

July 13, 2017

Nation Rise Wind Farm Limited Partnership
110 Spadina Ave, Suite 609
Toronto, ON
M5V 2K4

RE: Natural Heritage Section of the EEMP for Nation Rise Wind Farm

Dear Kenneth Little:

Ministry of Natural Resources and Forestry (MNRF) has reviewed the Natural Heritage section of the Environmental Effects Monitoring Plan (EEMP) for the Nation Rise Wind Farm located in the Township of North Stormont and the United Counties of Stormont, Dundas and Glengarry, the final version of which was submitted by Nation Rise Wind Farm Limited Partnership on July 12, 2017.

This letter confirms that the EEMP was prepared in respect of birds and bats in accordance with MNRF's:

- *Bird and Bird Habitats: Guidelines for Wind Power Projects (2011)*, and
- *Bat and Bat Habitats: Guidelines for Wind Power Projects (2011)*.

Post-construction bird and bat mortality monitoring for the Nation Rise Wind Farm will be conducted at a minimum of 10 turbines, including T46, if this turbine is built. The post-construction monitoring requirements, as outlined in the NHA Confirmation letter issued July 11, 2017, will also be implemented.

MNRF expects the information contained in the natural heritage section of the EEMP to be considered in MOECC's Renewable Energy Approval decision, and if approved, be implemented by the applicant.

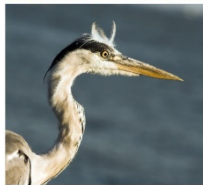
If you wish to discuss any part of this letter please contact Mike Poskin, A/Renewable Energy Coordinator, at 705-755-1362.

Sincerely,



Renée Bowler
Manager, Regional Resources Section
Southern Region
Ministry of Natural Resources and Forestry

cc. Dan Thompson, District Manager, MNR Kemptville District
cc. Mike Poskin, A/Renewable Energy Coordinator, MNRF
cc. Amy Cameron, Regional Planning Ecologist, MNRF
cc. Korey Walker, Regional Planner, MNRF
cc. Mohsen Keyvani, MOECC
cc. Nick Colella, MOECC
cc. Zeljko Romic, MOECC



Nation Rise Wind Farm **Bird and Bat Environmental Effects** **Monitoring Plan**

Prepared for:
DNV GL - Energy
4100 Rue Molson, Suite 100
Montréal, QC
H1Y 3N1

Project No. 1756B | July 2017



NATURAL RESOURCE SOLUTIONS INC.

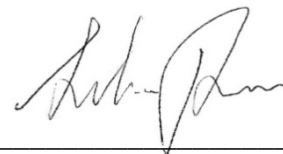
Aquatic, Terrestrial and Wetland Biologists

Nation Rise Wind Farm
Bird and Bat Environmental Effects Monitoring Plan

Project Team:

Staff	Role
Andrew Ryckman	Project Advisor
Christy Humphrey	Project Manager/Biologist
Charlotte Teat	Biologist
Lillian Knopf	Biologist
Laura Hockley	GIS Technician

Report submitted on July 12, 2017



Andrew Ryckman
Senior Terrestrial & Wetland Biologist

TABLE OF CONTENTS

1.0	Project Overview	1
2.0	Purpose of the Environmental Effects Monitoring Plan.....	2
3.0	Post-Construction Monitoring for Significant Wildlife Habitats	3
4.0	Post-Construction Monitoring for Bat and Bird Mortality	13
4.1	Mortality Thresholds.....	13
4.1.1	Bats	13
4.1.2	Birds and Raptors	13
4.2	Post-Construction Mortality Monitoring Methods	14
4.2.1	Effort and Timing for Bird and Bat Mortality Monitoring	15
4.2.2	Carcass Searches.....	17
4.2.3	Carcass Removal Trials	18
4.2.4	Searcher Efficiency Trials.....	19
4.2.5	Proportion of Area Searched.....	20
4.2.6	Calculations	21
4.2.7	Other Considerations	22
4.3	Post-Construction Mitigation	22
4.3.1	Bats	23
4.3.2	Birds	23
4.3.3	Raptors	24
4.4	Contingency Plans	25
4.5	Post-Construction Mortality Monitoring Reporting Requirements.....	25
5.0	Species at Risk	27
6.0	References	28

List of Tables

Table 1.	Summary of Confirmed Significant or Treated as Significant Bat and Bird Wildlife Habitats	3
Table 2.	Summary of the Environmental Effects Monitoring Plan for Confirmed or Treated as Significant Wildlife Habitats for the Project	6
Table 3.	Summary of Mortality Monitoring Turbine Selection.....	16
Table 3.	Schedule for Post-construction Mortality Monitoring Reports Detailing Results of the Environmental Effects Monitoring Plan.....	25
Table 4.	Timeline for Reporting Mortality to the Ministry of Natural Resources and Forestry	26

List of Maps

Map 1.	Key Map
Maps 2-1 to 2-12.	Significant Bat and Bird Habitats

List of Appendices

Appendix I:	Nation Rise Wind Project NHA Letter of Confirmation
Appendix II:	Post-Construction Mortality Monitoring Data Sheet Templates

1.0 Project Overview

Natural Resource Solutions Inc. (NRSI) was retained in April 2016 by DNV-GL, on behalf of Nation Rise Wind Farm Limited Partnership (the Proponent) to conduct a Natural Heritage Assessment (NHA) in accordance with the Renewable Energy Approval (REA) Regulation, Ontario Regulation (O.Reg.) 359/09. This assessment includes a records review, site investigation, evaluation of significance, and environmental impact study of any potentially significant natural features or wildlife habitats at a proposed wind energy generating facility of up to 34 permitted wind turbines, with a nameplate capacity of approximately 100 megawatts (MW).

The Nation Rise Wind Farm (Nation Rise WF or Project) is being proposed by Nation Rise Wind Farm Limited Partnership, a wholly-owned subsidiary of EDP Renewables Canada Ltd. (EDPR). The Nation Rise Wind Farm is located in eastern Ontario, within the Township of North Stormont and the United Counties of Stormont, Dundas and Glengarry, Ontario. More specifically, the Project is located in the western portion of North Stormont bounded to the south by the Township of South Stormont and to the west by the boundary of the Township of North Dundas. The north portion of the Project is delimited by the municipality boundaries of Russell and The Nation. Courville Road and MacMillan Road are the east boundaries of the Project.

As identified in O. Reg. 359/09, the proposed layout of these project components is collectively referred to as the 'Project Location'. For the purposes of this report, NRSI will refer to the areas within 120m of the Project Location as the 'Project Area'. See Maps 1 for an illustration of the Project Area and natural features.

In accordance with the REA Regulation, NRSI has developed a monitoring program, which is outlined in this report, to assess the potential environmental impacts in respect of birds and bats that may result from engaging in the Project. This monitoring program has been developed as a supporting document to Nation Rise Wind Farm Natural Heritage Environmental Impact Study (EIS; NRSI 2017).

2.0 Purpose of the Environmental Effects Monitoring Plan

An Environmental Effects Monitoring Plan (EEMP) must be prepared to address negative environmental effects, if any, that may result from engaging in a renewable energy project. The EEMP must set out:

- Performance objectives in respect of the potential negative environmental effects,
- Mitigation measures to assist in achieving the performance objectives, and
- A program for monitoring potential negative environmental effects for the duration of the time that the project is [in development, construction, and operations], including a contingency plan to be implemented if any mitigation measures fail.

Furthermore, all Class 3 and 4 wind facilities must prepare an EEMP in respect of birds and bats in accordance with the following publications of the Ministry of Natural Resources and Forestry (MNRF):

- *Bats and Bat Habitats: Guidelines for Wind Power Projects* (OMNR 2011a)
- *Birds and Bird Habitats: Guidelines for Wind Power Projects* (OMNR 2011b)

This post-construction monitoring plan is one component of the EEMP submitted to the Ministry of the Environment and Climate Change (MOECC) as part of the Renewable Energy Approval (REA) Application for the Project. This document has been prepared in accordance with Ontario Regulation (O. Reg.) 359/09, MNRF's *Bats and Bat Habitats: Guidelines for Wind Power Projects* (July 2011) and MNRF's *Birds and Bird Habitats: Guidelines for Wind Power Projects* (December 2011).

3.0 Post-Construction Monitoring for Significant Wildlife Habitats

The full Nation Rise Wind Farm NHA (NRSI 2017a), including Records Review, Site Investigation, Evaluation of Significance, and Environmental Impact Study received a confirmation letter from the MNRF's Regional Operations Division on July 11, 2017 (refer to Appendix I). As part of this confirmation, several candidate significant wildlife habitats have been identified, and subsequently treated as significant with a commitment for additional pre-construction surveys to be undertaken during the appropriate season prior to any construction activities, if site access to the habitat is granted.

The evaluation of significance of all candidate significant wildlife habitats utilizes evaluation criteria or procedures established or accepted by the Ministry of Natural Resources and Forestry (MNRF). The results of the evaluation of significance can be found within the *Nation Rise Wind Farm: Natural Heritage Evaluation of Significance Report* (NRSI 2017b).

In addition to these significant wildlife habitats which may require post-construction monitoring, the REA Regulation requires that bird and bat post-construction mortality monitoring be conducted at all Class 4 wind facilities. Table 1 provides a summary of potential negative operational impacts to all bird and bat habitats confirmed as significant following the evaluation methods outlined within the *Nation Rise Wind Farm: Natural Heritage Evaluation of Significance Report* (NRSI 2017b). It also summarizes potential negative operational impacts to all bird and bat habitats treated as significant in the same report (NRSI 2017b), which may be confirmed as significant after evaluation of significance surveys are undertaken prior to construction of the Project. Post-construction mortality monitoring is detailed separately in Section 4.0 of this report.

Table 1. Summary of Confirmed Significant or Treated as Significant Bat and Bird Wildlife Habitats

Habitat Type	Feature ID	Potential Operational Impacts
Bat Maternity Colony	BMA-001* BMA-002** BMA-003*	<ul style="list-style-type: none"> Species avoidance of habitat during operational phase. Direct mortalities of individual bats through collisions with operational turbines.
Waterfowl Stopover and Staging Area (Aquatic)	WSA-001	<ul style="list-style-type: none"> Species avoidance of habitat during operational phase, if overhead collector lines are installed. Direct mortalities of individual birds, although

Habitat Type	Feature ID	Potential Operational Impacts
		unlikely, through collisions with overhead collector lines (if installed). <ul style="list-style-type: none"> Spills, although unlikely, (i.e. oil, gasoline, grease, etc.) during the operational phase.
Open Country Bird Breeding Habitat	OCB-001*	<ul style="list-style-type: none"> Species avoidance of habitat during operational phase. Direct mortalities of individual birds, although unlikely, through collisions with operational turbines. Spills, although unlikely, (i.e. oil, gasoline, grease, etc.) during the operational phase.
Bird Species of Conservation Concern: Common Nighthawk Habitat Eastern Wood-Pewee Habitat Wood Thrush Habitat	CONI-001* CONI-002* CONI-003* CONI-004* CONI-005* CONI-006* CONI-007* CONI-008* CONI-009* EAWP-001* EAWP-002* EAWP-003* EAWP-004* EAWP-005* EAWP-006* EAWP-007* EAWP-008* EAWP-009* EAWP-010* EAWP-011* EAWP-012** EAWP-013* EAWP-014* EAWP-015* EAWP-016* EAWP-017* EAWP-018* WOTH-001* WOTH-002* WOTH-003** WOTH-004* WOTH-005*	<ul style="list-style-type: none"> Species avoidance of habitat during operational phase. Direct mortalities of individual birds, although unlikely, through collisions with operational turbines and access roads. Spills, although unlikely, (i.e. oil, gasoline, grease, etc.) during the operational phase.

* Only if these habitats are determined to be significant through pre-construction surveys described in the Nation Rise Wind Farm NHA Environmental Impact Study (EIS; NRSI 2017).

** These habitats have been treated as significant. The significance of these habitats could not be evaluated as site access was denied, and therefore no site-specific results could be collected.

The locations of wildlife habitats confirmed, or treated as, significant are shown on Maps 2-1 to 2-12. The potential negative environmental effects, performance objectives, mitigation strategy, environmental effects monitoring plan, and contingency measures are described in Table 2. The environmental effects monitoring plan for each wildlife

habitat confirmed, or treated as, significant includes the post-construction survey methods, monitoring locations, frequency and duration of sample collection, technical and statistical value of the data, and reporting commitments.

Table 2. Summary of the Environmental Effects Monitoring Plan for Confirmed or Treated as Significant Wildlife Habitats for the Project

Feature ID	Infrastructure with Potential for Operational Impact within 120m of, or Overlapping, Significant Wildlife Habitat	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection	Technical and Statistical Value of Data	Reporting Requirements [†]	
BMA-001* BMA-003* Bat Maternity Colony	Wind Turbine (<120m)	Avoidance of habitat during operation phase. Direct mortality of individual bats through collisions with operational turbines. Spills, although unlikely, (i.e. oil, gasoline, grease etc.) during the operational phase.	Protection of bat maternity colony habitat. Minimize the potential for mortality of applicable bat species from collisions with operational turbines.	Avoid the use of herbicides (Project related activities only) within significant natural features and SWHs. Schedule regular (non-critical) Project maintenance activities within 30m of significant wildlife habitats to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife, wherever possible. If Project maintenance activities within 30m of significant wildlife habitats must occur outside of daylight hours, spotlights will be directed downward and/or away from the features to limit potential light disturbance to bats. Implement red LED flashing lights on turbines. Light turbines and permanent meteorological/communication towers to the minimum federal standards. Ground-level lights (i.e. buildings, turbine bases, etc.) will be directed downward and shall use motion or heat sensors where practical and allowed by applicable codes and the authority having jurisdiction. Use of high-intensity lighting spotlights, if required, will be temporary and will be kept to a minimum. Any internal nacelle lighting will only be used when occupied. On-site speed limits will be clearly posted, applied, and followed by Project staff throughout the operational phase. Develop a Bird and Bat EEMP in accordance with MNR's Bats and Bat Habitats (OMNR 2011a) guidance, as outlined in Section 4.0. Develop a spill response plan and train staff on appropriate procedures. Keep emergency spill kits on site.	Monitoring sites will be selected within candidate bat maternity colony habitats identified through the site investigation using the criteria outlined in the Bats and Bat Habitats guidelines (OMNR 2011a). A total of 10 suitable cavity trees (if available) will be selected within BMA-001 since it is less than 10ha in size. A total of 19 suitable cavity trees will be selected within BMA-003 since it is 18.93ha in size. Following the Bats and Bat Habitat guidelines (OMNR 2011a), exit surveys will be conducted during the month of June. Observers will choose a viewing station with a clear aspect of cavity opening or crevice. Cavity opening or crevice will be monitored from 30 minutes before dusk until 60 minutes after dusk for evidence of bats exiting. An acoustic bat detector paired with a digital recorder will be used in conjunction with visual surveys to determine species. Each candidate tree will only be monitored once. Night-vision or infrared video equipment may be substituted for observers. Once an evening's monitoring is completed (60 minutes after sunset), the cameras will be collected by the staff members conducting visual surveys in the same candidate significant habitat and the visual recordings for each video recorder will be reviewed for evidence of significant bat roosting activity. In addition to the behaviour monitoring methods outlined above, the closest turbine to these features should be selectively considered in the	The location of the candidate bat maternity colony habitat can be seen on Maps 2-5, 2-6, and 2-12. Monitoring locations within this habitat will be determined prior to pre-construction surveys and will be repeated at the same locations during post-construction surveys.	Pre-construction Survey (baseline): 1. Jun 2017 3 years of Post-construction Surveys: 1. Jun 2020 2. Jun 2021 3. Jun 2022	Determine the potential disturbance impact of operational turbines on significant bat maternity colony habitats.	Annual reports or memos summarizing results will be submitted to the MNR and MOECC following the anticipated schedule below: Pre-construction Survey (baseline): 1. Dec 2017 Post-construction Disturbance Report: 1. Mar 2021 2. Mar 2022 3. Mar 2023 Post-construction Mortality Report: 1. Feb 2021 2. Feb 2022 3. Feb 2023	An annual report, which documents the results of behaviour monitoring, will be prepared following each year that disturbance monitoring occurs. The report will be submitted to the MNR and the results presented in these annual reports will be used to determine if any additional mitigation measures should be implemented during the operational phase of this Project to further protect the habitat. Additional contingency measures will be based on the completion of post-construction mortality monitoring in proximity to these habitats. See section 4.0 for more detail on the post-construction mortality monitoring methods.

Feature ID	Infrastructure with Potential for Operational Impact within 120m of, or Overlapping, Significant Wildlife Habitat	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection †	Technical and Statistical Value of Data	Reporting Requirements ‡	
				<p>Keep contact information for the MOECC Spills Action Centre in a designated area on-site.</p> <p>Dispose of waste material by authorized and approved off-site vendors.</p> <p>Store hazardous materials in designated areas.</p> <p>Locate all vehicle refueling or washing, as well as the storage of chemicals and heavy equipment more than 30m from significant natural features and SWHs.</p>	subset of turbines to be monitored as part of the post-construction mortality for bats, as described in Section 4.0 below.					
BMA-002** Bat Maternity Colony	Wind Turbine (<120m)	<p>Avoidance of habitat during operation phase.</p> <p>Direct mortality of individual bats through collisions with operational turbines.</p> <p>Spills, although unlikely, (i.e. oil, gasoline, grease, etc.) during the operational phase.</p>	<p>Protection of bat maternity colony habitat.</p> <p>Minimize the potential for mortality of applicable bat species from collisions with operational turbines.</p>	<p>Avoid the use of herbicides (Project related activities only) within significant natural features and SWHs.</p> <p>Schedule regular (non-critical) Project maintenance activities within 30m of significant wildlife habitats to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife, wherever possible. If Project maintenance activities within 30m of significant wildlife habitats must occur outside of daylight hours, spotlights will be directed downward and/or away from the features to limit potential light disturbance to bats.</p> <p>Implement red LED flashing lights on turbines.</p> <p>Light turbines and permanent meteorological/communication towers to the minimum federal standards.</p> <p>Ground-level lights (i.e. buildings, turbine bases, etc.) will be directed downward and shall use motion or heat sensors where practical and allowed by applicable codes and the authority having jurisdiction.</p> <p>Use of high-intensity lighting spotlights, if required, will be temporary and will be kept to a minimum.</p> <p>Any internal nacelle lighting will only be used when occupied.</p> <p>On-site speed limits will be clearly posted, applied, and followed by Project staff</p>	<p>The presence of suitable cavity trees within BMA-002 could not be verified during the site investigation phase of the Project as site access was not granted. As such, no site-specific surveys can be conducted at this habitat.</p> <p>The closest turbine to this feature (T46), if built, will be included in the subset of turbines to be monitored as part of the post-construction mortality for bats, as described in Section 4.0.</p>				<p>Contingency measures will be based on the completion of post-construction mortality monitoring in proximity to these habitats.</p> <p>See Section 4.0 for more detail on the post-construction mortality monitoring methods</p>	

