)	412,657	5,076,391	63.1	4.5	40.0	600	33.3	760	Yes	Yes	Yes
	AQ Noise sensitive point: User defined (43)	411,822	5,074,852	50.7	4.5	40.0	600	35.1	485	Yes	Yes	Yes
	AR Noise sensitive point: User defined (44)	411,931	5,077,767	57.6	4.5	40.0	600	31.6	981	Yes	Yes	Yes
	AS Noise sensitive point: User defined (45)	412,980	5,077,625	75.0	4.5	40.0	600	28.4	1,572	Yes	Yes	Yes
	AT Noise sensitive point: User defined (46)	412,722	5,076,231	54.1	4.5	40.0	600	33.0	802	Yes	Yes	Yes
	AU Noise sensitive point: User defined (47)	411,337	5,077,903	49.2	4.5	40.0	600	32.0	917	Yes	Yes	Yes
	AV Noise sensitive point: User defined (48)	409,973	5,077,612	45.0	4.5	40.0	600	32.0	938	Yes	Yes	Yes
	AW Noise sensitive point: User defined (49)	412,848	5,075,349	32.9	4.5	40.0	600	31.4	1,031	Yes	Yes	Yes
	AX Noise sensitive point: User defined (50)	410,575	5,077,689	57.8	4.5	40.0	600	33.3	751	Yes	Yes	Yes
	AY Noise sensitive point: User defined (51)	412,716	5,075,955	44.8	4.5	40.0	600	33.1	788	Yes	Yes	Yes
	AZ Noise sensitive point: User defined (52)	410,809	5,077,676	62.5	4.5	40.0	600	33.7	687	Yes	Yes	Yes
	BA Noise sensitive point: User defined (53)	409,819	5,077,307	57.3	4.5	40.0	600	33.0	793	Yes	Yes	Yes
	BB Noise sensitive point: User defined (54)	412,854	5,075,234	35.0	4.5	40.0	600	31.1	1,078	Yes	Yes	Yes
	BC Noise sensitive point: User defined (55)	410,573	5,078,822	37.4	4.5	40.0	600	27.1	1,857	Yes	Yes	Yes
	BD Noise sensitive point: User defined (56)	411,281	5,077,776	60.2	4.5	40.0	600	32.9	783	Yes	Yes	Yes
	BE Noise sensitive point: User defined (57)	411,755	5,074,975	57.8	4.5	40.0	600	36.3	346	Yes	Yes	Yes
	BF Noise sensitive point: User defined (58)	409,573	5,077,673	33.5	4.5	40.0	600	30.3	1,229	Yes	Yes	Yes
	BG Noise sensitive point: User defined (59)	412,840	5,075,082	35.0	4.5	40.0	600	30.8	1,127	Yes	Yes	Yes
	BH Noise sensitive point: User defined (60)	411,385	5,077,782	59.2	4.5	40.0	600	32.8	806	Yes	Yes	Yes
	BI Noise sensitive point: User defined (61)	412,181	5,075,412	56.8	4.5	40.0	600	36.0	390	Yes	Yes	Yes
	BJ Noise sensitive point: User defined (62)	409,564	5,077,151	59.6	4.5	40.0	600	32.4	873	Yes	Yes	Yes
	BK Noise sensitive point: User defined (63)	409,521	5,077,076	62.4	4.5	40.0	600	32.5	861	Yes	Yes	Yes
	BL Noise sensitive point: User defined (64)	411,829	5,075,161	66.3	4.5	40.0	600	37.3	249	Yes	Yes	Yes
	BM Noise sensitive point: User defined (65)	409,821	5,077,822	32.6	4.5	40.0	600	30.5	1,197	Yes	Yes	Yes
	BN Noise sensitive point: User defined (66)	412,926	5,075,138	35.0	4.5	40.0	600	30.5	1,181	Yes	Yes	Yes
	BO Noise sensitive point: User defined (67)	411,328	5,077,855	55.0	4.5	40.0	600	32.4	868	Yes	Yes	Yes
	BP Noise sensitive point: User defined (68)	412,716	5,077,559	75.0	4.5	40.0	600	29.7	1,325	Yes	Yes	Yes
	BQ Noise sensitive point: User defined (69)	409,280	5,073,978	27.3	4.5	40.0	600	27.5	1,783	Yes	Yes	Yes
	BR Noise sensitive point: User defined (70)	412,052	5,077,442	69.3	4.5	40.0	600	33.0	775	Yes	Yes	Yes
	BS Noise sensitive point: User defined (71)	411,061	5,077,829	58.5	4.5	40.0	600	32.7	821	Yes	Yes	Yes
	BT Noise sensitive point: User defined (72)	412,655	5,076,219	58.7	4.5	40.0	600	33.4	734	Yes	Yes	Yes
	BU Noise sensitive point: User defined (73)	409,819	5,073,832	32.6	4.5	40.0	600	28.4	1,604	Yes	Yes	Yes
	BV Noise sensitive point: User defined (74)	413,605	5,075,505	39.8	4.5	40.0	600	27.7	1,725	Yes	Yes	Yes
	BW Noise sensitive point: User defined (75)	412,682	5,077,344	71.6	4.5	40.0	600	30.6	1,165	Yes	Yes	Yes

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Project:

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DECIBEL - Main Result**Calculation: Amherst Noise Assessment**

