

Appendix B
Pre- and Post-Construction Survey
Methodology for Bat Maternity
Colonies

Bat Maternity Colonies

In order to confirm significance, exit surveys must be conducted at snag and cavity trees in order to confirm their use by bats. Two candidate habitats (BMC-005 and BMC-009) will be surveyed for the presence of bats in order to confirm significance prior to construction.

Eight candidate habitats (BMC-001, BMC-003, BMC-004, BMC-006, BMC-007, BMC-010, BMC-011 and BMC-012) were only partially surveyed at the Site Investigation stage. Additional plots will be sampled in order to confirm whether candidate habitat exists. These will be conducted in the winter of 2013. If they are found to provide candidate habitat, exit surveys to confirm significance will be conducted in June 2013.

Two candidate habitats (BMC-002, BMC-008) were entirely inaccessible and could not be surveyed to determine their candidacy as habitat or its use by bats. They will also be treated as significant and subject to post-construction monitoring (closest turbine to be monitored for mortality).

The type of additional sampling at each habitat is summarized in **Table B-1**.

Table B-1 Habitat Sampling and Habitat Use Studies to be Conducted Prior to Construction

Feature ID	Status			Next Steps
	Confirmed as Candidate Habitat	Requiring Additional Habitat Survey to Confirm Candidacy	Inaccessible, To Be Treated As Significant	
BMC-001		Y		Complete habitat surveys and identify roost trees (winter 2013); Complete exit surveys at roost trees if candidate habitat exists (June 2013).
BMC-002			Y	Treat as significant and implement post-construction monitoring (closest turbine to be monitored for mortality).
BMC-003		Y		Complete habitat surveys and identify roost trees (winter 2013); Complete exit surveys at roost trees if candidate habitat exists (June 2013).
BMC-004		Y		Complete habitat surveys and identify roost trees (winter 2013); Complete exit surveys at roost trees if candidate habitat exists (June 2013).

Feature ID	Status			Next Steps
	Confirmed as Candidate Habitat	Requiring Additional Habitat Survey to Confirm Candidacy	Inaccessible, To Be Treated As Significant	
BMC-005	Y			Identify roost trees for exit surveys (winter 2013) and complete exit surveys (June 2013).
BMC-006		Y		Complete habitat surveys and identify roost trees (winter 2013); Complete exit surveys at roost trees if candidate habitat exists (June 2013).
BMC-007		Y		Complete habitat surveys and identify roost trees (winter 2013); Complete exit surveys at roost trees if candidate habitat exists (June 2013).
BMC-008			Y	Treat as significant and implement post-construction monitoring (closest turbine to be monitored for mortality).
BMC-009	Y			Identify roost trees for exit surveys (winter 2013) and complete exit surveys (June 2013).
BMC-010		Y		Complete habitat surveys and identify roost trees (winter 2013); Complete exit surveys at roost trees if candidate habitat exists (June 2013).
BMC-011		Y		Complete habitat surveys and identify roost trees (winter 2013); Complete exit surveys at roost trees if candidate habitat exists (June 2013).
BMC-012		Y		Complete habitat surveys and identify roost trees (winter 2013); Complete exit surveys at roost trees if candidate habitat exists (June 2013).

Habitat Surveys

Survey plots will be undertaken in the following habitats in order to confirm whether they provide suitable candidate habitat:

- BMC-001;
- BMC-003;
- BMC-004;
- BMC-006;
- BMC-007;
- BMC-010;

- BMC-011; and,
- BMC-012.

Surveys will be completed in a similar manner to those undertaken during the Site Investigation. Specifically, where stands are located within a participating property and where access has been granted, the following steps will be taken:

- random survey plots will be marked on a map within portions of forests that are accessible on participating properties;
- a minimum of 10 plots will be surveyed within each of the three habitats;
- plot locations will be entered into a GPS unit and each plot will be visited in the field;
- at each point, a radius of 12.6 m will be identified using a tape measure and flagging tape; and,
- within each 12.6 m radius (0.05 ha) plot, the number of snags/cavity trees over 25 cm diameter at breast height (“dbh”) will be recorded. Diameters will be measured using a dbh tape.

The number of plots to be completed in each habitat is listed in **Table B-2**.

Surveys will be conducted during the leaf-off period so that tree cavities and crevices will not be obscured by foliage. Weather conditions will be recorded. Each plot will be visited only once.

The number of snags and cavity trees in each plot will be divided by the size of the plot (0.05 ha) to determine the number of snags/cavity trees per hectare. Based on the results, one of two actions will be undertaken, as follows:

- if any of the habitats has a snag/cavity tree density of greater than or equal to 10/hectare, exit surveys, using the protocol noted below will be undertaken; or,
- if the density is less than 10 snags/cavity trees per hectare, no exit surveys will be completed and the mitigation described in **Tables 5.4 and 7.1** will not be undertaken. However, as the entire woodlot could not be surveyed, post-construction monitoring will be completed at the closest turbine for the first three years after construction as described in the EEMP.

Table B-2 Habitat Survey Plots to be Completed Winter 2012/13

CSWH ID	Feature ID	ELC Unit	ELC Community Name	Minimum distance between feature & Project Location	Feature Size (Ha)	Size of Accessible Portion of Habitat (Ha)	Total Number of 0.5ha Plots to be Surveyed	Notes
BMC-001	W-004	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	25 m	4.82	1.7	10	
BMC-002	W-013	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	7 m	3.17	0	0	Entire woodlot is inaccessible on non-participating property. To be treated as significant and subject to post-construction monitoring (closest turbine to be monitored for mortality).
BMC-003	W-014	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	4 m	5.73	5.73	10	
BMC-004	W-020	FOD5-8	Dry – Fresh Sugar Maple – White Ash Deciduous Forest Type	2 m	11.18	11.18	11	
BMC-005	W-021	FOD5-1	Dry – Fresh Sugar Maple Deciduous Forest Type	2 m	14.77	-	-	Previously Identified as Significant. No further surveys required.
BMC-006	W-023	FOM6-1	Fresh – Moist Sugar Maple – Hemlock Mixed Forest Type	36 m	3.43	1.4	10	
BMC-007	W-026	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	2 m	34.06	3.1	10	
		FOD5-8	Dry – Fresh Sugar Maple – White Ash Deciduous Forest Type					

CSWH ID	Feature ID	ELC Unit	ELC Community Name	Minimum distance between feature & Project Location	Feature Size (Ha)	Size of Accessible Portion of Habitat (Ha)	Total Number of 0.5ha Plots to be Surveyed	Notes
BMC-009	W-037	FOD5-8	Dry – Fresh Sugar Maple – White Ash Deciduous Forest Type	2 m	28.98	-	-	Previously Identified as Significant. No further surveys required.
		FOD7-2	Fresh – Moist Green Ash - Hardwood Lowland Deciduous Forest Type					
		FOD7-2	Fresh – Moist Green Ash - Hardwood Lowland Deciduous Forest Type					
BMC-010	W-041	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	30 m	2.57	0.6	10	
BMC-011	W-042	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	2 m	48.58	2.2	10	
BMC-008		FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	18 m	8.16	0	0	Woodlot unit is inaccessible on non-participating property. To be treated as significant and subject to post-construction monitoring (closest turbine to be monitored for mortality).
BMC-012	W-067	FOD5-1	Dry-Fresh Sugar Maple Deciduous Forest Type	90 m	3.75	3.6	10	

Habitat Use Surveys

Identification of Survey Trees

Bat maternity colony exit surveys will be conducted in the two candidate habitats noted in **Table B-1** above (BMC-005 and BMC-009) as well as any of the other habitats if they are found to provide candidate habitat conditions. The exit surveys will follow the protocols outlined in the Bat and Bat Habitats: Guidelines for Wind Power Projects (MNR 2011). In accordance with these guidelines, exit surveys are conducted at the best candidate snag/cavity trees. These will be identified through the following methodology:

- Wandering transects will be walked through each habitat or portion of each habitat that is accessible.
- Transects will be completed during the leaf-off period in the winter of 2012/13.
- While completing the transects, the surveyor will identify the best candidate snag/cavity trees, using the following criteria (in order of importance):
 - tallest snag/cavity tree,
 - exhibits cavities or crevices most often originating as cracks, scars, knot holes, or woodpecker cavities,
 - has the largest diameter at breast height,
 - is within the highest density of snags/cavity trees (e.g., clusters of snags),
 - has a large amount of loose, peeling bark,
 - cavity or crevice is positioned high up in the snag/cavity tree (>10 m),
 - tree species that provide good cavity habitat (e.g., white pine, maple, aspen, ash, oak),
 - canopy is more open (where canopy cover can be determined by the percentage of the ground covered by a vertical projection of the outermost perimeter of the natural spread of the foliage of the trees),
 - exhibits early stages of decay (decay Class 1-3; Watt and Caceres 1999 will be used as a reference for determining stage of decay).
- The number of trees identified will be based on the following guidelines:
 - a minimum of 10 snags/cavity trees will be surveyed for habitats that are ≤ 10 ha,
 - one snag/cavity tree will be surveyed for each additional hectare in habitats that are ≤ 30 ha,
 - a maximum of 30 snags/cavity trees will be surveyed for habitats that are ≥ 30 ha.

Exit Survey Methods

Each of the snag/cavity trees selected as the best representative bat maternity roost will have a single exit survey completed during the month of June, 2013. Viewing stations will be positioned so they provide a clear view of the snag/cavity tree's cavity opening or crevice. When final snags/cavity trees are chosen, specific UTM monitoring locations for

each selected station will be collected. For snags/cavity trees with multiple openings, multiple viewing stations may be established.