Feature ID	Infrastructure with Potential for Operational Impact within 120m of, or Overlapping, Significant Wildlife Habitat	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection [‡]	Technical and Statistical Value of Data	Reporting Requirements [‡]	
				<p>throughout the operational phase.</p> <p>Develop a Bird and Bat EEMP in accordance with MNR's Bats and Bat Habitats (OMNR 2011a) guidance, as outlined in Section 4.0.</p> <p>Develop a spill response plan and train staff on appropriate procedures.</p> <p>Keep emergency spill kits on site.</p> <p>Keep contact information for the MOECC Spills Action Centre in a designated area on-site.</p> <p>Dispose of waste material by authorized and approved off-site vendors.</p> <p>Store hazardous materials in designated areas.</p> <p>Locate all vehicle refueling or washing, as well as the storage of chemicals and heavy equipment more than 30m from significant natural features and SWHs.</p>						
WSA-001 Waterfowl Stopover and Staging Area (Aquatic)	Collection Line (Overlapping) Construction Activity (Overlapping)	<p>Avoidance of habitat during operational phase.</p> <p>Direct mortality to individual birds, although unlikely, through collisions with overhead collector lines (if installed).</p> <p>Spills, although unlikely, (i.e. oil, gasoline, grease, etc.) during the operational phase.</p>	<p>Protection of waterfowl stopover and staging habitat.</p> <p>Minimize the potential for mortality of waterfowl species from collisions with operational turbines.</p>	<p>Avoid the use of herbicides (Project related activities only) within 30m of significant natural features and SWHs.</p> <p>If regular (non-critical) Project maintenance activities must occur within 30m of waterfowl stopover and staging habitats during the most important period for staging waterfowl (March 1st – April 30th), all reasonable attempts should be made to schedule these activities to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife.</p> <p>Develop a Bird and Bat EEMP in accordance with MNR's Bats and Bat Habitats (OMNR 2011a) guidance, as outlined in Section 4.0.</p> <p>Install high visibility markers on overhead lines installed within significant waterfowl stopover and staging area (aquatic) habitats.</p> <p>On-site speed limits will be clearly posted, applied, and followed by Project staff throughout the operational phase.</p>	<p>Surveys will consist of 30-minute stopover counts at locations with good vantage points of the habitat where potential impacts are most likely to occur, and will be conducted using binoculars and/or a spotting scope. Surveys will be carried out during daylight hours between 0800-1700hrs when waterfowl are typically present using aquatic staging areas.</p> <p>The stopover counts will be surveyed on 4 separate visits in March, spaced approximately 7 days apart. Specific timing may vary slightly based on seasonal conditions, but will be conducted to overlap with peak waterfowl movement through this area of the province.</p>	<p>The location of the candidate waterfowl stopover and staging habitat (aquatic) can be seen on Maps 2-4 to 2-6.</p> <p>Monitoring locations at this habitat will be determined in conjunction with pre-construction surveys and will be repeated at the same locations during post-construction surveys.</p>	<p>Survey (baseline):</p> <p>1. Mar 2017</p> <p>If overhead collection lines are installed within the habitat, 3 years of Post-construction Surveys:</p> <p>1. Mar 2020 2. Mar 2021 3. Mar 2022</p> <p>If only underground collection lines are installed within the habitat, 1 year of Post-construction Surveys:</p> <p>1. Mar 2020</p>	<p>Determine the potential disturbance impact resulting from construction activities and (if applicable) the presence of overhead collection line on significant waterfowl stopover and staging habitat.</p>	<p>Annual reports or memos summarizing results will be submitted to the MNR and MOECC following the anticipated schedule below:</p> <p>Pre-construction Survey (baseline):</p> <p>1. Dec 2017</p> <p>Post-construction Disturbance Report:</p> <p>1. Mar 2021 2. Mar 2022⁺ 3. Mar 2023⁺</p>	<p>An annual report, which documents the results of behaviour monitoring, will be prepared following each year that disturbance monitoring occurs. The report will be submitted to the MNR and the results presented in these annual reports will be used to determine if any additional mitigation measures should be implemented during the operational phase of this Project to further protect the habitat.</p> <p>Additional contingency measures will be based on the completion of post-construction mortality monitoring in proximity to these</p>

Feature ID	Infrastructure with Potential for Operational Impact within 120m of, or Overlapping, Significant Wildlife Habitat	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection [‡]	Technical and Statistical Value of Data	Reporting Requirements [‡]	
				<p>Develop a spill response plan and train staff on appropriate procedures.</p> <p>Keep emergency spill kits on site.</p> <p>Keep contact information for the MOECC Spills Action Centre in a designated area on-site.</p> <p>Dispose of waste material by authorized and approved off-site vendors.</p> <p>Store hazardous materials in designated areas.</p> <p>Locate all maintenance activities, vehicle refueling or washing, as well as the storage of chemicals and heavy equipment more than 30m from significant natural features and SWHs.</p>						<p>habitats.</p> <p>See section 4.0 for more detail on the post-construction mortality monitoring methods.</p>
OCB-001* Open Country Bird Breeding Habitat	Wind Turbine (<120m)	<p>Avoidance of habitat during operational phase.</p> <p>Direct mortality to individual birds, although unlikely, through collisions with operational turbines.</p> <p>Spills, although unlikely, (i.e. oil, gasoline, grease, etc.) during the operational phase.</p>	<p>Protection of open country bird breeding habitat.</p> <p>Minimize the potential for mortality of open country bird species from collisions with operational turbines.</p>	<p>Avoid the use of herbicides (Project related activities only) within 30m of significant natural features and SWHs.</p> <p>If regular (non-critical) Project maintenance activities within 30m of significant open country bird breeding habitat occur during the breeding bird period (May 1st – July 31st), all reasonable attempts will be made to schedule these activities to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife.</p> <p>Develop a Bird and Bat EEMP in accordance with MNR's Bats and Bat Habitats (OMNR 2011a) guidance, as outlined in Section 4.0.</p> <p>On-site speed limits will be clearly posted, applied, and followed by Project staff throughout the operational phase.</p> <p>Develop a spill response plan and train staff on appropriate procedures.</p> <p>Keep emergency spill kits on site.</p> <p>Keep contact information for the MOECC Spills Action Centre in a designated area on-site.</p>	<p>Surveys will consist of 3 open country breeding bird point count surveys in June and early July, with no less than 10 days between visits.</p> <p>Surveys will be carried out between dawn (half hour before sunrise) and 3 hours after sunrise, during a time period when males are singing and defending territories. Where site access permits, the observer will walk along a standardized transect, stopping at each point count to undertake 10 minutes of observations and listening. Optimal weather conditions for these surveys are clear, calm, sunny days with little to no precipitation.</p> <p>In addition to the behaviour monitoring methods outlined above, the closest turbine to this feature (T4) should be selectively considered in the subset of turbines to be monitored as part of the post-construction mortality for bats, as described in Section 4.0</p>	<p>The location of the candidate open country bird breeding habitat can be seen on Map 2-1 and 2-2.</p> <p>Monitoring locations at this habitat will be determined prior to pre-construction surveys and will be repeated at the same locations during post-construction surveys.</p>	<p>Survey (baseline):</p> <ol style="list-style-type: none"> 1. Jun-Jul 2017 <p>3 years of Post-construction Surveys:</p> <ol style="list-style-type: none"> 1. Jun-Jul 2020 2. Jun-Jul 2021 3. Jun-Jul 2022 	<p>Determine the potential disturbance impact of operational turbines on significant open country bird breeding habitat.</p>	<p>Annual reports or memos summarizing results will be submitted to the MNR and MOECC following the anticipated schedule below:</p> <p>Pre-construction Survey (baseline):</p> <ol style="list-style-type: none"> 1. Dec 2017 <p>Post-construction Disturbance Report:</p> <ol style="list-style-type: none"> 1. Mar 2021 2. Mar 2022 3. Mar 2023 <p>Post-construction Mortality Report:</p> <ol style="list-style-type: none"> 1. Feb 2021 2. Feb 2022 3. Feb 2023 	<p>An annual report, which documents the results of behaviour monitoring, will be prepared following each year that disturbance monitoring occurs. The report will be submitted to the MNR and the results presented in these annual reports will be used to determine if any additional mitigation measures should be implemented during the operational phase of this Project to further protect the habitat.</p> <p>Additional contingency measures will be based on the completion of post-construction mortality monitoring in proximity to this habitats.</p> <p>See section 4.0 for more detail on the post-construction mortality</p>

Feature ID	Infrastructure with Potential for Operational Impact within 120m of, or Overlapping, Significant Wildlife Habitat	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection †	Technical and Statistical Value of Data	Reporting Requirements ‡	
				<p>Dispose of waste material by authorized and approved off-site vendors.</p> <p>Store hazardous materials in designated areas.</p> <p>Locate all maintenance activities, vehicle refueling or washing, as well as the storage of chemicals and heavy equipment more than 30m from significant natural features and SWHs.</p>	below.					monitoring methods.
<p>Bird Species of Conservation Concern:</p> <p>CONI-001* CONI-002* CONI-003* CONI-004* CONI-005* CONI-006* CONI-007* CONI-008* CONI-009*</p> <p>Common Nighthawk Habitat</p> <p>EAWP-001* EAWP-002* EAWP-003* EAWP-004* EAWP-005* EAWP-006* EAWP-007* EAWP-008* EAWP-009* EAWP-010* EAWP-011* EAWP-013* EAWP-014* EAWP-015* EAWP-016* EAWP-017* EAWP-018*</p> <p>Eastern Wood-Pewee Habitat</p> <p>WOTH-001* WOTH-002* WOTH-004* WOTH-005*</p> <p>Wood Thrush Habitat</p>	<p>Wind Turbine (<120m)</p> <p>Access Road (Overlapping)</p> <p>Collection Line (Overlapping)</p> <p>Construction Activity (Overlapping)</p>	<p>Avoidance of habitat during operational phase.</p> <p>Direct mortality to individual birds, although unlikely, through collisions with operational turbines.</p> <p>Spills, although unlikely, (i.e. oil, gasoline, grease, etc.) during the operational phase.</p>	<p>Protection of bird species of conservation concern habitats.</p> <p>Minimize the potential for mortality of bird species of conservation concern from collisions with operational turbines.</p>	<p>Avoid the use of herbicides (Project related activities only) within 30m of significant natural features and SWHs.</p> <p>If regular (non-critical) Project maintenance activities within 30m of significant bird SCC habitats occur during the breeding bird period for common nighthawk (April 1st – August 31st), schedule these activities to occur during daylight hours to increase visibility and to avoid light pollution effects during the night.</p> <p>If regular (non-critical) Project maintenance activities within 30m of significant bird SCC habitats occur during the breeding bird period for eastern wood-pewee or wood thrush (May 1st – July 31st), all reasonable attempts will be made to schedule these activities to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife.</p> <p>Develop a Bird and Bat EEMP in accordance with MNR's Bats and Bat Habitats (OMNR 2011a) guidance, as outlined in Section 4.0.</p> <p>On-site speed limits will be clearly posted, applied, and followed by Project staff throughout the operational phase.</p> <p>Develop a spill response plan and train staff on appropriate procedures.</p> <p>Keep emergency spill kits on site.</p> <p>Keep contact information for the MOECC Spills Action Centre in a designated area on-site.</p>	<p>Common nighthawk:</p> <p>Surveys will consist of 10-minute point counts conducted within or adjacent to common nighthawk habitats on 3 survey dates between late May and early July. Survey dates will be selected based on evenings (after sunset) or early morning (before sunrise) that fit the following parameters:</p> <ul style="list-style-type: none"> At least 50% of the visible moon surface is illuminated, i.e. between 1st quarter and last quarter moon phases. Little or no cloud-cover so that the moon is visible. Calm or light winds up to 3 on the Beaufort scale. No precipitation. Temperatures above 10°C. <p>Surveys will begin at sunset and finish no later than 90 minutes after sunset.</p> <p>Eastern wood-pewee and wood thrush:</p> <p>Surveys will consist of 10-minute point counts conducted within or adjacent to each candidate SWH for eastern wood-pewee or wood thrush in June and early July. Each point count station will be surveyed 3 times, once during each of early, mid and late season (spring and early summer) and no less than 10 days apart.</p>	<p>The location of each of the significant habitats for bird species of conservation concern can be seen on Maps 2-1 to 2-12.</p> <p>Monitoring locations at these habitats will be determined prior to pre-construction surveys and will be repeated at the same locations during post-construction surveys.</p>	<p>Survey (baseline):</p> <p>1. May-Jul 2017</p> <p>3 years of Post-construction Surveys:</p> <p>1. May-Jul 2020 2. May-Jul 2021 3. May-Jul 2022</p>	<p>Determine the potential disturbance impact of operational wind turbines on significant habitats for bird species of conservation concern.</p>	<p>Annual reports or memos summarizing results will be submitted to the MNR and MOECC following the anticipated schedule below:</p> <p>Pre-construction Survey (baseline):</p> <p>1. Dec 2017</p> <p>Post-construction Disturbance Report:</p> <p>1. Mar 2021 2. Mar 2022 3. Mar 2023</p> <p>Post-construction Mortality Report:</p> <p>1. Feb 2021 2. Feb 2022 3. Feb 2023</p>	<p>An annual report, which documents the results of behaviour monitoring, will be prepared following each year that disturbance monitoring occurs. The report will be submitted to the MNR and the results presented in these annual reports will be used to determine if any additional mitigation measures should be implemented during the operational phase of this Project to further protect the habitat.</p> <p>Additional contingency measures will be based on the completion of post-construction mortality monitoring in proximity to this habitats.</p> <p>See section 4.0 for more detail on the post-construction mortality monitoring methods.</p>

Feature ID	Infrastructure with Potential for Operational Impact within 120m of, or Overlapping, Significant Wildlife Habitat	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection [‡]	Technical and Statistical Value of Data	Reporting Requirements [‡]	
				<p>Dispose of waste material by authorized and approved off-site vendors.</p> <p>Store hazardous materials in designated areas.</p> <p>Locate all maintenance activities, vehicle refueling or washing, as well as the storage of chemicals and heavy equipment more than 30m from significant natural features and SWHs.</p>	<p>Where site access allows, point counts will be spaced at least 250m apart in forests, ideally with the center point at least 100m from the habitat edge. Where more than one point count will be conducted within each candidate habitat, a standardized transect will also be conducted between point count sites.</p> <p>Surveys will be conducted between dawn (one half hour before sunrise) and 3 hours after sunrise. These surveys will occur during a time period when males are expected to be actively singing and defending territories.</p> <p>Days with high wind speeds and rain will be avoided. During each visit, the highest observed breeding evidence will be recorded for each species.</p> <p>In addition to the behaviour monitoring methods outlined above, the closest turbine to these features should be selectively considered in the subset of turbines to be monitored as part of the post-construction mortality for bats, as described in Section 4.0 below.</p>					
<p>Bird Species of Conservation Concern:</p> <p>EAWP-012** Eastern Wood-Pewee Habitat</p> <p>WOTH-003** Wood Thrush Habitat</p>	Wind Turbine (<120m)	<p>Avoidance of habitat during operational phase.</p> <p>Direct mortality to individual birds, although unlikely, through collisions with operational turbines.</p> <p>Spills, although unlikely, (i.e. oil,</p>	<p>Protection of bird species of conservation concern habitats.</p> <p>Minimize the potential for mortality of bird species of conservation concern from collisions with operational turbines.</p>	<p>Avoid the use of herbicides (Project related activities only) within 30m of significant natural features and SWHs.</p> <p>If regular (non-critical) Project maintenance activities within 30m of significant bird SCC habitats occur during the breeding bird period for eastern wood-pewee or wood thrush (May 1st – July 31st), all reasonable attempts will be made to schedule these activities to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife..</p>	<p>The presence of suitable habitat for bird species of conservation concern could not be verified within EAWP-012 and WOTH-003 during the evaluation of significance phase of the Project as site access was not granted. As such, no site-specific surveys can be conducted at these habitats.</p> <p>The closest turbine to these features (for both habitats, T46), if built, will be included in the subset of turbines to be monitored as part of the post-construction mortality for birds, as described in Section 4.0.</p>				<p>Contingency measures will be based on the completion of post-construction mortality monitoring in proximity to these habitats.</p> <p>See Section 4.0 for more detail on the post-construction mortality monitoring methods.</p>	

Feature ID	Infrastructure with Potential for Operational Impact within 120m of, or Overlapping, Significant Wildlife Habitat	Potential Negative Environmental Effects	Performance Objective	Mitigation Strategy	Bird and Bat Environmental Effects Monitoring Plan					Contingency Measure
					Monitoring Methods	Monitoring Locations	Frequency and Duration of Sample Collection †	Technical and Statistical Value of Data	Reporting Requirements ‡	
		gasoline, grease, etc.) during the operational phase.		<p>Develop a Bird and Bat EEMP in accordance with MNR's Bats and Bat Habitats (OMNR 2011a) guidance, as outlined in Section 4.0.</p> <p>On-site speed limits will be clearly posted, applied, and followed by Project staff throughout the operational phase.</p> <p>Develop a spill response plan and train staff on appropriate procedures.</p> <p>Keep emergency spill kits on site.</p> <p>Keep contact information for the MOECC Spills Action Centre in a designated area on-site.</p> <p>Dispose of waste material by authorized and approved off-site vendors.</p> <p>Store hazardous materials in designated areas.</p> <p>Locate all maintenance activities, vehicle refueling or washing, as well as the storage of chemicals and heavy equipment more than 30m from significant natural features and SWHs.</p>						

† Actual post-construction monitoring (and reporting) timelines are subject to change if there are modifications to the construction schedule; however, post-construction surveys will occur during the correct seasonality and during the first year following the completion of construction activities.

* Only if these habitats are determined to be significant through pre-construction surveys described in the Nation Rise Wind Farm NHA Environmental Impact Study (EIS; NRSI 2017).

** These habitats have been treated as significant. The significance of these habitats could not be evaluated as site access was denied, and therefore no site-specific results could be collected.

+ Only if overhead collection lines are installed within the habitat.

4.0 Post-Construction Monitoring for Bat and Bird Mortality

Post-construction mortality surveys are required for all Class 3 and 4 wind power projects. This post-construction monitoring program has been prepared in accordance with MNRF's *Bats and Bat Habitats: Guidelines for Wind Power Projects* (July 2011) and MNRF's *Birds and Bird Habitats: Guidelines for Wind Power Projects* (December 2011).

4.1 Mortality Thresholds

A threshold approach, consistent with MNRF guidelines, will be used to identify and mitigate significant bat and bird mortality resulting from the operation of wind turbines.

4.1.1 Bats

Bat mortality is considered significant when a threshold of annual bat mortality (averaged across the site) exceeds:

- 10 bats/turbine/year

This threshold has been determined based on bat mortality reported at wind power projects in Ontario and through a comparison with other jurisdictions across North America.

4.1.2 Birds and Raptors

Bird mortality is considered significant when a threshold of annual bird mortality exceeds:

- 14 birds/year at individual turbines or turbine groups.

A significant bird mortality event is defined to have occurred when bird mortality during a single mortality monitoring survey (as observed in the field on a single day) exceeds:

- 10 or more birds at any one turbine, or
- 33 or more birds (including raptors) at multiple turbines.

NOTE: Significant bird mortality events are defined by actual carcasses found (not corrected numbers).

The MNRF will be notified within 48 hours of observation, or no later than 2 business days, if one of the thresholds above is exceeded during a single mortality monitoring survey. MNRF will be consulted to determine appropriate contingency plans should a significant bird mortality event occur or if mitigation actions fail.

Raptor mortality is considered significant when a threshold of annual bird mortality exceeds:

- 0.2 raptors/turbine/year (all raptors) across a wind power project, or
- 0.1 raptors/turbine/year (provincially tracked raptors) across a wind power project.

Provincially tracked raptors are defined as raptors of provincial conservation concern by MNR's Natural Heritage Information Centre, and include those considered as a species of Special Concern in Ontario or with a provincial status of S1-S3, indicating sensitive populations within Ontario. As of the date of this report, provincially tracked raptors in Ontario include (NHIC 2016):

- bald eagle (*Haliaeetus leucocephalus*);
- barn owl (*Tyto alba*);
- golden eagle (*Aquila chrysaetos*);
- peregrine falcon (*Falco peregrinus*);
- rough-legged hawk (*Buteo lagopus*); and
- short-eared owl (*Asio flammeus*).

4.2 Post-Construction Mortality Monitoring Methods

Post-construction bat and bird mortality surveys estimate bird and bat mortality from wind turbines and may identify species and specific periods of high mortality. This knowledge can be used to evaluate the success of mitigation measures, establish protocols for operational mitigation, and inform adaptive management.

Bat and bird mortality surveys identify the number of bats or birds killed per turbine over a known period of time (expressed as bats/turbine/year or birds/turbine/year). This value represents an estimate of bat and bird mortality adjusted for carcass removal rates, searcher efficiency, and percent area searched. Standard methods for mortality surveys are identified below.

For bats and birds, a monitoring year is considered to be from May 1 – October 31, and continues until November 30, specifically for raptor monitoring. Bat and non-raptor bird mortality data collected during the weekly raptor survey period in November will not be included in detailed bat and bird mortality estimates.