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Noise sensitive area

Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20					Demands		Sound Level		Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Distance to noise demand	Noise	Distance	All	
				[m]	[m]	[dB(A)]	[m]	[dB(A)]	[m]				
	BX Noise sensitive point: User defined (76)	410,520	5,078,801	38.8	4.5	40.0	600	27.1	1,845	Yes	Yes	Yes	
	BY Noise sensitive point: User defined (77)	410,203	5,073,611	28.7	4.5	40.0	600	28.1	1,650	Yes	Yes	Yes	
	BZ Noise sensitive point: User defined (78)	409,689	5,077,214	57.6	4.5	40.0	600	32.8	819	Yes	Yes	Yes	
	CA Noise sensitive point: User defined (79)	412,647	5,076,460	64.4	4.5	40.0	600	33.2	764	Yes	Yes	Yes	
	CB Noise sensitive point: User defined (80)	410,561	5,077,786	55.0	4.5	40.0	600	32.6	848	Yes	Yes	Yes	
	CC Noise sensitive point: User defined (81)	410,282	5,077,768	45.8	4.5	40.0	600	32.1	927	Yes	Yes	Yes	
	CD Noise sensitive point: User defined (82)	410,532	5,077,683	58.0	4.5	40.0	600	33.2	758	Yes	Yes	Yes	
	CE Noise sensitive point: User defined (83)	412,639	5,077,501	72.6	4.5	40.0	600	30.2	1,229	Yes	Yes	Yes	
	CF Noise sensitive point: User defined (84)	408,957	5,076,550	60.7	4.5	40.0	600	30.6	1,152	Yes	Yes	Yes	
	CG Noise sensitive point: User defined (85)	410,871	5,077,619	65.1	4.5	40.0	600	34.2	622	Yes	Yes	Yes	
	CH Noise sensitive point: User defined (86)	409,864	5,077,809	33.7	4.5	40.0	600	30.7	1,163	Yes	Yes	Yes	
	CI Noise sensitive point: User defined (87)	410,056	5,078,619	38.9	4.5	40.0	600	27.4	1,800	Yes	Yes	Yes	
	CJ Noise sensitive point: User defined (88)	411,620	5,074,792	47.0	4.5	40.0	600	35.5	436	Yes	Yes	Yes	
	CK Noise sensitive point: User defined (89)	410,139	5,073,616	26.1	4.5	40.0	600	28.0	1,667	Yes	Yes	Yes	
	CL Noise sensitive point: User defined (90)	413,559	5,075,468	40.0	4.5	40.0	600	27.9	1,687	Yes	Yes	Yes	
	CM Noise sensitive point: User defined (91)	412,846	5,075,215	35.0	4.5	40.0	600	31.1	1,077	Yes	Yes	Yes	
	CN Noise sensitive point: User defined (92)	409,496	5,077,941	30.7	4.5	40.0	600	28.9	1,485	Yes	Yes	Yes	
	CO Noise sensitive point: User defined (93)	413,083	5,075,431	34.1	4.5	40.0	600	30.2	1,233	Yes	Yes	Yes	
	CP Noise sensitive point: User defined (94)	412,040	5,077,678	60.0	4.5	40.0	600	31.8	961	Yes	Yes	Yes	
	CQ Noise sensitive point: User defined (95)	410,988	5,077,728	62.2	4.5	40.0	600	33.4	721	Yes	Yes	Yes	
	CR Noise sensitive point: User defined (96)	409,723	5,077,872	30.9	4.5	40.0	600	29.9	1,294	Yes	Yes	Yes	
	CS Noise sensitive point: User defined (97)	410,429	5,077,688	55.7	4.5	40.0	600	33.0	797	Yes	Yes	Yes	
	CT Noise sensitive point: User defined (98)	410,008	5,077,764	38.4	4.5	40.0	600	31.4	1,049	Yes	Yes	Yes	
	CU Noise sensitive point: User defined (99)	410,131	5,078,630	40.0	4.5	40.0	600	27.4	1,784	Yes	Yes	Yes	
	CV Noise sensitive point: User defined (100)	411,555	5,077,917	50.0	4.5	40.0	600	31.6	978	Yes	Yes	Yes	
	CW Noise sensitive point: User defined (101)	409,514	5,077,056	63.3	4.5	40.0	600	32.5	855	Yes	Yes	Yes	
	CX Noise sensitive point: User defined (102)	412,671	5,076,075	51.9	4.5	40.0	600	33.4	742	Yes	Yes	Yes	
	CY Noise sensitive point: User defined (103)	411,191	5,077,777	60.0	4.5	40.0	600	33.0	774	Yes	Yes	Yes	
	CZ Noise sensitive point: User defined (104)	413,150	5,077,878	74.7	4.5	40.0	600	27.0	1,863	Yes	Yes	Yes	
	DA Noise sensitive point: User defined (105)	411,129	5,077,856	56.1	4.5	40.0	600	32.5	849	Yes	Yes	Yes	
	DB Noise sensitive point: User defined (106)	409,209	5,076,469	68.8	4.5	40.0	600	32.2	888	Yes	Yes	Yes	
	DC Noise sensitive point: User defined (107)	412,591	5,077,280	70.0	4.5	40.0	600	31.2	1,054	Yes	Yes	Yes	
	DD Noise sensitive point: User defined (108)	412,888	5,077,758	75.0	4.5	40.0	600	28.3	1,584	Yes	Yes	Yes	
	DE Noise sensitive point: User defined (109)	410,214	5,077,780	45.3	4.5	40.0	600	31.9	966	Yes	Yes	Yes	
	DF Noise sensitive point: User defined (110)	410,075	5,073,646	25.1	4.5	40.0	600	28.1	1,663	Yes	Yes	Yes	
	DG Noise sensitive point: User defined (111)	409,777	5,077,617	37.7	4.5	40.0	600	31.3	1,057	Yes	Yes	Yes	
	DH Noise sensitive point: User defined (112)	412,653	5,076,088	53.6	4.5	40.0	600	33.5	724	Yes	Yes	Yes	
	DI Noise sensitive point: User defined (113)	411,499	5,077,845	55.0	4.5	40.0	600	32.2	893	Yes	Yes	Yes	
	DJ Noise sensitive point: User defined (114)	412,983	5,078,023	69.5	4.5	40.0	600	27.1	1,834	Yes	Yes	Yes	
	DK Noise sensitive point: User defined (115)	409,292	5,076,881	62.9	4.5	40.0	600	31.8	954	Yes	Yes	Yes	
	DL Noise sensitive point: User defined (116)	410,501	5,077,760	55.3	4.5	40.0	600	32.6	841	Yes	Yes	Yes	
	DM Noise sensitive point: User defined (117)	409,648	5,073,801	27.1	4.5	40.0	600	27.8	1,716	Yes	Yes	Yes	
	DN Noise sensitive point: User defined (118)	412,013	5,077,394	70.1	4.5	40.0	600	33.4	714	Yes	Yes	Yes	
	DO Noise sensitive point: User defined (119)	412,938	5,075,690	32.5	4.5	40.0	600	31.4	1,036	Yes	Yes	Yes	
	DP Noise sensitive point: User defined (120)	412,810	5,077,685	75.0	4.5	40.0	600	28.9	1,478	Yes	Yes	Yes	
	DQ Noise sensitive point: User defined (121)	410,251	5,077,632	49.9	4.5	40.0	600	32.8	817	Yes	Yes	Yes	
	DR Noise sensitive point: User defined (122)	410,048	5,077,769	40.0	4.5	40.0	600	31.4	1,033	Yes	Yes	Yes	
	DS Noise sensitive point: User defined (123)	412,838	5,075,164	35.0	4.5	40.0	600	31.0	1,090	Yes	Yes	Yes	
	DT Noise sensitive point: User defined (124)	412,752	5,075,742	38.4	4.5	40.0	600	32.6	844	Yes	Yes	Yes	
	DU Noise sensitive point: User defined (125)	412,809	5,075,941	42.0	4.5	40.0	600	32.4	882	Yes	Yes	Yes	
	DV Noise sensitive point: User defined (126)	412,727	5,075,907	43.4	4.5	40.0	600	33.0	802	Yes	Yes	Yes	
	DW Noise sensitive point: User defined (127)	412,556	5,075,942	51.7	4.5	40.0	600	34.2	629	Yes	Yes	Yes	
	DX Noise sensitive point: User defined (128)	412,602	5,075,989	50.5	4.5	40.0	600	33.9	673	Yes	Yes	Yes	
	DY Noise sensitive point: User defined (129)	412,665	5,076,029	50.1	4.5	40.0	600	33.4	736	Yes	Yes	Yes	

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Project:

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DECIBEL - Main Result**Calculation: Amherst Noise Assessment**

