

Karst Areas Map (www.dnr.state.oh.us/portals/10/pdf/karstmap.pdf), for additional information. If caves or sinkholes are present within the project area, we recommend further coordination with this office to determine if surveys of these areas are recommended.

Indiana Bat Migratory Habitat

Wind energy facilities in various habitat types across the U.S. and Canada have been documented to cause “widespread and often extensive fatalities of bats” (Arnett *et al.* 2008), primarily during the fall *migratory* season. Further, Indiana bat mortalities have been detected at a wind power facility in Indiana, confirming suspicions that migrating Indiana bats are also susceptible to mortality from wind turbines. At this time, research into the mechanisms that cause mortality of bats at wind power sites is still ongoing, and few operational tools exist to avoid and minimize take — feathering of turbines during times when bats are most at risk has been shown to reduce mortality in some situations. Based on this, we are advising all operating wind farms and wind farms in planning stages within the range of the listed bats that lethal take is a possibility without curtailment of operations at night during the migratory period regardless of whether summer habitat is present or if Indiana bats are detected during summer mist netting. Due to the potential of take during spring and fall migration, we recommend developers evaluate their exposure to the prohibitions of ESA. This is a risk management decision the developer must make. The Service advises you to consider the following two options to ensure violations of the Endangered Species Act (ESA) Section 9 take prohibition do not occur:

- 1) Feather turbines during low wind speed conditions at night during the fall and spring migratory seasons as a way to proactively and definitively avoid take of Indiana bats (and other species of bats as well). Based on the Indiana bat Draft Recovery Plan First Revision (Service, 2007), fall migration generally occurs between August 1 and October 15, and spring migration generally occurs between April 1 and May 15.
- 2) Wind facility developers can work with the Service to apply for an Incidental Take Permit by submitting a Habitat Conservation Plan (HCP), as required under Section 10 of the Endangered Species Act. A HCP can be used to address Indiana bat presence during both summer foraging and migration periods. A HCP does typically require some time and survey effort to complete. Alternatively, you may consider joining in the regional effort to develop a wind power HCP to address Indiana bats and other listed species.

If you plan to implement either of these two options, please contact us for further information.

The proposed project lies within the range of the **rayed bean** (*Villosa fabalis*), a freshwater mussel that is currently proposed for listing as federally endangered. The rayed bean is generally known from smaller, headwater creeks, but records exist in larger rivers. They are usually found in or near shoal or riffle areas, and in the shallow, wave-washed areas of lakes. Substrates typically include gravel and sand, and they are often associated with, and buried under the roots of, vegetation, including water willow (*Justicia americana*) and water milfoil (*Myriophyllum* sp.). Should the proposed project directly or indirectly impact any of the habitat types described above, we recommend that a survey be conducted to determine the presence or probable absence of rayed bean mussels in the vicinity of the proposed site. Any survey should be designed and conducted in coordination with the Endangered Species Coordinator for this office.

The project lies within the range of the **eastern massasauga** (*Sistrurus catenatus catenatus*), a docile rattlesnake that is declining throughout its national range and is currently a Federal Candidate species. The snake is currently listed as endangered by the State of Ohio. Your proactive efforts to conserve this species now may help avoid the need to list the species under the Endangered Species Act in the future. Due to their reclusive nature, we encourage early project coordination to avoid potential impacts to

massasaugas and their habitat. At a minimum, project evaluations should contain delineations of whether or not massasauga habitat occurs within project boundaries.

The massasauga is often found in or near wet areas, including wetlands, wet prairie, or nearby woodland or shrub edge habitat. This often includes dry goldenrod meadows with a mosaic of early successional woody species such as dogwood or multiflora rose. Wet habitat and nearby dry edges are utilized by the snakes, especially during the spring and fall. Dry upland areas up to 1.5 miles away are utilized during the summer, if available. For additional information on the eastern massasauga, including project management ideas, please visit the following website:
<http://www.fws.gov/midwest/Endangered/lists/candidat.html> or contact this office directly.

The proposed project lies within the range of the **Kirtland's warbler** (*Dendroica kirtlandii*), a federally listed endangered species. The Kirtland's warbler is a small blue-gray songbird with a bright yellow breast. This species migrates through Ohio in the spring and fall, traveling between its breeding grounds in Michigan, Wisconsin, and Ontario and its wintering grounds in the Bahamas. During migration, individual birds usually forage in low vegetation and stay in one area for a few days. This species may occur in Ohio in the spring from late April through May and in the fall from late August to early October. The ODNR has recommended 11 passerine migration surveys for the proposed project boundary. We strongly recommend that surveyors note any possible Kirtland's warbler detections during the passerine migration survey, and photo-document the detections if possible. Any sightings should be reported to the Service within 24 hours, or the next business day.

MIGRATORY BIRD COMMENTS:

The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) implements four treaties that provide for international protection of migratory birds. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. While the MBTA has no provision for allowing unauthorized take, the FWS recognizes that some birds may be taken during activities such as wind turbine operation even if all reasonable measures to avoid take are implemented. The U.S. Fish and Wildlife Service's (FWS) Office of Law Enforcement carries out its mission to protect migratory birds not only through investigation and enforcement, but also through fostering relationships with individuals and industries that proactively seeks to eliminate their impacts on migratory birds. Although it is not possible under the MBTA to absolve individuals, companies, or agencies from liability (even if they implement avian mortality avoidance or similar conservation measures), the Office of Law Enforcement focuses on those individuals, companies, or agencies that take migratory birds with disregard for their actions and the law, especially when conservation measures have been developed but are not properly implemented.

At this time, we continue to encourage existing and proposed wind developments to follow current Service recommendations on wind power siting and construction (*Interim Guidelines to Avoid and Minimize Impacts from Wind Turbines – 2003*). The Service also encourages developers to coordinate with Service biologists regarding their projects. Proper coordination will help developers make informed decisions in siting, constructing, and operating their facilities. Additionally, the Service hopes to work cooperatively with wind developers to advance the state of the art of wind power siting, construction, and operation. Advancements in these areas will represent great strides towards the environmentally safe development of this otherwise renewable and clean source of energy.

The Service and ODNR DOW have worked together to develop a recommended bird survey protocol for wind turbine projects. The details of the protocol are provided in ODNR's On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio. ODNR has

documented that the project area qualifies for “extensive” survey effort due to the proximity to possible migratory bird high use areas. We recommend implementation of the ODNR bird survey protocol or alternatively, modification of the project boundary to avoid potential migratory bird high use areas and implementation of the “extensive” survey protocol. Bird survey results will be interpreted to determine if potential risk to birds is relatively high or low in various portions of the project area. Based on survey results we may make recommendations as to turbine placement and operation, or pre- or post-construction monitoring.

Research into the actual causes of bat and bird collisions with wind turbines is limited. To assist Service field staffs in review of wind farm proposals, as well as aid wind energy companies in developing best practices for siting and monitoring of wind farms, the Service published *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (2003). On February 8, 2011, the U.S. Fish and Wildlife Service released the Draft Voluntary, Land-Based Wind Energy Guidelines that have now been published in the Federal Register and are now open for public comment until May 19, 2011. The Guidelines can be found at: <http://www.fws.gov/windenergy>. Until those guidelines are final, the Service recommends following the 2003 Interim Guidelines. We encourage any company/licensee proposing a new wind farm to consider the following excerpted suggestions from the guidelines in an effort to minimize impacts to migratory birds and bats.

- 1) Pre-development evaluations of potential wind farm sites to be conducted by a team of Federal and/or State agency wildlife professions with no vested interest in potential sites;
- 2) Rank potential sites by risk to wildlife;
- 3) Avoid placing turbines in documented locations of federally-listed species;
- 4) Avoid locating turbines in known bird flyways or migration pathways, or near areas of high bird concentrations. (i.e., rookeries, leks, State or Federal refuges, staging areas, wetlands, riparian corridors, etc.) Avoid known daily movement flyways and areas with a high incidence of fog, mist or low visibility;
- 5) Avoid placing turbines near known bat hibernation, breeding, or maternity colonies, in migration corridors, or in flight paths between colonies and feeding areas;
- 6) Configure turbine arrays to avoid potential avian mortality where feasible. (i.e., group turbines and orient rows of turbines parallel to known bird movements) Implement storm water management practices that do not create attractions for birds, and maintain contiguous habitat for area-sensitive species;
- 7) Avoid fragmenting large, contiguous tracts of wildlife habitat. Wherever practical, place turbines on lands already disturbed and away from intact healthy native habitats. If not practical, select fragmented or degraded habitats over relatively intact areas;
- 8) Minimize roads, fences, and other infrastructure. Wherever possible, align collection lines and access roads to minimize disturbance;
- 9) Develop a habitat restoration plan for the proposed site that avoids or minimizes negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. (i.e., avoid attracting prey animals used by raptors;
- 10) Use tubular supports with pointed tops rather than lattice supports to minimize bird perching and nesting opportunities. Avoid placing external ladders and platforms on tubular towers to minimize

perching/nesting. Avoid use of guy wires for turbine or meteorological tower supports. All existing guy wires should be marked with bird deterrents. (Avian Power Line Interaction Committee 1996);

11) If taller turbines (top of rotor-swept area is greater than 199 feet above ground level) require lights for aviation safety, the minimum amount of lighting specified by the Federal Aviation Administration (FAA) should be used. Unless otherwise requested by the FAA, only white strobe lights should be used at night, and should be of the minimum intensity and frequency of flashes allowable;

12) Adjust tower height to reduce risk of strikes in areas of high risk for wildlife;

13) Wherever feasible, place electric power lines underground or on the surface as insulated, shielded wire to avoid electrocution of birds. Use recommendations of the Avian Power Line Interaction Committee (1996) for any required above-ground lines, transformers, or conductors.

The full text of the guidelines is available at <http://www.fws.gov/habitatconservation/wind.pdf>. The Service believes that implementing these guidelines may help reduce mortality caused by wind turbines. We encourage you to consider these guidelines in the planning and design of the project. We particularly encourage placement of turbines away from any large wetland, stream corridor, or wooded areas, including the areas mentioned previously, and avoid placing turbines between nearby habitat blocks.

BALD AND GOLDEN EAGLE COMMENTS:

Bald and golden eagles are included under the Migratory Bird Treaty Act, but are afforded additional legal protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). The Service recently issued a final rule that authorizes issuance of eagle take permits, where the take to be authorized is associated with otherwise lawful activities. If take of bald eagles is likely, based on the best information available, a bald eagle take permit for this project will be necessary. We understand the original project boundary was adjusted to avoid a known bald eagle nest and the Service greatly appreciates this effort to conserve trust resources. However, there are still 3 bald eagle nests within 2 miles of the proposed project boundary, including the proposed transmission line. The closest nest is approximately 1 mile southwest of the end of the transmission line on the Sandusky River. In addition, there are also 20 bald eagle nests within 10 miles of the project boundary. Raptor nest searches and nest monitoring should be conducted in accordance with ODNr's extensive survey protocol to identify any raptors, including bald eagles that may nest in or near the project area. The results of this survey should be coordinated with this office.

On February 8, 2011, the U.S. Fish and Wildlife Service released the Draft Eagle Conservation Plan Guidance that have now been published in the Federal Register and are available for public comment until May 19, 2011. The Guidelines can be found at: <http://www.fws.gov/windenergy>. The Draft Eagle Conservation Plan Guidance was developed to provide interpretive guidance to wind developers, Service biologists who evaluate potential impacts on eagles from proposed wind energy projects, and others in applying the regulatory permit standards as specified by the Bald and Golden Eagle Protection Act and other federal laws. While this guidance is still draft, we believe that it deserves careful attention, as it lays out a proposed process for evaluating risk to eagles from wind power projects and developing an eagle conservation plan, in support of applying for a permit to authorize take. Appendix C of the Draft Eagle Conservation Plan Guidance suggests a monitoring protocol for wind projects. Monitoring data should be interpreted to document potential risk to eagles. If take of eagles is likely, a bald eagle take permit will be necessary.

COORDINATION OF SURVEY RESULTS:

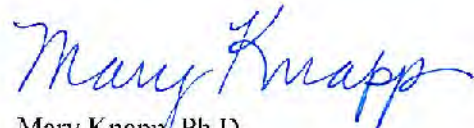
Please submit survey results to this office for review. Survey results will be interpreted to determine areas with relatively low bat and bird activity/diversity as opposed to areas with relatively high bat and bird activity/diversity. Based on the survey results, we may make recommendations as to turbine placement and operation, additional consultation under Section 7 or 10 of the Endangered Species Act of 1973, as amended, additional permits under the Bald and Golden Eagle Protection Act, or pre- or post-construction monitoring.

POST CONSTRUCTION MONITORING:

The Service recommends the project be monitored post-construction to determine impacts to migratory birds and bats. A specific post-construction monitoring plan should be prepared and reviewed by the Service and should include a scientifically robust, peer reviewed methodology of mortality surveys. We recommend that the post-construction monitoring protocol be developed based on the results of pre-construction monitoring, and look forward to working with the project proponent to develop this document.