Post-construction monitoring is required for three years at all Class 3 and 4 wind power projects. Post-construction monitoring will consist of:

- Regular bat/bird mortality surveys around specific wind turbines,
- Monitoring of bat/bird carcass removal rate by scavengers (or other means),
- Monitoring of bat/bird searcher efficiency (i.e. number of bat/bird fatalities present that are actually detected by surveyors),
- Avoidance-disturbance effects monitoring (where the Project is located within 120m of bird/bat significant wildlife habitat),
- For birds, two subsequent years of scoped mortality and cause and effects monitoring at individual turbines (and unmonitored turbines in near proximity) following any given year where an annual post-construction mortality report identifies significant bird or raptor mortality, and
- For birds/bats, an additional three years of effectiveness monitoring where mitigation is applied.

All searchers will have updated rabies pre-exposure vaccinations, or will follow an alternative safety protocol for minimizing risks associated with potential incidental contact with animals which may have been exposed to the rabies virus.

4.2.1 Effort and Timing for Bird and Bat Mortality Monitoring

Minimum requirements for post-construction monitoring of birds and bats include:

- Post-construction monitoring (including mortality surveys, carcass removal and searcher efficiency trials) will be conducted during the core season when birds and bats are active (May 1 - October 31) for the first three years of wind turbine operation.
- Bat and bird mortality surveys will occur at a sub-sample of at least 30% of installed turbines. Turbines will be selected to cover representative areas throughout the Project Location.
- Mortality surveys will be conducted at each monitored turbine twice per week (three and four day intervals) from May 1 – October 31.
- For raptors, mortality monitoring will continue at the selected sub-sample at a frequency of weekly during the month of November, and will occur at all turbines at least once per month from May to November.
- Should significant bat or bird mortality be observed, and operational mitigation implemented, post-construction monitoring will be conducted for an additional three years from the implementation of operational mitigation to evaluate the effectiveness of the mitigation.
- The results of weekly November surveys and monthly surveys at turbines not part of the regularly searched sub-sample (if applicable) will not be included in any annual bird or bat mortality estimates (although weekly searches in November will contribute to annual raptor mortality estimates).

The total number of turbines required for monitoring will meet the minimum requirement of 30% of the installed turbines, and therefore has been based on an assumed construction of 29 operational turbines. Since 30% of 29 turbines is lower than the minimum requirement of 10 turbines for Projects of this size, the Nation Rise Wind

Project will monitor 10 turbines at a frequency of twice weekly during the post-construction mortality monitoring program.

In accordance with provincial guidelines, the selection of the 10 turbines must consider factors such as geographic representation, proximity to natural features, significant wildlife habitats, etc. Using these selection criteria, NRSI proposes the following monitoring sub-sample at the Nation Rise Wind Project.

Table 3. Summary of Mortality Monitoring Turbine Selection

Turbine Location	Selection Rationale
T4	<ul style="list-style-type: none"> • Proximity to Treated as Significant Wildlife Habitat (OCB-001, CONI-001, EAWP-002, EAWP-003) • Landscape Feature (Wooded Habitat) • Geographic Representation (North)
T10	<ul style="list-style-type: none"> • Proximity to Treated as Significant Wildlife Habitat (EAWP-004) • Landscape Feature (Wooded Habitat; Morewood Bog) • Geographic Representation (West)
T18	<ul style="list-style-type: none"> • Landscape Feature (Open Agriculture)
T25	<ul style="list-style-type: none"> • Landscape Feature (Open Agriculture; South Nation River) • Geographic Representation (Central)
T27	<ul style="list-style-type: none"> • Proximity to Treated as Significant Wildlife Habitat (EAWP-008, WOTH-002) • Landscape Feature (Wooded Habitat) • Geographic Representation (East)
T43	<ul style="list-style-type: none"> • Landscape Feature (Wooded Habitat) • Geographic Representation (East)
T46	<ul style="list-style-type: none"> • Proximity to Treated as Significant Wildlife Habitat (EAWP-012, 013, WOTH-003, 004, BMA-002) • Landscape Feature (Wooded Habitat) • Geographic Representation (South)
T54	<ul style="list-style-type: none"> • Landscape Feature (Open Agriculture)
T57	<ul style="list-style-type: none"> • Proximity to Treated as Significant Wildlife Habitat (EAWP-016, CONI-009) • Landscape Feature (Wooded Habitat) • Geographic Representation (South)
T58	<ul style="list-style-type: none"> • Landscape Feature (Open Agriculture; South Nation River) • Geographic Representation (East)

Following the completion of pre-construction evaluation of significance surveys at the Project and the final determination of the constructible layout, the selection of sub-sample turbines may require an adjustment to reflect turbines that are no longer being built or to selectively choose turbines that are in close proximity to habitats that are determined to be significant. MNRF will be notified of any changes to the turbine sub-sample identified above prior to the onset of post-construction mortality monitoring.

Post-construction monitoring will begin on May 1st after the Project is fully operational. The commercial operation date of the Project is expected to be in late 2019 or early 2020; therefore, it is anticipated that post-construction monitoring will begin May 1, 2020.

If full Project commissioning is delayed, post-construction monitoring of the partially completed Project will not be delayed for longer than one year. If the Project is constructed in phases, monitoring for each phase will coincide with the commencement of operation of that phase. When available, post-construction monitoring data may be useful in considering potential effects on wildlife and wildlife habitats in adjacent phases.

4.2.2 Carcass Searches

Carcass searches will consider the following:

- Searchers will search for a consistent search time for all surveyed turbines (e.g. 20 minutes per turbine) within each month or season (i.e. for the period that the variables are applied).
- Each surveyed turbine will have a search area that has a 50m radius.
- Within this 50m radius, the search area will be examined using transects 5-6m apart, allowing for a visual search of approximately 3m on each side. The search area may be rectangular, square or circular depending on turbine locations, arrangements and surrounding terrain.
- The search area of each turbine will be mapped into visibility classes according to the following table. Where the majority of the search area would not be searchable due to vegetation cover or other impediments (e.g. Visibility Class 4), these turbines may be purposefully avoided during the selection of the sub-sample of monitored turbines.

%Vegetation Cover	Vegetation Height	Visibility Class
≥90% bare ground	≤15cm tall	Class 1 (Easy)
≥25% bare ground	≤15cm tall	Class 2 (Moderate)
≤25% bare ground	≤25% > 30cm tall	Class 3 (Difficult)
Little or no bare ground	≥25% > 30cm tall	Class 4 (Very Difficult)

- Where possible, ground cover around monitored turbines will be maintained at a low level in order to facilitate more accurate bat and bird mortality surveys.
- Mortality surveys that incorporate the use of trained dogs (i.e., dog handler teams to locate mortalities) to improve searcher efficiency may be considered, particularly in difficult terrain.
- All carcasses found will be photographed and recorded/labeled with species (if possible), sex (if possible), date, time, location (UTM coordinates), carcass condition, searcher, any apparent external injuries, ground cover, and distance and direction to nearest turbine.
- Weather conditions including wind speed and precipitation will be included as part of the data collection.

- The estimated number of days since death, and condition of each carcass collected will be recorded in one of the following categories:
 - Fresh
 - Early decomposition
 - Moderate decomposition
 - Advanced decomposition
 - Complete decomposition
 - Scavenged
- Bird carcasses found during mortality monitoring will be collected and stored in a freezer and used in carcass removal or searcher efficiency trials, assuming they are in reasonable condition.
- Carcasses of the following species found during bat mortality searches will be stored in a freezer and may be used in carcass removal or searcher efficiency trials, assuming they are in reasonable condition:
 - *Lasionycteris noctivagans* (silver-haired bat)
 - *Lasiurus cinereus* (hoary bat)
 - *Lasiurus borealis* (eastern red bat)
- Due to white-nose syndrome contamination risks, the following species will not be used in carcass removal or searcher efficiency trials (carcasses of these species may be sent to the Canadian Cooperative Wildlife Health Centre for analysis of white-nose syndrome):
 - *Myotis septentrionalis* (northern myotis)
 - *Myotis lucifugus* (little brown myotis)
 - *Myotis leibii* (eastern small-footed myotis)
 - *Perimyotis subflavus* (tricolored bat)
 - *Eptesicus fuscus* (big brown bat)

4.2.3 Carcass Removal Trials

The level of carcass scavenging must be determined through carcass removal trials. In these trials, carcasses are placed around the wind turbines and monitored until they disappear. The average carcass removal time is a factor in determining the estimated bat or bird mortality. As carcass removal rates vary considerably from one site to another and seasonally, removal trials will be conducted at every wind power project for every year of monitoring.

Below are some important considerations for conducting carcass removal trials:

- Carcass removal trials will be conducted at least once a season, including spring (May/June), summer (July/August), and fall (September/October) during the same period as the mortality surveys. Trials will be conducted more frequently (i.e. once per month) if vegetation changes occur during the season (e.g. crops grow, harvest, etc.).
- A minimum of ten carcasses will be used for each trial. A maximum of 5 trial carcasses will be placed at any one time to avoid flooding the area with carcasses.

- Carcasses will be monitored every three to four days in conjunction with regular carcass searches.
- Carcass removal trials will be conducted in a variety of weather conditions.
- Carcasses will be distributed across the range of different substrates/habitats and visibility classes of turbines being searched.
- To the extent possible, carcass removal trials will be conducted at turbines that are not part of the carcass search sub-sample.
- Carcasses will be placed before dusk using gloves and boots to avoid imparting human smell that might bias trial results (e.g. attract scavengers, etc).
- Trials will continue until all carcasses are removed or have completely decomposed, for a minimum of two weeks (14 days).
- To avoid confusion with turbine related fatalities, trial carcasses can be discretely marked (e.g., clipping of ear, wing, fur; hole punching ear, etc.) with a unique identification so they can be identified as trial carcasses.
- Carcasses used will be as fresh as possible, since frozen or decomposed carcasses are less attractive to scavengers. If frozen carcasses are used, they will be thawed prior to beginning carcass removal trials.
- To the extent possible, bat and bird carcasses should each account for a minimum of one third of the carcass removal trials. Trials using other small brown mammal or bird carcasses (e.g., mice or brown chicks) may also be used when bird and bat carcasses are not available.
- Scavenging rates may change over time as scavengers become aware of and develop search images for new sources of food beneath turbines.
- Scavenging will be determined on a project-specific basis and rates will not be assumed to be similar between sites or used in calculations for other projects.

4.2.4 Searcher Efficiency Trials

Searcher efficiency is another important factor in creating an estimate of total bat and bird mortality. Searcher efficiency trials require a known number of discretely marked carcasses to be placed around a wind turbine. Searchers examine the wind turbine area, and the number of carcasses that they find is compared to the number of carcasses placed. Searcher efficiency will vary considerably for each searcher and from one site to another (varying by vegetation cover, terrain and season), and will be conducted as part of post-construction monitoring at every wind power project for every year of monitoring.

Below are some important considerations for conducting searcher efficiency trials:

- Searcher efficiency trials will be conducted at least once a season (following the same general seasonal periods as identified in Section 4.2.3) during the same period as the mortality surveys. Trials will be conducted once per month if vegetation changes occur during the season (e.g., crops grow, harvest, etc.).

- A 'tester' will control the trials and return to collect marked trial carcasses at the completion of the trials to determine the number of carcasses remaining and if any carcasses were scavenged or removed during the trial.
- Searcher efficiency trials are to be conducted for each individual searcher or team involved in searching for carcasses (including teams using dogs). The searcher will not be notified when they are participating in an efficiency trial to avoid potential search biases.
- A minimum of ten carcasses per searcher per season (following the same general seasonal periods as identified in Section 4.2.3) in all applicable visibility classes (see table in Section 4.2.2) are to be used. The average per searcher across all visibility classes will be used for calculations.
- Trial carcasses will be spread out over the trial period (month or season) and will be conducted with the mortality surveys. A maximum of three trial carcasses will be placed at any one time (no more than two at any single turbine) to avoid bias and flooding the area with carcasses.
- Trial carcasses are placed for one search day only and then removed and recorded by the 'tester'.
- Trial carcasses will be randomly placed within the search area and location recorded so that they can be retrieved if they are not found during the trial.
- Trial carcasses can be discreetly marked (e.g., clipping of ear, wing, leg, fur; hole-punching ear; etc.) with a unique identification so that they can be identified as a trial carcass by the tester.
- To the extent possible, bird and bat carcasses will each be used for a minimum of one third of the carcass removal trials, and bird carcasses will comprise another third of the trial carcasses. Trials using other small brown mammal or bird carcasses (e.g., mice or brown chicks) may also be used when bird and bat carcasses are not available.
- If frozen carcasses are used, they will be thawed prior to beginning searcher efficiency trials.
- All observers, even those with trained dogs, will overlook some carcasses. This percentage will vary depending on the observer, the habitat and the area being searched, etc.

4.2.5 Proportion of Area Searched

Based on current Ontario post-construction data, most bats and birds appear to fall within 50m of a wind turbine base. This area therefore represents the maximum recommended search area. Since it may not always be possible to search the entire 50m radius because of the presence of thick or tall vegetation, steep slopes, active cultivation, etc. the actual area searched during the mortality surveys will be calculated at each turbine, using a GPS. A map of the actual search area for each turbine searched, and a description of areas deemed to be unsearchable (e.g. vegetation height, type, slope, etc.), will be provided in the mortality report.

4.2.6 Calculations

Scavenger Correction Factor

The following formula will be used to calculate the overall scavenger correction (S_c) factors based on the proportion of carcasses remaining after each search interval are pooled:

$$S_c = \frac{n_{\text{visit1}} + n_{\text{visit2}} + n_{\text{visit3}}}{n_{\text{visit0}} + n_{\text{visit1}} + n_{\text{visit2}}}$$

Where,

S_c is the proportion of carcasses not removed by scavengers over the search period,

n_{visit0} is the total number of carcasses placed, and

$n_{\text{visit1}} - n_{\text{visit3}}$ are the numbers of carcasses on visits one through three.

Searcher Efficiency

Searcher efficiency (S_e) will be calculated for each searcher as follows:

$$S_e = \frac{\text{number of test carcasses found}}{\text{Number of test carcasses placed} - \text{number of carcasses scavenged}}$$

The number of turbines that each individual searches may vary, in which case it will be necessary to calculate a weighted average that reflects the proportion of turbines each searcher searched. The weighted average or overall searcher efficiency will be calculated as follows:

$$S_{e0} = S_{e1}(n_1/T) + S_{e2}(n_2/T) + S_{e3}(n_3/T) \dots$$

Where,

S_{e0} is the overall searcher efficiency,

S_{e1} and S_{e2} and S_{e3} are individual searcher efficiency ratings,

n_1 and n_2 and n_3 are number of turbines searched by each searcher, and

T is the total number of turbines searched by all searchers.

Proportion Area Searched

Proportion area searched (P_s) is calculated as follows:

$$P_s = \frac{\text{actual area searched}}{\pi r^2}$$

Where $r = 50\text{m}$.

Corrected Mortality Estimates

The minimum estimated bat mortality (C) is calculated as follows:

$$C = c / (S_{e0} \times S_c \times P_s)$$

Where,

- C is the corrected number of bat fatalities,
- c is the number of carcasses found,
- S_{e0} is the weighted proportion of carcasses expected to be found by searchers (overall searcher efficiency),
- S_c is the proportion of carcasses not removed by scavengers over the search period, and
- P_s is the proportion of the area searched.

4.2.7 Other Considerations

The following additional factors will be taken into consideration during the data analysis and reporting phases associated with the post-construction bird and bat mortality monitoring:

- The above calculations will be presented in corrected number of bats/turbine per year and birds/turbine per year. In this context, the year is from May 1 to October 31 for all bats and birds (non-raptors) and relates to the individuals found at the sub-sample of monitored turbines. The year continues until November 30 specifically for raptor monitoring, and the results from November weekly surveys will be included in the annual raptor mortality estimate.
- All individuals documented during monthly searches and bat or bird (non-raptor) individuals documented during weekly November searches will be considered incidental observations. These results may be used to help inform any required mitigation, scoped mortality monitoring, or cause and effects monitoring that may be required at the facility, but will not be included in any presented estimated mortality rates.
- Should additional bird or bat mortality be reported through supplemental monitoring (e.g., associated with significant wildlife habitat) and using the same standard protocols, these mortalities should be included in the calculation of mortality rates. In this case, a monitoring year will be defined as all reporting periods in a calendar year.
- Tissue samples from bat and bird carcasses may be used in a number of DNA analyses to provide insight into population size and structure, as well as the geographic origin of migrants. The local MNR office may be contacted prior to disposing of bat and bird carcasses to determine if this type of research is occurring in the area.

4.3 Post-Construction Mitigation

Post-construction mitigation will be implemented if the monitoring results indicate that the Project has exceeded the bird or bat mortality thresholds outlined in Section 4.1 above. Post-construction mitigation options include operational mitigation, associated

with an additional three years of mitigation effectiveness monitoring to evaluate the success of the implemented mitigation.

4.3.1 Bats

Operational mitigation is required if post-construction monitoring shows that a wind power project is causing significant bat mortality. Bat mortality is considered significant when mortality levels at a Project exceed 10 bats/turbine/year.

Operational mitigation refers to adjustments made to the operation of wind turbines to help mitigate potential negative environmental effects on bats (i.e., significant bat mortality). Operational mitigation for bat mortality consists of changing the wind turbine cut-in speed to 5.5 m/s (measured at hub height), or feathering of wind turbine blades when wind speeds are below 5.5 m/s.

The majority of bat mortalities from wind turbine operations occur during fall migration. Across North America, it is estimated that 90% of bat fatalities occur from mid-July through September. Where a post-construction monitoring annual report indicates that the annual bat mortality threshold of ten bats/turbine/year has been met or exceeded, operational mitigation will be implemented across the wind power project (i.e., at all turbines) from sunset to sunrise, from July 15 to September 30. This mitigation will continue for the duration of the project. Should site-specific monitoring indicate a shifted peak mortality period, operational mitigation may be shifted to match the peak mortality, with mitigation maintained for a minimum of ten weeks. Any shift in the operational mitigation period to match peak mortality should be determined in coordination with and confirmed by MNRF.

Where post-construction mitigation is applied, an additional three years of mitigation effectiveness monitoring is required. Monitoring the effectiveness of any post-construction mitigation techniques will help to evaluate the success of this mitigation.

4.3.2 Birds

Post-construction mitigation or additional scoped monitoring may be required at individual turbines or groups of turbines where post-construction monitoring identifies

significant annual bird mortality, significant bird mortality events, or disturbance effects associated with bird significant wildlife habitat.

For turbines located outside 120m of bird significant wildlife habitat, two years of subsequent scoped mortality and cause and effects monitoring is required where a significant annual mortality threshold has been exceeded. Following scoped monitoring, post-construction monitoring (e.g., operational mitigation) and effectiveness monitoring may be required at individual turbines where a mortality effect has been identified or significant annual mortality persists.

For turbines located within 120m of bird significant wildlife habitat, immediate post-construction mitigation (including operational mitigation), as identified in the EIS, and three years of effectiveness monitoring will be required where monitoring identifies significant annual bird mortality or disturbance effects associated with bird significant wildlife habitat.

Operational mitigation techniques may include periodic shut-down of select turbines and/or blade feathering at specific times of the year when mortality risks to the affected bird species is particularly high (e.g., migration). Emerging and new technologies will be considered that may reduce bird fatalities.

4.3.3 Raptors

Post-construction mitigation or additional scoped monitoring may be required at individual turbines or groups of turbines where post-construction monitoring identifies significant annual raptor mortality.

Two years of subsequent scoped mortality and cause and effects monitoring is required where a significant annual mortality threshold has been exceeded. Following scoped monitoring, post-construction monitoring (e.g., operational mitigation) and effectiveness monitoring may be required at individual turbines where a mortality effect has been identified or significant annual mortality persists.

Operational mitigation techniques may include periodic shut-down of select turbines and/or blade feathering at specific times of the year when mortality risks to the affected

raptor species may be particularly high (e.g., migration). Emerging and new technologies will be considered that may reduce raptor fatalities.