Each survey will be conducted for 90 minutes (30 minutes before dusk until 60 minutes after dusk). Exit surveys will be conducted by biologists experienced in bat identification and monitoring, during warm or mild nights (>10°C) with low winds and no precipitation.

Visual surveys will be conducted in order to collect evidence of bats exiting the candidate snags/cavity trees. These surveys will be completed with the use of human visual observation. The use of a low light, night-vision, or infrared video recorders may also be considered. For the use of video recorders, viewing stations will be set-up prior to the exit survey timing window and will be conducted in the same candidate habitat as where there are also human visual exit surveys being conducted. Once an evening's monitoring is completed (60 minutes after sunset), the cameras will be collected by the consultant conducting visual surveys in the same candidate habitat and the visual recordings for each video recorder will be reviewed for evidence of significant bat roosting activity. Additional details regarding this method, including camera specifications, will be provided to the MNR prior to commencement.

A broadband bat detector will be used in conjunction with the visual observations (human or video recorder) in order to determine the bat species observed. Microphones will be positioned to maximize bat detection (e.g., situated away from nearby obstacles to allow for maximum range detection, microphones angled slightly away from the prevailing wind to minimize wind noise). The same broadband detector will be used throughout the survey. Information on the equipment used will be recorded, including information on all adjustable settings (e.g., gain level) and the position of the microphone. Audio data collected will be analyzed by a consultant experienced in bat identification and monitoring.

For each monitoring event, the following information will be recorded:

- the level of effort (including date, start and end time, time spent, weather conditions, etc.);
- the name of observer(s) conducting field work and number of video recorders used;
- the number of bats observed, including time of observation, number of passes (a bat detector will be used to collect audio recordings of bat passes for species identification following the completion of the monitoring);
- A description of the snag/cavity tree observed along with photographs; and,
- GPS point of the survey location.

Evaluation of Significance and Reporting

At the completion of the monitoring program in all data will be reviewed and compared to provincial standards for significant bat maternity colony habitats. According to the SWH 6E/7E Ecoregion Criteria, significant bat maternity colonies are those with confirmed use by at least:

- 20 Northern Myotis;
- 10 Big Brown Bats;
- 20 Little Brown Myotis; or,
- 5 Adult Female Silver-haired Bats.

However, more recent guidance from the MNR suggests that these criteria may be too broad. Due to maternity roosts being ephemeral and the fact that the survey is limited to only one night, the presence of two bats emerging from any cavity/crevice will make the roost tree a maternity roost and thus significant.

A detailed report will be prepared for submission to the MNR which describes the specific methods employed and details the results of the habitat and habitat use surveys. The report will clearly describe which habitats are significant and which are not and therefore which habitats will be subject to the mitigation described in this report and which will not. This report will be provided to the MNR for review and comment prior to the onset of construction activities.

Post-Construction Monitoring

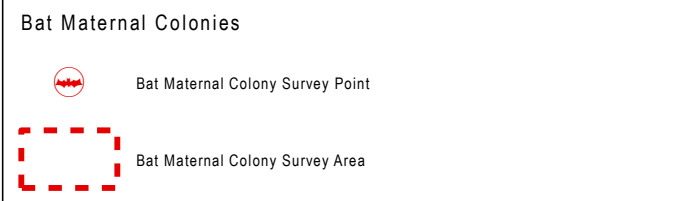
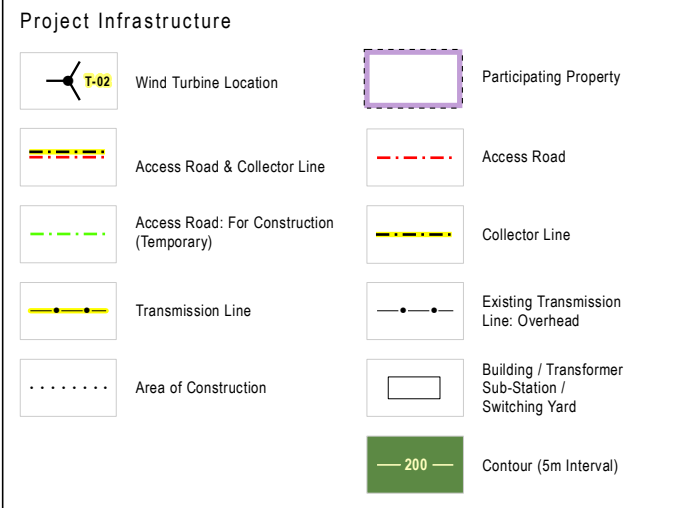
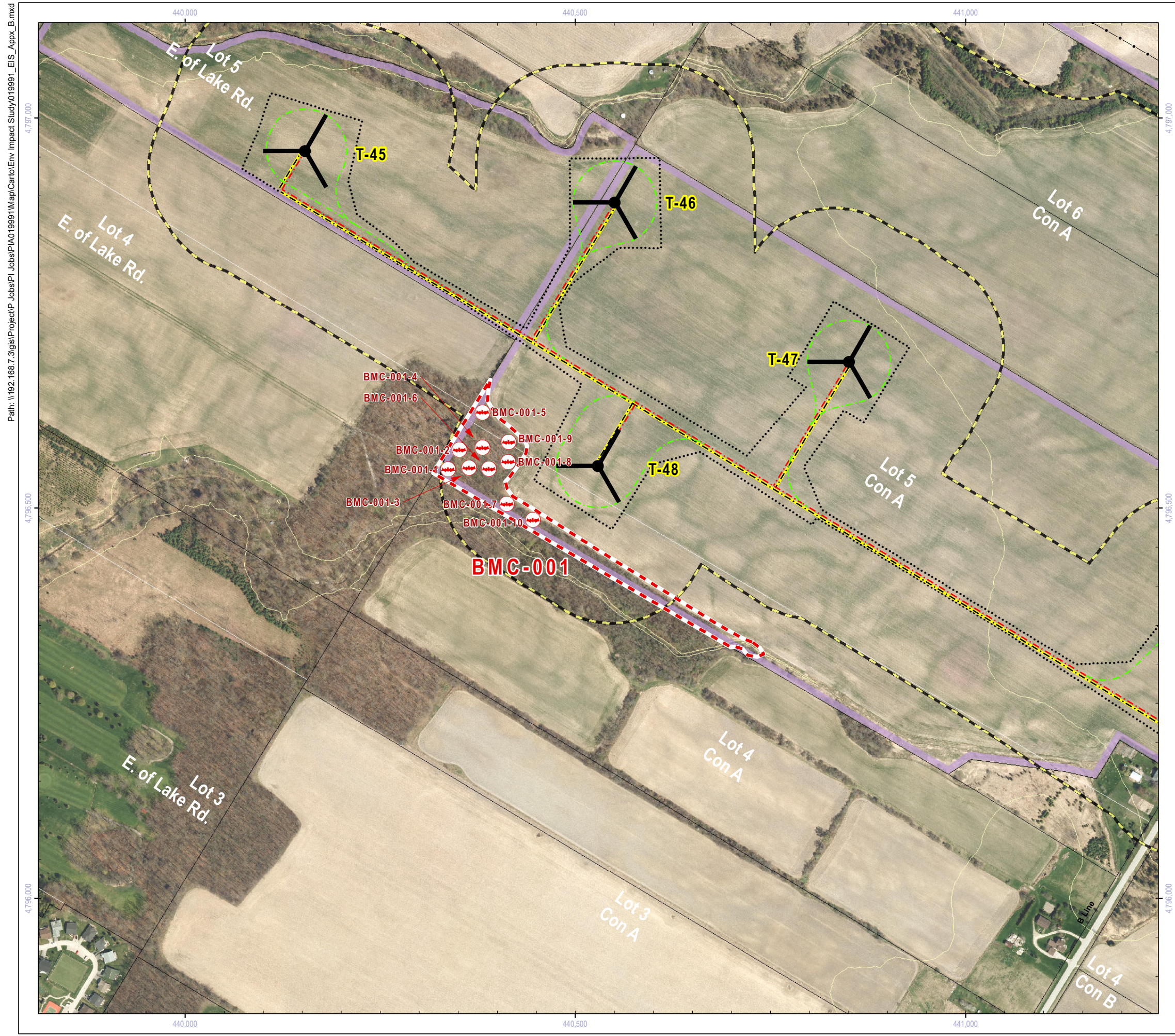
For any significant habitats identified, post-construction avoidance and disturbance monitoring will be required. The purpose of this monitoring will be to determine if there are any significant changes in the number of bats using the habitat during turbine operations as a result of disturbance from noise or other factors.

Within significant habitats, the same roost trees monitored during exit surveys will be monitored for three years post-construction. The methodology will follow the protocols used for exist surveys, as described above. Additional candidate trees in proximity to the previously-surveyed roost trees will also be included as cavities are ephemeral and bats may move to surrounding trees in subsequent years.

If bats continue to use trees within the ELC unit identified as significant, then no mitigation will be required.

If significant changes are found in the usage of the habitat, then the MNR will be consulted and mitigation measures will be developed.

Two candidate habitats which were inaccessible and were assumed to be significant (BMC-002, BMC-008). The closest turbine to these habitats will be monitored for mortality.

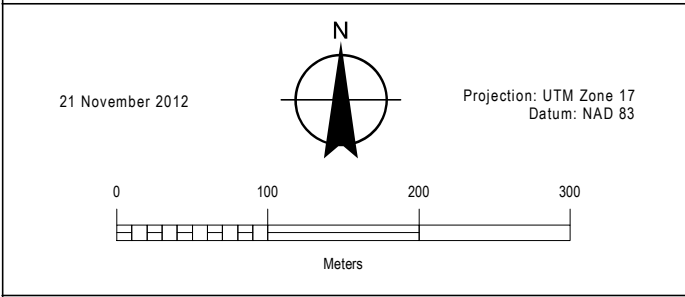


NOTES:

- Reference the Figure 1 Key Map for location in the overall project area.