Thank you for the opportunity to provide comments on this proposed project. If you have questions, or if we may be of further assistance in this matter, please contact Melanie Cota at extension 15 in this office or by email at Melanie_Cota@fws.gov or visit our website at <http://www.fws.gov/midwest/Ohio>.

Sincerely,



Mary Knapp, Ph.D.
Supervisor

Cc: Ms. Jennifer Norris, ODNR, Olentangy Wildlife Research Station, Ashley, OH
Mr. Brian Mitch, ODNR, REALM, Columbus, OH

Attachment: USFWS Permitted Indiana bat Surveyors in Ohio



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994
December 13, 2010

USFWS permittees for Indiana bat surveys in Ohio*

| | |
|---|---|
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*This list reflects permit data available as of December 13, 2010, and is subject to periodic revision to reflect permit changes

From: [Jennie Geiger](#)
To: "Lott, Keith"; Jennifer.Norris@dnr.state.oh.us
Cc: [Dave Phillips](#); [Scott Hawken](#); [John Arehart III \(john.arehart@apexcleanenergy.com\)](mailto:John.Arehart@apexcleanenergy.com); [Dalton Carr](#)
Subject: BUSINESS CONFIDENTIAL: Apex-Long Prairie Meeting Follow-Up
Date: Thursday, December 10, 2015 1:06:06 PM
Attachments: [Long Prairie Meeting Summary FINAL 2015-12-10.pdf](#)
[image001.png](#)

Hi Keith and Jenny –

Attached is the summary of our December 3, 2015 meeting, including the presentation. If you have comments on the meeting summary, or find that edits are needed, please let me know and I will revise accordingly before finalizing. Otherwise, if you could confirm that the summary accurately reflects our discussion and your recommendations at this time, that would be much appreciated.

Thanks,
Jennie

JENNIE GEIGER
Environmental Permitting Manager

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REPUBLIC WIND PROJECT - AGENCY MEETING SUMMARY

Meeting Attendees: Keith Lott, USFWS
Jennifer Norris, ODNR
Jennie Geiger, Apex
John Arehart, Apex
Dalton Carr, Apex
Dave Phillips, Apex (by phone)

Prepared by: Apex

Date: December 10, 2015

On December 3, 2015, Apex Clean Energy (Apex) met with the U.S. Fish and Wildlife Service (USFWS) and Ohio Department of Natural Resources (ODNR) to discuss the proposed Republic Wind Project (Project) located in Seneca County, Ohio. The purpose of this meeting was to update the agencies on Project status, discuss Tier 3 studies completed to date, and agree upon next steps. The meeting was held at the USFWS Office in Columbus, Ohio. The attached Powerpoint presentation was discussed and the following is a summary of the topics discussed.

Avian Studies: The group agreed that avian studies conducted to date meet ODNR requirements and are sufficient to adequately assess and respond to avian risk. There was agreement that these data demonstrate this is a low risk site in regards to eagles and that a take permit was not warranted; however, general risk reduction measures (e.g., carrion removal, operations staff training) and post-construction monitoring to confirm low risk conclusions were appropriate.

Bats: The group agreed that studies conducted to date meet ODNR requirements and are sufficient to adequately assess and respond to risk to bats. USFWS indicated that a Technical Assistance Letter (TAL) could be issued for the Project in response to Apex committing to implement impact avoidance measures to avoid risk to federally-listed bats. The group discussed the merits of analyzing bat telemetry data collected during mist net surveys to determine if federally-listed bats were inactive in certain conditions during summer (e.g., windspeed, precipitation, distance from habitat, etc.) and potentially incorporate a reduced windspeed or weather variable into the curtailment being considered during summer.

Other: Although impacts to state-protected species are not expected to be significant, ODNR encouraged the implementation of a Voluntary Cooperation Agreement between the Project and ODNR to address liability associated with potential take of protected wildlife. No additional studies are recommended by USFWS and ODNR to determine appropriate impact avoidance measures and for the Project to proceed through the Ohio Power and Siting Board permitting process.

Action Items:

- Apex will review the ODNR Voluntary Cooperation Agreement and work with ODNR to reach agreement on content.
- Apex will send a TAL term sheet to USFWS for review as soon as possible.

Jennie Geiger

From: Lott, Keith <keith_lott@fws.gov>
Sent: Wednesday, February 24, 2016 9:05 AM
To: Dave Phillips
Cc: Jennie Geiger; John Arehart III; Dalton Carr
Subject: Re: BUSINESS CONFIDENTIAL: Republic Wind Project Follow-Up

Dave et al.,

Typically we use a 5 mile buffer for instances where the maternity roost tree has not been located. Which is this case with this project. Then I went back and looked at our "Indiana Bat Section 7 and Section 10 Guidance for Wind Energy Projects", which appears to run contrary to our general office guidance. Within that document it says that "all suitable habitat within 2.5 miles of the line drawn between the two documented roost trees unless the distance between the capture location(s) and roost tree is larger. In that case, use the longer distance to create the polygon."

Because at least 2 roost trees were identified during both the 2011 and 2015 surveys I'll revised the buffer size to 2.5 miles within our database.

Keith

On Wed, Feb 24, 2016 at 8:02 AM, Dave Phillips <dave.phillips@apexcleanenergy.com> wrote:

Hi Keith,

Thanks for this information. However, I don't understand your expectation for curtailment within 5 miles of the Indiana bat capture during summer. Can you please explain the basis for this recommendation, as it is entirely inconsistent with other states in Region 3 and seems overly conservative, especially given the telemetry data we have for the Indiana bat captured at this site last year, in which all locations are within an area less than 1sq. mi.

Thanks, Dave

DAVE PHILLIPS

office: [434-282-2104](tel:434-282-2104) | cell: [434-906-9127](tel:434-906-9127)

dave.phillips@apexcleanenergy.com



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From: Lott, Keith [mailto:keith_lott@fws.gov]
Sent: Wednesday, February 24, 2016 7:25 AM
To: Jennie Geiger <jennie.geiger@apexcleanenergy.com>
Cc: Dave Phillips <dave.phillips@apexcleanenergy.com>; John Arehart III <john.arehart@apexcleanenergy.com>; Dalton Carr <dalton.carr@apexcleanenergy.com>
Subject: Re: BUSINESS CONFIDENTIAL: Republic Wind Project Follow-Up

Jennie,

We've been discussing Technical Assistance Letter (TAL) components within the region recently, and also have discussed them with ODNR relative to several wind projects in Ohio.

Below we present our final recommendations for obtaining a TAL from the Service for Republic. We request that you incorporate these components into a letter and send it to our office. We are prepared to respond quickly with a TAL response letter. Note that technical assistance letters are intended to document measures to **avoid** take of Indiana bats (and Northern long-eared bats, though take for this species is currently exempted under a 4(d) rule). The measures described below should result in avoidance, based on the best scientific information we have available relative to Indiana bat biology and impacts to Indiana bats from wind projects in Northwest Ohio and elsewhere. If you were to instead develop an HCP and obtain an incidental take permit, some take would be allowed to occur, thus the below measures could be negotiated. To date we have issued three TA letters in Ohio, and all have the same measures in order to avoid take of Indiana bats during migration. I have added a separate bullet for summer that was not included in the other TALs since they did not have summer risk. Please let me know if you have questions.

Keith

- Cut-in speed should be set at 6.9 m/s in spring and fall (see dates below). This is the speed at which the Service has determine that take of Indiana bats during migration is unlikely to occur based on Indiana bat morphology, behavior, and bat mortality rates at cut-in speed studies at existing wind projects.
- Spring dates should be **March 15-May 15**. We reviewed OH and IN data on Indiana bat spring migration and arrival at maternity colonies. This data showed that Indiana bats arrive at maternity colonies in IN and OH as early as the first week in April. This was documented at multiple sites and in multiple years, and so we assume migration can occur earlier than April 1. These "spring" dates are consistent with what Indiana is recommending in their TA letters. The single spring Indiana bat mortality was documented on April 14, and this date range incorporates this mortality.
- Fall dates should be **Aug. 1-Oct. 31**. We reviewed OH and IN data on Indiana bat departure from maternity colonies. This data showed that individual Indiana bats may stay at maternity colonies into late October. This was documented at multiple sites and in multiple years, and so we assume that migration can occur later into October. Further, Indiana bat fall mortalities have been detected on the following dates: Sept. 26, Sept. 11, Sept. 18, Oct. 3, and Oct. 10. When considering all-bat mortality, it is clear from post-construction studies in Ohio that monthly bat mortality rates vary between years. This may be related to weather patterns. Thus, all bat and Indiana bat migration may occur later in the year if warmer weather occurred later into Oct. Thus, we believe it is appropriate to extend the fall migration season through the end of October. **Very little bat mortality has been detected in**

Nov. at any of the wind projects in Northwest Ohio. Typically we assume Indiana bats have arrived at their hibernaculum by Nov, and thus would not be at risk at this project location in Nov.

- Technical assistance letters are intended to document measures to avoid take of Indiana bats. The Service does not have data indicating temperature thresholds at which Indiana bats are not active during the spring and fall migration periods. Thus temperature thresholds are not appropriate. This is consistent with the approach in TA letters issued by other states.
- Cut-in speeds should be implemented from 1/2 hr before sunset to 1/2 hr after sunrise. This is consistent with the approach in TA letters issued by other states.
- Monitoring will be necessary to document avoidance of take. ODNR currently requires up to 2 years of post-construction monitoring using their protocol. This is sufficient for the first two years of implementation of the TAL. Monitoring beyond 2 years will be determined at a later date based on the effectiveness of TAL in avoiding take during the first 2 years.
- Because Republic has documented Indiana bats within the project area during the summer, to avoid take of Indiana bats that may occur during summer, thus the 6.9 m/s cut-in speed should also be used from May 15 - July 31 for those areas within the 5-mile buffer of the capture location. This should be sufficient to avoid take of summering Indiana bats.

On Mon, Feb 22, 2016 at 2:21 PM, Jennie Geiger <jennie.geiger@apexcleanenergy.com> wrote:

Hi Keith -

Thanks for taking the time to speak with me last week and providing FWS guidance to ensure take of federally listed bats does not occur at our Republic Wind Project. As agreed, Apex will feather blades below wind speeds of 6.9 m/s from 30 mins before sunset to 30 mins after sunrise at all turbines during migration (Apr 1-May 31 and Aug 1-Oct 31), and at turbines within 2.5 miles of identified Indiana bat (IBAT) maternal roost trees during summer (Jun 1-Jul 31). Apex reached out to Copperhead Consulting for their technical expertise on the IBAT roost trees, and they confirmed that the trees were maternal in nature and that a 2.5 mile curtailment buffer was well within industry standards.

Apex will conduct any necessary tree clearing within 2.5 miles of identified IBAT roosts between Nov 1 and Mar 31, and within 150 feet of northern long-eared bat roosts between Aug 1 and May 31, to avoid impacts to roosting bats. We will also provide you with information on impacts to forested areas once the layout is complete so FWS can assess potential impacts of clearing habitat on the species.

Please review and let me know that I have captured our discussion accurately. If you have any questions or need additional information at this time, please don't hesitate to contact me.

Thanks,
Jennie

JENNIE GEIGER
Environmental Permitting Manager

Apex Clean Energy, Inc.
310 4th St. NE, Suite 200, Charlottesville, VA 22902
office: 434-260-6982 | cell: 720-320-9450 | fax: 434-220-3712

jennie.geiger@apexcleanenergy.com<mailto:jennie.geiger@apexcleanenergy.com> | www.apexcleanenergy.com<<http://www.apexcleanenergy.com>/>

[cid:image001.png@01CE6DB9.0BF695D0]<<http://www.apexcleanenergy.com>/>

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Fax: (614) 416-8994

From: [Lott, Keith](#)
To: [Jennie Geiger](#)
Cc: [Dave Phillips](#); [John Arehart III](#); [Dalton Carr](#)
Subject: Re: BUSINESS CONFIDENTIAL: Republic Wind Meeting Follow Up
Date: Monday, August 29, 2016 8:23:05 AM
Attachments: [Republic Wind internerst distance 8292016.pdf](#)

Jennie et al.,

This morning I edited our eagle nest layer to reflect changes from your survey. The new 1/2 eagle nest distance is 1.00 miles. There are two nests within the buffer (one confirmed, one unconfirmed) and three nests right along the border (map attached).

As for the Indiana bat roost, since multiple roost trees were identified, but none were the primary roost tree, we'll average the location of the two identified roosts (-82.9447775, 41.21847). There will be a 2.5 mile buffer on this average roost.

Let me know if you have any questions.