4.4 Contingency Plans

A contingency plan addresses immediate actions necessary in case of a significant bat, bird, or raptor mortality event, or if mitigation actions fail. A contingency plan allows additional mitigation measures to be implemented in the event that unanticipated negative environmental effects are observed during a single mortality monitoring survey.

Should post-construction mitigation be implemented and the bat, bird, and/or raptor mortality threshold continue to be exceeded, additional mitigation and scoped monitoring requirements will be determined in consultation with MNRF.

4.5 Post-Construction Mortality Monitoring Reporting Requirements

All mortality data collected during post-construction monitoring will be submitted in accordance with MNRF data standards and templates. Post-construction bird and bat mortality monitoring reports will be prepared and submitted as per Table 3.

Table 4. Schedule for Post-construction Mortality Monitoring Reports Detailing Results of the Environmental Effects Monitoring Plan

Monitoring Year	Report Submission Date
Year 1: May 1 – Nov 30, 2020	February 2021
Year 2: May 1 – Nov 30, 2021	February 2022
Year 3: May 1 – Nov 30, 2022	February 2023

If additional years of monitoring are required, the additional report submissions will follow a similar schedule as listed above.

All bat and bird mortality monitoring data and associated reports will be submitted to the MOECC and MNRF, consistent with MNRF's procedures and protocols, and satisfy the data standards and requirements of the Wind Energy Bird and Bat Monitoring Database (see Appendix II for data template). Standardized templates available online through the Wind Energy Bird and Bat Monitoring Database (found at: http://www.bsc-eoc.org/birdmon/wind/wind_templates.jsp) will be used to record and report all field data. Other similar data sheets may be used, providing they allow for the collection and submission of the same data as the templates identified above. All data sheet templates are provided in Appendix II.

Reports will also include maps of areas searched for each surveyed turbine and raw data for all carcass searches, searcher efficiency trials and carcass removal trials will be submitted as part of the annual report.

A summary of when information about a particular mortality event or threshold is reported to MNRF is included in Table 4.

Table 5. Timeline for Reporting Mortality to the Ministry of Natural Resources and Forestry

Mortality Threshold	How mortality is calculated	Reporting Timeline for Results
10 bats/turbine/year	Based on calculation described in Section 4.2.6 and applying the following formula $C = c / (S_{e0} \times S_c \times P_s)$	Results to be submitted annually to MNRF (within 3 months of completion of mortality surveys) as outlined in Table 3.
14 birds/turbine/year	Based on annual calculation described in Section 4.2.6 and applying the following formula $C = c / (S_{e0} \times S_c \times P_s)$	Results to be submitted annually to MNRF (within 3 months of completion of mortality surveys) as outlined in Table 3.
10 birds/turbine	Single event as observed in the field during monitoring	Mortality event to be reported to MNRF within 48 hours (or within 2 business days) of detection.
33 birds (including raptors) at any multiple turbines	Single event as observed in the field during monitoring	Mortality event to be reported to MNRF within 48 hours (or within 2 business days) of detection.
0.2 raptors/turbine/year (all raptors) across a wind power project	Based on annual calculation described in Section 4.2.6 and applying the following formula $C = c / (S_{e0} \times S_c \times P_s)$	Results to be submitted annually to MNRF (within 3 months of completion of mortality surveys) as outlined in Table 3.
0.1 raptors/turbine/year (provincially tracked raptors) across a wind power project	Based on annual calculation described in Section 4.2.6 and applying the following formula $C = c / (S_{e0} \times S_c \times P_s)$	Results to be submitted annually to MNRF (within 3 months of completion of mortality surveys) as outlined in Table 3.
Endangered and Threatened Bird and Bat Species	Single event as observed in the field during monitoring	Mortality event to be reported to MNRF within 24hrs (or next business day) of a confirmed identification.

5.0 Species at Risk

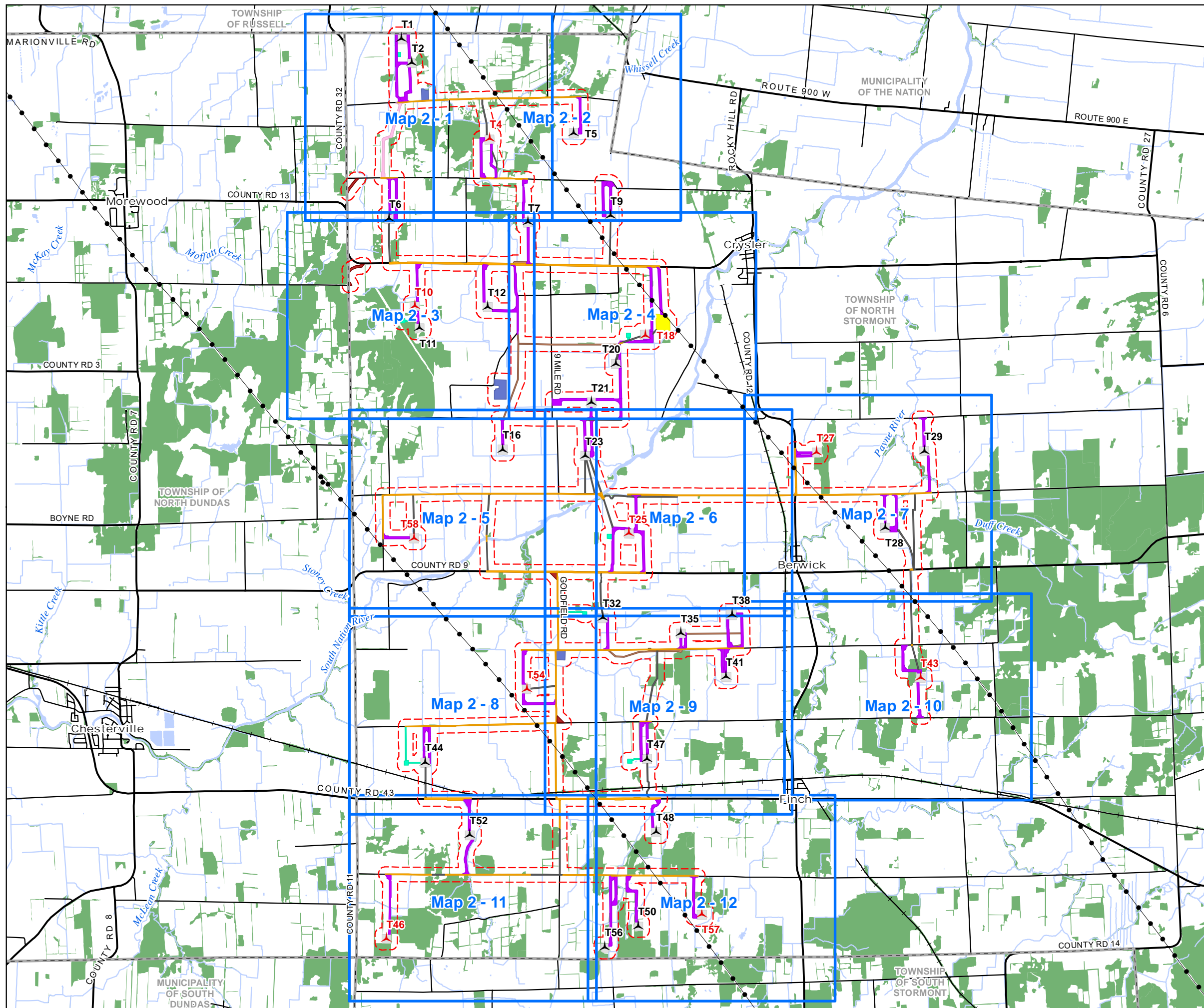
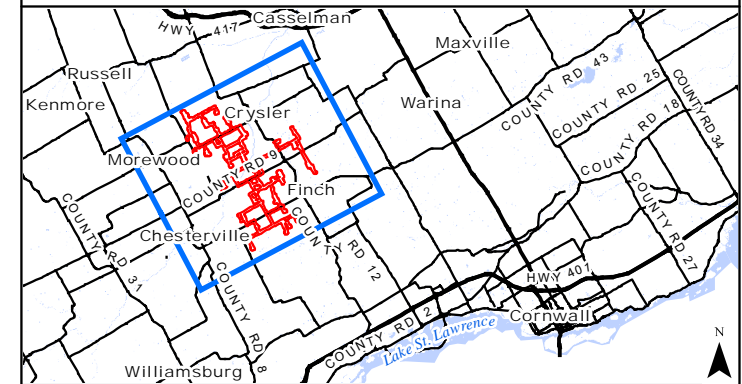
The Species at Risk in Ontario List (O. Reg. 230/08) will be consulted to determine species listed as Endangered and Threatened in Ontario. Mortality or injury of an Endangered or Threatened bird (including raptor) or bat species will be reported to the MNRF within 24 hours (or next business day) of a confirmed identification of a Species at Risk. Due to the possibility of encountering decomposed or scavenged carcasses, a confirmed identification may sometimes take several days from the date of first observation/collection. All reasonable efforts will be made to determine species identification if a Species at Risk cannot be ruled out. This may include physiological and skeletal measures, circulation of photo(s) to MNRF staff, and/or DNA analysis.

6.0 References

- Natural Resource Solutions Inc. (NRSI). 2017. Nation Rise Wind Farm: Natural Heritage Assessment. April 2017.
- Natural Resource Solutions Inc. (NRSI). 2017b. Nation Rise Wind Farm: Evaluation of Significance Report. April 2017.
- Ontario Ministry of Natural Resources (OMNR). 2011a. Bats and Bat Habitats: Guidelines for Wind Power Projects. First Edition. Queen's Printer for Ontario, Canada. July 2011.
- Ontario Ministry of Natural Resources (OMNR). 2011b. Birds and Bird Habitats: Guidelines for Wind Power Projects. First Edition. Queen's Printer for Ontario, Canada. December 2011.
- Natural Heritage Information Centre (NHIC). 2016. Ontario Tracked Species [Data file]. Last updated August 26, 2016. Available at: http://www.giscoeapp.lrc.gov.on.ca/Mamnh/Index.html?site=MNR_NHLUPS_NaturalHeritage&viewer=NaturalHeritage&locale=en-US (Accessed November 2016).

Map 1
Key Map

Nation Rise Wind Farm Key Map



Legend

- Map Extent
- Utility Line
- Railway
- Primary Road
- Secondary Road
- Permanent Watercourse (LIO)
- Intermittent Watercourse (LIO)
- Open Water (LIO)
- Wooded Area (LIO)
- Municipal Boundary

Project Components

- Project Area
- Proposed Turbine (Searched Monthly)
- Proposed Turbine (Sub-sample Turbine; Searched Twice-weekly)
- Proposed Access Road and Collection System
- Proposed Above/Underground Collection System
- Proposed Underground Collection System
- Proposed Turbine Laydown, Access Road, Collection Line
- Proposed Laydown Area
- Proposed Temporary Turning Radius
- Proposed Temporary Access Road for Construction
- Proposed Crane Path
- Proposed Meteorological Tower Footprint and Access Road
- Proposed Substation



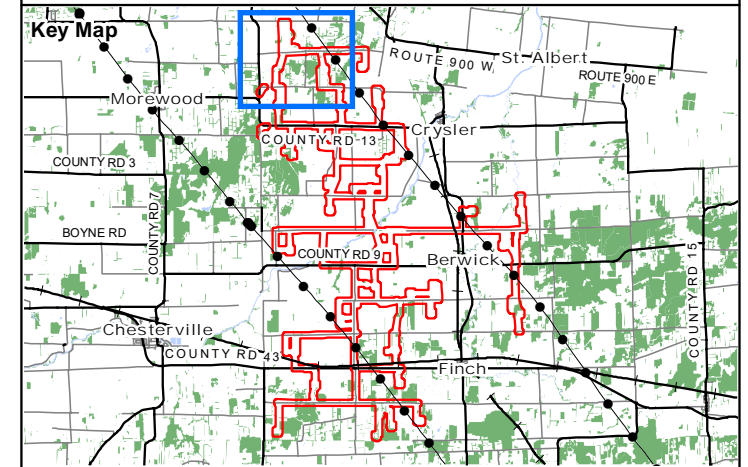
Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF © Copyright: Queen's Printer Ontario.

Project: 1756 Date: July 12, 2017	NAD83 - UTM Zone 18 Size: 11x17" 1:68,000

Maps 2-1 to 2-12
Significant Bat and Bird Habitats

Nation Rise Wind Farm

Significant Bird and Bat Habitats



Legend

- Utility Line
 - Primary Road
 - Secondary Road
 - ~ Permanent Watercourse (LIO)
 - Open Water (LIO)
 - Proposed Access Road and Collection System
 - Proposed Above/Underground Collection System
 - Proposed Underground Collection System
 - Proposed Turbine Laydown, Access Road, Collection Line
 - Proposed Laydown
 - Proposed Temporary Turning Radius
 - Proposed Temporary Access Road for Construction
 - Proposed Meteorological Tower Footprint and Access Road
- Treated As Significant Bird and Bat Habitats***
- Open Country Bird Breeding Habitat (OCB)
 - Eastern Wood-Pewee (EAWP)
 - Common Nighthawk (CONI)

Project Components

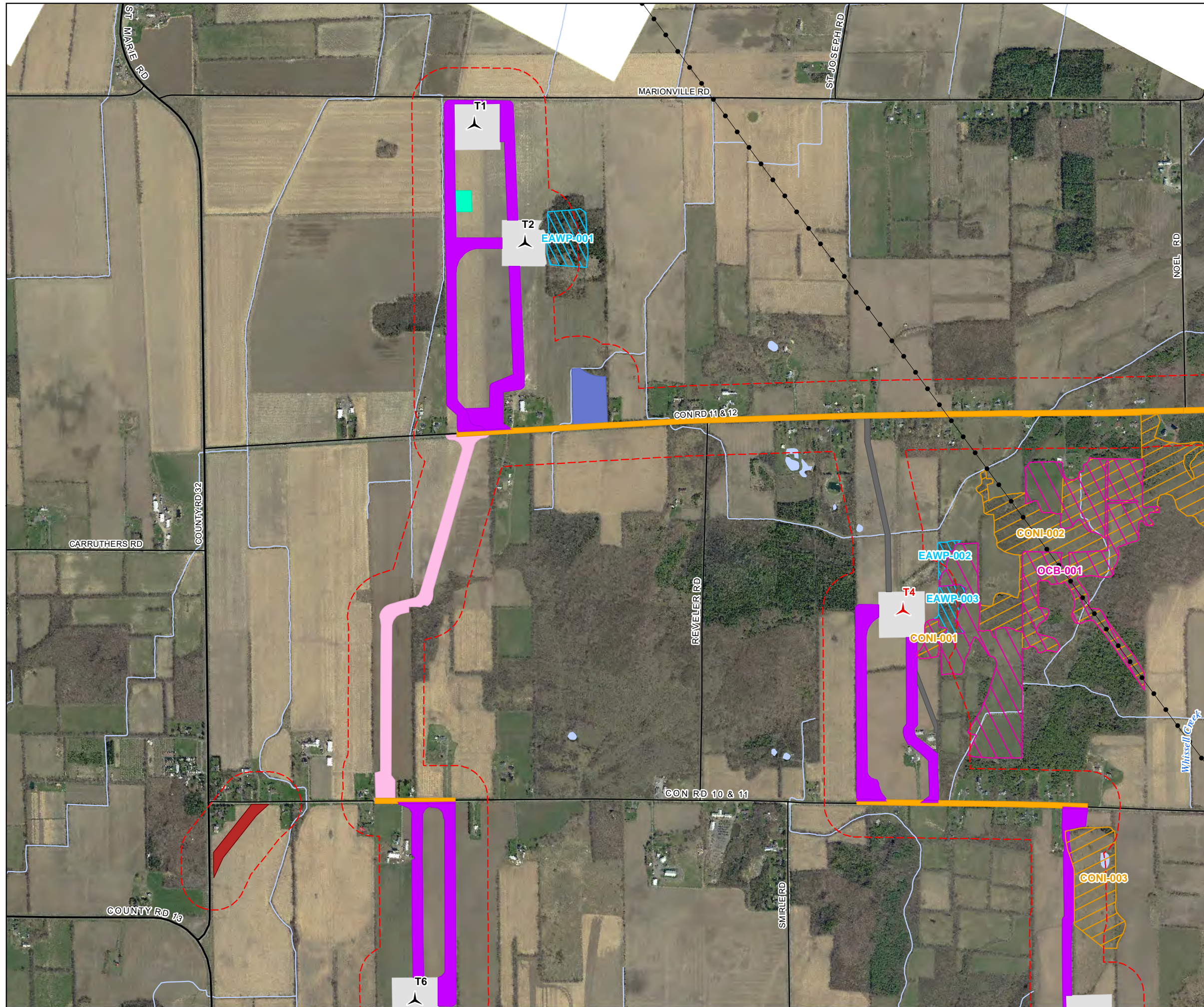
- Project Area
- Proposed Turbine (Searched Monthly)
- Proposed Turbine (Sub-sample Turbine; Searched Twice-weekly)
- Proposed Access Road and Collection System
- Proposed Above/Underground Collection System
- Proposed Underground Collection System
- Proposed Turbine Laydown, Access Road, Collection Line
- Proposed Laydown
- Proposed Temporary Turning Radius
- Proposed Temporary Access Road for Construction
- Proposed Meteorological Tower Footprint and Access Road

*Candidate Bird and Bat Habitats that have been Treated As Significant with a commitment to conduct pre-construction surveys to determine significance, or which access to the habitat to conduct surveys has been denied.



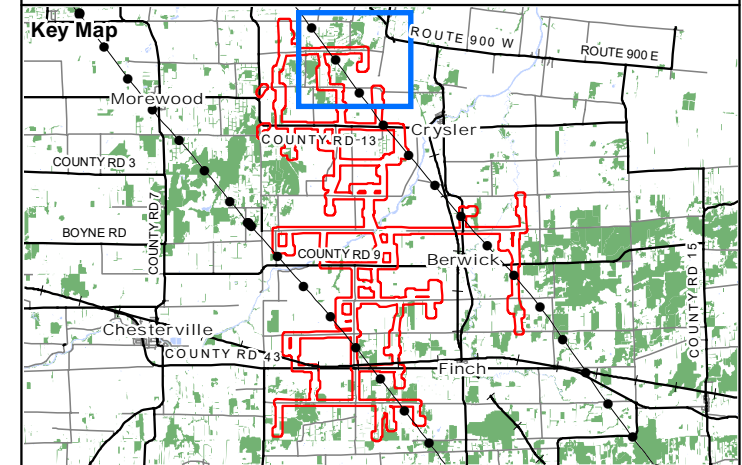
Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF© Copyright: Queen's Printer Ontario. Imagery: DNV-GL (2014).