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Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20				Demands		Sound Level		Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Distance to noise demand	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]	[m]			
DZ	Noise sensitive point: User defined (130)	411,436	5,074,795	49.0	4.5	40.0	600	36.1	367	Yes	Yes	Yes
EA	Noise sensitive point: User defined (131)	411,323	5,074,711	40.9	4.5	40.0	600	35.7	422	Yes	Yes	Yes
EB	Noise sensitive point: User defined (132)	411,343	5,074,557	35.0	4.5	40.0	600	34.4	577	Yes	Yes	Yes
EC	Noise sensitive point: User defined (133)	411,223	5,074,585	33.6	4.5	40.0	600	34.8	532	Yes	Yes	Yes
ED	Noise sensitive point: User defined (134)	411,200	5,074,416	25.2	4.5	40.0	600	33.5	698	Yes	Yes	Yes
EE	Noise sensitive point: User defined (135)	411,046	5,074,410	30.0	4.5	40.0	600	33.6	700	Yes	Yes	Yes
EF	Noise sensitive point: User defined (136)	410,991	5,074,359	32.5	4.5	40.0	600	33.2	753	Yes	Yes	Yes
EG	Noise sensitive point: User defined (137)	410,962	5,074,302	33.6	4.5	40.0	600	32.8	811	Yes	Yes	Yes
EH	Noise sensitive point: User defined (138)	410,847	5,074,207	34.1	4.5	40.0	600	32.1	917	Yes	Yes	Yes
EI	Noise sensitive point: User defined (139)	410,735	5,074,078	30.2	4.5	40.0	600	31.2	1,061	Yes	Yes	Yes
EJ	Noise sensitive point: User defined (140)	410,669	5,074,028	30.7	4.5	40.0	600	30.9	1,123	Yes	Yes	Yes
EK	Noise sensitive point: User defined (141)	410,614	5,073,961	33.0	4.5	40.0	600	30.4	1,199	Yes	Yes	Yes
EL	Noise sensitive point: User defined (142)	410,502	5,073,855	35.0	4.5	40.0	600	29.7	1,329	Yes	Yes	Yes
EM	Noise sensitive point: User defined (143)	410,440	5,073,776	35.0	4.5	40.0	600	29.2	1,421	Yes	Yes	Yes
EN	Noise sensitive point: User defined (144)	410,381	5,073,715	35.0	4.5	40.0	600	28.9	1,496	Yes	Yes	Yes
EO	Noise sensitive point: User defined (145)	410,338	5,073,669	35.0	4.5	40.0	600	28.6	1,553	Yes	Yes	Yes
EP	Noise sensitive point: User defined (146)	410,299	5,073,643	33.7	4.5	40.0	600	28.4	1,589	Yes	Yes	Yes
EQ	Noise sensitive point: User defined (147)	410,268	5,073,611	31.2	4.5	40.0	600	28.2	1,629	Yes	Yes	Yes
ER	Noise sensitive point: User defined (148)	410,183	5,073,596	27.2	4.5	40.0	600	28.0	1,671	Yes	Yes	Yes
ES	Noise sensitive point: User defined (149)	410,112	5,073,628	25.3	4.5	40.0	600	28.0	1,666	Yes	Yes	Yes
ET	Noise sensitive point: User defined (150)	409,024	5,074,298	44.8	4.5	40.0	600	27.7	1,724	Yes	Yes	Yes
EU	Noise sensitive point: User defined (151)	408,806	5,076,791	55.0	4.5	40.0	600	29.4	1,366	Yes	Yes	Yes
EV	Noise sensitive point: User defined (152)	408,762	5,076,595	55.0	4.5	40.0	600	29.5	1,352	Yes	Yes	Yes
EW	Noise sensitive point: User defined (153)	408,811	5,076,539	58.9	4.5	40.0	600	29.8	1,291	Yes	Yes	Yes
EX	Noise sensitive point: User defined (154)	408,876	5,076,594	57.0	4.5	40.0	600	30.1	1,241	Yes	Yes	Yes
EY	Noise sensitive point: User defined (155)	408,902	5,076,567	58.7	4.5	40.0	600	30.3	1,209	Yes	Yes	Yes
EZ	Noise sensitive point: User defined (156)	408,851	5,076,499	60.0	4.5	40.0	600	30.1	1,243	Yes	Yes	Yes
FA	Noise sensitive point: User defined (157)	408,876	5,076,468	60.8	4.5	40.0	600	30.3	1,212	Yes	Yes	Yes
FB	Noise sensitive point: User defined (158)	408,823	5,076,389	61.2	4.5	40.0	600	30.0	1,251	Yes	Yes	Yes
FC	Noise sensitive point: User defined (159)	409,006	5,076,580	64.8	4.5	40.0	600	30.8	1,112	Yes	Yes	Yes
FD	Noise sensitive point: User defined (160)	409,036	5,076,615	65.0	4.5	40.0	600	31.0	1,093	Yes	Yes	Yes
FE	Noise sensitive point: User defined (161)	408,848	5,077,333	33.9	4.5	40.0	600	28.5	1,564	Yes	Yes	Yes
FF	Noise sensitive point: User defined (162)	408,816	5,077,274	36.4	4.5	40.0	600	28.5	1,561	Yes	Yes	Yes
FG	Noise sensitive point: User defined (163)	408,790	5,077,254	37.7	4.5	40.0	600	28.4	1,573	Yes	Yes	Yes
FH	Noise sensitive point: User defined (164)	408,765	5,077,234	39.1	4.5	40.0	600	28.3	1,585	Yes	Yes	Yes
FI	Noise sensitive point: User defined (165)	408,854	5,077,222	40.0	4.5	40.0	600	28.8	1,502	Yes	Yes	Yes
FJ	Noise sensitive point: User defined (166)	408,834	5,077,189	41.6	4.5	40.0	600	28.7	1,503	Yes	Yes	Yes
FK	Noise sensitive point: User defined (167)	408,784	5,077,149	43.5	4.5	40.0	600	28.6	1,529	Yes	Yes	Yes
FL	Noise sensitive point: User defined (168)	408,889	5,077,170	43.1	4.5	40.0	600	29.0	1,446	Yes	Yes	Yes
FM	Noise sensitive point: User defined (169)	408,899	5,077,029	53.4	4.5	40.0	600	29.4	1,372	Yes	Yes	Yes
FN	Noise sensitive point: User defined (170)	408,906	5,077,257	37.7	4.5	40.0	600	28.9	1,475	Yes	Yes	Yes
FO	Noise sensitive point: User defined (171)	408,933	5,077,225	40.9	4.5	40.0	600	29.1	1,435	Yes	Yes	Yes
FP	Noise sensitive point: User defined (172)	408,968	5,077,195	43.5	4.5	40.0	600	29.3	1,390	Yes	Yes	Yes
FQ	Noise sensitive point: User defined (173)	408,987	5,077,171	45.5	4.5	40.0	600	29.5	1,361	Yes	Yes	Yes
FR	Noise sensitive point: User defined (174)	408,982	5,077,077	51.8	4.5	40.0	600	29.7	1,320	Yes	Yes	Yes
FS	Noise sensitive point: User defined (175)	408,965	5,077,052	52.6	4.5	40.0	600	29.7	1,323	Yes	Yes	Yes
FT	Noise sensitive point: User defined (176)	409,085	5,077,090	54.2	4.5	40.0	600	30.2	1,236	Yes	Yes	Yes
FU	Noise sensitive point: User defined (177)	409,119	5,077,060	55.5	4.5	40.0	600	30.4	1,191	Yes	Yes	Yes
FV	Noise sensitive point: User defined (178)	409,165	5,076,994	57.6	4.5	40.0	600	30.8	1,119	Yes	Yes	Yes
FW	Noise sensitive point: User defined (179)	409,080	5,076,943	58.3	4.5	40.0	600	30.5	1,171	Yes	Yes	Yes
FX	Noise sensitive point: User defined (180)	409,096	5,076,843	62.8	4.5	40.0	600	30.8	1,115	Yes	Yes	Yes
FY	Noise sensitive point: User defined (181)	409,023	5,076,890	60.0	4.5	40.0	600	30.4	1,201	Yes	Yes	Yes
FZ	Noise sensitive point: User defined (182)	409,149	5,076,893	60.0	4.5	40.0	600	31.0	1,088	Yes	Yes	Yes
GA	Noise sensitive point: User defined (183)	409,213	5,076,950	59.2	4.5	40.0	600	31.2	1,056	Yes	Yes	Yes

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Project:

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DECIBEL - Main Result**Calculation: Amherst Noise Assessment**