Keith

On Wed, Aug 24, 2016 at 8:46 AM, Jennie Geiger <jennie.geiger@apexcleanenergy.com> wrote:

Hi Keith -

Attached are the following:

- a summary of our August 17, 2016 meeting, including a copy of the PPT presentation
- shapefiles for the revised project boundary
- shapefiles from our 2016 eagle nest surveys

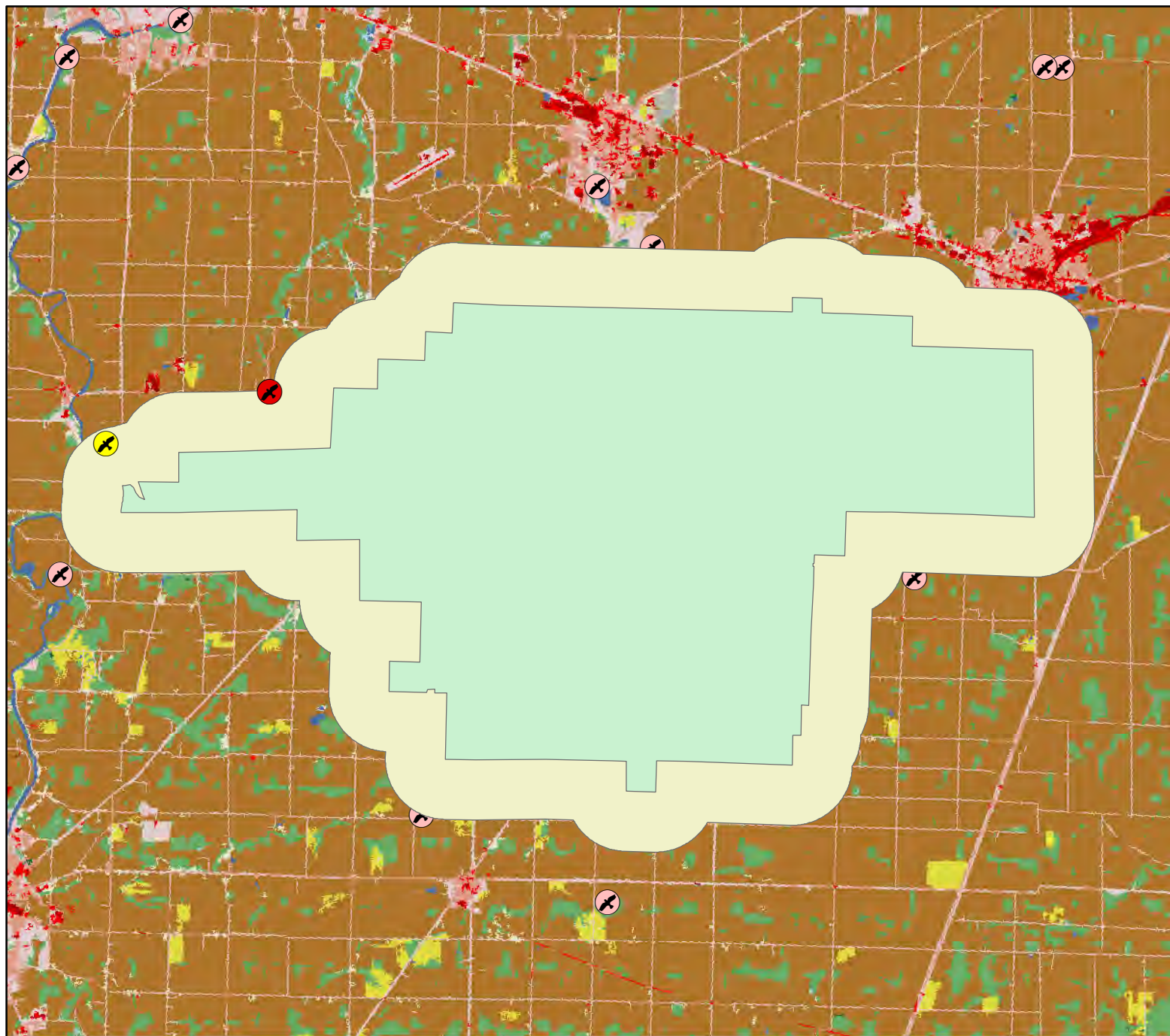
Please let me know if you have comments on the meeting notes or need additional information at this time.

Also, could you please provide us with a shapefile of the Indiana bat roost buffer that you are utilizing for this project along with any new eagle nests and the re-calculated ½ eagle inter-nest distance for our use in designing the project?

Thanks,
Jennie

JENNIE GEIGER
Environmental Permitting Manager

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office: 434-260-6982 | cell: 720-320-9450 | fax: 434-220-3712
jennie.geiger@apexcleanenergy.com | <http://www.apexcleanenergy.com>



Republic_eagle_nest_within_buffer_8_29_2016

Status



Confirmed



Unconfirmed

REP_ProjectBoundary_20160818

Republic_eagle_nest_buffer_8_29_2016

Bald eagle nest

Status



Confirmed



Unconfirmed

REPUBLIC WIND PROJECT - MEETING SUMMARY

Meeting Attendees: Keith Lott, USFWS
Jennifer Norris, ODNR
Dave Kohler, ODNR
Katie Parsons, ODNR
Dave Phillips, Apex
Jennie Geiger, Apex
Dalton Carr, Apex
Sarah Moser, Apex

Notes Prepared by: Apex

Date: August 23, 2016

On August 17, 2016, Apex Clean Energy (Apex) met with the U.S. Fish and Wildlife Service (USFWS), and Ohio Department of Natural Resources (ODNR) to discuss the Republic Wind Project in Seneca County, Ohio. The purpose of the meeting was to present a revision to the project boundary, discuss the results of additional bat studies completed to date, and agree on any necessary next steps to complete in advance of submittal of an Ohio Power Siting Board (OPSB) permit application. The meeting was held at the USFWS Office in Columbus, Ohio. The attached Powerpoint presentation was provided and the following is a summary of the topics discussed.

Avian Studies: It was agreed that avian studies conducted to date are sufficient to adequately assess the revised area and respond to avian risk for purposes of OPSB permit submittal. The group agreed that siting turbines a minimum of ½ inter-nest distance from existing eagle nests is appropriate to minimize risk to the species and that no take permit is warranted. USFWS indicated that they will provide locations of additional eagle nests near the project and re-calculate the ½ inter-nest distance setback recommendation based on the revised project boundary. USFWS will review the revised boundary and provide additional avian recommendations, if warranted.

Bats: Apex reviewed existing bat information and presented results from the 2016 mist-net bat surveys. The group agreed that studies conducted to date meet ODNR and USFWS requirements and are sufficient to adequately assess and respond to risk to bats in the revised project area for purposes of OPSB permit submittal. Avoidance and minimization measures recommended by USFWS in an email dated February 24, 2016 to avoid take of Indiana bats and northern long-eared bats were discussed and confirmed. USFWS stated they will issue a technical assistance letter (TAL) upon receiving a term sheet from Apex committing to implement these measures, as outlined below:

- Feather all turbines at winds up to 6.9 m/s from 30 mins before sunset to 30 mins after sunrise during spring (Mar 15 – May 15) and fall (Aug 1 – Oct 31) migration.
- Feather turbines within 2.5 miles of the Indiana bat roost location at winds up to 6.9 m/s from 30 mins before sunset to 30 mins after sunrise during summer (May 16 – Jul 31).
- Conduct post-construction monitoring in accordance with ODNR guidelines.

In addition to the terms outlined above, it was agreed that any necessary tree clearing will be conducted as follows to avoid impacts to roosting bats:

- Minimize tree clearing, and clear trees if necessary:
 - From Oct 1 – May 31 within 2.5 miles of the Indiana bat roost location identified within the project (see PPT slide 7).
 - From Aug 1 – May 31 within 150 feet of identified northern long-eared bat roosts (see PPT slide 7).

Other: Apex and ODNR discussed some aspects of the Voluntary Cooperation Agreement. Apex indicated that it would provide ODNR edits for discussion.

Action Items:

- Apex to provide shapefiles of the revised boundary to ODNR and USFWS.
- USFWS to recalculate ½ inter-nest distance based on current eagle nest data and provide recommendations.
- Apex to provide comments to ODNR on the Voluntary Cooperation Agreement.

From: Jennie Geiger
To: [Dave Phillips \(dave.phillips@apexcleanenergy.com\)](mailto:dave.phillips@apexcleanenergy.com)
Subject: FOR REVIEW: Email to ODNR on REP
Date: Wednesday, February 22, 2017 12:11:00 PM
Attachments: [Republic_USFWS_ODNR_Meeting_Summary_2016-08-23.pdf](#)
[image001.png](#)

Hi Kate –

Thank you for the call today. Attached are the meeting notes from our August 17, 2016 meeting with USFWS and ODNR on the Republic Wind Project for your records. As I mentioned on the phone, there have been some minor adjustments to the Project boundary since the August meeting. I will send you the revised boundary as soon as it is finalized for your review and final comment.

Thanks,
Jennie

JENNIE GEIGER
Environmental Permitting Manager

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REPUBLIC WIND PROJECT - MEETING SUMMARY

Meeting Attendees: Keith Lott, USFWS
Jennifer Norris, ODNR
Dave Kohler, ODNR
Katie Parsons, ODNR
Dave Phillips, Apex
Jennie Geiger, Apex
Dalton Carr, Apex
Sarah Moser, Apex

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Date: August 23, 2016

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Action Items:

- Apex to provide shapefiles of the revised boundary to ODNR and USFWS.
- USFWS to recalculate ½ inter-nest distance based on current eagle nest data and provide recommendations.
- Apex to provide comments to ODNR on the Voluntary Cooperation Agreement.

From: [Lott, Keith](#)
To: [Jennie Geiger](#)
Subject: Re: Republic Wind Follow Up
Date: Friday, March 3, 2017 11:14:14 AM

Jennie,

That is correct. Based upon the project area maps that we have been provided, this project falls outside of areas where we have known occurrences or what we consider suitable habitat for the eastern massasauga.

Keith

On Fri, Mar 3, 2017 at 10:59 AM, Jennie Geiger <jennie.geiger@apexcleanenergy.com> wrote:

Hi Keith -

As a follow up to our phone call yesterday, this email is to confirm that the eastern massasauga is not a species of concern within the Republic Wind Project and surveys are not necessary.

Thanks,
Jennie

JENNIE GEIGER
Environmental Permitting Manager

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--
Keith Lott
Wildlife Biologist

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Phone: (614) 416-8993 ext. 31
Fax: (614) 416-8994

Jennie Geiger

From: Lott, Keith <keith_lott@fws.gov>
Sent: Thursday, June 29, 2017 6:47 AM
To: Jennie Geiger
Subject: Re: Responses regarding eagle questions

Jennie,

I calculated the revised 1/2 inter-nest distance this morning. Based on the revised project boundary the new value is 1.17 miles.

Keith

On Mon, Jun 26, 2017 at 9:18 AM, Jennie Geiger <jennie.geiger@apexcleanenergy.com> wrote:

Thanks Keith – sorry about that! Please see attached.

JENNIE GEIGER

office: 434-260-6982 | cell: 720-320-9450

jennie.geiger@apexcleanenergy.com



From: Lott, Keith [mailto:keith_lott@fws.gov]
Sent: Monday, June 26, 2017 8:37 AM
To: Jennie Geiger <jennie.geiger@apexcleanenergy.com>
Subject: Re: Responses regarding eagle questions

Jennie,

I'd be happy to recalculate the new inter-nest distance, but I need a shapefile of the new project boundary, instead of a PDF.

Thanks,

Keith

On Thu, Jun 22, 2017 at 4:51 PM, Jennie Geiger <jennie.geiger@apexcleanenergy.com> wrote:

Hi Keith –

Thank you for your email. As requested, I have attached a map of the current Republic boundary and the location of all known eagle nests in proximity to the Project. The new nest in the NW portion of the Project is still within the official Project boundary; however, no turbines are planned within 1.9 miles of the nest. We were unable to completely remove the nest from the boundary as we are still considering two transmission line options, one of which would run along the western boundary of the parcel where the nest is located (approximately 0.4 miles from nest).

Based on the ½ inter-nest setbacks that we have implemented around all nests, and the low use of the site by eagles as illustrated through previous Stage 2 surveys, we consider this a low risk site to eagles with no permit warranted and no further surveys warranted. If you disagree, please let me know. Also, can you please recalculate the ½ inter-nest distance based on the discovery of the new nest to inform our new setbacks?

Thanks,

Jennie

JENNIE GEIGER

office: 434-260-6982 | cell: 720-320-9450

jennie.geiger@apexcleanenergy.com



From: Lott, Keith [mailto:keith_lott@fws.gov]
Sent: Thursday, May 25, 2017 9:27 AM
To: Jennie Geiger <jennie.geiger@apexcleanenergy.com>
Subject: Responses regarding eagle questions

Jennie,

I got your message regarding how Apex plans on changing their project boundary in response to the discovery of a new eagle nest in the western portion of the project. When they are available I'd still like to see a map of the revised project boundary and the location of the new nest. I did talk to Chris Mensing from our East Lansing Field Office, he's directly involved in the eagle protocols and is willing to meet with Apex once we assess the revised project boundary and it's relationship to the new nest.

Regarding Long Prairie, I think the level of survey effort within the previous boundary continues to be sufficient to assess risk, as long as nothing has changed (e.g., a new nest has been established near the project). I would recommend a nest survey new portion of the project area as well.

Let me know if you have any questions.