DATA SOURCES:

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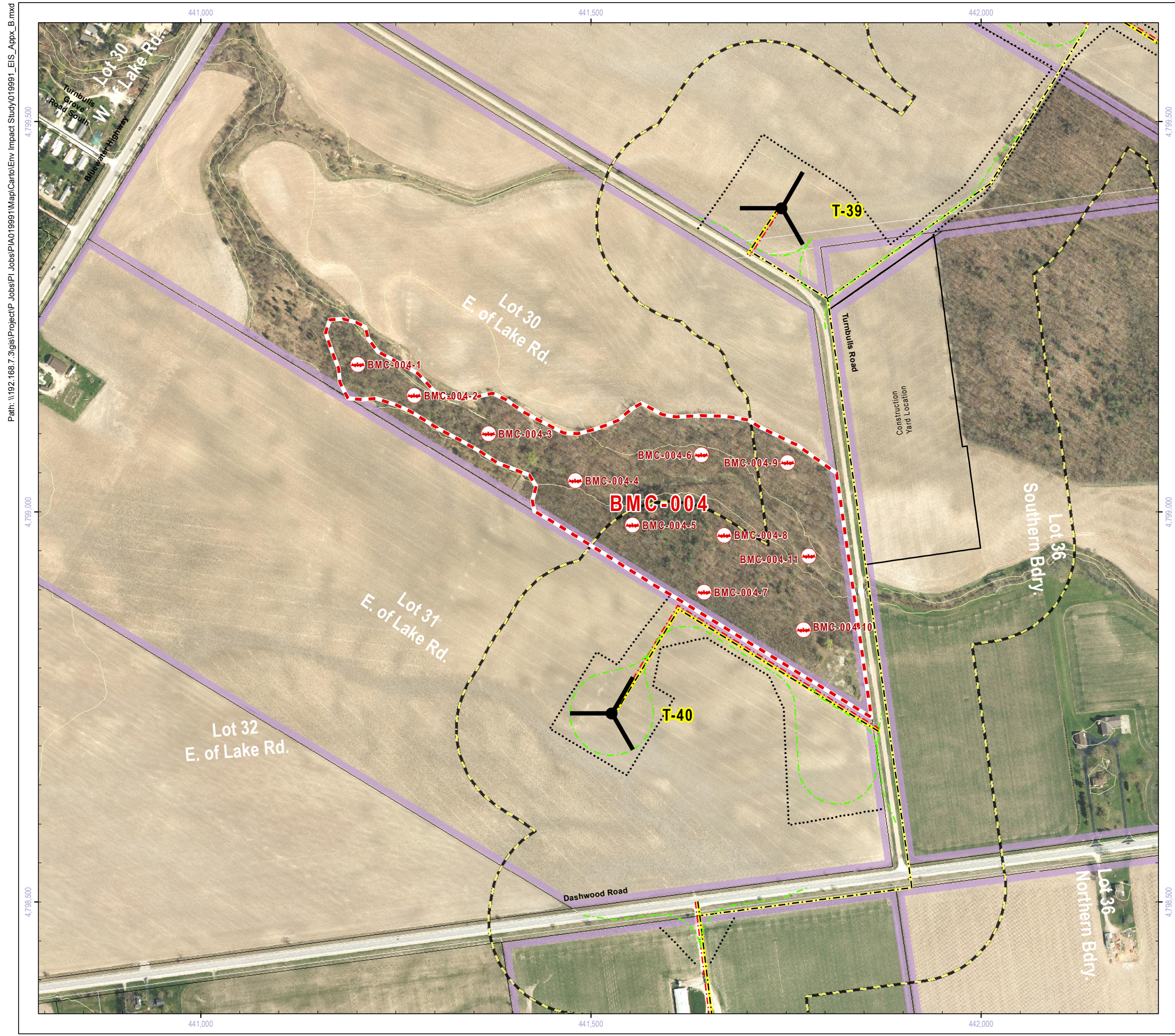


Title

**Grand Bend Wind Farm
Grand Bend Wind Limited Partnership
Environmental Impact Study
Bat Maternal Colony Candidate Habitat Survey Plots**

Prepared	P. Stubbert	Checked	T. Radburn	Appendix B-1
Scale	1:5,000	Project	PIA019991	

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Project Infrastructure

	Wind Turbine Location		Participating Property
	Access Road & Collector Line		Access Road
	Access Road: For Construction (Temporary)		Collector Line
	Transmission Line		Existing Transmission Line: Overhead
	Area of Construction		Building / Transformer Sub-Station / Switching Yard
			Contour (5m Interval)

Bat Maternal Colonies

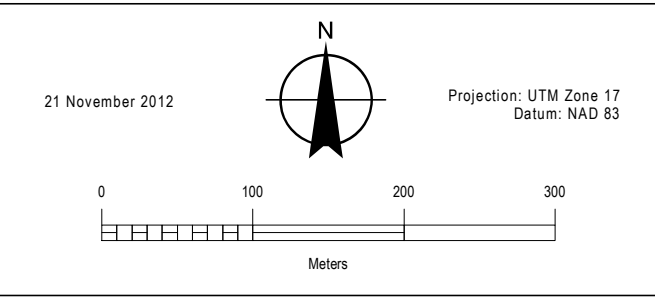
	Bat Maternal Colony Survey Point
	Bat Maternal Colony Survey Area

NOTES:

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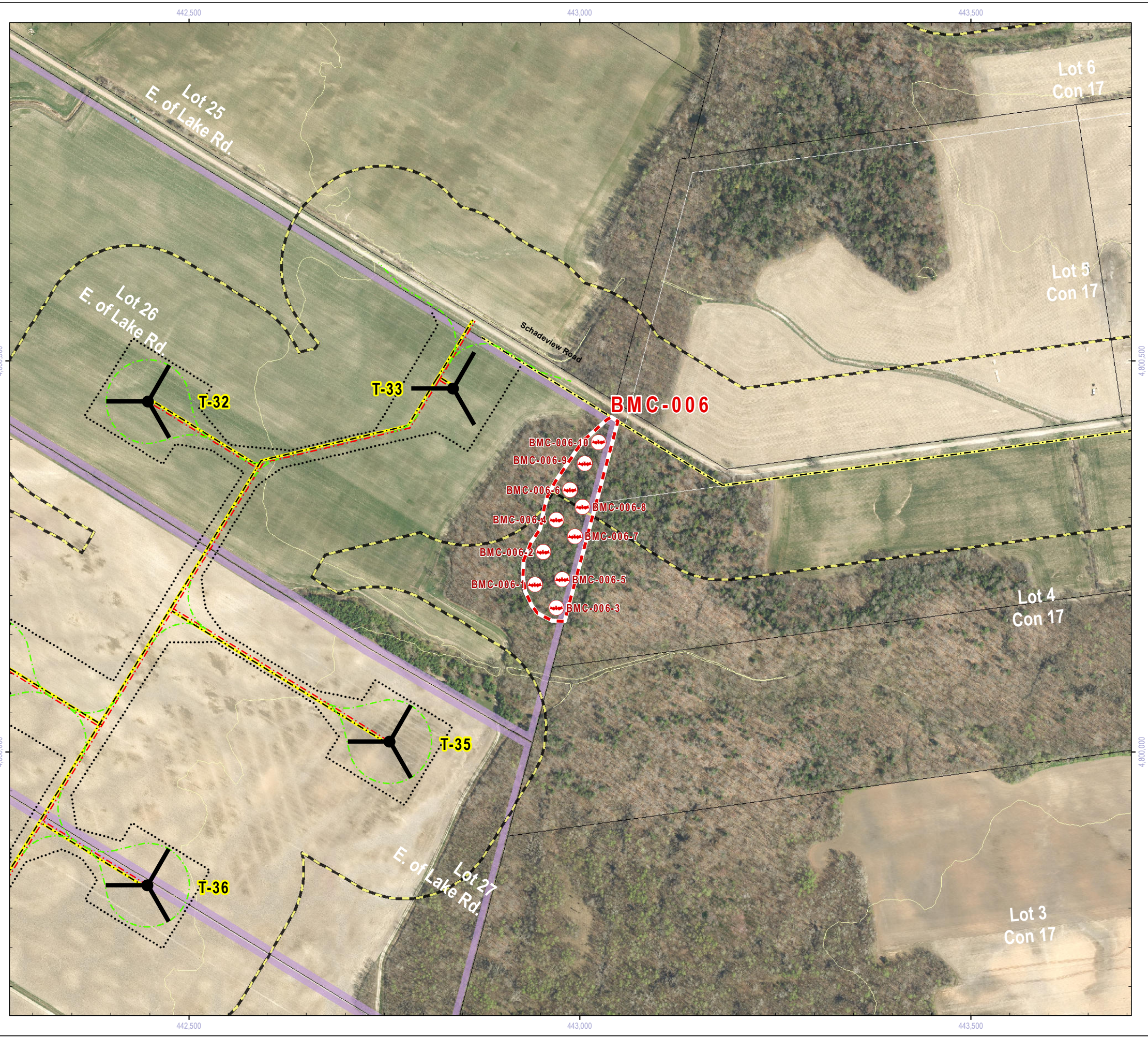
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**Grand Bend Wind Farm
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Environmental Impact Study
Bat Maternal Colony Candidate Habitat Survey Plots**

Prepared	P. Stubbert	Checked	T. Radburn	Appendix B-2
Scale	1:5,000	Project	PIA019991	



Project Infrastructure

	Wind Turbine Location		Participating Property
	Access Road & Collector Line		Access Road
	Access Road: For Construction (Temporary)		Collector Line
	Transmission Line		Existing Transmission Line: Overhead
	Area of Construction		Building / Transformer Sub-Station / Switching Yard
			Contour (5m Interval)

Bat Maternal Colonies

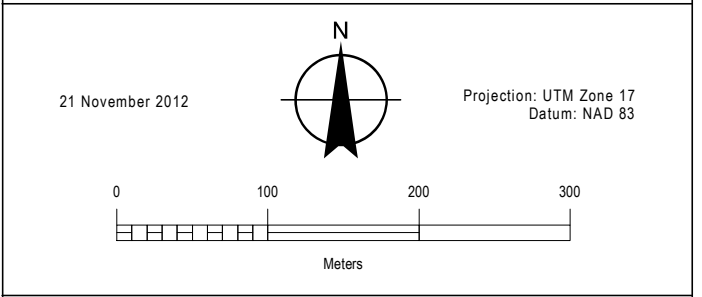
	Bat Maternal Colony Survey Point
	Bat Maternal Colony Survey Area

NOTES:

- Reference the Figure 1 Key Map for location in the overall project area.