Project: 1756 Date: July 12, 2017	NAD83 - UTM Zone 18 Size: 11x17" 1:14,000
0 200 400 600 800 Meters	
N	



Nation Rise Wind Farm

Significant Bird and Bat Habitats



Legend

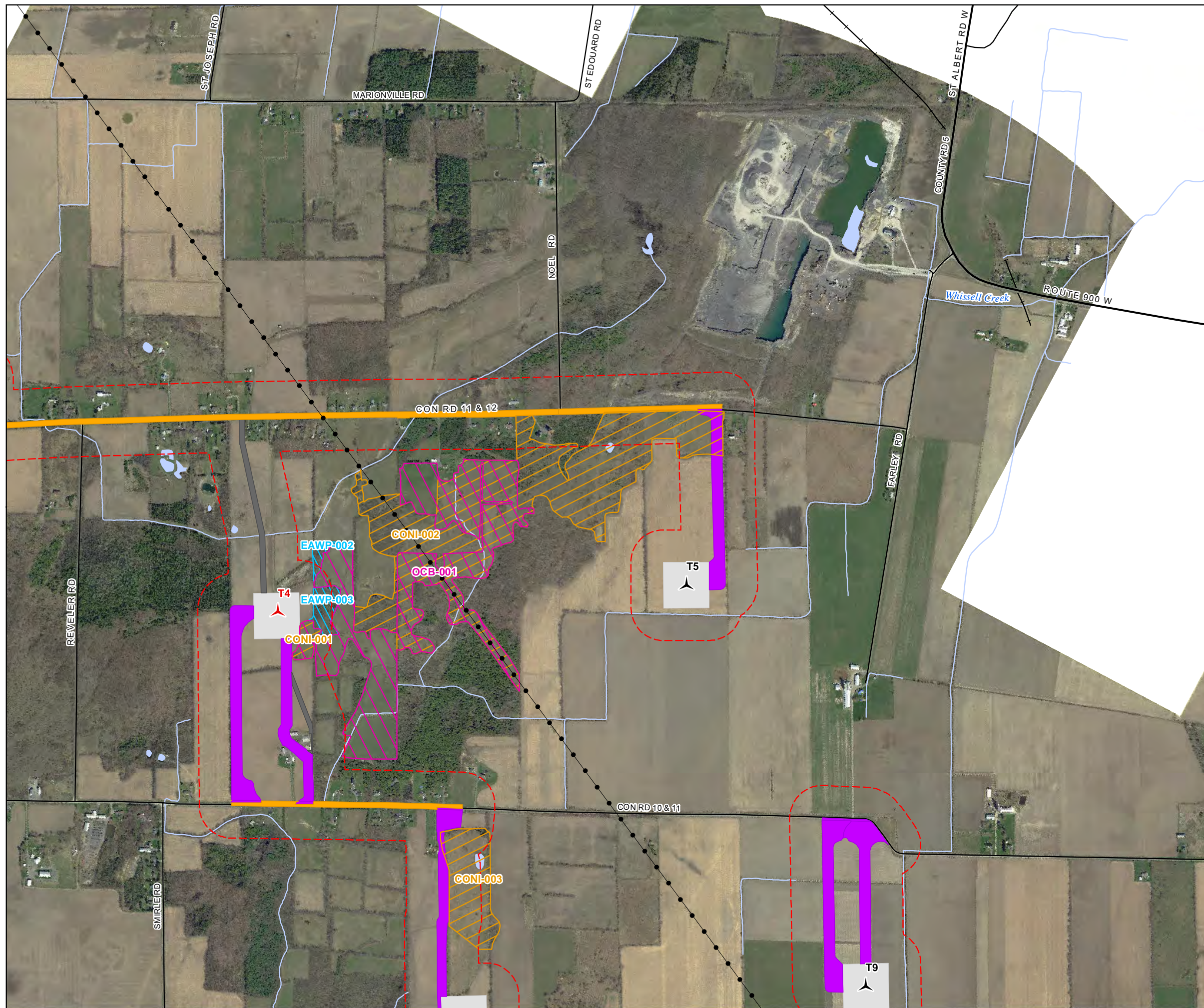
- Utility Line
 - Railway
 - Primary Road
 - Secondary Road
 - ~ Permanent Watercourse (LIO)
 - Open Water (LIO)
 - Project Area
 - Proposed Turbine (Searched Monthly)
 - Proposed Turbine (Sub-sample Turbine; Searched Twice-weekly)
 - Proposed Access Road and Collection System
 - Proposed Above/Underground Collection System
 - Proposed Underground Collection System
 - Proposed Turbine Laydown, Access Road, Collection Line
- Treated As Significant Bird and Bat Habitats***
- Open Country Bird Breeding Habitat (OCB)
 - Eastern Wood-Pewee (EAWP)
 - Common Nighthawk (CONI)

*Candidate Bird and Bat Habitats that have been Treated As Significant with a commitment to conduct pre-construction surveys to determine significance, or which access to the habitat to conduct surveys has been denied.



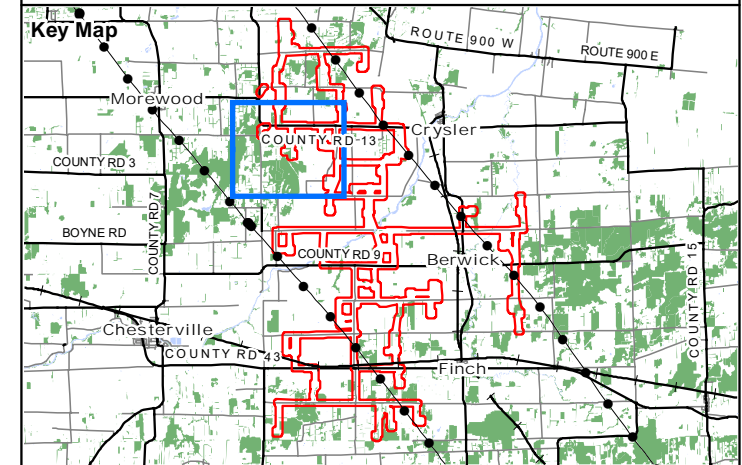
Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF© Copyright: Queen's Printer Ontario. Imagery: DNV-GL (2014).

Project: 1756 Date: July 12, 2017	NAD83 - UTM Zone 18 Size: 11x17" 1:14,000
0 200 400 600 800 Meters	
N	



Nation Rise Wind Farm

Significant Bird and Bat Habitats



Legend

- Primary Road
 - Secondary Road
 - Permanent Watercourse (LIO)
 - Open Water (LIO)
 - Treated As Significant Bird and Bat Habitats*
 - Eastern Wood-Pewee (EAWP)
- ### Project Components
- Project Area
 - Proposed Turbine (Searched Monthly)
 - Proposed Turbine (Sub-sample Turbine; Searched Twice-weekly)
 - Proposed Access Road and Collection System
 - Proposed Above/Underground Collection System
 - Proposed Underground Collection System
 - Proposed Turbine Laydown, Access Road, Collection Line
 - Proposed Laydown
 - Proposed Temporary Turning Radius
 - Proposed Crane Path
 - Proposed Meteorological Tower Footprint and Access Road

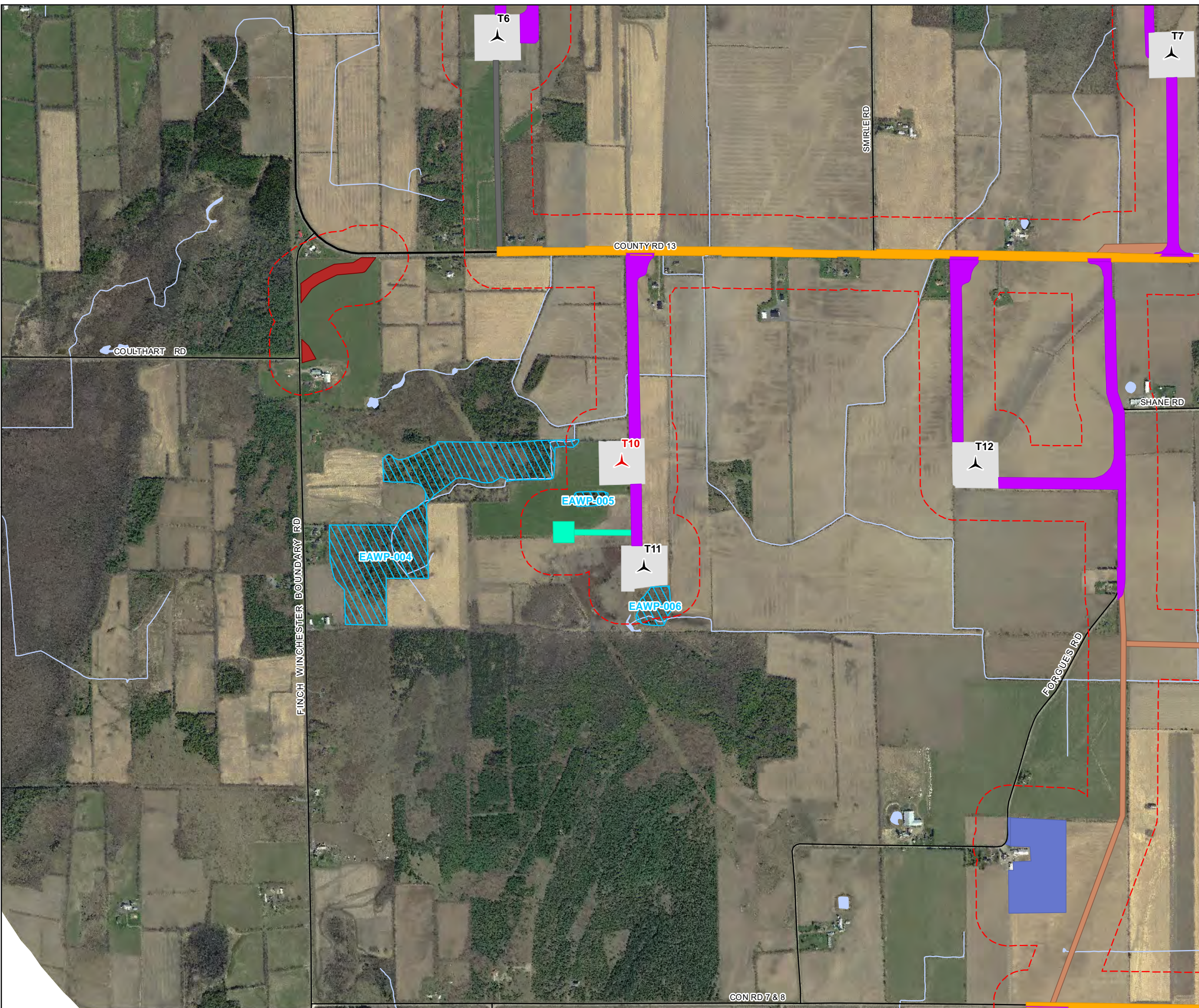
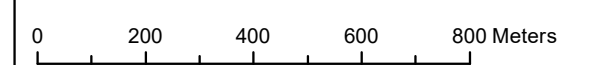
*Candidate Bird and Bat Habitats that have been Treated As Significant with a commitment to conduct pre-construction surveys to determine significance, or which access to the habitat to conduct surveys has been denied.



Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF© Copyright: Queen's Printer Ontario. Imagery: DNV-GL (2014).

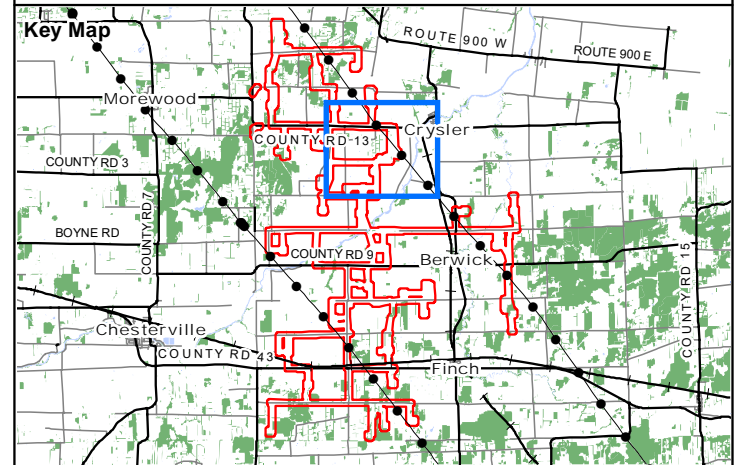
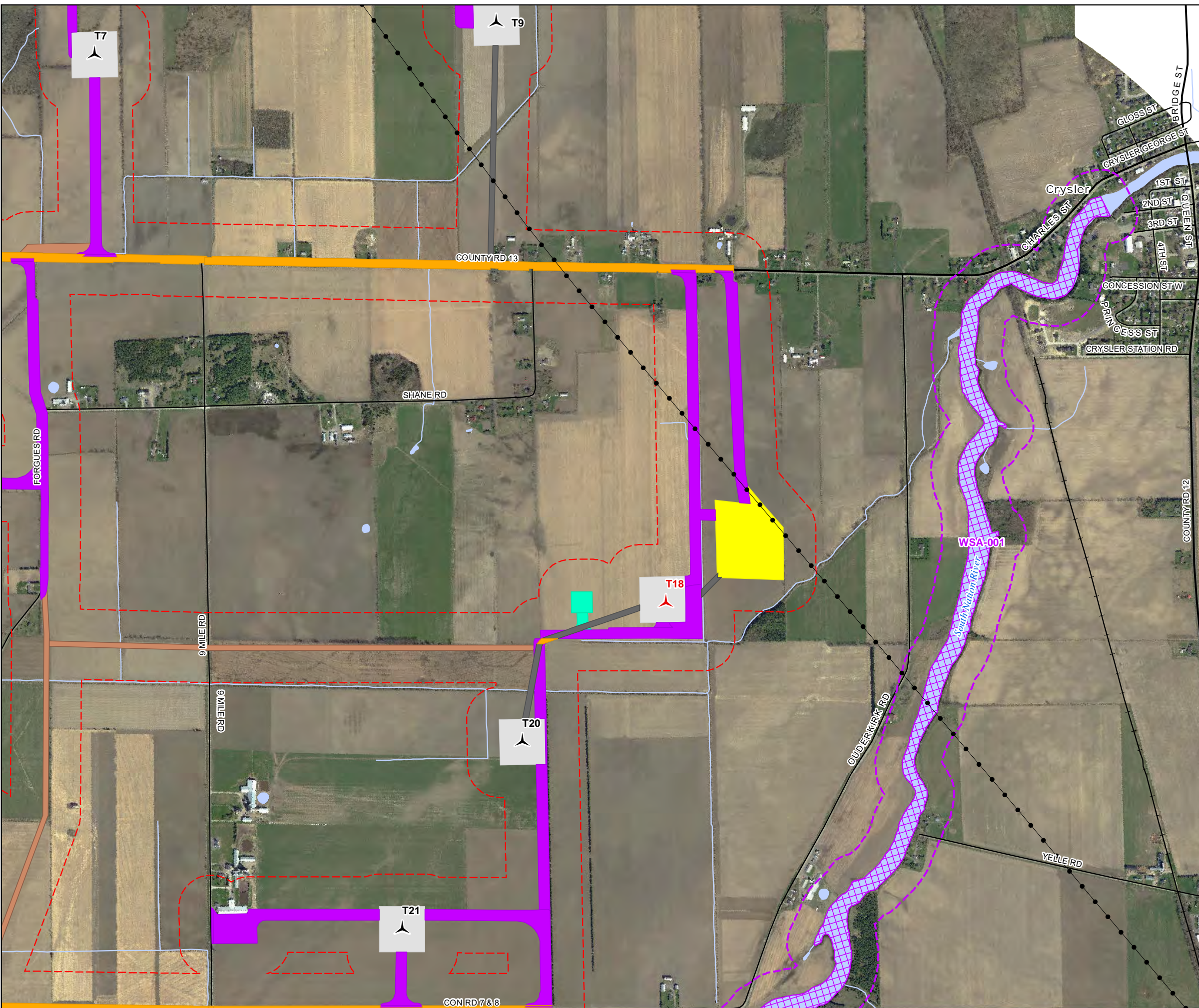
Project: 1756
Date: July 12, 2017

NAD83 - UTM Zone 18
Size: 11x17"
1:14,000



Nation Rise Wind Farm

Significant Bird and Bat Habitats



- Legend**
- Utility Line
 - Railway
 - Primary Road
 - Secondary Road
 - ~ Permanent Watercourse (LIO)
 - Open Water (LIO)
 - Proposed Access Road and Collection System
 - Proposed Above/Underground Collection System
 - Proposed Underground Collection System
 - Proposed Turbine Laydown, Access Road, Collection Line
 - Proposed Crane Path
 - Proposed Meteorological Tower Footprint and Access Road
 - Proposed Substation
- Treated As Significant Bird and Bat Habitats***
- Waterfowl Stopover and Staging Area (Aquatic) (WSA)
 - Waterfowl Stopover and Staging Area (Aquatic) (WSA) - Buffer
- Project Components**
- Project Area
 - Proposed Turbine (Searched Monthly)
 - Proposed Turbine (Sub-sample Turbine; Searched Twice-weekly)

*Candidate Bird and Bat Habitats that have been Treated As Significant with a commitment to conduct pre-construction surveys to determine significance, or which access to the habitat to conduct surveys has been denied.

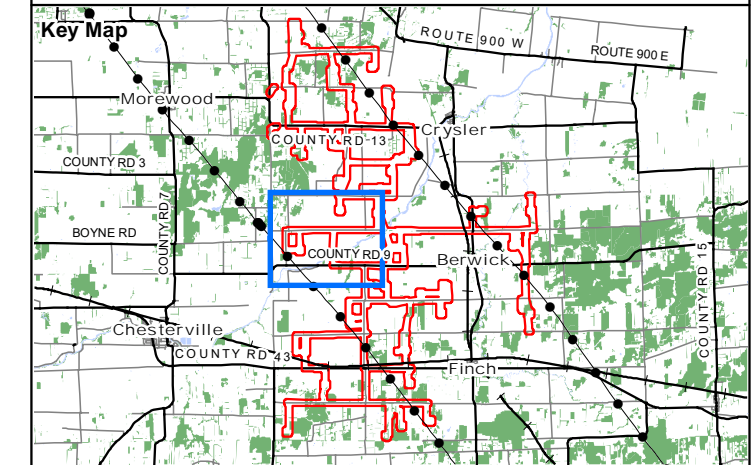


Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF© Copyright: Queen's Printer Ontario. Imagery: DNV-GL (2014).

Project: 1756 Date: July 12, 2017	NAD83 - UTM Zone 18 Size: 11x17" 1:14,000
0 200 400 600 800 Meters	

Nation Rise Wind Farm

Significant Bird and Bat Habitats



Legend

- Utility Line
- Primary Road
- Secondary Road
- Permanent Watercourse (LIO)
- Open Water (LIO)

Project Components

- Project Area
- Proposed Turbine (Searched Monthly)
- Proposed Turbine (Sub-sample Turbine; Searched Twice-weekly)
- Proposed Access Road and Collection System
- Proposed Above/Underground Collection System
- Proposed Underground Collection System
- Proposed Turbine Laydown, Access Road, Collection Line
- Proposed Temporary Turning Radius
- Proposed Crane Path
- Proposed Meteorological Tower Footprint and Access Road

Treated As Significant Bird and Bat Habitats*

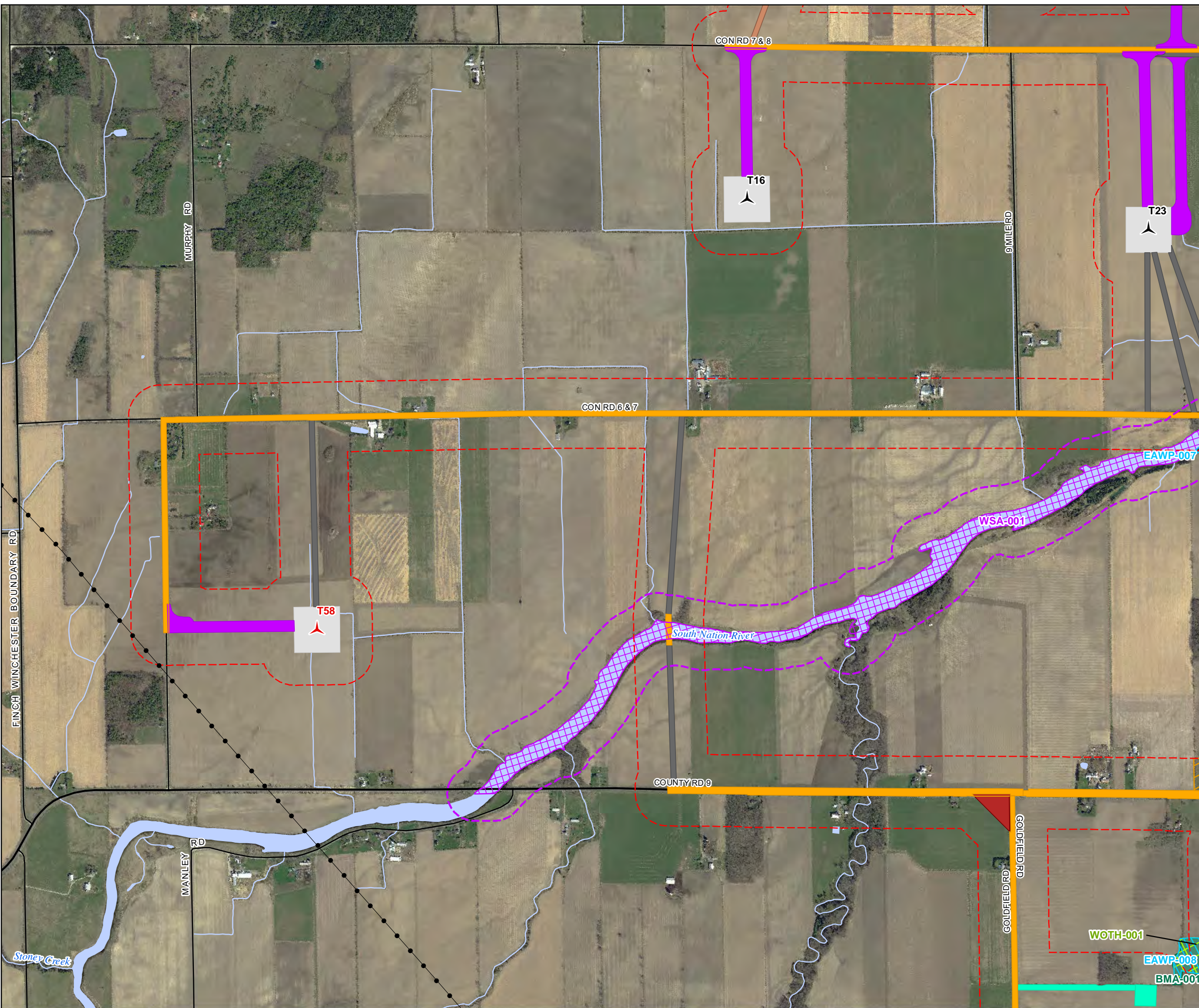
- Waterfowl Stopover and Staging Area (Aquatic) (WSA)
- Waterfowl Stopover and Staging Area (Aquatic) (WSA) - Buffer
- Eastern Wood-Pewee (EAWP)
- Wood Thrush (WOTH)
- Common Nighthawk (CONI)
- Bat Maternity Colony (BMA)

*Candidate Bird and Bat Habitats that have been Treated As Significant with a commitment to conduct pre-construction surveys to determine significance, or which access to the habitat to conduct surveys has been denied.