Keith

--

Keith Lott

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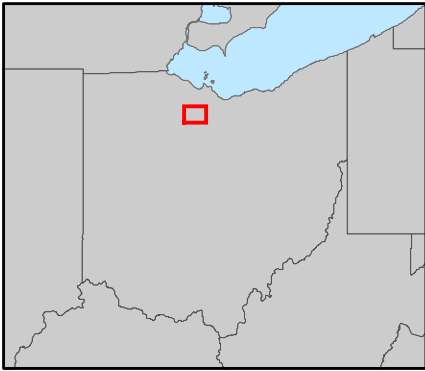
U.S. Fish and Wildlife Service

4625 Morse Road, Suite 104

Columbus, Ohio 43230

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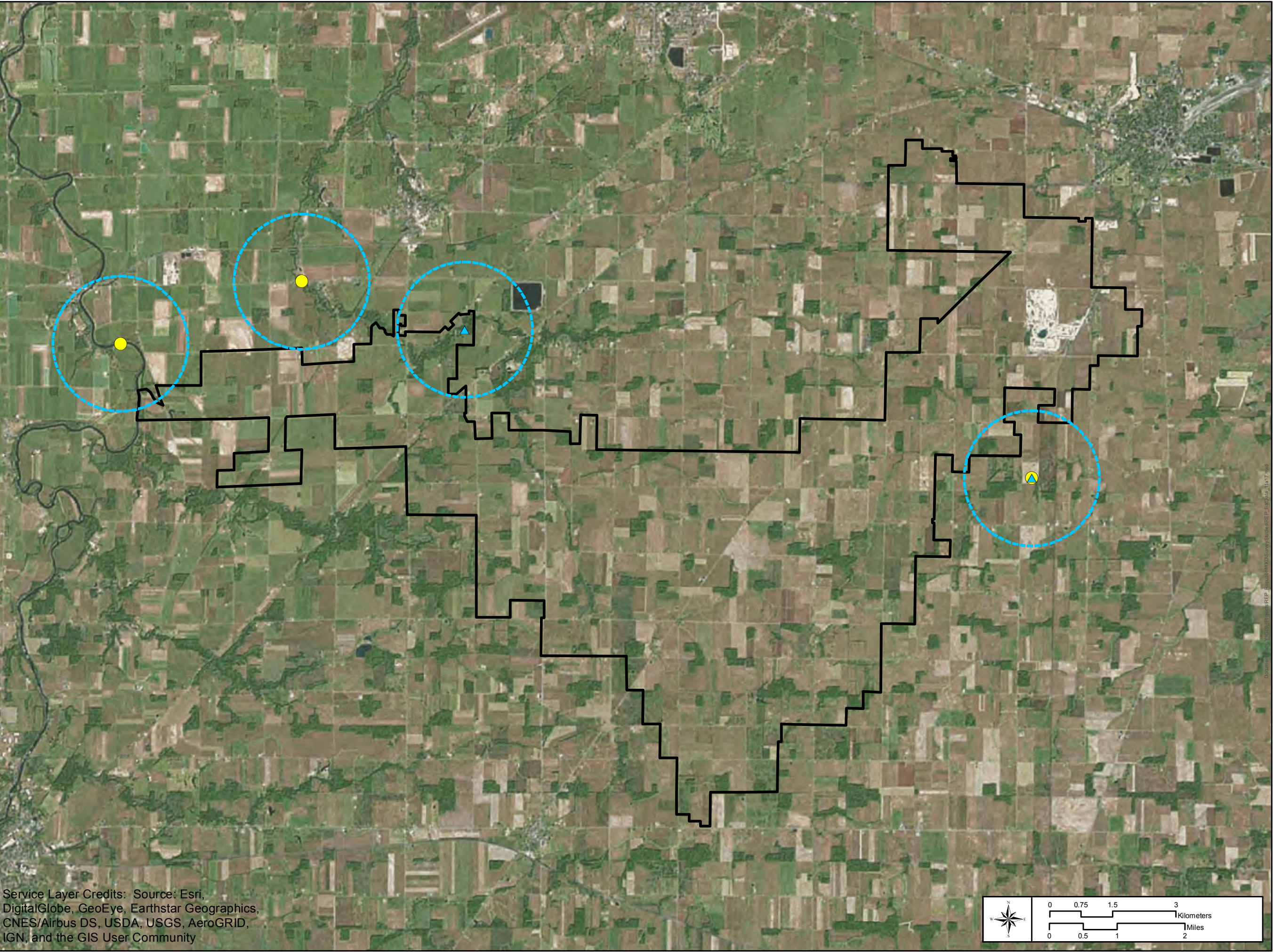
Fax: (614) 416-8994



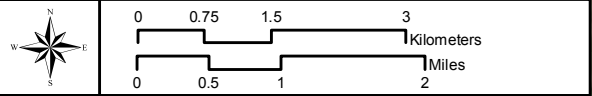
Republic:
Eagle Nests

- ▲ 2017 BAEA Nest
- 2016 BAEA Nest
- 1/2 inter-nest distance (1.00 mi)
- ▭ Project Boundary

Date: 6/22/2017 Author: SML
Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
Units: Foot US



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Document: \\ms01\projects\REP_República\GIS\MapDocs\REP_BAENests_1x17.mxd

Republic Wind Project

APPENDIX

F

WETLAND AND WATERBODY IMPACT TABLES

Table F-1 - Anticipated Wetland Impacts for the Apex Republic Wind Project

| | | | | | | | | | | | TURBINES | | | | ACCESS ROADS | | | | COLLECTION LINES | | | |
|------------|----------|--------------------------|---------------------------|---------------------------|--------------|------------|------------------|----------------------------|---|------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------------------------|---------------------------|---------------------------|---------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | | | | | | | | | | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | |
| Wetland ID | County | Latitude of Center Point | Longitude of Center Point | Acres within Project Area | Wetland Type | ORAM Score | Wetland Category | Anticipated Jurisdictional | Drainage Basin | Crossed (Yes/No) | Turbine Impact (s.f.) | Turbine Impact (acre) | Turbine Impact (s.f.) | Turbine Impact (acre) | Access Road Impact (s.f.) | Access Road Impact (acre) | Access Road Impact (s.f.) | Access Road Impact (acre) | Collection Line Impact (s.f.) | Collection Line Impact (acre) | Collection Line Impact (s.f.) | Collection Line Impact (acre) |
| WOH-002 | Seneca | 41.201968 | -83.034263 | 0.28 | PEM | 10 | 1 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-003 | Seneca | 41.190625 | -83.012886 | 0.94 | PEM/PFO | 41 | Modified 2 | No | Sugar Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-004 | Seneca | 41.192700 | -83.043890 | 0.84 | PFO | 47.5 | 2 | No | Beaver Creek, Sugar Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-006 | Seneca | 41.204589 | -83.020032 | 0.58 | PEM/PFO | 48.5 | 2 | Yes | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-007 | Seneca | 41.205141 | -83.002509 | 0.83 | PEM/PFO | 56 | 2 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-008 | Seneca | 41.154758 | -82.944182 | 28.97 | PEM/PFO | 78 | 3 | Yes | Westerhouse Ditch | Yes | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 847 | 0.02 | 0 | 0.00 |
| WOH-009 | Seneca | 41.160548 | -82.959679 | 6.07 | PFO | 51 | 2 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-010 | Seneca | 41.165705 | -82.948423 | 4.31 | PEM/PFO | 49 | 2 | Yes | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-101 | Seneca | 41.221805 | -83.709945 | 0.91 | PEM | 54 | 1 | Yes | Indian Creek - Sandusky River | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-106 | Seneca | 41.216242 | -83.041332 | 0.1 | PEM | 5 | 1 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-107 | Seneca | 41.213152 | -83.039569 | 0.42 | PEM | 28 | 1 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-108 | Seneca | 41.207756 | -83.041203 | 4.2 | PFO | 55 | 2 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-109 | Seneca | 41.205033 | -83.040217 | 0.14 | PFO | 48 | 2 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-110 | Seneca | 41.203937 | -83.045129 | 2.73 | PFO | 67 | 3 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-111 | Seneca | 41.202879 | -83.046153 | 2.13 | PFO | 67 | 3 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-122 | Seneca | 41.195529 | -83.018252 | 4.16 | PFO | 60 | 2 | No | Beaver Creek, Westerhouse Ditch | Yes | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 10 | 0.00 | 0 | 0.00 |
| WOH-123 | Seneca | 41.186764 | -83.026634 | 1.05 | PFO | 45 | 2 | No | Sugar Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-124 | Seneca | 41.181940 | -83.026110 | 0.15 | PFO | 43 | Modified 2 | No | Sugar Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-125 | Seneca | 41.180627 | -83.027909 | 3.84 | PFO | 56 | 2 | No | Sugar Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-126 | Seneca | 41.181471 | -83.024988 | 0.84 | PFO | 48 | 2 | No | Sugar Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-127 | Seneca | 41.179755 | -83.022584 | 0.16 | PFO | 51 | 2 | No | Sugar Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-128 | Seneca | 41.176205 | -83.018391 | 0.37 | PFO | 31 | 1 | No | Sugar Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-129 | Seneca | 41.175564 | -83.005209 | 0.28 | PEM | 10 | 1 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-130 | Seneca | 41.176763 | -83.004862 | 0.24 | PFO | 46 | 2 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-131 | Seneca | 41.162911 | -82.990186 | 6.19 | PFO | 60 | 2 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-132 | Seneca | 41.133728 | -82.964188 | 1.52 | PFO | 65 | 3 | No | Morrison Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-136 | Seneca | 41.180942 | -82.876640 | 0.33 | PEM/PFO | 42.5 | Modified 2 | No | Pickerel Creek-Frontal Sandusky Bay | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-137 | Seneca | 41.185628 | -82.886756 | 0.86 | PEM | 30 | 1 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-138 | Seneca | 41.192356 | -82.891760 | 0.45 | PEM | 42.5 | Modified 2 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-140 | Seneca | 41.199828 | -82.922442 | 1.71 | PFO | 41 | Modified 2 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-141 | Seneca | 41.167043 | -82.954935 | 0.27 | PEM | 16 | 1 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-142 | Seneca | 41.167209 | -82.957386 | 0.09 | PEM | 19 | 1 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-144 | Seneca | 41.163863 | -82.950640 | 0.02 | PEM | 25.5 | 1 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-145 | Seneca | 41.195810 | -82.898428 | 0.45 | PEM | 35 | Modified 2 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-200 | Sandusky | 41.266449 | -82.917019 | 0.59 | PFO | 19 | 1 | No | Pickerel Creek-Frontal Sandusky Bay, Raccoon Creek-Frontal Sandusky Bay | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-201 | Sandusky | 41.260036 | -82.908767 | 0.12 | PEM | 6 | 1 | No | Pickerel Creek-Frontal Sandusky Bay | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-202 | Seneca | 41.232944 | -82.845721 | 0.28 | PFO | 28 | 1 | Yes | Pickerel Creek-Frontal Sandusky Bay | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-203 | Seneca | 41.235834 | -82.847672 | 0.01 | PSS | 17 | 1 | No | Pickerel Creek-Frontal Sandusky Bay | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-204 | Seneca | 41.225412 | -82.917667 | 1.03 | PFO | 23 | 1 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-205 | Seneca | 41.225558 | -82.914889 | 0.13 | PEM | 16 | 1 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-208 | Seneca | 41.206005 | -82.922117 | 0.03 | PFO | 55 | 2 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-209 | Seneca | 41.205893 | -82.924472 | 0.02 | PFO | 55 | 2 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-210 | Seneca | 41.203101 | -82.917019 | 5.19 | PEM | 22 | 1 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-211 | Seneca | 41.201617 | -82.914577 | 13.31 | PEM | 28 | 1 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-212 | Seneca | 41.206968 | -82.901503 | 4.75 | PEM | 11 | 1 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-213 | Seneca | 41.191198 | -82.905287 | 0.17 | PEM | 7 | 1 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-221 | Seneca | 41.188515 | -82.935231 | 8.29 | PEM | 20 | 1 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-222 | Seneca | 41.183686 | -82.937197 | 1.32 | PSS/PFO | 52 | 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-223 | Seneca | 41.183172 | -82.935594 | 0.04 | PFO | 48 | 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |