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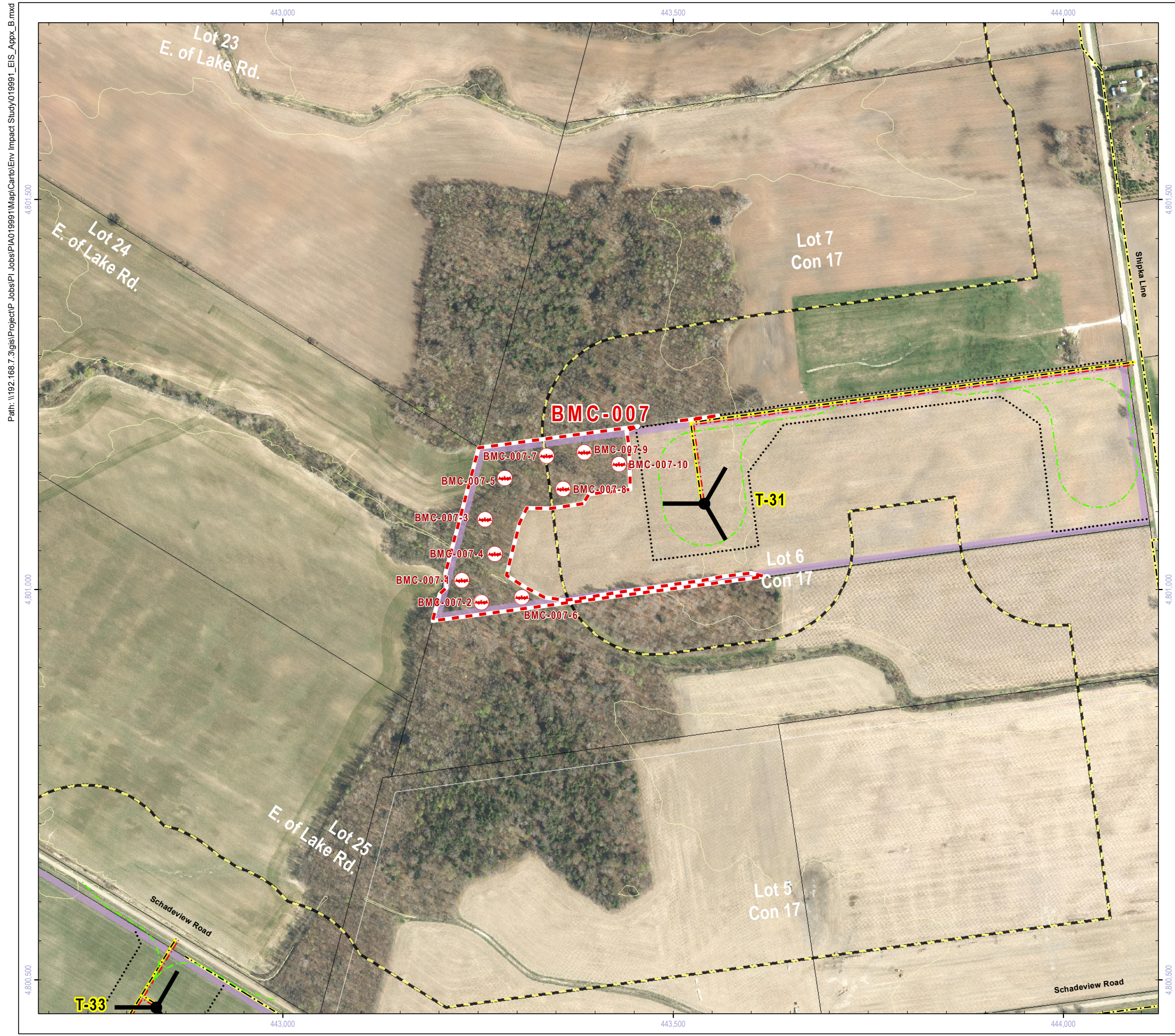
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Environmental Impact Study
Bat Maternal Colony Candidate Habitat Survey Plots**

Prepared	P. Stubbart	Checked	T. Radburn	Appendix B-3
Scale	1:5,000	Project	PIA019991	



Project Infrastructure

	Wind Turbine Location		Participating Property
	Access Road & Collector Line		Access Road
	Access Road: For Construction (Temporary)		Collector Line
	Transmission Line		Existing Transmission Line: Overhead
	Area of Construction		Building / Transformer Sub-Station / Switching Yard
			Contour (5m Interval)

Bat Maternal Colonies

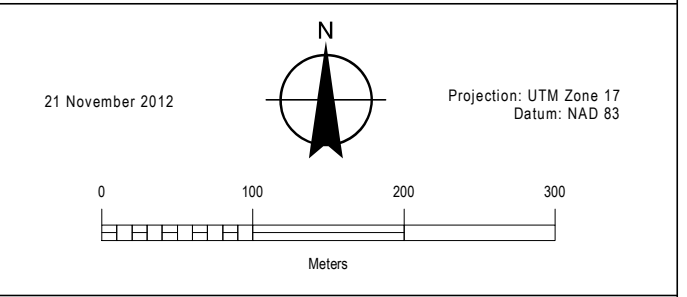
	Bat Maternal Colony Survey Point
	Bat Maternal Colony Survey Area

NOTES:

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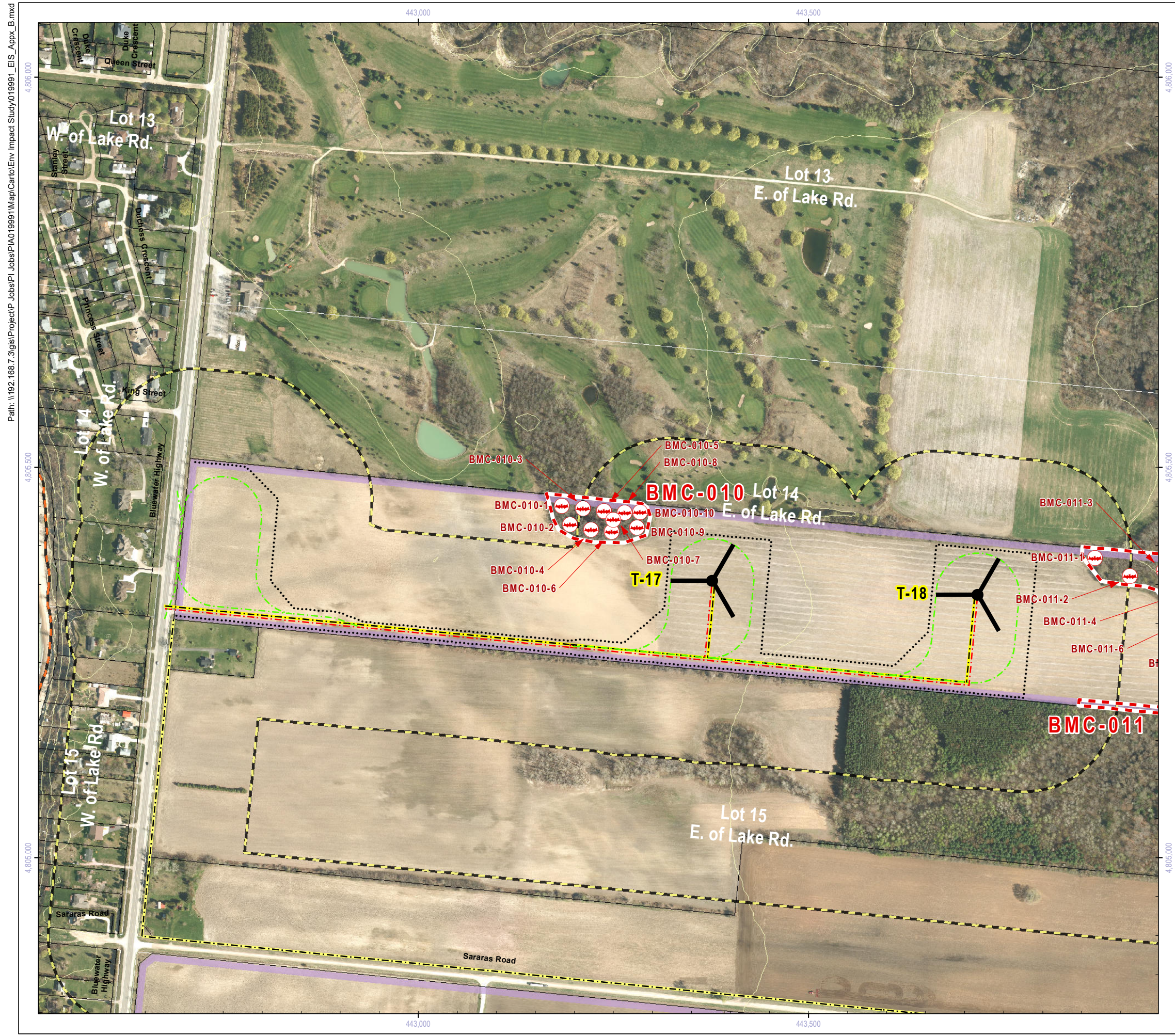
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Grand Bend Wind Limited Partnership
Environmental Impact Study
Bat Maternal Colony Candidate Habitat Survey Plots**