NATURAL RESOURCE SOLUTIONS INC.
 Aquatic, Terrestrial and Wetland Biologists

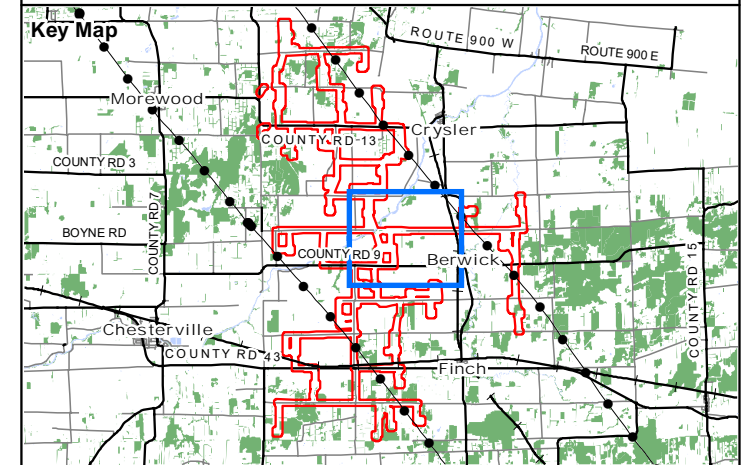
Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF© Copyright: Queen's Printer Ontario. Imagery: DNV-GL (2014).

Project: 1756 Date: July 12, 2017	NAD83 - UTM Zone 18 Size: 11x17" 1:14,000
0 200 400 600 800 Meters	



Nation Rise Wind Farm

Significant Bird and Bat Habitats



Legend

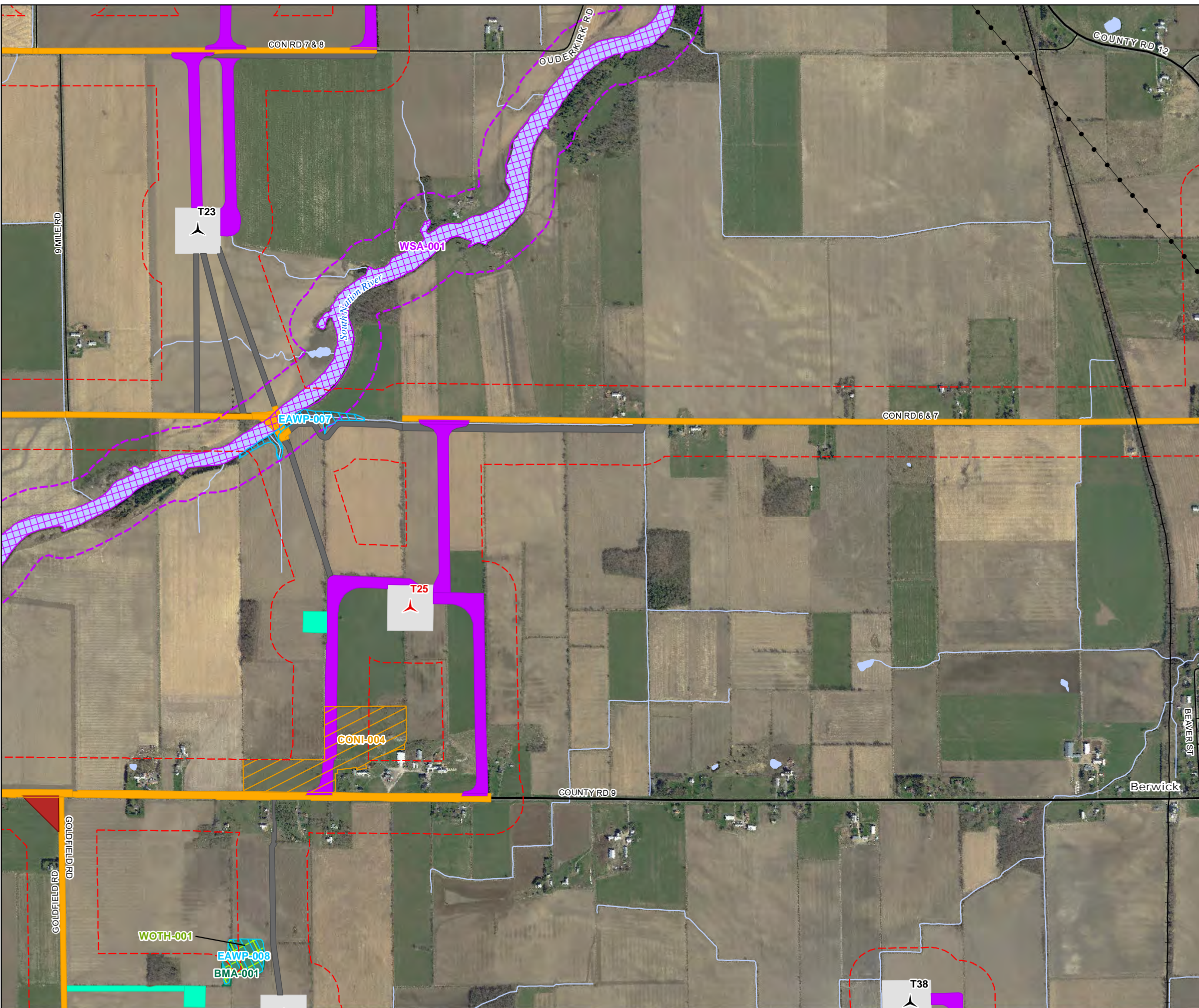
● Utility Line	Treated As Significant Bird and Bat Habitats*
— Railway	Waterfowl Stopover and Staging Area (Aquatic) (WSA)
— Primary Road	Waterfowl Stopover and Staging Area (Aquatic) (WSA) - Buffer
— Secondary Road	Eastern Wood-Pewee (EAWP)
— Permanent Watercourse (LIO)	Wood Thrush (WOTH)
— Open Water (LIO)	Common Nighthawk (CONI)
Project Components	Bat Maternity Colony (BMA)
Project Area	
Proposed Turbine (Searched Monthly)	
Proposed Turbine (Sub-sample Turbine; Searched Twice-weekly)	
Proposed Access Road and Collection System	
Proposed Above/Underground Collection System	
Proposed Underground Collection System	
Proposed Turbine Laydown, Access Road, Collection Line	
Proposed Temporary Turning Radius	
Proposed Meteorological Tower Footprint and Access Road	

*Candidate Bird and Bat Habitats that have been Treated As Significant with a commitment to conduct pre-construction surveys to determine significance, or which access to the habitat to conduct surveys has been denied.



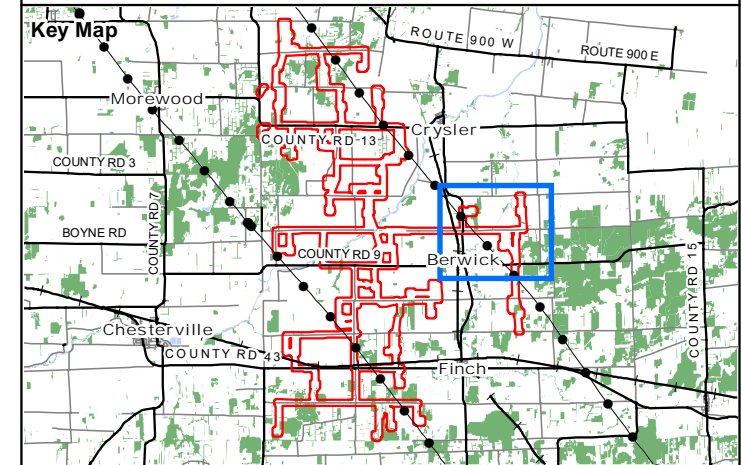
Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF© Copyright: Queen's Printer Ontario. Imagery: DNV-GL (2014).

Project: 1756 Date: July 12, 2017	NAD83 - UTM Zone 18 Size: 11x17" 1:14,000
0 200 400 600 800 Meters	



Nation Rise Wind Farm

Significant Bird and Bat Habitats



Legend

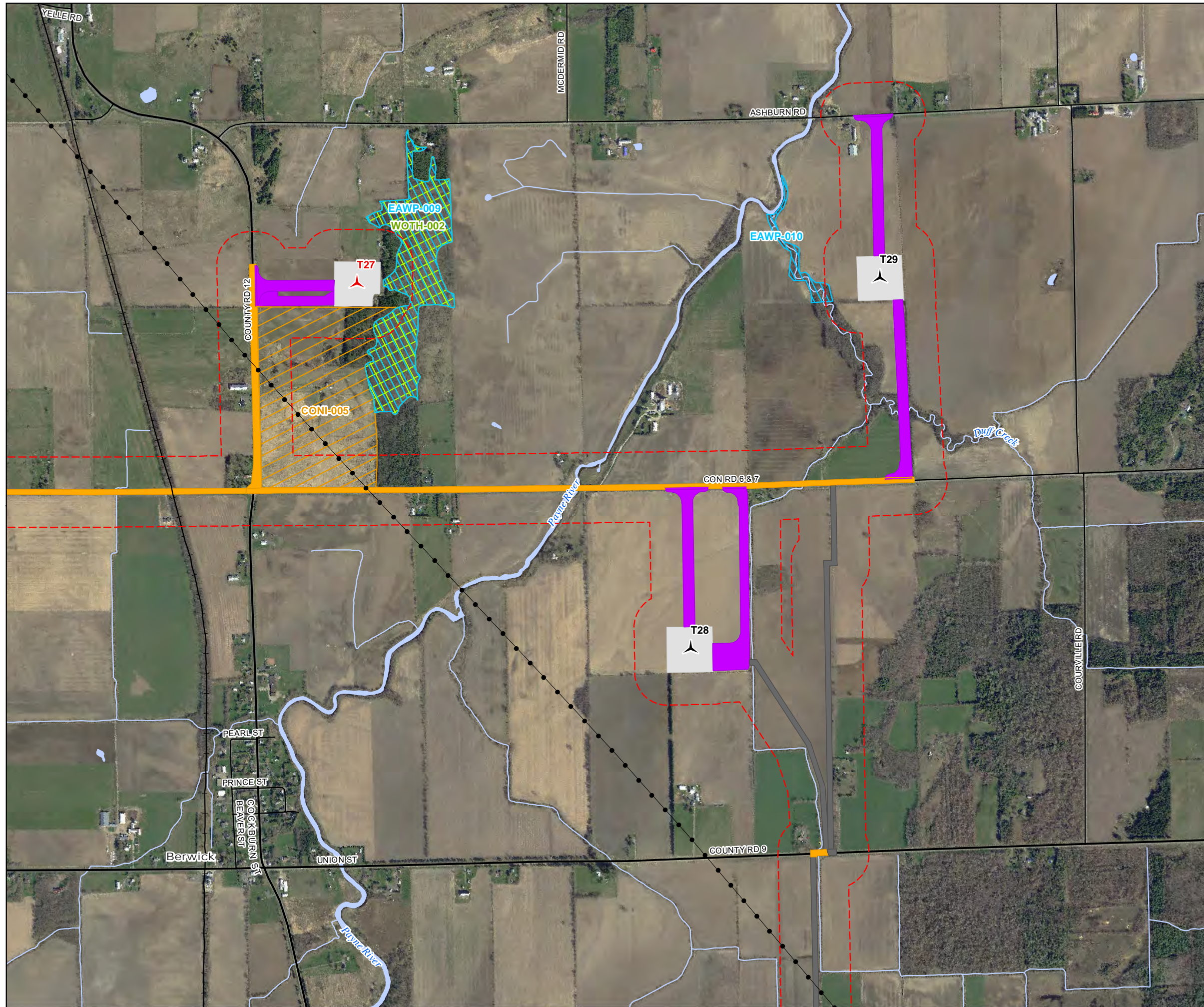
- Utility Line
 - Railway
 - Primary Road
 - Secondary Road
 - ~ Permanent Watercourse (LIO)
 - ~ Open Water (LIO)
 - ▭ Project Area
 - ▲ Proposed Turbine (Searched Monthly)
 - ▲ Proposed Turbine (Sub-sample Turbine; Searched Twice-weekly)
 - Proposed Access Road and Collection System
 - Proposed Above/Underground Collection System
 - Proposed Underground Collection System
 - Proposed Turbine Laydown, Access Road, Collection Line
- Treated As Significant Bird and Bat Habitats***
- ▭ Eastern Wood-Pewee (EAWP)
 - ▭ Wood Thrush (WOTH)
 - ▭ Common Nighthawk (CONI)

*Candidate Bird and Bat Habitats that have been Treated As Significant with a commitment to conduct pre-construction surveys to determine significance, or which access to the habitat to conduct surveys has been denied.



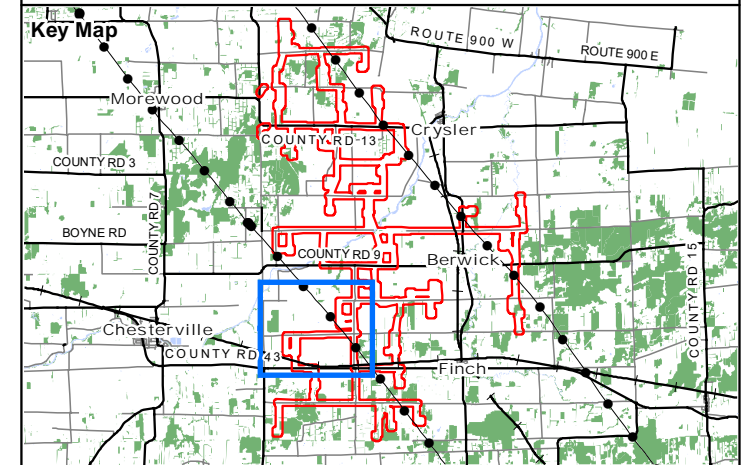
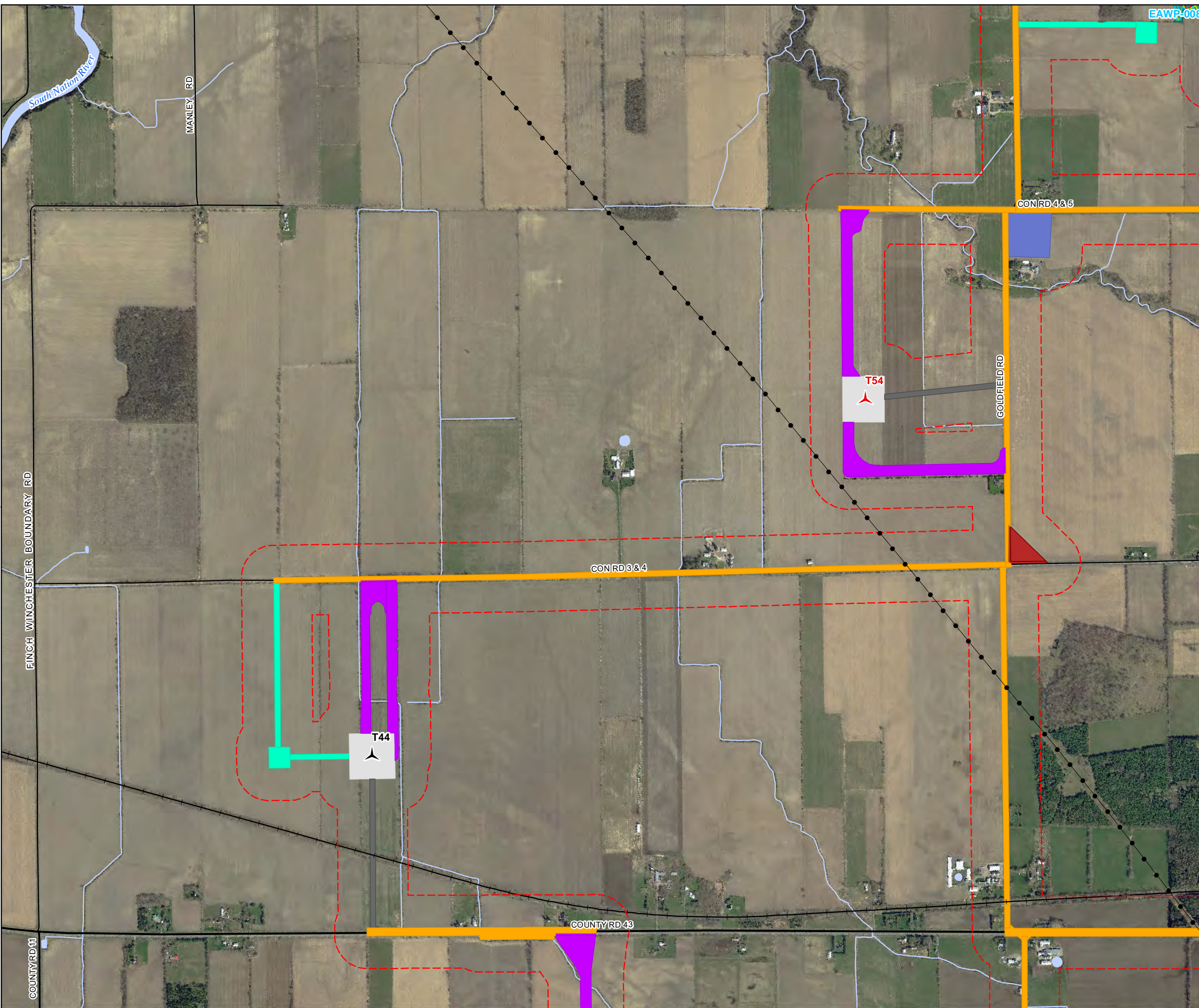
Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF© Copyright: Queen's Printer Ontario. Imagery: DNV-GL (2014).