Table F-1 - Anticipated Wetland Impacts for the Apex Republic Wind Project

| | | | | | | | | | | | TURBINES | | | | ACCESS ROADS | | | | COLLECTION LINES | | | |
|----------------|--------|--------------------------|---------------------------|---------------------------|--------------|------------|------------------|----------------------------|-------------------|------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------------------------|---------------------------|---------------------------|---------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | | | | | | | | | | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | |
| Wetland ID | County | Latitude of Center Point | Longitude of Center Point | Acres within Project Area | Wetland Type | ORAM Score | Wetland Category | Anticipated Jurisdictional | Drainage Basin | Crossed (Yes/No) | Turbine Impact (s.f.) | Turbine Impact (acre) | Turbine Impact (s.f.) | Turbine Impact (acre) | Access Road Impact (s.f.) | Access Road Impact (acre) | Access Road Impact (s.f.) | Access Road Impact (acre) | Collection Line Impact (s.f.) | Collection Line Impact (acre) | Collection Line Impact (s.f.) | Collection Line Impact (acre) |
| WOH-224 | Seneca | 41.182743 | -82.935499 | 0.01 | PFO | 48 | 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-225 | Seneca | 41.184502 | -82.935621 | 1.09 | PEM | 53 | 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-226 | Seneca | 41.191774 | -82.945462 | 0.01 | PFO | 42 | Modified 2 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-226A | Seneca | 41.191749 | -82.945490 | 0.16 | PFO | 42 | Modified 2 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-227 | Seneca | 41.189647 | -82.967763 | 2.48 | PFO | 68 | 3 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-228 | Seneca | 41.184633 | -82.937129 | 0.05 | PEM | 31 | 1 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-229 | Seneca | 41.184450 | -82.933280 | 5.58 | PFO | 70 | 3 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-230 | Seneca | 41.186033 | -82.932719 | 0.84 | PFO | 52 | 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-231 | Seneca | 41.183390 | -82.931626 | 0.19 | PFO | 43 | Modified 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-232 | Seneca | 41.183836 | -82.931450 | 0.07 | PFO | 45 | 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-233 | Seneca | 41.184964 | -82.931828 | 0.66 | PFO | 44 | Modified 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-234 | Seneca | 41.184867 | -82.931222 | 0.1 | PFO | 47 | 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-235 | Seneca | 41.185779 | -82.931123 | 0.21 | PFO | 47 | 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-236 | Seneca | 41.182012 | -82.932628 | 5.93 | PFO | 62 | 3 | Yes | Beaver Creek | Yes | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 4,261 | 0.10 | 0 | 0.00 |
| WOH-237 | Seneca | 41.182189 | -82.936031 | 0.19 | PEM/PSS | 39 | Modified 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-238 | Seneca | 41.180698 | -82.929741 | 0.04 | PEM/PSS | 47 | 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-239 | Seneca | 41.182078 | -82.929576 | 4.39 | PFO | 80 | 3 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-240 | Seneca | 41.184060 | -82.928561 | 0.79 | PFO | 52 | 2 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-241 | Seneca | 41.179328 | -82.928861 | 0.25 | PEM/PSS | 46 | 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-242 | Seneca | 41.178186 | -82.928454 | 2.84 | PFO | 40 | Modified 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-243 | Seneca | 41.178971 | -82.932631 | 0.15 | PEM | 27 | 1 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-244 | Seneca | 41.174513 | -82.960147 | 0.02 | PFO | 36 | Modified 2 | Yes | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-245 | Seneca | 41.177343 | -82.960023 | 0.12 | PFO | 59 | 2 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-247 | Seneca | 41.164786 | -82.926576 | 0.18 | PFO | 32 | 1 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-248 | Seneca | 41.160245 | -82.928326 | 0.03 | PFO | 25 | 1 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-249 | Seneca | 41.159074 | -82.923732 | 0.11 | PFO | 32 | 1 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-250 | Seneca | 41.154426 | -82.924118 | 0.35 | PEM | 28 | 1 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-251 | Seneca | 41.153880 | -82.924975 | 0.01 | PEM | 25 | 1 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-252 | Seneca | 41.155938 | -82.926091 | 0.1 | PEM | 18 | 1 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-253 | Seneca | 41.158514 | -82.926236 | 0.01 | PFO | 31 | 1 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-254 | Seneca | 41.154433 | -82.928490 | 0.15 | PFO | 33 | 1 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-255 | Seneca | 41.167565 | -82.944848 | 4.32 | PFO | 66 | 3 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-256 | Seneca | 41.167389 | -82.946499 | 0.18 | PEM/PFO | 57 | 2 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-257 | Seneca | 41.168270 | -82.943480 | 0.84 | PFO | 66 | 3 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-259 | Seneca | 41.147422 | -82.942959 | 2.69 | PEM | 38 | Modified 2 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-260 | Seneca | 41.154244 | -82.954963 | 0.06 | PEM | 12 | 1 | No | Morrison Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-262 | Seneca | 41.160385 | -82.962193 | 2.29 | PFO | 67 | 3 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-263 | Seneca | 41.161735 | -82.960222 | 0.8 | PFO | 55 | 2 | No | Westerhouse Ditch | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-264 | Seneca | 41.168648 | -82.892613 | 0.98 | PFO | 65 | 3 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-265 | Seneca | 41.169335 | -82.892875 | 0.12 | PFO | 51 | 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-266 | Seneca | 41.169448 | -82.891286 | 0.09 | PFO | 53 | 2 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-267 | Seneca | 41.168639 | -82.889729 | 0.1 | PFO | 53 | 2 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-268 | Seneca | 41.168221 | -82.890955 | 0.18 | PFO | 54 | 2 | No | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| WOH-269 | Seneca | 41.170457 | -82.893063 | 0.08 | PFO | 52 | 2 | Yes | Beaver Creek | No | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 |
| Wetland Totals | | | | 150 | | | | | | | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | 5,118 | 0.12 | 0 | 0.00 |

| | | | | | | | Table F-2 - Anticipated Waterbody Crossing Methods & Impacts for the Apex Republic Wind Project | | | | | | | | | | | | | | | |
|------------|--------------|------------------------|--------------------------------------|-------------------------------------|------------------|------------------------|---|-----------------------|-----------------------|-----------------------|---------------------|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------|-----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | | | | | | | TURBINES | | | | ACCESS ROADS | | | | | | COLLECTION LINES | | | | | |
| | | | | | | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | | CROSSINGS | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | | CROSSINGS | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | |
| Feature ID | Flow Regime | PHWH Class Designation | Drainage Basin | Anticipated Jurisdictional (Yes/No) | Crossed (Yes/No) | Waterbody Width (feet) | Turbine Impact (l.f.) | Turbine Impact (acre) | Turbine Impact (l.f.) | Turbine Impact (acre) | Number of Crossings | Crossing Method | Access Road Impact (l.f.) | Access Road Impact (acre) | Access Road Impact (l.f.) | Access Road Impact (acre) | Number of Crossings | Crossing Method | Collection Line Impact (l.f.) | Collection Line Impact (acre) | Collection Line Impact (l.f.) | Collection Line Impact (acre) |
| DOH-001 | Ephemeral | I | Indian Creek-Sandusky River | Yes | No | 15 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-002 | Intermittent | II | Spicer Creek-Sandusky River | Yes | No | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-005 | Perennial | II | Indian Creek-Sandusky River | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-006 | Ephemeral | I | Indian Creek-Sandusky River | No | No | 7 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-008 | Ephemeral | I | Beaver Creek | No | Yes | 4 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 22 | 0.00 | 0 | 0.00 |
| DOH-010 | Intermittent | II | Beaver Creek | Yes | Yes | 13 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | Open Cut | 41 | 0.01 | 0 | 0.00 |
| DOH-011 | Intermittent | I | Beaver Creek | No | Yes | 2 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 20 | 0.00 | 0 | 0.00 |
| DOH-023 | Perennial | II | Sugar Creek | Yes | No | 15 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-024 | Intermittent | II | Westerhouse Ditch | Yes | Yes | 15 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | Open Cut | 47 | 0.02 | 0 | 0.00 |
| DOH-027 | Intermittent | II | Sugar Creek | Yes | Yes | 12 | 0 | 0.00 | 0 | 0.00 | 1 | Culvert | 26 | 0.01 | 21 | 0.01 | 6 | Open Cut | 130 | 0.04 | 0 | 0.00 |
| DOH-028 | Ephemeral | I | Westerhouse Ditch | Yes | Yes | 15 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 (4 lines) | Open Cut | 65 | 0.02 | 0 | 0.00 |
| DOH-035 | Intermittent | I | Westerhouse Ditch | Yes | Yes | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | HDD | 0 | 0.00 | 0 | 0.00 |
| DOH-036 | Ephemeral | I | Westerhouse Ditch | No | Yes | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | HDD | 0 | 0.00 | 0 | 0.00 |
| DOH-037 | Intermittent | II | Morrison Creek | Yes | Yes | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 (2 lines) | Open Cut | 48 | 0.01 | 0 | 0.00 |
| DOH-038 | Intermittent | II | Beaver Creek | Yes | Yes | 22 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | Open Cut | 41 | 0.02 | 0 | 0.00 |
| DOH-040 | Perennial | III | Westerhouse Ditch | Yes | Yes | 35 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | HDD | 0 | 0.00 | 0 | 0.00 |
| DOH-041 | Perennial | III | Westerhouse Ditch | Yes | Yes | 18 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | HDD | 0 | 0.00 | 0 | 0.00 |
| DOH-042 | Intermittent | II | Westerhouse Ditch | No | Yes | 22 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 21 | 0.01 | 0 | 0.00 |
| DOH-043 | Intermittent | II | Beaver Creek | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-044 | Ephemeral | II | Beaver Creek | Yes | Yes | 25 | 0 | 0.00 | 0 | 0.00 | 1 | Culvert | 20 | 0.01 | 16 | 0.01 | 3 | Open Cut | 94 | 0.06 | 0 | 0.00 |
| DOH-047 | Intermittent | II | Beaver Creek | Yes | Yes | 40 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | Open Cut | 41 | 0.04 | 0 | 0.00 |
| DOH-051 | Intermittent | I | Beaver Creek | Yes | Yes | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 20 | 0.00 | 0 | 0.00 |
| DOH-055 | Intermittent | I | Westerhouse Ditch | Yes | Yes | 25 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 (4 lines) | Open Cut | 128 | 0.04 | 0 | 0.00 |
| DOH-057 | Intermittent | I | Westerhouse Ditch | Yes | Yes | 40 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 20 | 0.02 | 0 | 0.00 |
| DOH-058 | Ephemeral | II | Beaver Creek | Yes | Yes | 30 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 49 | 0.03 | 0 | 0.00 |
| DOH-059 | Intermittent | II | Pickereel Creek-Frontal Sandusky Bay | Yes | Yes | 25 | 0 | 0.00 | 0 | 0.00 | 2 | Culvert | 41 | 0.02 | 34 | 0.02 | 1 | Open Cut | 20 | 0.01 | 0 | 0.00 |
| DOH-100 | Perennial | II | Spicer Creek-Sandusky River | Yes | No | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-101 | Intermittent | II | Indian Creek-Sandusky River | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-102 | Intermittent | II | Indian Creek-Sandusky River | Yes | No | 18 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-110 | Ephemeral | I | Beaver Creek | No | Yes | 5 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 20 | 0.00 | 0 | 0.00 |
| DOH-111 | Intermittent | II | Beaver Creek | Yes | No | 8 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-113 | Intermittent | II | Westerhouse Ditch | Yes | No | 18 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-114 | Intermittent | II | Westerhouse Ditch | Yes | No | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-115 | Intermittent | II | Westerhouse Ditch | No | Yes | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 27 | 0.01 | 0 | 0.00 |
| DOH-116 | Perennial | III | Sugar Creek | Yes | Yes | 30 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | HDD | 0 | 0.00 | 0 | 0.00 |
| DOH-117 | Intermittent | II | Sugar Creek | No | Yes | 6 | 0 | 0.00 | 0 | 0.00 | 1 | Culvert | 20 | 0.00 | 19 | 0.00 | 2 | Open Cut | 43 | 0.01 | 0 | 0.00 |
| DOH-118 | Ephemeral | I | Westerhouse Ditch | No | No | 4 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-119 | Intermittent | II | Morrison Creek | Yes | No | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-120 | Intermittent | II | Morrison Creek | Yes | No | 8 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-121 | Ephemeral | I | Morrison Creek | No | No | 4 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-122 | Ephemeral | I | Morrison Creek | No | No | 4 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-123 | Intermittent | II | Morrison Creek | Yes | No | 30 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-125 | Ephemeral | I | Morrison Creek, Westerhouse Ditch | No | Yes | 1 | 0 | 0.00 | 0 | 0.00 | 1 | Culvert | 20 | 0.00 | 16 | 0.00 | 2 | Open Cut | 41 | 0.00 | 0 | 0.00 |
| DOH-126 | Ephemeral | I | Morrison Creek, Westerhouse Ditch | No | Yes | 1 | 0 | 0.00 | 0 | 0.00 | 2 | Culvert | 40 | 0.00 | 32 | 0.00 | 1 | Open Cut | 21 | 0.00 | 0 | 0.00 |
| DOH-128 | Intermittent | II | Westerhouse Ditch | Yes | No | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-150 | Ephemeral | I | Westerhouse Ditch | Yes | No | 3 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-152 | Ephemeral | I | Beaver Creek | No | No | 25 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-153 | Perennial | III | Beaver Creek | Yes | No | 35 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-156 | Intermittent | I | Beaver Creek | No | No | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-159 | Intermittent | II | Beaver Creek | Yes | No | 8 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-160 | Intermittent | II | Beaver Creek | No | No | 15 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-161 | Ephemeral | II | Beaver Creek | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-171 | Intermittent | I | Morrison Creek | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-204 | Ephemeral | II | Pickereel Creek-Frontal Sandusky Bay | No | No | 5 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-205 | Ephemeral | II | Pickereel Creek-Frontal Sandusky Bay | No | Yes | 5 | 0 | 0.00 | 0 | 0.00 | 1 | -- | 343 | 0.02 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-206 | Intermittent | II | Pickereel Creek-Frontal Sandusky Bay | Yes | No | 11 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-207 | Intermittent | II | Beaver Creek | Yes | Yes | 25 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 391 | 0.03 | 0 | 0.00 |