Prepared	P. Stubbert	Checked	T. Radburn	Appendix
Scale	1:5,000	Project	PIA019991	B-4



Project Infrastructure

	Wind Turbine Location		Participating Property
	Access Road & Collector Line		Access Road
	Access Road: For Construction (Temporary)		Collector Line
	Transmission Line		Existing Transmission Line: Overhead
	Area of Construction		Building / Transformer Sub-Station / Switching Yard
			Contour (5m Interval)

Bat Maternal Colonies

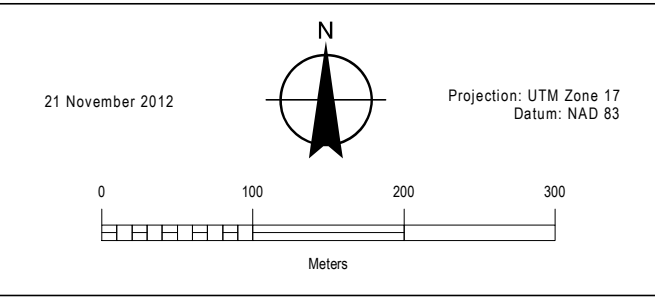
	Bat Maternal Colony Survey Point
	Bat Maternal Colony Survey Area

NOTES:

- Reference the Figure 1 Key Map for location in the overall project area.

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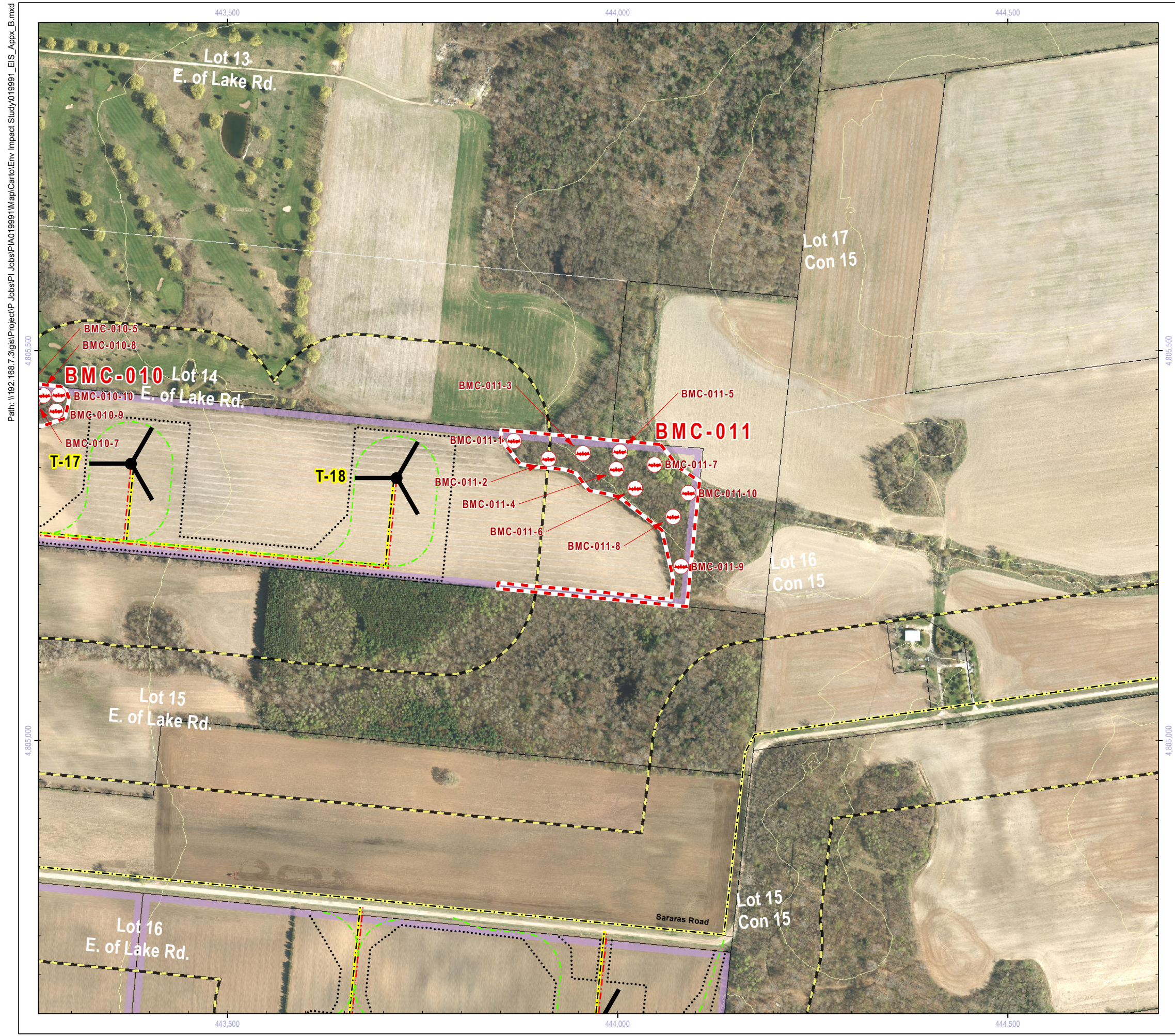
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**Grand Bend Wind Farm
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Environmental Impact Study
Bat Maternal Colony Candidate Habitat Survey Plots**

Prepared	P. Stubbert	Checked	T. Radburn	Appendix
Scale	1:5,000	Project	PIA019991	B-5



Project Infrastructure

T-02	Wind Turbine Location		Participating Property
	Access Road & Collector Line		Access Road
	Access Road: For Construction (Temporary)		Collector Line
	Transmission Line		Existing Transmission Line: Overhead
	Area of Construction		Building / Transformer Sub-Station / Switching Yard
			Contour (5m Interval)

Bat Maternal Colonies

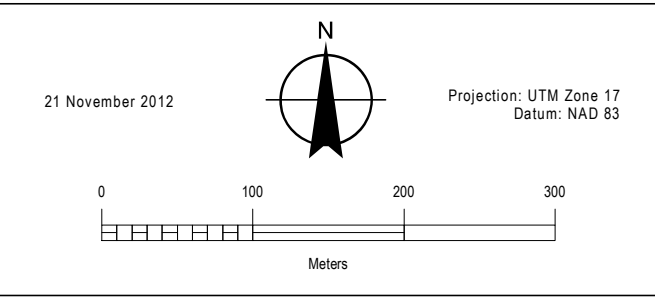
	Bat Maternal Colony Survey Point
	Bat Maternal Colony Survey Area

NOTES:

- Reference the Figure 1 Key Map for location in the overall project area.

DATA SOURCES:

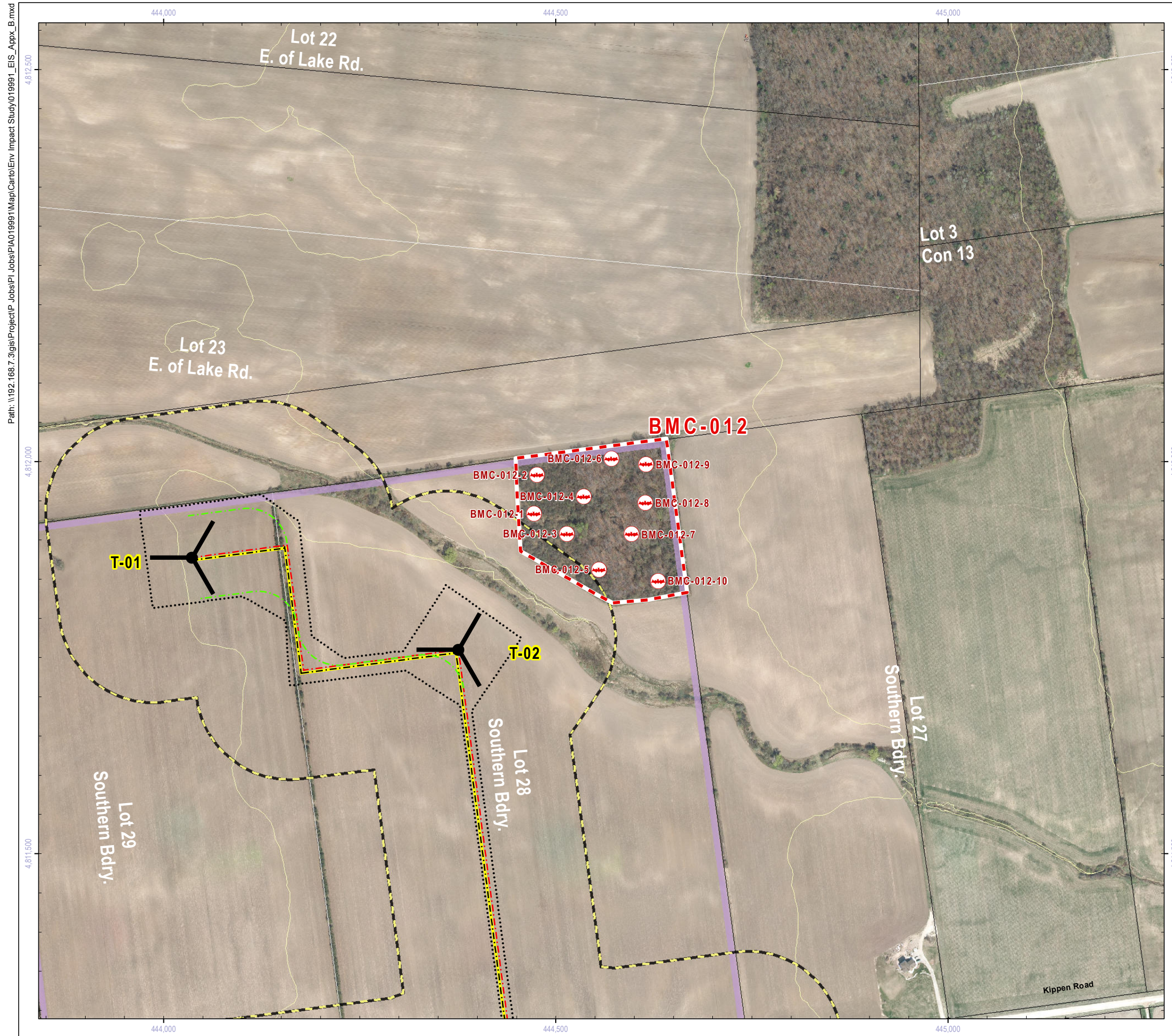
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Environmental Impact Study
Bat Maternal Colony Candidate Habitat Survey Plots**