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Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20				Demands		Sound Level		Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Distance to noise demand	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]	[m]			
GB	Noise sensitive point: User defined (184)	409,262	5,076,909	61.4	4.5	40.0	600	31.6	994	Yes	Yes	Yes
GC	Noise sensitive point: User defined (185)	409,201	5,076,822	65.5	4.5	40.0	600	31.5	1,011	Yes	Yes	Yes
GD	Noise sensitive point: User defined (186)	409,617	5,077,923	30.0	4.5	40.0	600	29.4	1,398	Yes	Yes	Yes
GE	Noise sensitive point: User defined (187)	409,763	5,077,549	42.1	4.5	40.0	600	31.6	1,013	Yes	Yes	Yes
GF	Noise sensitive point: User defined (188)	409,784	5,077,492	45.9	4.5	40.0	600	31.9	955	Yes	Yes	Yes
GG	Noise sensitive point: User defined (189)	409,801	5,077,452	48.4	4.5	40.0	600	32.2	914	Yes	Yes	Yes
GH	Noise sensitive point: User defined (190)	409,838	5,077,414	50.9	4.5	40.0	600	32.5	861	Yes	Yes	Yes
GI	Noise sensitive point: User defined (191)	409,894	5,077,483	48.8	4.5	40.0	600	32.4	879	Yes	Yes	Yes
GJ	Noise sensitive point: User defined (192)	409,861	5,077,504	46.9	4.5	40.0	600	32.2	916	Yes	Yes	Yes
GK	Noise sensitive point: User defined (193)	409,887	5,077,667	39.9	4.5	40.0	600	31.5	1,032	Yes	Yes	Yes
GL	Noise sensitive point: User defined (194)	409,938	5,077,562	46.1	4.5	40.0	600	32.2	917	Yes	Yes	Yes
GM	Noise sensitive point: User defined (195)	410,012	5,077,627	44.7	4.5	40.0	600	32.1	930	Yes	Yes	Yes
GN	Noise sensitive point: User defined (196)	409,988	5,077,526	48.0	4.5	40.0	600	32.6	859	Yes	Yes	Yes
GO	Noise sensitive point: User defined (197)	410,074	5,077,535	47.8	4.5	40.0	600	32.8	819	Yes	Yes	Yes
GP	Noise sensitive point: User defined (198)	409,927	5,077,710	39.8	4.5	40.0	600	31.4	1,046	Yes	Yes	Yes
GQ	Noise sensitive point: User defined (199)	410,091	5,077,651	45.0	4.5	40.0	600	32.2	910	Yes	Yes	Yes
GR	Noise sensitive point: User defined (200)	410,175	5,077,737	45.5	4.5	40.0	600	32.0	945	Yes	Yes	Yes
GS	Noise sensitive point: User defined (201)	410,244	5,077,747	46.5	4.5	40.0	600	32.1	923	Yes	Yes	Yes
GT	Noise sensitive point: User defined (202)	410,304	5,077,752	46.4	4.5	40.0	600	32.3	903	Yes	Yes	Yes
GU	Noise sensitive point: User defined (203)	410,219	5,077,668	48.2	4.5	40.0	600	32.5	863	Yes	Yes	Yes
GV	Noise sensitive point: User defined (204)	410,242	5,077,624	49.8	4.5	40.0	600	32.9	814	Yes	Yes	Yes
GW	Noise sensitive point: User defined (205)	411,329	5,077,781	60.0	4.5	40.0	600	32.9	796	Yes	Yes	Yes
GX	Noise sensitive point: User defined (206)	411,616	5,077,845	54.2	4.5	40.0	600	32.0	927	Yes	Yes	Yes
GY	Noise sensitive point: User defined (207)	411,648	5,077,836	54.3	4.5	40.0	600	32.0	928	Yes	Yes	Yes
GZ	Noise sensitive point: User defined (208)	412,916	5,077,837	73.4	4.5	40.0	600	28.0	1,658	Yes	Yes	Yes
HA	Noise sensitive point: User defined (209)	412,949	5,077,888	71.4	4.5	40.0	600	27.7	1,716	Yes	Yes	Yes
HB	Noise sensitive point: User defined (210)	412,979	5,077,927	70.0	4.5	40.0	600	27.5	1,765	Yes	Yes	Yes
HC	Noise sensitive point: User defined (211)	412,665	5,077,213	70.0	4.5	40.0	600	31.1	1,077	Yes	Yes	Yes
HD	Noise sensitive point: User defined (212)	412,710	5,077,128	68.9	4.5	40.0	600	31.2	1,070	Yes	Yes	Yes
HE	Noise sensitive point: User defined (213)	412,732	5,077,070	67.1	4.5	40.0	600	31.2	1,061	Yes	Yes	Yes
HF	Noise sensitive point: User defined (214)	412,619	5,076,996	68.4	4.5	40.0	600	32.1	927	Yes	Yes	Yes
HG	Noise sensitive point: User defined (215)	412,763	5,076,976	65.0	4.5	40.0	600	31.3	1,045	Yes	Yes	Yes
HH	Noise sensitive point: User defined (216)	412,634	5,076,917	67.1	4.5	40.0	600	32.2	903	Yes	Yes	Yes
HI	Noise sensitive point: User defined (217)	412,751	5,076,885	64.9	4.5	40.0	600	31.6	996	Yes	Yes	Yes
HJ	Noise sensitive point: User defined (218)	412,621	5,076,849	66.6	4.5	40.0	600	32.5	863	Yes	Yes	Yes
HK	Noise sensitive point: User defined (219)	412,751	5,076,815	64.3	4.5	40.0	600	31.8	969	Yes	Yes	Yes
HL	Noise sensitive point: User defined (220)	412,612	5,076,785	66.8	4.5	40.0	600	32.7	829	Yes	Yes	Yes
HM	Noise sensitive point: User defined (221)	412,607	5,076,709	66.0	4.5	40.0	600	33.0	796	Yes	Yes	Yes
HN	Noise sensitive point: User defined (222)	412,606	5,076,659	65.3	4.5	40.0	600	33.1	779	Yes	Yes	Yes
HO	Noise sensitive point: User defined (223)	412,613	5,076,560	65.0	4.5	40.0	600	33.3	756	Yes	Yes	Yes
HP	Noise sensitive point: User defined (224)	412,961	5,074,234	29.8	4.5	40.0	600	27.7	1,708	Yes	Yes	Yes
HQ	Noise sensitive point: User defined (225)	412,627	5,076,481	65.0	4.5	40.0	600	33.3	750	Yes	Yes	Yes
HR	Noise sensitive point: User defined (226)	412,861	5,073,989	32.4	4.5	40.0	600	27.2	1,810	Yes	Yes	Yes
HS	Noise sensitive point: User defined (227)	413,071	5,074,350	35.0	4.5	40.0	600	27.7	1,716	Yes	Yes	Yes
HT	Noise sensitive point: User defined (228)	412,749	5,076,324	54.1	4.5	40.0	600	32.7	840	Yes	Yes	Yes
HU	Noise sensitive point: User defined (229)	413,229	5,075,453	35.0	4.5	40.0	600	29.5	1,369	Yes	Yes	Yes
HV	Noise sensitive point: User defined (230)	409,888	5,077,361	55.8	4.5	40.0	600	33.0	788	Yes	Yes	Yes
HW	Noise sensitive point: User defined (231)	413,009	5,074,477	35.0	4.5	40.0	600	28.3	1,590	Yes	Yes	Yes
HX	Noise sensitive point: User defined (232)	410,404	5,077,677	55.0	4.5	40.0	600	33.0	796	Yes	Yes	Yes
HY	Noise sensitive point: User defined (233)	410,466	5,077,689	57.6	4.5	40.0	600	33.0	785	Yes	Yes	Yes
HZ	Noise sensitive point: User defined (234)	408,680	5,076,222	61.5	4.5	40.0	600	29.4	1,373	Yes	Yes	Yes
IA	Noise sensitive point: User defined (235)	408,648	5,076,184	62.5	4.5	40.0	600	29.2	1,403	Yes	Yes	Yes
IB	Noise sensitive point: User defined (236)	408,619	5,076,158	62.3	4.5	40.0	600	29.1	1,431	Yes	Yes	Yes
IC	Noise sensitive point: User defined (237)	408,593	5,076,117	62.4	4.5	40.0	600	28.9	1,455	Yes	Yes	Yes