| | | | | | | | TURBINES | | | | ACCESS ROADS | | | | | | COLLECTION LINES | | | | | |
|------------|--------------|------------------------|--------------------------------------|-------------------------------------|------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------------------|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------|-----------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | | | | | | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | | CROSSINGS | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | | CROSSINGS | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | |
| Feature ID | Flow Regime | PHWH Class Designation | Drainage Basin | Anticipated Jurisdictional (Yes/No) | Crossed (Yes/No) | Waterbody Width (feet) | Turbine Impact (l.f.) | Turbine Impact (acre) | Turbine Impact (l.f.) | Turbine Impact (acre) | Number of Crossings | Crossing Method | Access Road Impact (l.f.) | Access Road Impact (acre) | Access Road Impact (l.f.) | Access Road Impact (acre) | Number of Crossings | Crossing Method | Collection Line Impact (l.f.) | Collection Line Impact (acre) | Collection Line Impact (l.f.) | Collection Line Impact (acre) |
| DOH-001 | Ephemeral | I | Indian Creek-Sandusky River | Yes | No | 15 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-002 | Intermittent | II | Spicer Creek-Sandusky River | Yes | No | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-005 | Perennial | II | Indian Creek-Sandusky River | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-006 | Ephemeral | I | Indian Creek-Sandusky River | No | No | 7 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-008 | Ephemeral | I | Beaver Creek | No | Yes | 4 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 22 | 0.00 | 0 | 0.00 |
| DOH-010 | Intermittent | II | Beaver Creek | Yes | Yes | 13 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | Open Cut | 41 | 0.01 | 0 | 0.00 |
| DOH-011 | Intermittent | I | Beaver Creek | No | Yes | 2 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 20 | 0.00 | 0 | 0.00 |
| DOH-023 | Perennial | II | Sugar Creek | Yes | No | 15 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-024 | Intermittent | II | Westerhouse Ditch | Yes | Yes | 15 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | Open Cut | 47 | 0.02 | 0 | 0.00 |
| DOH-027 | Intermittent | II | Sugar Creek | Yes | Yes | 12 | 0 | 0.00 | 0 | 0.00 | 1 | Culvert | 26 | 0.01 | 21 | 0.01 | 6 | Open Cut | 130 | 0.04 | 0 | 0.00 |
| DOH-028 | Ephemeral | I | Westerhouse Ditch | Yes | Yes | 15 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 (4 lines) | Open Cut | 65 | 0.02 | 0 | 0.00 |
| DOH-035 | Intermittent | I | Westerhouse Ditch | Yes | Yes | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | HDD | 0 | 0.00 | 0 | 0.00 |
| DOH-036 | Ephemeral | I | Westerhouse Ditch | No | Yes | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | HDD | 0 | 0.00 | 0 | 0.00 |
| DOH-037 | Intermittent | II | Morrison Creek | Yes | Yes | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 (2 lines) | Open Cut | 48 | 0.01 | 0 | 0.00 |
| DOH-038 | Intermittent | II | Beaver Creek | Yes | Yes | 22 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | Open Cut | 41 | 0.02 | 0 | 0.00 |
| DOH-040 | Perennial | III | Westerhouse Ditch | Yes | Yes | 35 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | HDD | 0 | 0.00 | 0 | 0.00 |
| DOH-041 | Perennial | III | Westerhouse Ditch | Yes | Yes | 18 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | HDD | 0 | 0.00 | 0 | 0.00 |
| DOH-042 | Intermittent | II | Westerhouse Ditch | No | Yes | 22 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 21 | 0.01 | 0 | 0.00 |
| DOH-043 | Intermittent | II | Beaver Creek | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-044 | Ephemeral | II | Beaver Creek | Yes | Yes | 25 | 0 | 0.00 | 0 | 0.00 | 1 | Culvert | 20 | 0.01 | 16 | 0.01 | 3 | Open Cut | 94 | 0.06 | 0 | 0.00 |
| DOH-047 | Intermittent | II | Beaver Creek | Yes | Yes | 40 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | Open Cut | 41 | 0.04 | 0 | 0.00 |
| DOH-051 | Intermittent | I | Beaver Creek | Yes | Yes | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 20 | 0.00 | 0 | 0.00 |
| DOH-055 | Intermittent | I | Westerhouse Ditch | Yes | Yes | 25 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 (4 lines) | Open Cut | 128 | 0.04 | 0 | 0.00 |
| DOH-057 | Intermittent | I | Westerhouse Ditch | Yes | Yes | 40 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 20 | 0.02 | 0 | 0.00 |
| DOH-058 | Ephemeral | II | Beaver Creek | Yes | Yes | 30 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 49 | 0.03 | 0 | 0.00 |
| DOH-059 | Intermittent | II | Pickereel Creek-Frontal Sandusky Bay | Yes | Yes | 25 | 0 | 0.00 | 0 | 0.00 | 2 | Culvert | 41 | 0.02 | 34 | 0.02 | 1 | Open Cut | 20 | 0.01 | 0 | 0.00 |
| DOH-100 | Perennial | II | Spicer Creek-Sandusky River | Yes | No | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-101 | Intermittent | II | Indian Creek-Sandusky River | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-102 | Intermittent | II | Indian Creek-Sandusky River | Yes | No | 18 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-110 | Ephemeral | I | Beaver Creek | No | Yes | 5 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 20 | 0.00 | 0 | 0.00 |
| DOH-111 | Intermittent | II | Beaver Creek | Yes | No | 8 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-113 | Intermittent | II | Westerhouse Ditch | Yes | No | 18 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-114 | Intermittent | II | Westerhouse Ditch | Yes | No | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-115 | Intermittent | II | Westerhouse Ditch | No | Yes | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 27 | 0.01 | 0 | 0.00 |
| DOH-116 | Perennial | III | Sugar Creek | Yes | Yes | 30 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 | HDD | 0 | 0.00 | 0 | 0.00 |
| DOH-117 | Intermittent | II | Sugar Creek | No | Yes | 6 | 0 | 0.00 | 0 | 0.00 | 1 | Culvert | 20 | 0.00 | 19 | 0.00 | 2 | Open Cut | 43 | 0.01 | 0 | 0.00 |
| DOH-118 | Ephemeral | I | Westerhouse Ditch | No | No | 4 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-119 | Intermittent | II | Morrison Creek | Yes | No | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-120 | Intermittent | II | Morrison Creek | Yes | No | 8 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-121 | Ephemeral | I | Morrison Creek | No | No | 4 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-122 | Ephemeral | I | Morrison Creek | No | No | 4 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-123 | Intermittent | II | Morrison Creek | Yes | No | 30 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-125 | Ephemeral | I | Morrison Creek, Westerhouse Ditch | No | Yes | 1 | 0 | 0.00 | 0 | 0.00 | 1 | Culvert | 20 | 0.00 | 16 | 0.00 | 2 | Open Cut | 41 | 0.00 | 0 | 0.00 |
| DOH-126 | Ephemeral | I | Morrison Creek, Westerhouse Ditch | No | Yes | 1 | 0 | 0.00 | 0 | 0.00 | 2 | Culvert | 40 | 0.00 | 32 | 0.00 | 1 | Open Cut | 21 | 0.00 | 0 | 0.00 |
| DOH-128 | Intermittent | II | Westerhouse Ditch | Yes | No | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-150 | Ephemeral | I | Westerhouse Ditch | Yes | No | 3 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-152 | Ephemeral | I | Beaver Creek | No | No | 25 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-153 | Perennial | III | Beaver Creek | Yes | No | 35 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-156 | Intermittent | I | Beaver Creek | No | No | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-159 | Intermittent | II | Beaver Creek | Yes | No | 8 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-160 | Intermittent | II | Beaver Creek | No | No | 15 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-161 | Ephemeral | II | Beaver Creek | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-171 | Intermittent | I | Morrison Creek | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-204 | Ephemeral | II | Pickereel Creek-Frontal Sandusky Bay | No | No | 5 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-205 | Ephemeral | II | Pickereel Creek-Frontal Sandusky Bay | No | Yes | 5 | 0 | 0.00 | 0 | 0.00 | 1 | -- | 343 | 0.02 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-206 | Intermittent | II | Pickereel Creek-Frontal Sandusky Bay | Yes | No | 11 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-207 | Intermittent | II | Beaver Creek | Yes | Yes | 25 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 391 | 0.03 | 0 | 0.00 |

| | | | | | | | TURBINES | | | | ACCESS ROADS | | | | COLLECTION LINES | | | | | | | |
|------------------|--------------|------------------------|-----------------------------|-------------------------------------|------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|---------------------|-----------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------|------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | | | | | | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | | CROSSINGS | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | | CROSSINGS | | TEMPORARY IMPACTS | | PERMANENT IMPACTS | |
| Feature ID | Flow Regime | PHWH Class Designation | Drainage Basin | Anticipated Jurisdictional (Yes/No) | Crossed (Yes/No) | Waterbody Width (feet) | Turbine Impact (l.f.) | Turbine Impact (acre) | Turbine Impact (l.f.) | Turbine Impact (acre) | Number of Crossings | Crossing Method | Access Road Impact (l.f.) | Access Road Impact (acre) | Access Road Impact (l.f.) | Access Road Impact (acre) | Number of Crossings | Crossing Method | Collection Line Impact (l.f.) | Collection Line Impact (acre) | Collection Line Impact (l.f.) | Collection Line Impact (acre) |
| DOH-208 | Ephemeral | II | Beaver Creek | No | No | 25 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-209 | Intermittent | II | Beaver Creek | Yes | No | 30 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-211 | Intermittent | II | Beaver Creek | Yes | Yes | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 20 | 0.01 | 0 | 0.00 |
| DOH-212 | Intermittent | II | Westerhouse Ditch | Yes | No | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-213 | Ephemeral | I | Westerhouse Ditch | No | Yes | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 2 (4 lines) | Open Cut | 74 | 0.02 | 0 | 0.00 |
| DOH-214 | Ephemeral | I | Beaver Creek | No | Yes | 5 | 0 | 0.00 | 0 | 0.00 | 1 | Culvert | 28 | 0.00 | 23 | 0.00 | 1 | Open Cut | 22 | 0.00 | 0 | 0.00 |
| DOH-215 | Ephemeral | I | Beaver Creek | No | No | 6 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-216 | Perennial | III | Beaver Creek | Yes | No | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-217 | Ephemeral | II | Beaver Creek | No | No | 5 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-218 | Perennial | II | Westerhouse Ditch | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-219 | Perennial | II | Westerhouse Ditch | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| DOH-220 | Perennial | III | Westerhouse Ditch | Yes | No | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| Ditch Subtotals | | | | 46 | 31 | | 0 | 0.00 | 0 | 0.00 | 10 | (9) Culvert | 539 | 0.07 | 160 | 0.04 | 48 (57 lines) | (8) HDD (40) Open Cut | 1,465 | 0.42 | 0 | 0.00 |
| POH-001 | Perennial | NA | Spicer Creek-Sandusky River | Yes | No | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| POH-100 | Perennial | NA | Westerhouse Ditch | No | No | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| POH-101 | Perennial | NA | Westerhouse Ditch | No | No | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| POH-200 | Perennial | NA | Beaver Creek | No | No | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| Pond Subtotals | | | | 1 | 0 | -- | | | | | 0 | N/A | 0 | 0 | 0 | 0 | 0 | N/A | 0 | 0 | 0 | 0 |
| SOH-001 | Intermittent | II | Spicer Creek-Sandusky River | Yes | No | 3 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-004 | Intermittent | II | Beaver Creek | Yes | No | 3 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-005 | Intermittent | III | Beaver Creek | Yes | Yes | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | HDD | 0 | 0.00 | 0 | 0.00 |
| SOH-006 | Perennial | III | Beaver Creek | Yes | No | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-009 | Intermittent | II | Westerhouse Ditch | No | No | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-010 | Perennial | III | Westerhouse Ditch | Yes | No | 35 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-011 | Perennial | III | Westerhouse Ditch | Yes | Yes | 35 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 (4 lines) | HDD | 0 | 0.00 | 0 | 0.00 |
| SOH-014 | Perennial | III | Westerhouse Ditch | Yes | No | 7 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-015 | Perennial | III | Westerhouse Ditch | Yes | No | 25 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-016 | Intermittent | II | Beaver Creek | Yes | Yes | 35 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 21 | 0.02 | 0 | 0.00 |
| SOH-017 | Intermittent | II | Westerhouse Ditch | Yes | Yes | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 27 | 0.01 | 0 | 0.00 |
| SOH-018 | Intermittent | I | Beaver Creek | Yes | Yes | 15 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 3 | Open Cut | 82 | 0.03 | 0 | 0.00 |
| SOH-019 | Perennial | III | Beaver Creek | Yes | No | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-103 | Perennial | III | Beaver Creek | Yes | Yes | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | HDD | 0 | 0.00 | 0 | 0.00 |
| SOH-104 | Intermittent | II | Beaver Creek | No | No | 4 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-105 | Intermittent | II | Beaver Creek | No | No | 3 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-106 | Ephemeral | I | Beaver Creek | No | No | 3 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-107 | Intermittent | II | Morrison Creek | No | No | 12 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-108 | Ephemeral | I | Westerhouse Ditch | No | No | 10 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-109 | Ephemeral | I | Sugar Creek | No | No | 4 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-154 | Perennial | III | Perennial | Yes | No | 35 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-201 | Perennial | III | Beaver Creek | Yes | No | 20 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-202 | Ephemeral | I | Beaver Creek | Yes | No | 15 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 |
| SOH-203 | Ephemeral | II | Beaver Creek | Yes | Yes | 6 | 0 | 0.00 | 0 | 0.00 | 0 | -- | 0 | 0.00 | 0 | 0.00 | 1 | Open Cut | 70 | 0.01 | 0 | 0.00 |
| Stream Subtotals | | | | 17 | 7 | | 0 | 0.00 | 0 | 0.00 | 0 | N/A | 0 | 0.00 | 0 | 0.00 | 9 (12 lines) | (3) HDD (6) Open Cut | 199 | 0.06 | 0 | 0.00 |
| Project Totals | | | | 64 | 38 | | 0 | 0.00 | 0 | 0.00 | 10 | (9) Culvert | 539 | 0.07 | 160 | 0.04 | 57 (69 lines) | (11) HDD (46) Open Cut | 1,665 | 0.48 | 0 | 0.00 |