Project: 1756 Date: July 12, 2017	NAD83 - UTM Zone 18 Size: 11x17" 1:14,000
0 200 400 600 800 Meters	



Nation Rise Wind Farm

Significant Bird and Bat Habitats



Legend

● Utility Line	Treated As Significant Bird and Bat Habitats*
⊕ Railway	▨ Eastern Wood-Pewee (EAWP)
— Primary Road	▨ Wood Thrush (WOTH)
— Secondary Road	■ Bat Maternity Colony (BMA)
~ Permanent Watercourse (LIO)	
☪ Open Water (LIO)	

Project Components

- ▭ Project Area
- ⊙ Proposed Turbine (Searched Monthly)
- ⊙ Proposed Turbine (Sub-sample Turbine; Searched Twice-weekly)
- Proposed Access Road and Collection System
- Proposed Above/Underground Collection System
- Proposed Underground Collection System
- Proposed Turbine Laydown, Access Road, Collection Line
- Proposed Laydown
- ▭ Proposed Temporary Turning Radius
- ▭ Proposed Meteorological Tower Footprint and Access Road

*Candidate Bird and Bat Habitats that have been Treated As Significant with a commitment to conduct pre-construction surveys to determine significance, or which access to the habitat to conduct surveys has been denied.

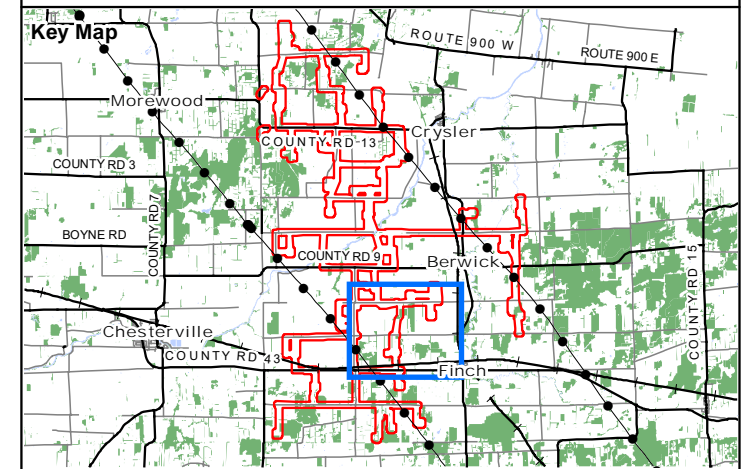


Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF© Copyright: Queen's Printer Ontario. Imagery: DNV-GL (2014).

Project: 1756 Date: July 12, 2017	NAD83 - UTM Zone 18 Size: 11x17" 1:14,000
0 200 400 600 800 Meters	
N	

Nation Rise Wind Farm

Significant Bird and Bat Habitats



Legend

- | | |
|-------------------------------|---|
| ● Utility Line | Treated As Significant Bird and Bat Habitats* |
| ⊕ Railway | Eastern Wood-Pewee (EAWP) |
| — Primary Road | Wood Thrush (WOTH) |
| — Secondary Road | Common Nighthawk (CONI) |
| ~ Permanent Watercourse (LIO) | Bat Maternity Colony (BMA) |
| ☁ Open Water (LIO) | |

Project Components

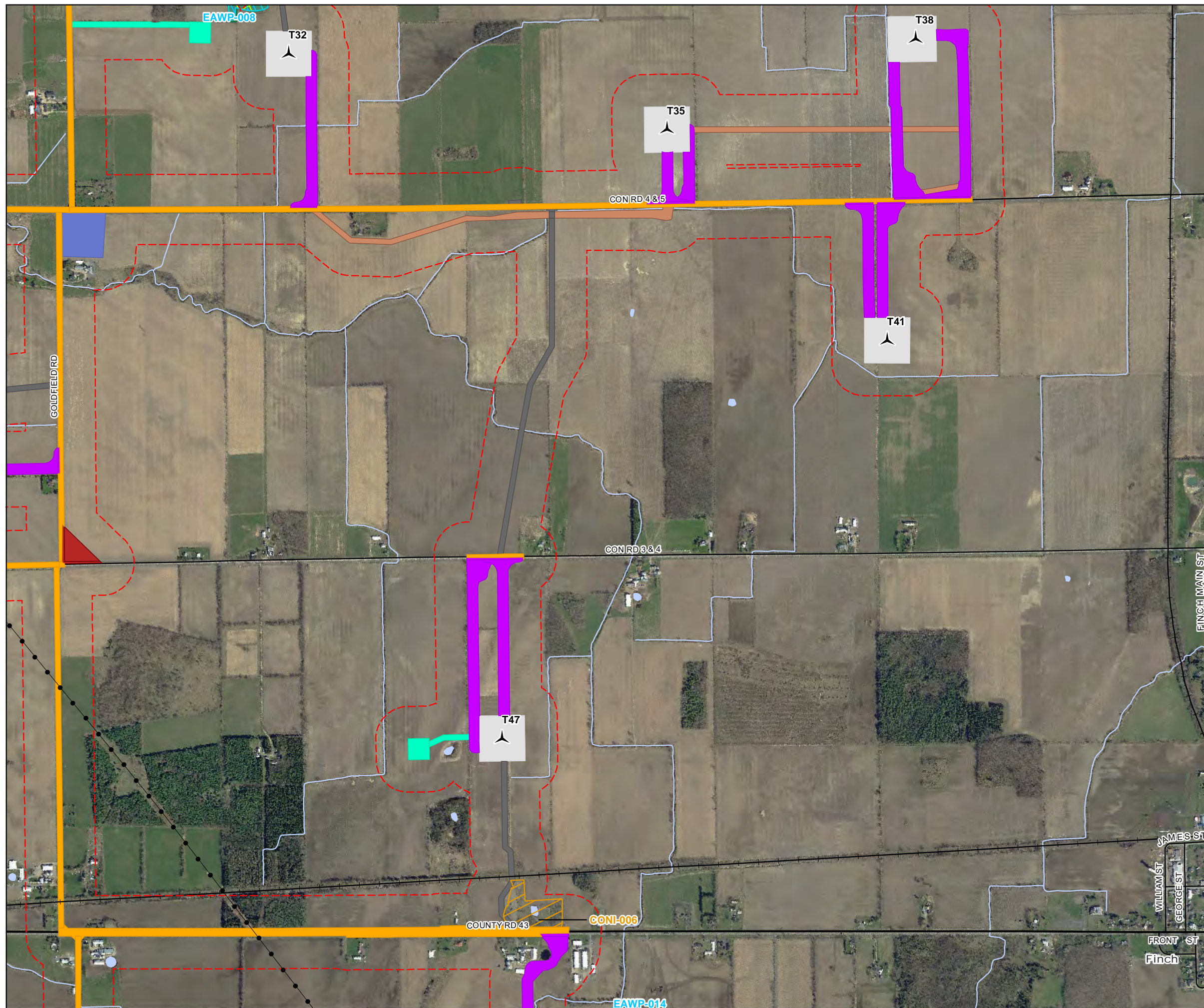
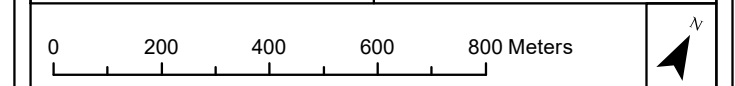
- Project Area
- Proposed Turbine (Searched Monthly)
- Proposed Access Road and Collection System
- Proposed Above/Underground Collection System
- Proposed Underground Collection System
- Proposed Turbine Laydown, Access Road, Collection Line
- Proposed Laydown Area
- Proposed Temporary Turning Radius
- Proposed Crane Path
- Proposed Meteorological Tower Footprint and Access Road

*Candidate Bird and Bat Habitats that have been Treated As Significant with a commitment to conduct pre-construction surveys to determine significance, or which access to the habitat to conduct surveys has been denied.



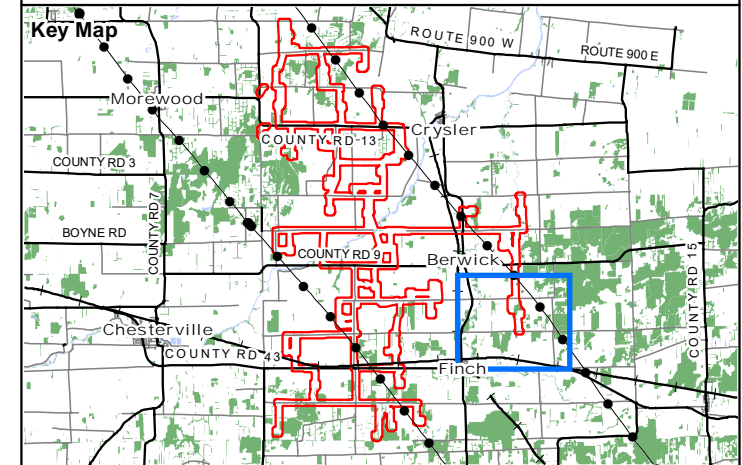
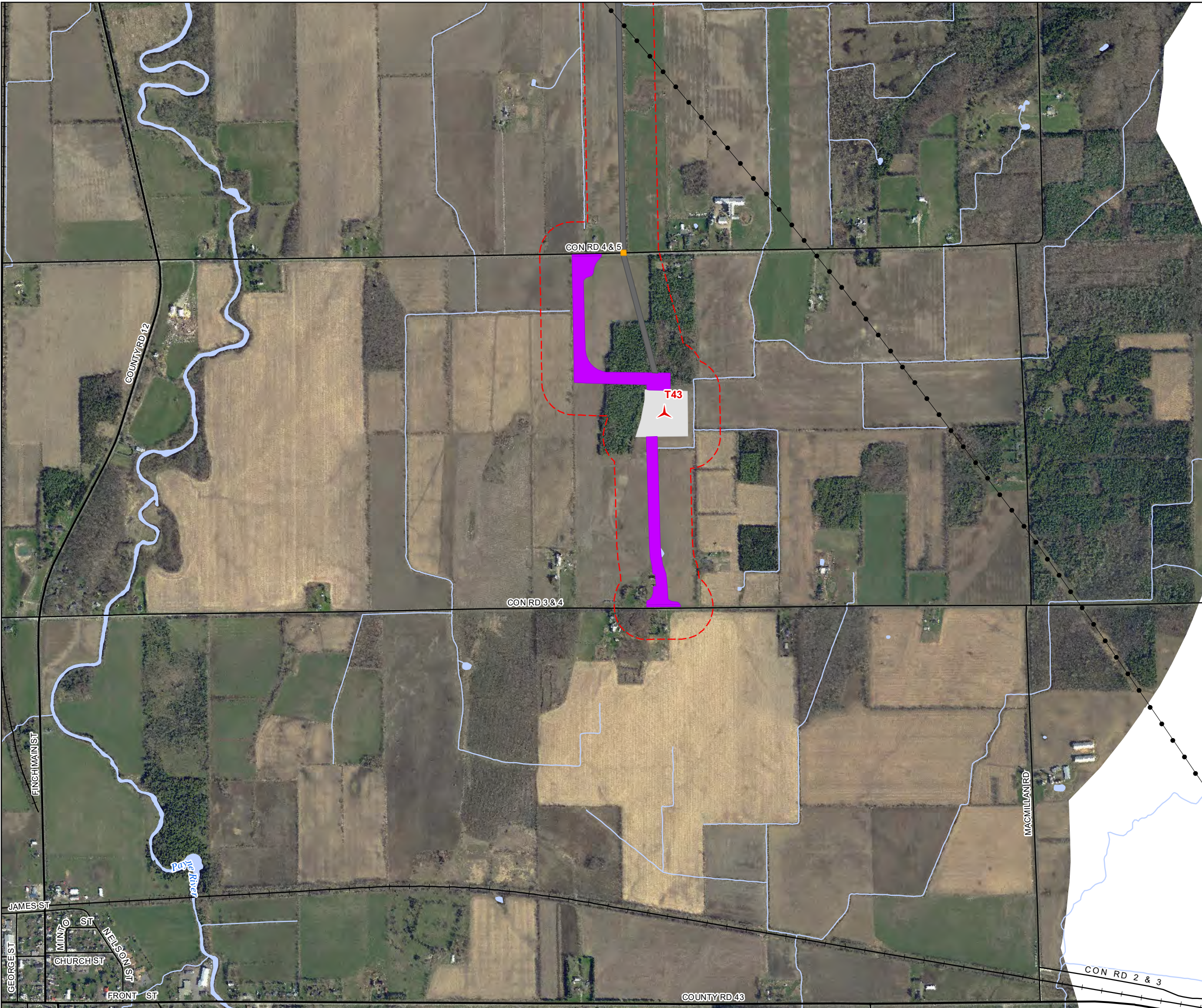
Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF© Copyright: Queen's Printer Ontario. Imagery: DNV-GL (2014).

Project: 1756 Date: July 12, 2017	NAD83 - UTM Zone 18 Size: 11x17" 1:14,000
--------------------------------------	---



Nation Rise Wind Farm

Significant Bird and Bat Habitats



Legend

- Utility Line
- Railway
- Primary Road
- Secondary Road
- Permanent Watercourse (LIO)
- Open Water (LIO)
- Project Components**
- Project Area
- Proposed Turbine (Sub-sample Turbine; Searched Twice-weekly)
- Proposed Access Road and Collection System
- Proposed Above/Underground Collection System
- Proposed Underground Collection System
- Proposed Turbine Laydown, Access Road, Collection Line

**Candidate Bird and Bat Habitats that have been Treated As Significant with a commitment to conduct pre-construction surveys to determine significance, or which access to the habitat to conduct surveys has been denied.*

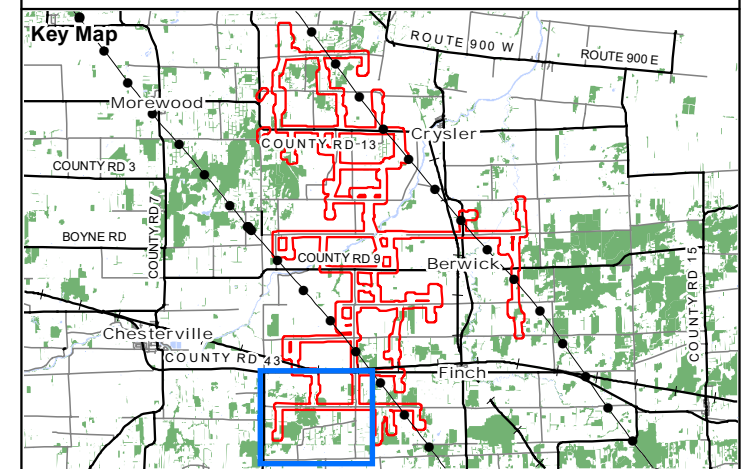


Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF© Copyright: Queen's Printer Ontario. Imagery: DNV-GL (2014).

Project: 1756 Date: July 12, 2017	NAD83 - UTM Zone 18 Size: 11x17" 1:14,000
0 200 400 600 800 Meters	

Nation Rise Wind Farm

Significant Bird and Bat Habitats



Legend

- Utility Line
 - Railway
 - Primary Road
 - Secondary Road
 - Permanent Watercourse (LIO)
 - Open Water (LIO)
 - Project Area
 - ▲ Proposed Turbine (Searched Monthly)
 - ▲ Proposed Turbine (Sub-sample Turbine; Searched Twice-weekly)
 - Proposed Access Road and Collection System
 - Proposed Above/Underground Collection System
 - Proposed Underground Collection System
 - Proposed Turbine Laydown, Access Road, Collection Line
- Treated As Significant Bird and Bat Habitats***
- ▨ Eastern Wood-Pewee (EAWP)
 - ▨ Wood Thrush (WOTH)
 - Bat Maternity Colony (BMA)

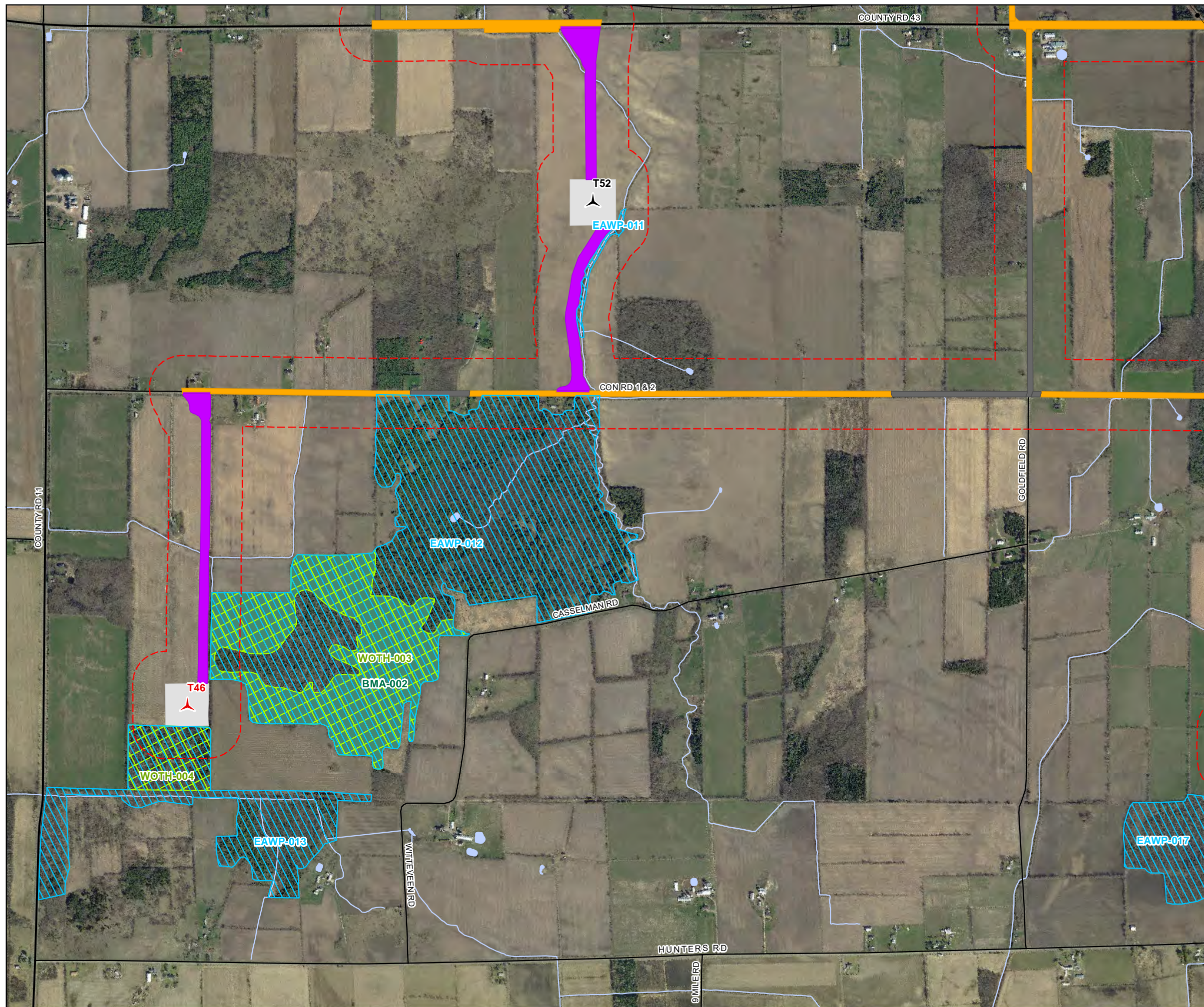
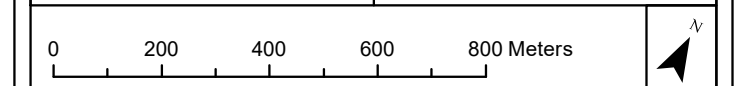
*Candidate Bird and Bat Habitats that have been Treated As Significant with a commitment to conduct pre-construction surveys to determine significance, or which access to the habitat to conduct surveys has been denied.



Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF© Copyright: Queen's Printer Ontario. Imagery: DNV-GL (2014).