Prepared	P. Stubbert	Checked	T. Radburn	Appendix
Scale	1:5,000	Project	PIA019991	B-6



Project Infrastructure

	Wind Turbine Location		Participating Property
	Access Road & Collector Line		Access Road
	Access Road: For Construction (Temporary)		Collector Line
	Transmission Line		Existing Transmission Line: Overhead
	Area of Construction		Building / Transformer Sub-Station / Switching Yard
			Contour (5m Interval)

Bat Maternal Colonies

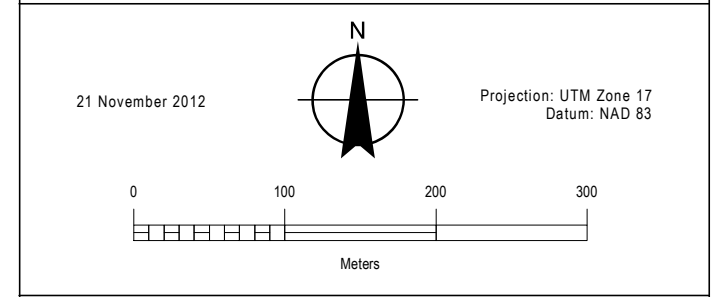
	Bat Maternal Colony Survey Point
	Bat Maternal Colony Survey Area

NOTES:

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**Grand Bend Wind Farm
Grand Bend Wind Limited Partnership
Environmental Impact Study
Bat Maternal Colony Candidate Habitat Survey Plots**

Prepared	P. Stubbert	Checked	T. Radburn	Appendix B-7
Scale	1:5,000	Project	PIA019991	

Appendix C
Pre- and Post-Construction Survey
Methodology for Turtle Nesting and
Wintering Areas

Turtle Nesting and Wintering Areas

Habitat Use Surveys

The Turtle Wintering Area (TWA-003) will be searched three times for congregations of turtles basking on warm, sunny days during spring (March to May). The three surveys should be conducted in late March, mid April and early May. Surveys are to occur on days without rain or fog. Surveys can be conducted within the fall (September or October) however spring surveys are preferred.

One hour (60 minutes or more) will be spent at the site on each visit using binoculars to determine species observed. The habitat will be observed for signs of turtles emerging from, or preparing for, hibernation and basking on surrounding logs and rocks. Particular attention will be paid to any observations of Snapping Turtle, *Chelydra serpentina*. Turtles that are observed, if any, will be photographed and the location recorded with a GPS unit.

The following information will be recorded at all surveys:

- Date;
- Time (start and end time, duration);
- Weather conditions (temperature, %cloud cover, beaufort wind scale);
- GPS location; and,
- Species presence and abundance.

At the completion of the monitoring program in all data will be reviewed and compared to provincial standards for significant turtle over-wintering habitats. In accordance with SWH 6E/7E Ecoregion Criteria, significant habitats are those with confirmed use by at least:

- 5 over-wintering midland painted turtles; or,
- ≥1 over-wintering northern map turtle OR snapping turtle.

If the site is found to be significant, the deep-water pool upstream of the dam where the turtles are over-wintering is the significant habitat.

A report will be provided to the MNR prior to construction which will summarize the surveys and findings and will note whether the criteria for significance were met. If not significant, the mitigation noted in this report will not be undertaken.

Post-Construction Monitoring

TNA-002 and TWA-003 (if found to be significant) will be subject to two years of post-construction monitoring. Monitoring will be completed using the same methodology used in the pre-construction habitat use survey, described above.

Specifically, TNA-002 and TWA-003 (If found to be significant) will be searched three times for congregations of turtles basking on warm, sunny days during spring (March to May). The three surveys should be conducted in late March, mid April and early May. Surveys are to occur on days without rain or fog. Surveys can be conducted within the fall (September or October) however spring surveys are preferred.

One hour (60 minutes or more) will be spent at the site on each visit using binoculars to determine species observed. The habitat will be observed for signs of turtles emerging from, or preparing for, hibernation and basking on surrounding logs and rocks. Particular attention will be paid to any observations of Snapping Turtle, *Chelydra serpentina*. Turtles that are observed, if any, will be photographed and the location recorded with a GPS unit.

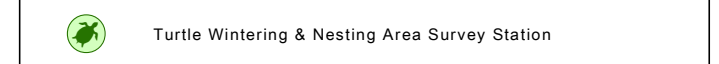
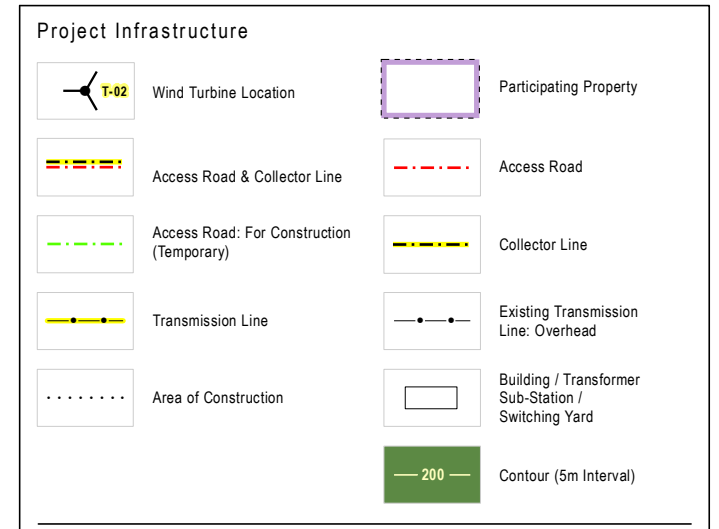
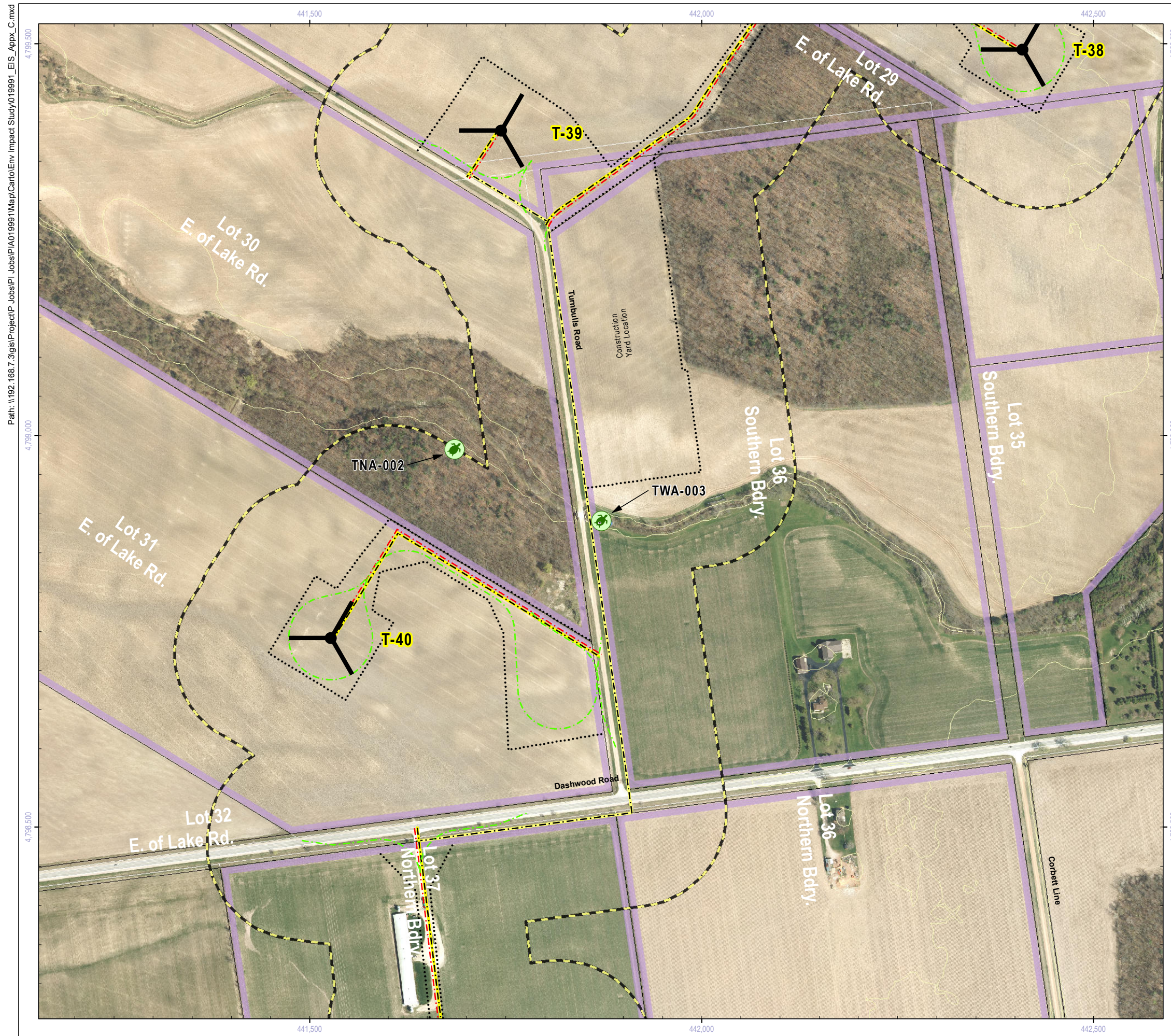
The following information will be recorded at all surveys:

- Date;
- Time (start and end time, duration);
- Weather conditions (temperature, %cloud cover, beaufort wind scale);
- GPS location; and,
- Species presence and abundance.

Annual Reports Will be submitted to the MNR. Estimated Report Submission Dates are as follows:

- Summer 2015(yr 1 post-construction)
- Summer 2016 (yr 2 post-construction)

During surveys to date, no turtles have been observed but a single snapping turtle nest with eggshells was seen. As such, the significance and cause of any changes will be difficult to determine. Post-construction survey results will be discussed with the MNR and any necessary contingency measures will be developed in consultation with MNR staff.

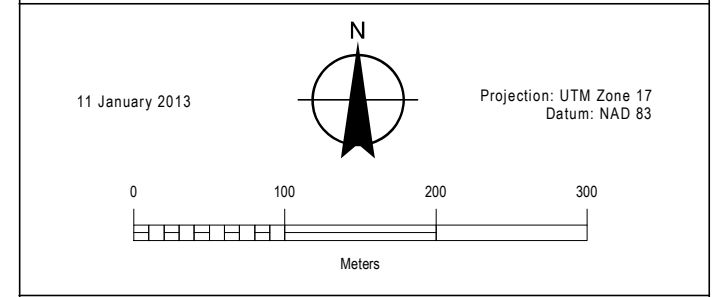


NOTES:

- Reference the Figure 1 Key Map for location in the overall project area.

DATA SOURCES:

- County of Huron (including Imagery: 2010)
- Ministry of Natural Resources, © Queen's Printer for Ontario
- Natural Resources Canada © Her Majesty the Queen in Right of Canada



Title

**Grand Bend Wind Farm
Grand Bend Wind Limited Partnership
Environmental Impact Study
Turtle Wintering & Nesting Area Survey Station**

Prepared	P. Stubbert	Checked	T. Radburn	Appendix C-1
Scale	1:5,000	Project	PIA019991	

Appendix D
Pre- Construction Survey Methodology
for Habitats for Special Concern and
Rare Species

Habitat for Special Concern and Rare Species

Candidate Habitats for Special Concern and Rare Species will be surveyed by a qualified biologist prior to construction. Surveys will occur within the applicable bloom times noted in **Table D-1**. Surveys will include random, wandering transects throughout the candidate habitat. Any Special Concern or Rare species observed will be documented and their location will be recorded using a GPS. Some candidate habitats are located on non-participating lands and are not accessible. An Alternative Investigation will be conducted in these areas which will include surveys, using binoculars from the nearest accessible vantage point. Habitat is considered to be significant if one or more individuals are observed.

No parts of the project are proposed within any of these habitats; however, work will occur adjacent to them. Surveys will be focused on portions of the habitat immediately adjacent to project components, particularly the areas where access roads and collector lines will be installed immediately adjacent to woodlands as noted in **Table D-2**.

If any of the listed species are found within the candidate habitats, the form and function of the habitat required by the species will be considered. The area of significant habitat will include the habitat to the finest ELC scale that protects the habitat form and function. This will be delineated in the field and recorded using a GPS unit.

A report will be provided to the MNR prior to construction which will summarize the surveys and their findings and will note whether any Special Concern or rare species were observed. A figure, or figures, will be provided which show the location of the species and the boundaries of their associated significant habitat. Significant habitats will be subject to the mitigation listed in this report. If none of the listed species are observed, the applicable mitigation will not be undertaken.

Table D-1 Bloom Time for Species Which May be Present in the Study Area

Species	Bloom Time/Appropriate Survey Period
Tuberous Indian-plantain	June
Hill's Pond Weed	July, August
Green Dragon	May, June
Harbinger-of-spring	Late February through early April
Burning Bush	Colour most prevalent in the fall
Large Round-leaved Orchid	June to September
Hairy Wood Mint	July and August
Autumn Coral-root	September and October
Chinese Hemlock Parsley	August and September
Crowned Beggar-ticks	August, September, October
Eastern Green-violet	May and June
Fogg's Goosefoot	August, September, October
Rattle-snake Hawkweed	June and July
Slender Knotweed	May, June, July
Slender Vulpia	April, May, June
Slim-flowered Muhly	Summer/Fall
Slim-spiked Three-awned Grass	Summer/Fall
Stiff Gentian	August through October
Hairy Valerian	June, July
Woodland Pinedrops	June through August
Yellow Ladies'-tresses	Late September through mid October
Giant Ironweed	July through September
American Gromwell	May, June
Carolina Whitlow-grass	June through August
Pillose Evening Primrose	July through September
Hairy Bedstraw	May through August
False Tomentose Balsam Groundsel	April, May, June
Scarlet Beebalm	June through August
Lizard's Tail	May through July
Pawpaw	May
Round-leaved Hawthorn	May, June

Table D-2 Methodology for Species of Conservation Concern Habitat Use Study

CSWH ID	ELC Unit	ELC Community Name	Species Which May be Present	Habitat Use Survey or Alternative Investigation? (i.e. Edge survey vs. full access)
UPLAND HABITATS				
SCC-001	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	Burning Bush Hairy Wood Mint Slim-flowered Muhly American Gromwell Hairy Bedstraw.	Limited Access. Combination of alternative investigation and habitat use survey may be required.
	FOD5-8	Dry – Fresh Sugar Maple – White Ash Deciduous Forest Type		
SCC-014	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	Burning Bush Hairy Wood Mint Slim-flowered Muhly American Gromwell Hairy Bedstraw.	No property access. Alternative Investigation only.
SCC-002	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	Burning Bush Hairy Wood Mint Slim-flowered Muhly American Gromwell Hairy Bedstraw.	Habitat Use Survey.
SCC-004	FOD5-8	Dry – Fresh Sugar Maple – White Ash Deciduous Forest Type	Burning Bush Hairy Wood Mint Slim-flowered Muhly American Gromwell Hairy Bedstraw.	Habitat Use Survey.
SCC-005	FOD5-1	Dry – Fresh Sugar Maple Deciduous Forest Type	Burning Bush Hairy Wood Mint Slim-flowered Muhly American Gromwell Hairy Bedstraw.	Habitat Use Survey.
SCC-015	FOM6-1	Fresh – Moist Sugar Maple – Hemlock Mixed Forest Type	Harbinger-of-spring Green Dragon Burning Bush Large Round-leaved Orchid Hairy Wood Mint Stiff Gentian American Gromwell Pilose Evening Primrose Scarlet Beebalm	Limited Access. Combination of alternative investigation and habitat use survey may be required.
SCC-007	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	Burning Bush Hairy Wood Mint Slim-flowered Muhly American Gromwell Hairy Bedstraw.	Limited Access. Combination of alternative investigation and habitat use survey may be required.
	FOD5-8	Dry – Fresh Sugar Maple – White Ash Deciduous Forest Type		
SCC-009	FOD3-2	Dry – Fresh White Birch Deciduous Forest Type	Burning Bush Hairy Wood Mint Slim-flowered Muhly American Gromwell Hairy Bedstraw	Habitat Use Survey.
	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type		

CSWH ID	ELC Unit	ELC Community Name	Species Which May be Present	Habitat Use Survey or Alternative Investigation? (i.e. Edge survey vs. full access)
SCC-010	FOD5-8	Dry – Fresh Sugar Maple – White Ash Deciduous Forest Type	Burning Bush Hairy Wood Mint Slim-flowered Muhly American Gromwell Hairy Bedstraw Scarlet Beeblam.	Habitat Use Survey.
	FOD5-8	Dry – Fresh Sugar Maple – White Ash Deciduous Forest Type		
SCC-011	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	Burning Bush Hairy Wood Mint Slim-flowered Muhly American Gromwell Hairy Bedstraw.	Limited Access. Combination of alternative investigation and habitat use survey may be required.
	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type		
SCC-012	FOD4-2	Dry - Fresh White Ash - Hardwood Deciduous Forest Type	Burning Bush Hairy Wood Mint Slim-flowered Muhly American Gromwell Hairy Bedstraw.	Limited Access. Combination of alternative investigation and habitat use survey may be required.
SCC-013	FOD3-1	Dry – Fresh Poplar Deciduous Forest Type	Burning Bush Hairy Wood Mint Slim-flowered Muhly American Gromwell Hairy Bedstraw	No property access. Alternative Investigation only.
WETLAND HABITATS				
SCC-003	SWD2-2	Green Ash Mineral Deciduous Swamp Type	Green Dragon Scarlet Beebalm	No property access. Alternative Investigation only.
SCC-006	SWD2-2	Green Ash Mineral Deciduous Swamp Type	Green Dragon Scarlet Beebalm.	Limited Access. Combination of alternative investigation and habitat use survey may be required.
SCC-008	SWD2-2	Green Ash Mineral Deciduous Swamp Type	Green Dragon Scarlet Beebalm.	Habitat Use Survey.
SCC-016	OA	Open Water	Chinese Hemlock Parsley Crowned Beggar-ticks Lizard's Tail	Habitat Use Survey.
	SWT2-5	Red-osier Dogwood Mineral Deciduous Thicket Swamp Type		
	MAM2-2	Reed-canary Grass Graminoid Mineral Meadow Marsh Type		
	SWT2-5	Red-osier Dogwood Mineral Deciduous Thicket Swamp Type		

CSWH ID	ELC Unit	ELC Community Name	Species Which May be Present	Habitat Use Survey or Alternative Investigation? (i.e. Edge survey vs. full access)
SCC-017	SWD2-2	Green Ash Mineral Deciduous Swamp Type	Green Dragon Scarlet Beebalm.	No property access. Alternative Investigation only.