Republic Wind Project

APPENDIX

G

HDD FRAC OUT CONTINGENCY
PLAN

INADVERTENT RELEASE OF DRILLING FLUID CONTINGENCY PLAN

For Horizontal Directional Drilling
Republic Wind Project
Seneca and Sandusky, Ohio

I. Introduction

Construction of the Republic Wind Project in Seneca and Sandusky Counties, Ohio, will include the use of trenchless excavation methods known as horizontal directional drilling (“HDD”). This widely used technique accomplishes the installation of buried utilities with minimal impact, by routing the utility under a sensitive feature (such as a stream, river or wetland). The HDD procedure uses a bentonite slurry, a fine clay material as a drilling lubricant (“drilling mud”). Although bentonite is non-toxic and non-hazardous, a potential environmental risk associated with conducting HDD under sensitive features occurs when bentonite is released to the surface during construction (sometimes referred to as an inadvertent release or “frac-out”).

Seepage of drilling fluid is most likely to occur near the bore entry and exit points where the drill head is shallow. Frac-outs can occur, however, in any location along a directional bore. This plan establishes operational procedures and responsibilities for the prevention, containment, and remediation of any of frac-outs that may occur in connection with the proposed HDD as part of the construction of the Republic Wind Project in Seneca and Sandusky Counties, Ohio.

The objectives of this Plan are to:

1. Minimize the potential for an inadvertent release associated with HDD activities;
2. Provide for the timely detection of an inadvertent release;
3. Protect sensitive water courses and associated riparian vegetation;
4. Ensure an organized, timely, and minimum-impact response in the event an inadvertent release occurs; and
5. Ensure that all appropriate notifications are made immediately to management and environmental personnel.

Measures to be deployed as part of the contingency plan include site inspection, proper training of the contractor and construction personnel, development of response procedures, provision of containment materials, and implementation of appropriate clean up procedures. These measures are described in detail below:

II. Description of Work

Drilling operations will be carefully monitored to determine if and when a frac-out may be occurring. Operations will be halted immediately upon detection of a significant decline in drilling pressure or other evidence that a frac-out may be occurring. The clean-up of all spills shall begin immediately. Management and environmental personnel shall be notified immediately of any spills and shall be consulted regarding remediation procedures. Spill response kits shall be maintained on-site and used if a frac-out occurs. A vacuum truck and containment materials, such as straw bales, shall also be readily available. In the event of a frac-out, the on-site supervisor of construction activities (“Site Supervisor”) will conduct an evaluation of the situation and direct recommended mitigation actions, based on the following guidelines:

1. If the frac-out is minor, easily contained, has not reached the surface, and is not threatening sensitive resources, then drilling operations may resume after use of a leak-stopping compound or redirection of the bore; and
2. If the frac-out has reached the surface, any hazardous materials within the bentonite shall be removed, contained and properly disposed of, as required by law. The drilling contractor shall be responsible for ensuring that the bentonite either is properly disposed of at an approved disposal facility or properly recycled in an approved manner. The Site Supervisor shall notify and take any necessary follow-up response actions in coordination with the relevant regulatory agency representatives. The Site Supervisor shall coordinate the mobilization of equipment stored at off-site locations (e.g., vacuum trucks) on an as needed basis.

III. Site Supervisor Responsibilities

The Site Supervisor has ultimate responsibility for implementing this plan. The Site Supervisor shall ensure that all relevant employees are trained prior to drilling. The Site Supervisor shall be notified immediately when a frac-out is detected. The Site Supervisor shall be responsible for ensuring that environmental personnel are aware of the frac-out, and coordinate personnel, response, remediation, and regulatory agency notification. The Site Supervisor shall ensure all waste materials are properly containerized, labeled, and removed from the site to an approved disposal facility by personnel experienced in the removal, transport and disposal of drilling mud.

The Site Supervisor shall be familiar with all aspects of the drilling activity, the contents of this plan and the conditions of approval under which the HDD is authorized to take place. The Site Supervisor shall have the authority to stop work and commit the resources (personnel and equipment) necessary to implement this plan. The Site Supervisor shall ensure that a copy of this plan is available (at the project work site) and accessible to all construction personnel. The Site

Supervisor shall ensure that all workers are properly trained and familiar with the necessary procedures for response to a frac-out, prior to commencement of drilling operations.

IV. Equipment

The Site Supervisor shall ensure that:

1. Spill responses kit and spill containment materials are available on-site at all times, and that the equipment is in good working order;
2. Equipment required to contain and remediate a frac-out release either will either be available at the work site or readily available at an offsite location within 15- minutes of the bore site; and
3. If equipment is required to be operated adjacent to a water course, absorbent pads and plastic sheeting for placement beneath motorized equipment shall be used to protect sensitive areas from engine fluids.

V. Training

Prior to the start of construction, the Site Supervisor shall ensure that relevant workers receive training in the following areas:

1. The provisions of this plan, equipment maintenance and site-specific permit and monitoring requirements;
2. Inspection procedures for release prevention and containment equipment and materials;
3. Contractor/employee obligations to immediately stop the drilling operation upon first evidence of the occurrence of a frac-out and to immediately report any frac-out releases;
4. Contractor/employee responsibilities in the event of a release;
5. Operation of release prevention and control equipment and the location of release control materials, as necessary and appropriate; and
6. Protocols for communication with relevant regulatory agency representatives who might be on-site during the remediation effort.

VI. Procedures

The following procedures shall be followed each day, prior to the start of work. This plan shall be available on-site during all construction. The Site Supervisor shall be on-site at any time that HDD is occurring or is planned to occur. The Site Supervisor shall ensure that a briefing is held at the start of each day of HDD to review the appropriate procedures to be followed in case of a frac-out. Questions shall be answered and clarification given on any point over which the HDD operating crew or other employees or contractors have concerns.

A. Drilling

Drilling pressures shall be closely monitored so they do not exceed those needed to penetrate the target formation. Pressure levels shall be monitored randomly by the operator. Pressure levels shall be set at a minimum level to prevent frac-outs. During the pilot bore, the drilled annulus shall be maintained. Cutters and reamers shall be pulled back into previously-drilled sections after each new joint of pipe is added.

Exit and entry pits shall be enclosed by silt fences and straw or similar material. A spill kit shall be on-site and used if a frac-out occurs. A vacuum truck shall be readily available prior to and during all HDD operations. Containment materials (straw, silt fencing, sand bags, frac-out spill kits, etc.) shall be staged on-site at locations where they are readily available and easily mobilized for immediate use in the event of a frac-out. If necessary, barriers (straw bales or sedimentation fences) between the bore site and the edge of the water source, shall be constructed, prior to drilling, to prevent released bentonite material from reaching the water.

Once the drill rig is in place, and drilling begins, the drill operator shall stop work whenever the pressure in the drill rig significantly drops or there is a lack of returns in the entrance pit. If either of these occur, the Site Supervisor shall be informed that a possible frac-out has occurred. The Site Supervisor and the drill rig operator(s) shall work to coordinate the likely location of the frac-out.

The location of the frac-out shall be recorded and notes made on the location and measures taken to address the concern. The following subsections shall be adhered to when addressing a frac-out situation.

Water containing mud, silt, bentonite, or other pollutants from equipment washing or other activities, shall not be allowed to enter any water course. The bentonite used in the drilling process shall be either disposed of at an approved disposal facility or recycled in an approved manner. Other construction materials and wastes shall be recycled, or disposed of, as appropriate.

B. Vacuum Truck

A vacuum truck shall be staged at a location from which it can be mobilized and relocated so that any place along the drill shot, can be reached by the apparatus, within thirty (30) minutes of information indicating a possible frac-out.

C. Field Response

The response of the field crew to a frac-out release shall be immediate and in accordance with procedures set forth in this plan. All appropriate emergency actions that do not pose additional threats to sensitive resources will be taken, as follows:

1. Boring shall stop immediately;
2. The bore stem shall be pulled back to relieve pressure on the frac-out;
3. The Site Supervisor shall be notified to ensure that management and environmental personnel are notified, adequate response actions are taken and required notifications are made;
4. The Site Supervisor shall evaluate the situation and recommend the type and level of response warranted, including the level of notification required;
5. If the frac-out is minor, easily contained, has not reached the surface and is not threatening any sensitive resources, then a leak-stopping compound shall be employed to block the frac-out. If the use of leak-stopping compound is not fully successful, then the bore stem shall be redirected to a new location along the desired drill path (i.e., where a frac-out has not occurred);
6. If the frac-out has reached the surface, any hazardous materials within the bentonite shall be removed to a depth of 48 inches, contained and properly disposed of, as required by law. A dike or berm may be constructed around the frac-out to entrap released drilling fluid, if necessary. Clean sand shall be deployed and the area returned to pre-project contours; and
7. If a frac-out occurs, reaches the surface and becomes widespread, the Site Supervisor shall authorize a vacuum truck and bulldozer stored off-site to be mobilized. The vacuum truck may be either positioned at either end of the line of the drill so that the frac-out can be reached by crews on foot, or may be pulled by a bulldozer, so that contaminated soils can be vacuumed up.

D. Response Close-out Procedures

1. When the release has been contained and remediated, response close-out activities shall be conducted at the direction of the Site Supervisor. These activities shall include those below.
2. The recovered drilling fluid shall either be recycled or transported to an approved facility for disposal. No recovered drilling fluids may be discharged into streams, storm drains or any other water source;
3. All frac-out excavation and remediation sites shall be returned to pre-project contours using clean fill, as necessary; and
4. All containment measures (fiber rolls, straw bale, etc.) shall be removed, unless otherwise specified by the Site Supervisor.

E. Resumption of HDD

For minor releases not necessitating external notification, HDD may continue, if full containment is achieved through the use of a leak-stopping compound or redirection of the bore and the cleanup crew remains at the frac-out location throughout the HDD activity. For releases necessitating external notification, HDD activities shall not restart without prior approval from the Site Supervisor.

F. Bore Abandonment

Abandonment of the bore will only be required when all efforts to control the frac-out within the existing directional bore have failed.

VII. Notification

In the event of a frac-out that reaches a water source, the Site Supervisor shall notify safety personnel so they can notify the appropriate regulatory agencies. All agency notifications will occur within 24 hours and proper documentation will be created in a timely and complete manner.

The following information will be provided:

1. Name and telephone number of person reporting;
2. Location of the release;
3. Date and time of release;
4. Type and quantity, estimated size of release;
5. How the release occurred;
6. The type of activity that was occurring around the area of the frac-out;

7. Description of any sensitive areas, and their location in relation to the frac-out; and
8. Description of the methods used to remediate the site.

A. Communicating with Regulatory Agency Personnel

All employees and subcontractors shall adhere to the following protocols when regulatory agency personnel arrive on site. Regulatory agency personnel shall be required to comply with appropriate safety rules. Only the Site Supervisor, safety personnel and environmental should coordinate communication with regulatory agency personnel.

B. Documentation

The Site Supervisor shall record the frac-out event in his or her daily log. The log will include the following:

1. Details on the release event, including an estimate of the amount of bentonite released;
2. The location and time of release;
3. The size of the area impacted, and the success of the remediation action;
4. Name and telephone number of person reporting;
5. Date;
6. How the release occurred;
7. The type of activity that was occurring around the area of the frac-out;
8. Description of any sensitive areas, and their location in relation to the frac-out;
9. Description of the methods used to remediate the site; and
10. Listing of the water-related permits for the project.

VIII. Project Completion and Clean-up

1. All materials and any rubbish-construction debris shall be removed from the construction zone at the end of each work day;
2. Sump pits at bore entry and exits will be filled and returned to natural grade; and
3. All protective measures (fiber rolls, straw bale, silt fence, etc.) will be removed unless otherwise specified by the Site Supervisor.