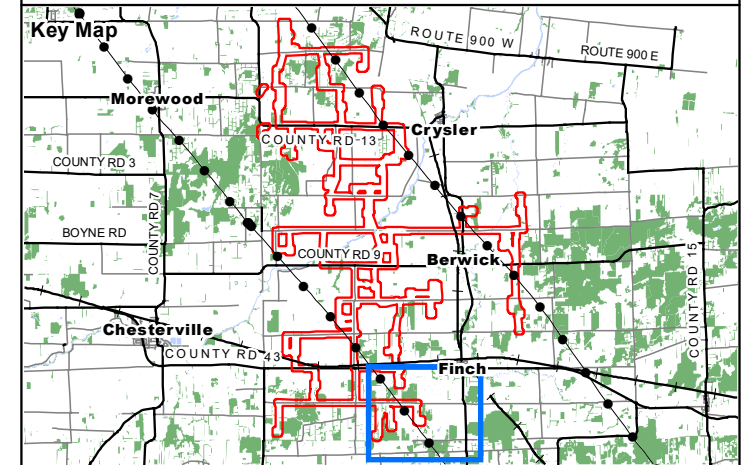
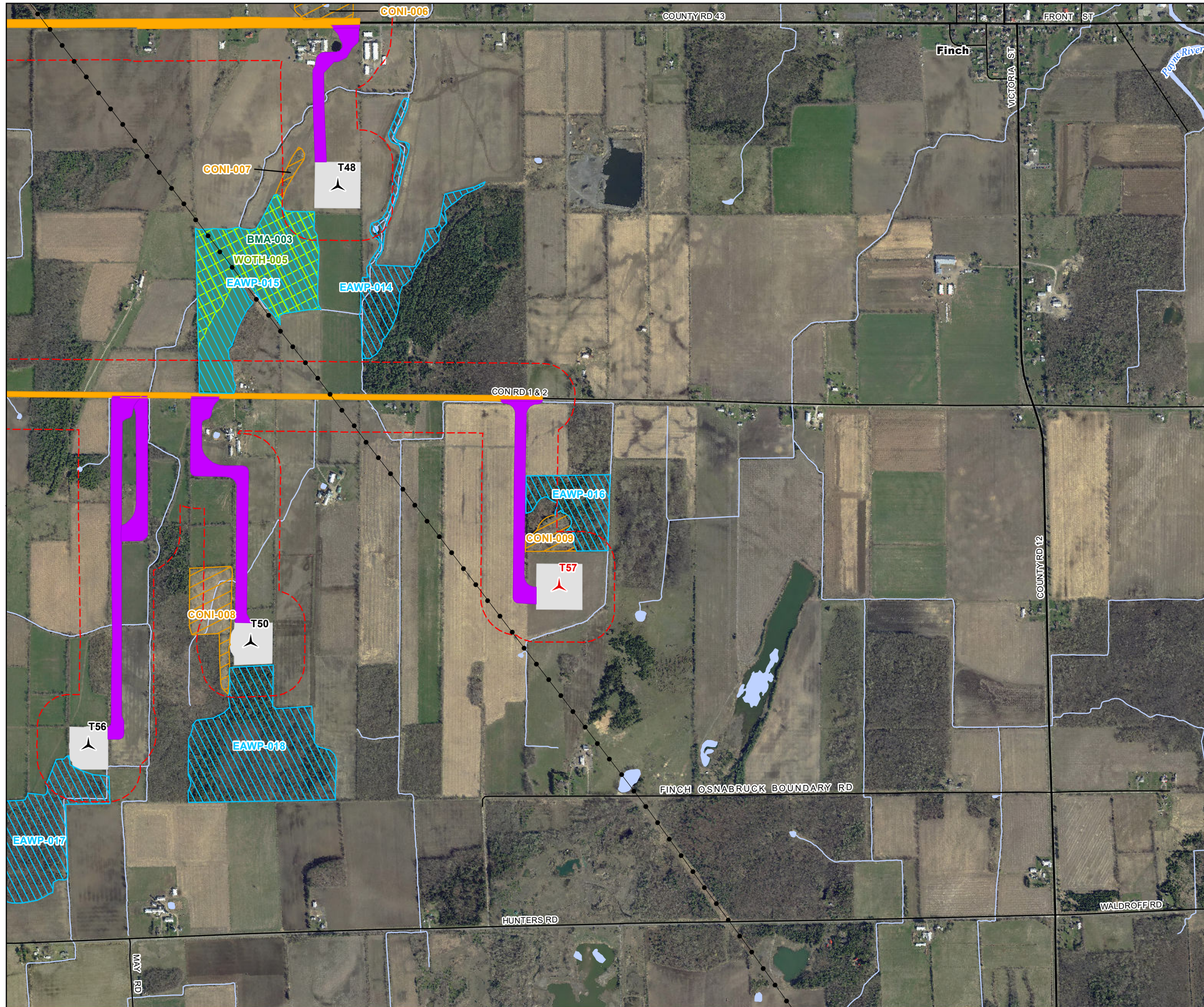
Project: 1756
Date: July 12, 2017

NAD83 - UTM Zone 18
Size: 11x17"
1:14,000



Nation Rise Wind Farm

Significant Bird and Bat Habitats



Legend

● Utility Line	Treated As Significant Bird and Bat Habitats*
⊕ Railway	▨ Eastern Wood-Pewee (EAWP)
— Primary Road	▨ Wood Thrush (WOTH)
— Secondary Road	▨ Common Nighthawk (CONI)
~ Permanent Watercourse (LIO)	■ Bat Maternity Colony (BMA)
■ Open Water (LIO)	

Project Components

- ▭ Project Area
- ⊕ Proposed Turbine (Searched Monthly)
- ⊕ Proposed Turbine (Sub-sample Turbine; Searched Twice-weekly)
- Proposed Access Road and Collection System
- Proposed Above/Underground Collection System
- Proposed Underground Collection System
- Proposed Turbine Laydown, Access Road, Collection Line

*Candidate Bird and Bat Habitats that have been Treated As Significant with a commitment to conduct pre-construction surveys to determine significance, or which access to the habitat to conduct surveys has been denied.

NATURAL RESOURCE SOLUTIONS INC.
 Aquatic, Terrestrial and Wetland Biologists

Map Produced by Natural Resource Solutions Inc. This map is proprietary and confidential and must not be duplicated or distributed by any means without express written permission of NRSI. Data provided by Land Information Ontario (LIO), MNRF© Copyright: Queen's Printer Ontario. Imagery: DNV-GL (2014).

Project: 1756 Date: July 12, 2017	NAD83 - UTM Zone 18 Size: 11x17" 1:14,000
0 200 400 600 800 Meters	

Appendix I
Nation Rise Wind Farm NHA Letter of Confirmation

July 11, 2017

Nation Rise Wind Farm Limited Partnership
110 Spadina Ave, Suite 609
Toronto, ON
M5V 2K4

RE: NHA Confirmation for Nation Rise Wind Farm

Dear Kenneth Little:

In accordance with the Ministry of the Environment and Climate Change's (MOECC's) Renewable Energy Approvals (REA) Regulation (O.Reg.359/09), the Ministry of Natural Resources and Forestry (MNRF) has reviewed the natural heritage assessment (NHA) and environmental impact study (EIS) for the Nation Rise Wind Farm located in the Township of North Stormont and the United Counties of Stormont, Dundas and Glengarry, the final version of which was submitted by Nation Rise Wind Farm Limited Partnership on July 11, 2017.

In accordance with Section 28(2) and 38(2)(b) of the REA regulation, MNRF provides the following confirmations following review of the NHA and EIS:

1. The MNRF confirms that the determination of the existence of natural features and the boundaries of natural features was made using applicable evaluation criteria or procedures established or accepted by MNRF.
2. The MNRF confirms that the site investigation and records review were conducted using applicable evaluation criteria, or procedures established or accepted by MNRF if no natural features were identified.
3. The MNRF confirms that the evaluation of the significance or provincial significance of the natural features was conducted using applicable evaluation criteria or procedures established or accepted by MNRF.
4. The MNRF confirms that the project location is not in a provincial park or conservation reserve.
5. The MNRF confirms that the environmental impact assessment report has been prepared in accordance with procedures established by the MNRF.

In accordance with Section 28(3)(c) and 38(2)(c), MNRF also offers the following comments in respect of the project:

Pre-construction Monitoring

In accordance with Appendix D of the Natural Heritage Assessment Guide, a commitment has been made to complete pre-construction assessments of habitat use for the following candidate significant wildlife habitats:

- Bat Maternity Colony (features BMA-001, 003)
- Turtle Wintering Area (features TWA-001)
- Alvar Habitat (features ALV-001, 002)
- Savannah Habitat (feature SAV-001)
- Tallgrass Prairie Habitat (features TGP-001, 002)
- Amphibian Woodland Breeding Habitat (features AWO-001, 004, 006, 007, 008, 010, 011, 012, 013, 014, 015, 016, 017, 019, 020, 022, 023, 024)
- Open Country Bird Breeding Habitat (feature OCB-001)
- Common Nighthawk Habitat (features CONI-001, 002, 003, 004, 005, 006, 007, 008, 009)
- Eastern Wood Peewee Habitat (features EAWP-001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 013, 014, 015, 016, 017, 018)
- Wood Thrush Habitat (features WOTH-001, 002, 004, 005)
- Mühlenberg's Weissia Habitat (features MUWE-001, 002, 003, 004, 005, 007, 009, 010)
- Monarch Butterfly Habitat (features MONA-001,002, 003, 004, 005, 006)

MNRF has reviewed and confirmed the assessment methods and the range of mitigation options. Pending completion of the assessments and determination of significance, the appropriate mitigation is expected to be implemented, as committed to in the EIS.

Post-construction Monitoring

A commitment has been made in the NHA and EIS to conduct post-construction monitoring, and if determined necessary, implement mitigation measures. For the Nation Rise Wind Farm this includes the following features if they are deemed significant following results of pre-construction monitoring requirements listed above:

- Bat Maternity Colony (features BMA-001, 003)
- Turtle Wintering Area (features TWA-001)
- Alvar Habitat (features ALV-001, 002)
- Savannah Habitat (feature SAV-001)
- Tallgrass Prairie Habitat (features TGP-001, 002)
- Amphibian Woodland Breeding Habitat (features AWO-001, 004, 006, 007, 008, 010, 011, 012, 013, 014, 015, 016, 017, 019, 020, 022, 023, 024)
- Open Country Bird Breeding Habitat (feature OCB-001)
- Common Nighthawk Habitat (features CONI-001, 002, 003, 004, 005, 006, 007, 008, 009)
- Eastern Wood Peewee Habitat (features EAWP-001, 002, 003, 004, 005, 006, 007, 008, 009, 010, 011, 013, 014, 015, 016, 017, 018)
- Wood Thrush Habitat (features WOTH-001, 002, 004, 005)
- Mühlenberg's Weissia Habitat (features MUWE-001, 002, 003, 004, 005, 007, 009, 010)
- Monarch Butterfly Habitat (features MONA-001,002, 003, 004, 005, 006)

In addition, the following confirmed significant wildlife habitats will receive post-construction monitoring, and mitigation outlined in the NHA and EIS will be applied:

- Waterfowl Stopover and Staging Area – Aquatic Habitat (feature WSA-001)
- Amphibian Woodland Breeding Habitat (feature AWO-018)

In addition to the NHA, an Environmental Effects Monitoring Plans (EEMP) that address post-construction monitoring and mitigation for birds and bats must be prepared and implemented. EEMPs for birds and bats must be prepared in accordance with MNRF Guidelines and should be reviewed by MNRF in advance of submitting a REA application to MOECC to minimize potential delays in determining if the application is complete. Comments provided by MNRF with respect to the EEMP must be submitted as part of the application for a REA.

This confirmation letter is valid for the project as proposed in the NHA and EIS. Should any changes be made to the proposed project that would alter the NHA or EIS, MNRF may need to undertake additional review of the NHA and EIS.

Where specific commitments have been made by the applicant in the NHA and EIS with respect to project design, construction, rehabilitation, operation, mitigation, or monitoring, MNRF expects that these commitments will be considered in MOECC's Renewable Energy Approval decision and, if approved, be implemented by the applicant.

In accordance with S.12 (1) of the Renewable Energy Approvals Regulation, this letter must be included as part of your application submitted to the MOECC for a Renewable Energy Approval.

Please be aware that your project may be subject to additional legislative approvals as outlined in the Ministry of Natural Resources' *Approvals and Permitting Requirements Document*. These approvals are required prior to the construction of your renewable energy facility.

If you wish to discuss any part of this confirmation or additional comments provided, please contact Mike Poskin, A/Renewable Energy Coordinator, at 705-755-1362.

Sincerely,



Erin Cotnam
Land Use Planning Supervisor
Regional Operations Division
Ministry of Natural Resources and Forestry

- cc. Dan Thompson, District Manager, MNR Kemptville District
- cc. Mike Poskin, A/Renewable Energy Coordinator, MNRF
- cc. Amy Cameron, Regional Planning Ecologist, MNRF
- cc. Korey Walker, Regional Planner, MNRF
- cc. Mohsen Keyvani, MOECC
- cc. Nick Colella, MOECC
- cc. Zeljko Romic, MOECC

Appendix II
Post-Construction Mortality Monitoring Data Sheet Templates

Overview of templates for Natural Heritage Assessment Reports and Post-construction Mortality Monitoring Reports

Report the data from these forms onto the provided Excel templates. Each form correspond to at least one Excel sheet. Refer to the instructions in the Excel templates and at the top of each form.

Post-construction Field Forms

1. Site Description Form (Carcass searches)
2. Site Description and Carcass
Distribution Form (Carcass searches)
3. Bird/Bat Carcass Searches Form
4. Searcher Efficiency Trials Form
5. Searcher Efficiency Trials Summary Form
6. Carcass Removal Trials Form
7. Carcass Removal Trials Summary Form

Wind Energy Bird and Bat Monitoring Database (post-construction)

1. Site Description Form (Carcass Searches)

Complete one Site Description Form for each turbine search (i.e. Each turbine sampled, once per season). Every turbine should have a unique turbine number, also referenced in other field sheets. Report each Site Description Form as a record in the data template (site_descr_carcass).

Project name : _____

Province : _____ **Turbine number :** _____

Date completed (dd/mm/yyyy) : ____/____/20____

UTM coordinates of the turbine :

Zone: _____ **Easting:** _____ **Northing :** _____

Slope : _____ ° **Orientation of slope :** _____ (e.g., SSW)

Required survey area : _____ m² (e.g. 7,854 m² for 50 m radius)

Transect separation : _____ m

Habitat description :

Distance from the turbine to the following features:

Distance to nearest wood : _____ m

Distance to nearest shoreline : _____ m

Distance to nearest wetland : _____ m

Distance to nearest Significant Wildlife Habitat : _____ m

Type of Significant Wildlife Habitat (eg. hibernacula): _____

Turbine details :

Power : _____ Megawatts

Turbine height (from ground to top of nacelle) : _____ m

Turbine blade diameter : _____ m

Wind Energy Bird and Bat Monitoring Database (post-construction)

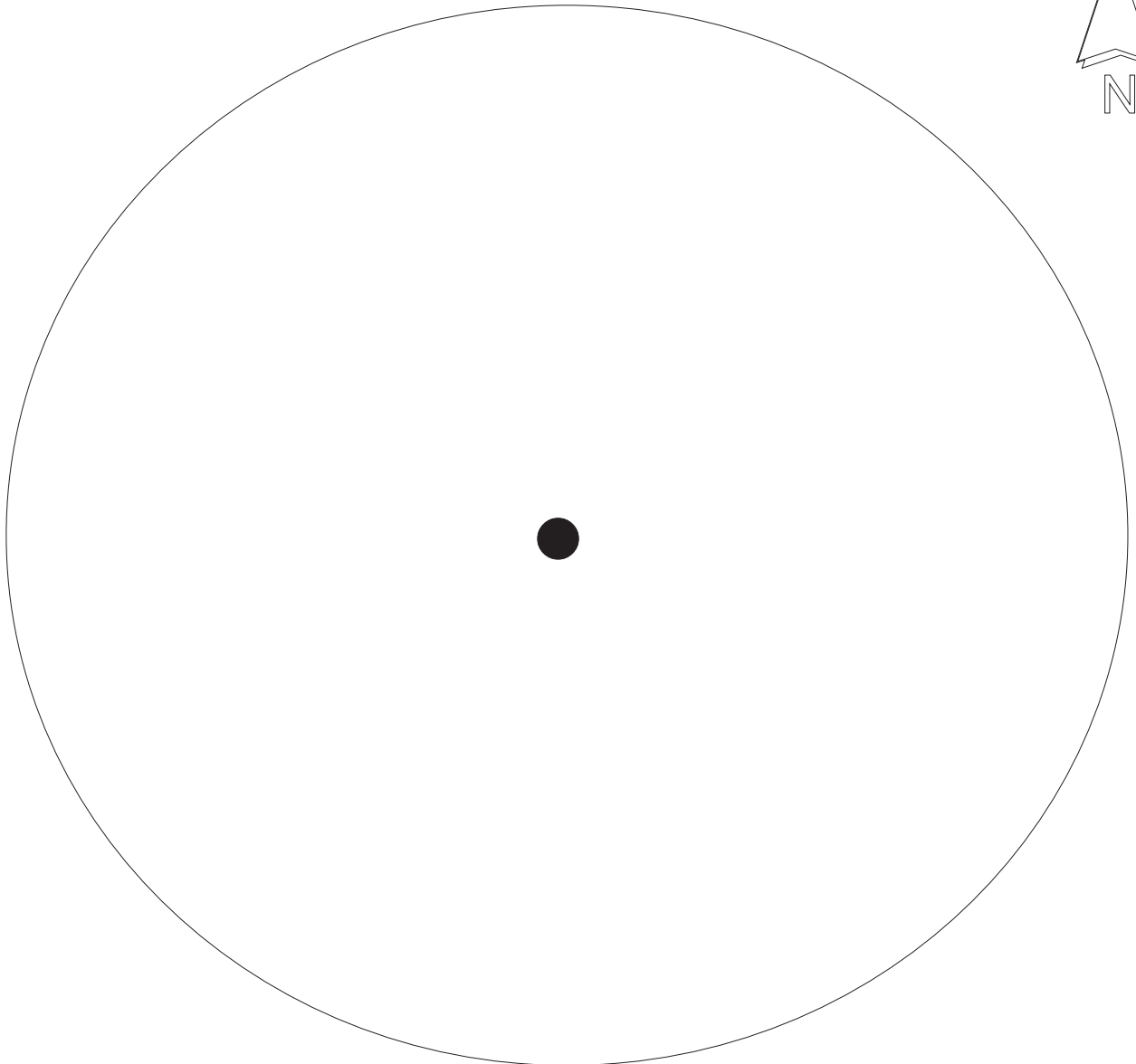
2. Site Description and Carcass Distribution Form (Carcass Searches)

Map the search plot, indicating visibility classes, substrate, carcass locations and area searched
This form should provided for information with the reports, and does not contain information that
needs to be transfered to the Excel data templates.

Project name: _____

Site number : _____

Year : _____



Wind Energy Bird and Bat Monitoring Database (post-construction)

5. Searcher Efficiency Trials Summary Form

Project name: _____ Year : _____

Spring (May-June)

Searcher	Number of carcasses placed	Number scavenged	Number found	Proportion found	Proportion turbines searched	Weighted searcher efficiency Se
Spring Total					100%	

Summer (July-August)

Searcher	Number of carcasses placed	Number scavenged	Number found	Proportion found	Proportion turbines searched	Weighted searcher efficiency Se
Summer Total					100%	

Fall (September-October)

Searcher	Number of carcasses placed	Number scavenged	Number found	Proportion found	Proportion turbines searched	Weighted searcher efficiency Se
Fall Total					100%	

Wind Energy Bird and Bat Monitoring Database (post-construction)

7. Carcass Removal Trials Summary Form

Project name: _____ Year : _____

Spring (May-June)

Turbine Number	Number of carcasses placed (N0)	Number of carcasses found per visit			Scavenger correction SC
		N1	N2	N3	

Spring Total

Summer (July-August)

Turbine Number	Number of carcasses placed (N0)	Number of carcasses found per visit			Scavenger correction SC
		N1	N2	N3	

Summer Total

Fall (September-October)

Turbine Number	Number of carcasses placed (N0)	Number of carcasses found per visit			Scavenger correction Sc
		N1	N2	N3	

Fall Total