Appendix E
Post- Construction Survey
Methodology for Amphibian Breeding
Habitat

Post-Construction Amphibian Call Surveys

Post-construction amphibian call surveys will be conducted at ABH-001 for two years following the start of turbine operations. Amphibian call surveys will follow the protocols identified in the Marsh Monitoring Program Manual (Bird Studies Canada, 1994).

Surveys will be conducted during each of the following periods:

- April 15-30;
- May 15-30; and,
- June 15-30.

Surveys will take place between one-half hour after sunset and midnight. The protocol will involve the surveyor standing at the survey station, shown on **Figure E-1, Appendix E**, and listening for three minutes. Amphibians will be recorded if they are within 100 m of the survey station. Consistent with the Marsh Monitoring Program protocol, all calling activity will be ranked using one of the following three abundance code categories:

- (1) calls not simultaneous – number of individuals can be accurately counted;
- (2) some calls simultaneous – number of individuals can be reliably estimated; and,
- (3) full chorus – calls continuous and overlapping, so number of individuals cannot be reliably estimated.

Baseline data collected during pre-construction surveys identified that the habitat was used by spring peepers and grey tree frog. Both had a calling index of 3 (full chorus), as shown in Table E-1.

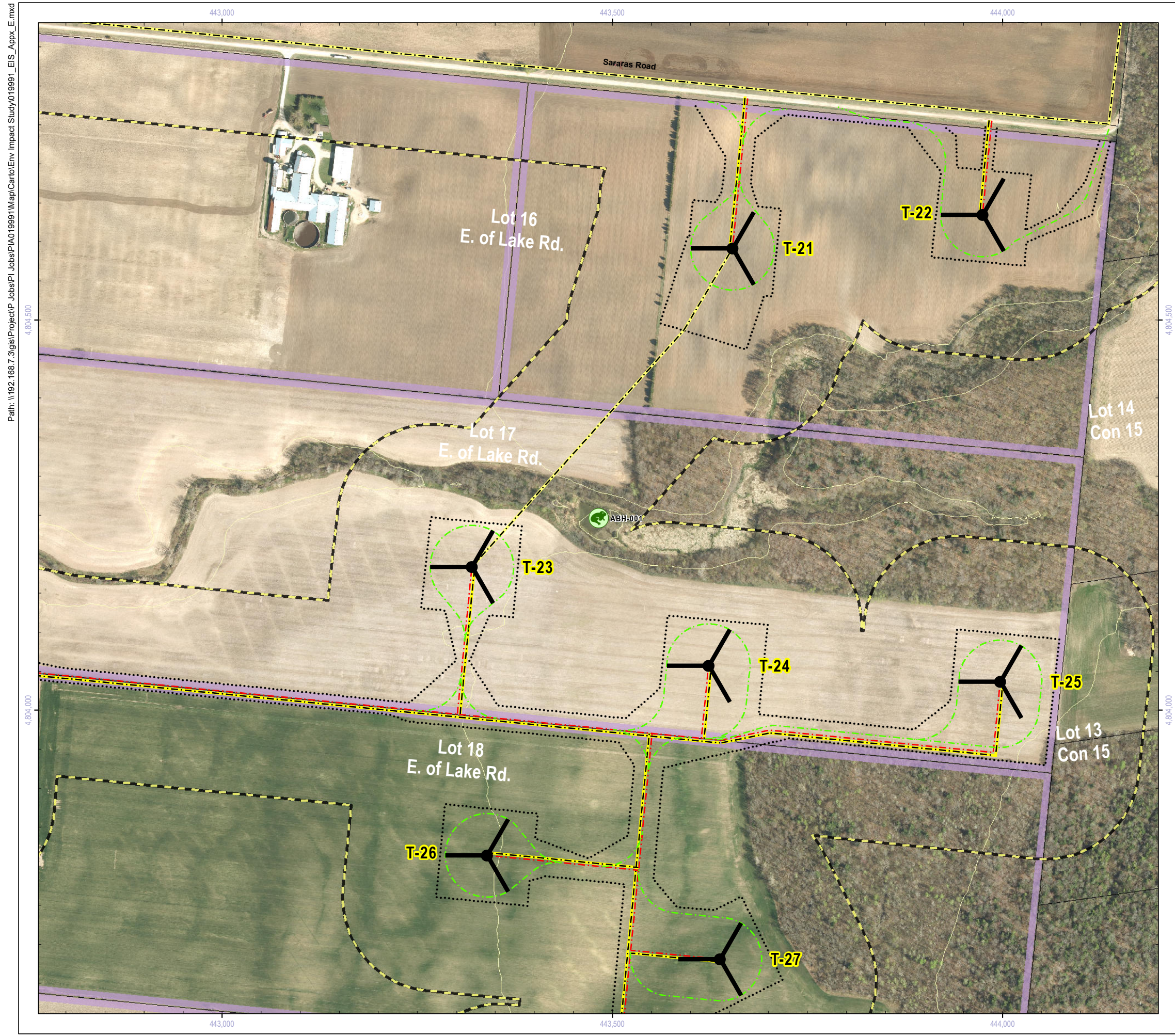
Table E-1 Baseline Amphibian Call Survey Results at ABH-001

Feature ID	Frog Call Counts		
	Survey #1 (April 20/25, 2012)	Survey #2 (May 29, 2012)	Survey #3 (June 27, 2012)
ABH-001	Spring Peeper 3-chorus	Grey Tree Frog 3-chorus	Grey Tree Frog 3-chorus

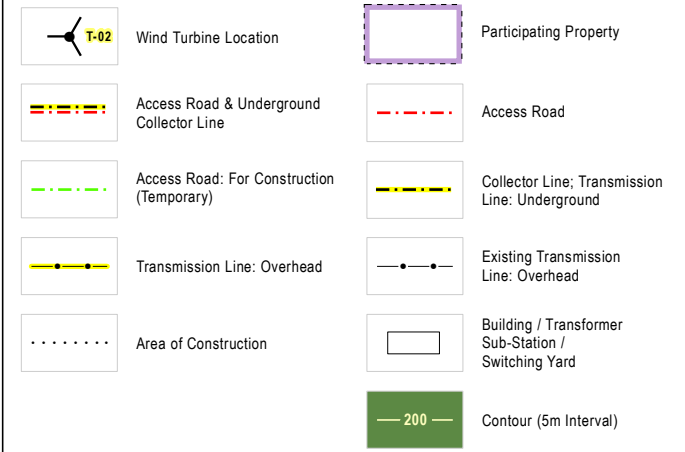
A report will be provided to the MNR on an annual basis which will summarize the findings of post-construction surveys. The report will note if any significant deviations are found in the usage of the habitat relative to the pre-construction findings. Upon submission of annual post-construction reports to MNR it will be determined in consultation with MNR whether contingency measures are required.

Contingency measures may include additional monitoring to determine cause of decline, possible turbine shut-down or blade feathering during breeding season.

Additional two years of monitoring using the same methodology described above will be completed if significant effects are observed.



Project Infrastructure



Amphibian Breeding Habitat Survey Location

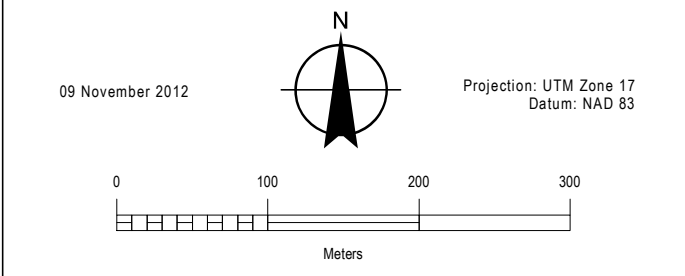
ABH-001

NOTES:

1. Reference the Figure 1 Key Map for location in the overall project area.

DATA SOURCES:

1. County of Huron (including Imagery: 2010)
2. Ministry of Natural Resources, © Queen's Printer for Ontario
3. Natural Resources Canada © Her Majesty the Queen in Right of Canada



Title
**Grand Bend Wind Farm
 Grand Bend Wind Limited Partnership
 Environmental Impact Study
 Amphibian Breeding Habitat Survey Location**

Prepared	P. Stubbert	Checked	T. Radburn	Appendix E-1
Scale	1:5,000	Project	PIA019991	

Path: \\192.168.7.3\gis\Project\PIA019991\Map\Carto\Env Impact Study\019991_EIS_Appx_E.mxd