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Project:

AMR_WindPro final location 141204

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Calculated:

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DECIBEL - Main Result**Calculation: Amherst Noise Assessment**

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Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20				Demands		Sound Level		Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Distance to noise demand	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]	[m]			
ID	Noise sensitive point: User defined (238)	408,550	5,076,083	61.5	4.5	40.0	600	28.7	1,498	Yes	Yes	Yes
IE	Noise sensitive point: User defined (239)	408,425	5,075,931	59.0	4.5	40.0	600	28.1	1,626	Yes	Yes	Yes
IF	Noise sensitive point: User defined (240)	408,403	5,075,924	58.3	4.5	40.0	600	28.0	1,648	Yes	Yes	Yes
IG	Noise sensitive point: User defined (241)	408,566	5,075,990	64.4	4.5	40.0	600	28.8	1,483	Yes	Yes	Yes
IH	Noise sensitive point: User defined (242)	408,572	5,075,967	65.0	4.5	40.0	600	28.8	1,477	Yes	Yes	Yes
II	Noise sensitive point: User defined (243)	408,553	5,075,947	65.0	4.5	40.0	600	28.7	1,497	Yes	Yes	Yes
IJ	Noise sensitive point: User defined (244)	408,424	5,075,815	63.5	4.5	40.0	600	28.0	1,636	Yes	Yes	Yes
IK	Noise sensitive point: User defined (245)	408,401	5,075,793	63.1	4.5	40.0	600	27.9	1,661	Yes	Yes	Yes
IL	Noise sensitive point: User defined (246)	408,389	5,075,769	62.4	4.5	40.0	600	27.8	1,676	Yes	Yes	Yes
IM	Noise sensitive point: User defined (247)	408,453	5,075,840	64.7	4.5	40.0	600	28.2	1,605	Yes	Yes	Yes
IN	Noise sensitive point: User defined (248)	408,437	5,075,832	63.8	4.5	40.0	600	28.1	1,622	Yes	Yes	Yes
IO	Noise sensitive point: User defined (249)	408,864	5,076,443	61.2	4.5	40.0	600	30.2	1,219	Yes	Yes	Yes
IP	Noise sensitive point: User defined (250)	408,708	5,076,635	55.0	4.5	40.0	600	29.2	1,414	Yes	Yes	Yes
IQ	Noise sensitive point: User defined (251)	408,926	5,076,353	64.5	4.5	40.0	600	30.6	1,143	Yes	Yes	Yes
IR	Noise sensitive point: User defined (252)	408,670	5,076,609	56.7	4.5	40.0	600	29.0	1,445	Yes	Yes	Yes
IS	Noise sensitive point: User defined (253)	408,683	5,076,628	55.8	4.5	40.0	600	29.0	1,437	Yes	Yes	Yes
IT	Noise sensitive point: User defined (254)	408,617	5,076,701	55.4	4.5	40.0	600	28.6	1,519	Yes	Yes	Yes
IU	Noise sensitive point: User defined (255)	408,572	5,076,771	50.6	4.5	40.0	600	28.3	1,583	Yes	Yes	Yes
IV	Noise sensitive point: User defined (256)	408,540	5,076,735	52.1	4.5	40.0	600	28.2	1,603	Yes	Yes	Yes
IW	Noise sensitive point: User defined (257)	408,677	5,076,803	51.7	4.5	40.0	600	28.8	1,492	Yes	Yes	Yes
IX	Noise sensitive point: User defined (258)	408,645	5,076,834	49.1	4.5	40.0	600	28.6	1,532	Yes	Yes	Yes
IY	Noise sensitive point: User defined (259)	408,583	5,076,908	45.0	4.5	40.0	600	28.2	1,616	Yes	Yes	Yes
IZ	Noise sensitive point: User defined (260)	408,971	5,076,639	60.5	4.5	40.0	600	30.6	1,162	Yes	Yes	Yes
JA	Noise sensitive point: User defined (261)	409,016	5,076,651	63.4	4.5	40.0	600	30.8	1,123	Yes	Yes	Yes
JB	Noise sensitive point: User defined (262)	408,928	5,076,992	56.4	4.5	40.0	600	29.6	1,330	Yes	Yes	Yes
JC	Noise sensitive point: User defined (263)	410,435	5,078,635	40.0	4.5	40.0	600	27.8	1,702	Yes	Yes	Yes
JD	Noise sensitive point: User defined (264)	411,332	5,078,365	33.8	4.5	40.0	600	29.4	1,374	Yes	Yes	Yes
JE	Noise sensitive point: User defined (265)	411,342	5,078,397	34.7	4.5	40.0	600	29.2	1,407	Yes	Yes	Yes
JF	Noise sensitive point: User defined (266)	413,544	5,075,493	40.0	4.5	40.0	600	28.0	1,667	Yes	Yes	Yes
JG	Noise sensitive point: User defined (267)	413,205	5,075,446	35.0	4.5	40.0	600	29.6	1,347	Yes	Yes	Yes
JH	Noise sensitive point: User defined (268)	410,460	5,073,823	35.0	4.5	40.0	600	29.5	1,371	Yes	Yes	Yes
JI	Noise sensitive point: User defined (269)	410,234	5,073,606	30.0	4.5	40.0	600	28.1	1,645	Yes	Yes	Yes
JJ	Noise sensitive point: User defined (270)	410,171	5,073,620	27.3	4.5	40.0	600	28.1	1,652	Yes	Yes	Yes
JK	Noise sensitive point: User defined (271)	410,079	5,073,674	27.3	4.5	40.0	600	28.2	1,635	Yes	Yes	Yes
JL	Noise sensitive point: User defined (272)	409,784	5,073,681	22.8	4.5	40.0	600	27.6	1,754	Yes	Yes	Yes
JM	Noise sensitive point: User defined (273)	409,799	5,073,696	24.7	4.5	40.0	600	27.7	1,733	Yes	Yes	Yes
JN	Noise sensitive point: User defined (274)	409,810	5,073,852	35.0	4.5	40.0	600	28.4	1,590	Yes	Yes	Yes
JO	Noise sensitive point: User defined (275)	409,707	5,073,761	25.3	4.5	40.0	600	27.8	1,720	Yes	Yes	Yes
JP	Noise sensitive point: User defined (276)	409,624	5,073,854	28.9	4.5	40.0	600	28.0	1,684	Yes	Yes	Yes
JQ	Noise sensitive point: User defined (277)	409,638	5,073,866	30.3	4.5	40.0	600	28.1	1,666	Yes	Yes	Yes
JR	Noise sensitive point: User defined (278)	409,477	5,073,946	32.6	4.5	40.0	600	27.9	1,689	Yes	Yes	Yes
JS	Noise sensitive point: User defined (279)	409,397	5,073,956	31.5	4.5	40.0	600	27.8	1,728	Yes	Yes	Yes
JT	Noise sensitive point: User defined (280)	409,033	5,074,316	45.0	4.5	40.0	600	27.8	1,705	Yes	Yes	Yes
JU	Noise sensitive point: User defined (281)	409,241	5,076,446	70.0	4.5	40.0	600	32.5	852	Yes	Yes	Yes
JV	Noise sensitive point: User defined (282)	410,583	5,077,810	53.4	4.5	40.0	600	32.5	866	Yes	Yes	Yes
JW	Noise sensitive point: User defined (283)	410,806	5,077,700	60.8	4.5	40.0	600	33.5	711	Yes	Yes	Yes
JX	Noise sensitive point: User defined (284)	410,799	5,077,727	58.6	4.5	40.0	600	33.3	739	Yes	Yes	Yes
JY	Noise sensitive point: User defined (285)	410,836	5,077,708	61.3	4.5	40.0	600	33.5	715	Yes	Yes	Yes
JZ	Noise sensitive point: User defined (286)	411,084	5,077,830	58.6	4.5	40.0	600	32.7	822	Yes	Yes	Yes
KA	Noise sensitive point: User defined (287)	411,343	5,077,856	55.1	4.5	40.0	600	32.3	872	Yes	Yes	Yes
KB	Noise sensitive point: User defined (288)	411,351	5,077,763	60.0	4.5	40.0	600	32.9	782	Yes	Yes	Yes
KC	Noise sensitive point: User defined (289)	411,559	5,077,890	52.7	4.5	40.0	600	31.8	953	Yes	Yes	Yes
KD	Noise sensitive point: User defined (290)	411,573	5,077,865	54.4	4.5	40.0	600	31.9	933	Yes	Yes	Yes
KE	Noise sensitive point: User defined (291)	411,583	5,077,836	55.0	4.5	40.0	600	32.1	908	Yes	Yes	Yes

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DECIBEL - Main Result**Calculation:** Amherst Noise Assessment

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Noise sensitive area

No.	Name	UTM (north)-NAD83 (US+CA) Zone: 20			Demands		Sound Level		Demands fulfilled ?	
		East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Distance to noise demand	Noise Distance All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]	[m]	
	KF Noise sensitive point: User defined (292)	411,645	5,077,877	50.0	4.5	40.0	600	31.7	966	Yes Yes Yes
	KG Noise sensitive point: User defined (293)	411,628	5,077,731	56.4	4.5	40.0	600	32.6	823	Yes Yes Yes
	KH Noise sensitive point: User defined (294)	411,682	5,077,731	57.4	4.5	40.0	600	32.5	842	Yes Yes Yes
	KI Noise sensitive point: User defined (295)	412,061	5,077,716	56.9	4.5	40.0	600	31.5	1,004	Yes Yes Yes
	KJ Noise sensitive point: User defined (296)	412,836	5,077,338	71.8	4.5	40.0	600	29.9	1,288	Yes Yes Yes
	KK Noise sensitive point: User defined (297)	412,749	5,076,218	50.7	4.5	40.0	600	32.8	828	Yes Yes Yes
	KL Noise sensitive point: User defined (298)	412,462	5,075,862	55.0	4.5	40.0	600	34.8	541	Yes Yes Yes
	KM Noise sensitive point: User defined (299)	412,490	5,075,869	55.0	4.5	40.0	600	34.6	569	Yes Yes Yes
	KN Noise sensitive point: User defined (300)	412,775	5,075,725	37.8	4.5	40.0	600	32.5	870	Yes Yes Yes
	KO Noise sensitive point: User defined (301)	412,808	5,075,957	42.5	4.5	40.0	600	32.4	880	Yes Yes Yes
	KP Noise sensitive point: User defined (302)	412,854	5,075,174	35.0	4.5	40.0	600	31.0	1,101	Yes Yes Yes
	KQ Noise sensitive point: User defined (303)	412,847	5,075,131	35.0	4.5	40.0	600	30.9	1,112	Yes Yes Yes
	KR Noise sensitive point: User defined (304)	412,833	5,075,144	35.0	4.5	40.0	600	31.0	1,094	Yes Yes Yes
	KS Noise sensitive point: User defined (305)	411,782	5,074,810	49.1	4.5	40.0	600	35.0	498	Yes Yes Yes
	KT Noise sensitive point: User defined (306)	412,319	5,075,502	51.5	4.5	40.0	600	35.3	482	Yes Yes Yes
	KU Noise sensitive point: User defined (307)	411,597	5,074,808	47.8	4.5	40.0	600	35.7	412	Yes Yes Yes
	KV Noise sensitive point: User defined (308)	411,500	5,074,910	54.5	4.5	40.0	600	36.9	281	Yes Yes Yes
	KW Noise sensitive point: User defined (309)	411,473	5,074,877	53.1	4.5	40.0	600	36.7	302	Yes Yes Yes
	KX Noise sensitive point: User defined (310)	411,438	5,074,808	49.9	4.5	40.0	600	36.2	355	Yes Yes Yes
	KY Noise sensitive point: User defined (311)	411,474	5,074,807	49.2	4.5	40.0	600	36.1	368	Yes Yes Yes
	KZ Noise sensitive point: User defined (312)	410,737	5,074,093	30.8	4.5	40.0	600	31.3	1,046	Yes Yes Yes
	LA Noise sensitive point: User defined (313)	412,703	5,075,931	44.5	4.5	40.0	600	33.1	776	Yes Yes Yes
	LB Noise sensitive point: User defined (314)	411,232	5,074,559	32.8	4.5	40.0	600	34.6	559	Yes Yes Yes

Distances (m)**WTG**

NSA	1	2	3
A	1472	1924	1636
B	2000	1816	2259
C	2016	2293	2449
D	1348	1775	1719
E	1979	2246	2412
F	1799	2093	2230
G	1486	1039	1426
H	1447	1902	1628
I	1459	1919	1674
J	2565	2996	2642
K	1562	2021	1847
L	1764	2051	2197
M	1550	1593	1933
N	1545	1971	1914
O	2464	2709	2250
P	2825	2600	2393
Q	2252	2549	2682
R	1811	1666	2096
S	1675	1950	2109
T	1495	1943	1642
U	2038	1844	2290
V	2339	2700	2276
W	1685	2086	2078
X	1608	2059	1929
Y	1429	1887	1630
Z	1516	1948	1878

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DECIBEL - Main Result**Calculation:** Amherst Noise Assessment

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WTG

NSA	1	2	3
AA	1448	1242	1687
AB	1557	1983	1636
AC	2539	2405	2835
AD	1832	2017	1559
AE	1534	1433	1844
AF	1643	2096	1958
AG	1788	2053	2222
AH	2187	2280	1844
AI	1573	2031	1869
AJ	2549	2798	2339
AK	1486	1945	1774
AL	2799	2419	2432
AM	1445	1906	1699
AN	1793	2179	1779
AO	1537	1987	1863
AP	1538	1609	1932
AQ	1598	1184	1612
AR	1686	2091	2074
AS	2289	2566	2722
AT	1601	1623	1975
AU	1629	2084	1934
AV	1753	2138	1738
AW	1965	1764	2211
AX	1504	1949	1640
AY	1628	1571	1965
AZ	1423	1880	1618
BA	1654	1991	1559
BB	2028	1804	2256
BC	2593	3050	2769
BD	1496	1953	1796
BE	1458	1045	1475
BF	2078	2428	2000
BG	2099	1847	2303
BH	1517	1969	1835
BI	1374	1111	1567
BJ	1781	2066	1615
BK	1784	2053	1598
BL	1330	951	1401
BM	2011	2397	1995
BN	2139	1905	2359
BO	1581	2036	1886
BP	2039	2335	2470
BQ	2954	2630	2550
BR	1482	1850	1897
BS	1542	2004	1796
BT	1535	1555	1908
BU	2780	2398	2415
BV	2604	2476	2904
BW	1884	2156	2317
BX	2584	3040	2752
BY	2830	2410	2509
BZ	1706	2015	1571
CA	1535	1625	1935
CB	1600	2046	1738
CC	1702	2126	1773
CD	1515	1956	1639
CE	1942	2240	2373

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WTG

NSA	1	2	3
CF	2181	2309	1863
CG	1354	1814	1564
CH	1974	2363	1963
CI	2563	2999	2653
CJ	1577	1137	1535
CK	2847	2431	2519
CL	2571	2436	2867
CM	2031	1803	2256
CN	2319	2684	2264
CO	2140	1973	2412
CP	1666	2054	2068
CQ	1446	1908	1685
CR	2113	2494	2086
CS	1562	1996	1661
CT	1849	2249	1861
CU	2543	2983	2645
CV	1686	2129	2023
CW	1782	2046	1591
CX	1564	1541	1917
CY	1491	1950	1773
CZ	2577	2865	3008
DA	1568	2029	1836
DB	1922	2044	1598
DC	1773	2046	2206
DD	2298	2598	2728
DE	1747	2166	1804
DF	2842	2432	2507
DG	1891	2256	1839
DH	1544	1525	1899
DI	1602	2048	1935
DJ	2544	2861	2971
DK	1924	2136	1677
DL	1598	2039	1720
DM	2891	2522	2514
DN	1420	1789	1835
DO	1912	1793	2215
DP	2191	2492	2621
DQ	1602	2017	1652
DR	1829	2233	1850
DS	2051	1814	2268
DT	1719	1604	2023
DU	1722	1663	2058
DV	1650	1579	1979
DW	1475	1411	1806
DX	1510	1461	1849
DY	1565	1528	1911
DZ	1526	1071	1436
EA	1590	1129	1463
EB	1745	1285	1613
EC	1706	1244	1547
ED	1874	1412	1702
EE	1880	1421	1675
EF	1933	1477	1716
EG	1992	1537	1769
EH	2099	1648	1854
EI	2244	1798	1981
EJ	2305	1862	2033

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WTG

NSA	1	2	3
EK	2382	1941	2103
EL	2511	2076	2218
EM	2603	2170	2304
EN	2678	2248	2374
EO	2734	2306	2426
EP	2770	2344	2458
EQ	2810	2385	2496
ER	2851	2432	2528
ES	2845	2432	2514
ET	2892	2619	2469
EU	2370	2535	2081
EV	2380	2508	2063
EW	2325	2445	2001
EX	2267	2400	1953
EY	2237	2367	1920
EZ	2281	2395	1953
FA	2253	2363	1922
FB	2301	2394	1959
FC	2136	2272	1824
FD	2111	2256	1806
FE	2503	2751	2293
FF	2508	2746	2287
FG	2524	2758	2299
FH	2540	2769	2310
FI	2453	2687	2228
FJ	2459	2687	2228
FK	2491	2710	2251
FL	2401	2630	2171
FM	2343	2552	2093
FN	2419	2661	2202
FO	2381	2621	2162
FP	2337	2575	2117
FQ	2310	2546	2088
FR	2281	2503	2044
FS	2288	2505	2046
FT	2189	2421	1962
FU	2147	2376	1917
FV	2080	2303	1844
FW	2144	2352	1893
FX	2101	2292	1834
FY	2184	2378	1920
FZ	2064	2267	1809
GA	2021	2239	1780
GB	1961	2176	1717
GC	1994	2188	1730
GD	2222	2597	2183
GE	1854	2211	1789
GF	1800	2154	1730
GG	1761	2112	1688
GH	1708	2059	1636
GI	1713	2078	1664
GJ	1752	2115	1699
GK	1851	2232	1827
GL	1739	2116	1710
GM	1739	2130	1735
GN	1679	2058	1655
GO	1629	2019	1625

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DECIBEL - Main Result**Calculation:** Amherst Noise Assessment

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WTG

NSA	1	2	3
GP	1857	2245	1847
GQ	1709	2109	1725
GR	1731	2144	1775
GS	1703	2123	1763
GT	1677	2103	1752
GU	1649	2063	1696
GV	1600	2013	1647
GW	1507	1962	1815
GX	1634	2071	1983
GY	1635	2070	1989
GZ	2370	2676	2799
HA	2429	2736	2857
HB	2477	2785	2905
HC	1799	2053	2232
HD	1796	2031	2229
HE	1790	2012	2221
HF	1656	1877	2087
HG	1779	1980	2208
HH	1638	1841	2067
HI	1735	1919	2161
HJ	1601	1791	2027
HK	1712	1881	2135
HL	1571	1748	1995
HM	1543	1703	1964
HN	1530	1677	1947
HO	1516	1636	1925
HP	2757	2412	2864
HQ	1517	1615	1920
HR	2883	2511	2954
HS	2749	2423	2879
HT	1627	1674	2013
HU	2266	2112	2548
HV	1635	1986	1564
HW	2615	2297	2755
HX	1564	1995	1655
HY	1547	1984	1655
HZ	2443	2501	2080
IA	2476	2527	2110
IB	2506	2553	2137
IC	2535	2573	2162
ID	2580	2613	2204
IE	2721	2727	2333
IF	2743	2749	2355
IG	2573	2589	2189
IH	2570	2582	2184
II	2592	2600	2204
IJ	2739	2726	2343
IK	2766	2749	2368
IL	2782	2762	2383
IM	2706	2697	2311
IN	2723	2713	2328
IO	2263	2368	1929
IP	2439	2572	2126
IQ	2197	2285	1851
IR	2473	2600	2155
IS	2463	2594	2148
IT	2539	2680	2231

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DECIBEL - Main Result**Calculation:** Amherst Noise Assessment

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WTG

NSA	1	2	3
IU	2595	2745	2295
IV	2620	2763	2315
IW	2499	2659	2206
IX	2536	2700	2247
IY	2614	2785	2331
IZ	2179	2325	1875
JA	2137	2288	1836
JB	2304	2509	2051
JC	2445	2898	2596
JD	2088	2545	2377
JE	2120	2577	2411
JF	2549	2417	2847
JG	2247	2090	2527
JH	2552	2119	2255
JI	2825	2403	2508
JJ	2832	2414	2508
JK	2814	2405	2479
JL	2930	2544	2568
JM	2910	2523	2549
JN	2767	2387	2400
JO	2896	2520	2525
JP	2858	2494	2478
JQ	2840	2476	2461
JR	2862	2517	2469
JS	2901	2564	2503
JT	2873	2601	2449
JU	1888	2007	1562
JV	1615	2062	1759
JW	1447	1904	1642
JX	1475	1932	1669
JY	1448	1907	1651
JZ	1542	2004	1801
KA	1584	2038	1891
KB	1493	1946	1806
KC	1661	2103	2000
KD	1640	2081	1983
KE	1615	2055	1961
KF	1673	2109	2025
KG	1529	1963	1887
KH	1548	1977	1912
KI	1709	2097	2110
KJ	2010	2264	2444
KK	1628	1646	2001
KL	1406	1312	1719
KM	1431	1341	1746
KN	1746	1628	2048
KO	1718	1663	2057
KP	2059	1825	2279
KQ	2077	1834	2290
KR	2058	1816	2271
KS	1619	1197	1618
KT	1432	1213	1661
KU	1554	1113	1509
KV	1429	982	1370
KW	1454	1003	1383
KX	1513	1059	1426
KY	1522	1070	1444

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DECIBEL - Main Result

Calculation: Amherst Noise Assessment

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WTG

NSA	1	2	3
KZ	2229	1783	1966
LA	1621	1556	1953
LB	1733	1271	1574

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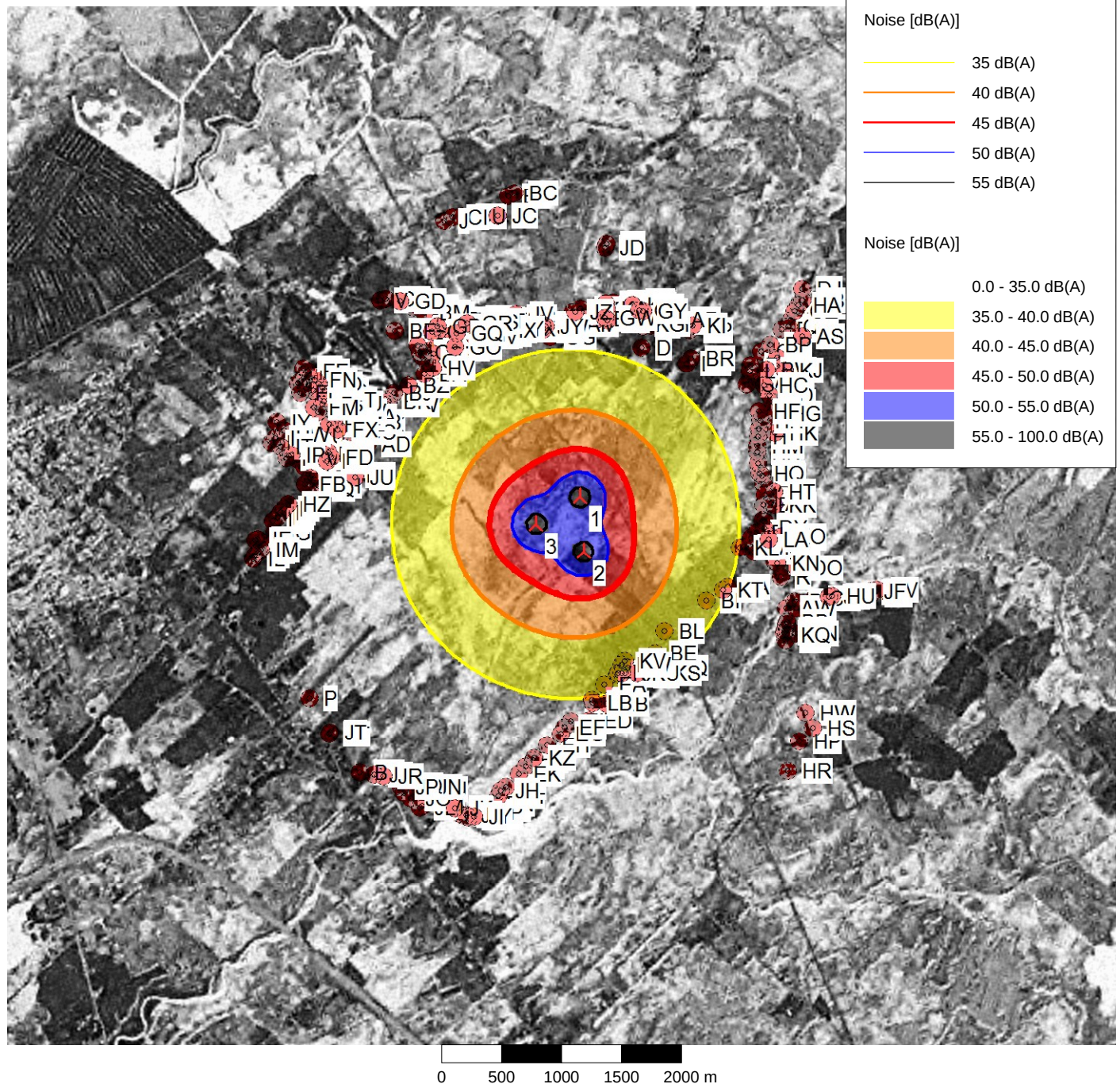
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DECIBEL - Map 9.0 m/s**Calculation:** Amherst Noise Assessment

Map: WindPRO map, Print scale 1:50,000, Map center UTM (north)-NAD83 (US+CA) Zone: 20 East: 410,952 North: 5,076,057

New WTG

Noise sensitive area

Noise calculation model: ISO 9613-2 General. Wind speed: 9.0 m/s

Height above sea level from active line object

Project:

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Calculated:

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DECIBEL - Assumptions for noise calculation**Calculation:** Amherst Noise Assessment**Noise calculation model:**

ISO 9613-2 General

Wind speed:

4.0 m/s - 12.0 m/s, step 1.0 m/s

Ground attenuation:

None

Meteorological coefficient, C0:

0.0 dB

Type of demand in calculation:

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

Noise values in calculation:

All noise values are mean values (Lwa) (Normal)

Pure tones:

Pure and Impulse tone penalty are added to WTG source noise

Height above ground level, when no value in NSA object:

4.5 m Don't allow override of model height with height from NSA object

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0.0 dB(A)

Octave data required

Air absorption

63	125	250	500	1,000	2,000	4,000	8,000
[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]
0.1	0.4	1.0	1.9	3.7	9.7	32.8	117.0

WTG: ENERCON E-92 2,3 MW 2300 92.0 !-!**Noise:** Level 0 - calculated - Op.Mode I - 03/2012

Source Source/Date Creator Edited

Manufacturer 16/03/2012 EMD 16/03/2012 5:58 PM

According to manufacturer specification document "SIAS-04-SPL-E-92 OM I 2 3 MW Est Rev1 1-en-eng.pdf" dated 03/2012

Status	Hub height [m]	Wind speed [m/s]	LwA.ref [dB(A)]	Pure tones	Octave data								
					63	125	250	500	1000	2000	4000	8000	
					[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	
ExtraPolated	98.0	4.0	97.6	No	Generic data	79.2	86.2	89.6	92.2	92.0	89.1	84.3	74.8
From Windcat	98.0	5.0	99.9	No	Generic data	81.5	88.5	91.9	94.5	94.3	91.4	86.6	77.1
From Windcat	98.0	6.0	102.2	No	Generic data	83.8	90.8	94.2	96.8	96.6	93.7	88.9	79.4
From Windcat	98.0	7.0	103.4	No	Generic data	85.0	92.0	95.4	98.0	97.8	94.9	90.1	80.6
From Windcat	98.0	8.0	104.4	No	Generic data	86.0	93.0	96.4	99.0	98.8	95.9	91.1	81.6
From Windcat	98.0	9.0	105.0	No	Generic data	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
From Windcat	98.0	10.0	105.0	No	Generic data	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
From Windcat	98.0	11.0	105.0	No	Generic data	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
From Windcat	98.0	12.0	105.0	No	Generic data	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2

NSA: Noise sensitive point: User defined (1)-A**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model**Noise demand:** 40.0 dB(A)**Ambient noise:** 0.0 dB(A)**Margin or Allowed additional exposure:** 0.0 dB(A)**Sound level always accepted:** 0.0 dB(A)**Distance demand:** 600**NSA:** Noise sensitive point: User defined (2)-B**Predefined calculation standard:****Imission height(a.g.l.):** Use standard value from calculation model