Republic Wind Project

APPENDIX

H

WETLAND AND STREAM
DELINEATION REPORT AND FORMS

Surface Water Delineation Report

Republic Wind Project
December, 2018



Prepared for:



Prepared by:



Table of Contents

| | | |
|----------|--|------------|
| 1 | Introduction | 1-1 |
| 2 | Desktop Assessment..... | 2-1 |
| 2.1 | National Land Cover Database Review | 2-1 |
| 2.2 | Geography..... | 2-1 |
| 2.3 | Hydric Soils..... | 2-2 |
| 2.4 | Navigable Waters | 2-2 |
| 2.5 | Remote Wetland and Waterbody Identification | 2-3 |
| 2.6 | Desktop Review Summary | 2-3 |
| 3 | Field Delineation Surveys | 3-1 |
| 3.1 | Methodologies | 3-1 |
| 3.1.1 | Wetland Delineations | 3-1 |
| 3.1.2 | Ohio Environmental Protection Agency - Ohio Rapid Assessment Methodology..... | 3-5 |
| 3.1.3 | Waterbody Delineations..... | 3-5 |
| 3.1.4 | Headwater Habitat Evaluation Index Assessments | 3-6 |
| 3.1.5 | Qualitative Habitat Evaluation Index Assessments | 3-7 |
| 3.1.6 | Potential Jurisdictional Determinations | 3-8 |
| 4 | Delineation Results..... | 4-1 |
| 4.1 | Wetlands..... | 4-1 |
| 4.1.1 | Category 1 Wetlands..... | 4-9 |
| 4.1.2 | Category 2 Wetlands..... | 4-9 |
| 4.1.3 | Category 3 Wetlands..... | 4-9 |
| 4.1.4 | Potentially Jurisdictional Delineated Wetlands in the Survey Area | 4-11 |
| 4.2 | Waterbodies | 4-11 |
| 4.2.1 | Class I Waterbodies | 4-17 |
| 4.2.2 | Class II Waterbodies | 4-17 |
| 4.2.3 | Class III Waterbodies | 4-18 |
| 4.2.4 | Potentially Jurisdictional Delineated Waterbodies in the Survey Area | 4-21 |
| 5 | Conclusions..... | 5-1 |
| 6 | References..... | 6-1 |

Appendices

| | |
|------------|--|
| Appendix A | Site Photos |
| Appendix B | Wetland and Waterbody Maps |
| Appendix C | Wetland Delineation and Assessment Forms |
| Appendix D | Waterbody Assessment Forms |

Tables

| | | |
|-----------|--|------|
| Table 2-1 | Land Use within the Survey Area..... | 2-1 |
| Table 2-2 | Fully Hydric Soils within the Survey Area (USDA-NRCS 2017) | 2-2 |
| Table 2-3 | Drainage Areas Within the Project Area | 2-3 |
| Table 3-1 | Plant Indicator Categories..... | 3-2 |
| Table 3-2 | Hydrology Indicators and Regional Manual Status..... | 3-4 |
| Table 3-3 | Flow Categories | 3-6 |
| Table 3-4 | Headwater Habitat Evaluation Index Scoring | 3-7 |
| Table 3-5 | Qualitative Habitat Evaluation Index Scoring..... | 3-8 |
| Table 4-1 | Wetlands Delineated in the Survey Area | 4-2 |
| Table 4-2 | Waterbodies Delineated in Survey Area | 4-12 |

Figures

| | | |
|------------|---|-----|
| Figure 1-1 | Project Overview of Republic Wind Project in Seneca and Sandusky Counties, Ohio..... | 1-2 |
|------------|---|-----|

Acronyms

| | |
|---------|--|
| CFR | Code of Federal Regulations |
| CR | County Road |
| CWA | Clean Water Act |
| CWH | cold water habitat |
| DBH | Diameter at Breast Height |
| DOH | ditches |
| EW | Exceptional Warm Water Habitat |
| FAC | Facultative Plants |
| FACU | Facultative Upland Plants |
| FACW | Facultative Wetland Plants |
| GPS | Global Positioning System |
| HDD | horizontal directional drilling |
| HHEI | Headwater Habitat Evaluation Index |
| MBTA | Migratory Bird Treaty Act |
| MW | megawatt |
| MWH | Modified Warmwater Habitat |
| NHD | National Hydrography Dataset |
| NLCD | National Land Cover Database |
| NRCS | National Resource Conservation Service |
| NWI | National Wetland Inventory |
| NWPL | National Wetland Plant List |
| OBL | Obligate Wetland Plants |
| ODNR | Ohio Department of Natural Resources |
| OEPA | Ohio Environmental Protection Agency |
| OHWM | Ordinary High Water Mark |
| ORAM | Ohio Rapid Assessment Methodology |
| OWI | Ohio Wetland Inventory |
| PEM | Palustrine Emergent Wetlands |
| PFO | Palustrine Forested Wetlands |
| PHWH | Primary Headwater Stream |
| POH | ponds |
| Project | Republic Wind Project |
| PSS | Palustrine Scrub/Shrub Wetlands |
| QHEI | Qualitative Habitat Evaluation Index |
| RTE | rare, threatened and endangered |
| SOH | streams |
| SR | State Route |
| SWANCC | Solid Waste Agency of Northern Cook County |
| TNW | traditionally navigable waterway |
| TOB | Top-of-Bank |
| TR | Township Road |

| | |
|-------|--------------------------------------|
| UPL | Obligate Upland Plants |
| USACE | U.S. Army Corp of Engineers |
| USDA | U.S. Department of Agriculture |
| USEPA | U.S. Environmental Protection Agency |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Service |
| UTV | utility terrain vehicle |
| WOH | wetlands |
| WOTUS | Waters of the U.S. |
| WWH | warm water habitat |

1 Introduction

Republic Wind, LLC is developing the Republic Wind Project (Project) in northern Seneca County and southeast Sandusky County, Ohio. The Project is proposed as a 200-megawatt (MW) wind project with up to 50 wind turbines. In support of Project planning, Cardno completed a field delineation survey of 315 parcels (approximately 20,286 acres) to identify surface waters within the parcels of land planned for ground disturbance (Survey Area; Figure 1-1). Surface waters are regulated under the jurisdiction of either the state or federal government. Cardno identified potentially jurisdictional Waters of the U.S. (WOTUS), including Traditionally Navigable Waters (TNW), their tributaries, and non-isolated wetlands, which are regulated under the jurisdiction of the State of Ohio and the U.S. Army Corps of Engineers (USACE) in accordance with Sections 401/404 of the Clean Water Act (CWA). Cardno also identified isolated waterbodies and wetlands that do not have a significant nexus to TNW, which are considered waters of Ohio (as defined under OAC Rule 3745-1-02 (b)(77)¹) and are regulated by the Ohio Environmental Protection Agency (OEPA)'s Isolated Wetlands Permitting Program.

Prior to the field survey, Cardno completed a desktop review of publicly-available data sources to review site-specific conditions and to identify potential surface water features. Between the fall of 2016 and fall of 2018, Cardno completed field delineation surveys within all areas of proposed ground disturbance associated with installation of the Project.

¹ OEPA 2017.

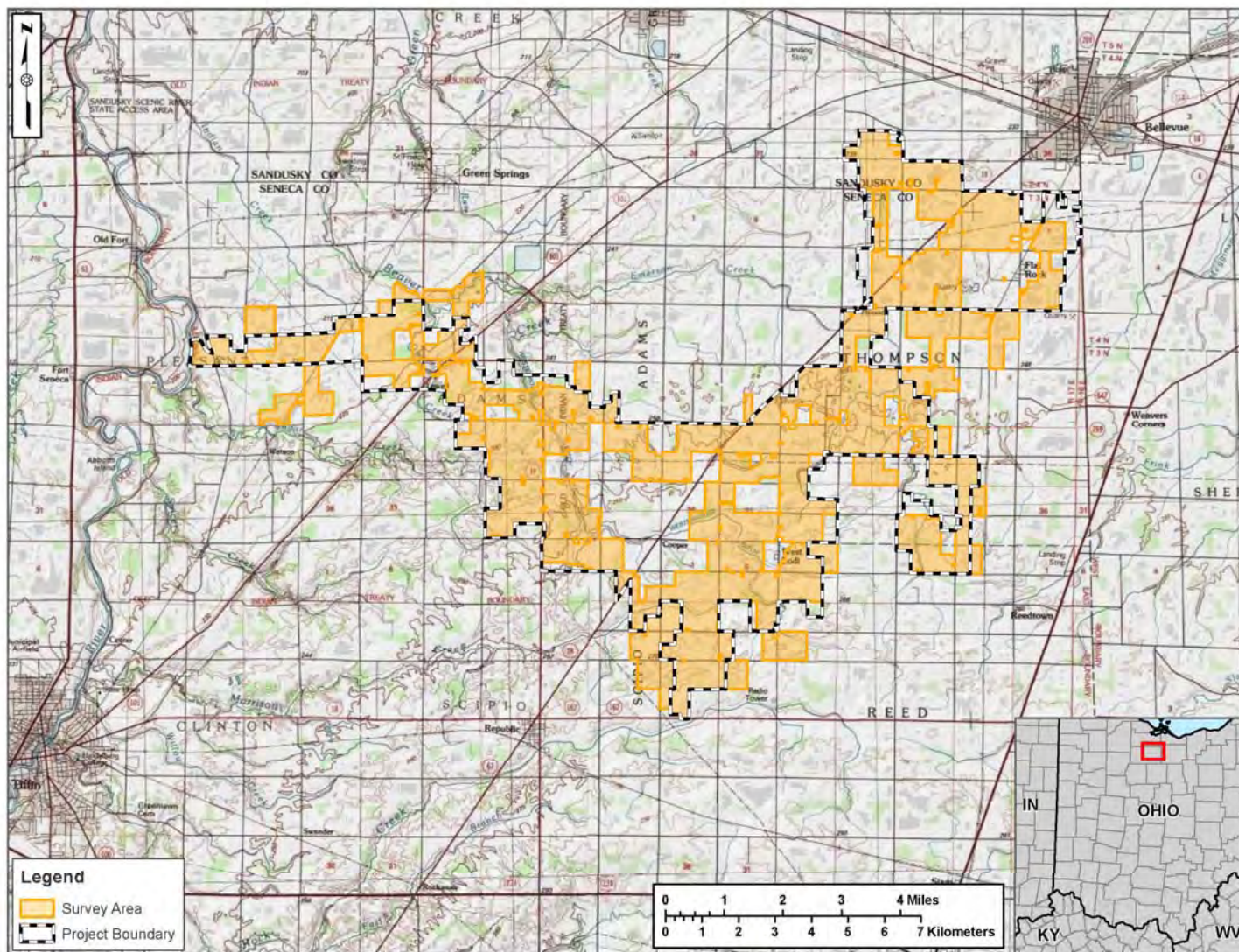


Figure 1-1 Project Overview of Republic Wind Project in Seneca and Sandusky Counties, Ohio

2 Desktop Assessment

Prior to field surveys, Cardno completed a desktop review of the Survey Area using publicly-available data to identify and classify potential surface water features and create field maps for use during surveys. Sources of this reference material included, but was not limited to: the National Land Cover Database (NLCD); the U.S. Department of Agriculture (USDA) National Resource Conservation Service (NRCS) Soil Survey for Seneca and Sandusky Counties; historic aerial photographs; U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps; U.S. Geologic Service (USGS) topographic maps; USGS National Hydrography Dataset (NHD); and Ohio Wetland Inventory (OWI).

2.1 National Land Cover Database Review

Review of the 2011 NLCD (Homer et al. 2015) shows that the most prominent land use type within the Survey Area was cultivated crops and accounted for approximately 87 percent of the total Survey Area acreage. The second most prominent land use type within the Survey Area was identified as “Deciduous Forest” at approximately 6 percent, followed by “Developed, Open Space” for approximately 5 percent. The classification of “Developed, Open Space” refers to “areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses” (Homer et al. 2015). Pasture/Hay was the only other land use type to account for at least 1 percent. All other land use activities accounted for less than 1 percent of the total acreage in the Survey Area. A summary is provided in Table 2-1 below.

Table 2-1 Land Use within the Survey Area

| Type | Acreage | Percentage of Total Acreage |
|------------------------------|---------------|-----------------------------|
| Cultivated Crops | 17,654 | 87% |
| Deciduous Forest | 1,195 | 6% |
| Developed, Open Space | 925 | 5% |
| Pasture/Hay | 390 | 2% |
| Developed, Low Intensity | 68 | <1% |
| Grassland/Herbaceous | 25 | <1% |
| Open Water | 8 | <1% |
| Barren Land (Rock/Sand/Clay) | 7 | <1% |
| Developed, Medium Intensity | 5 | <1% |
| Woody Wetlands | 4 | <1% |
| Emergent Herbaceous Wetlands | 3 | <1% |
| Evergreen Forest | 1 | <1% |
| Developed, High Intensity | <1 | <1% |
| TOTAL | 20,286 | 100% |

Compiled from NLCD 2011.

2.2 Geography

The Project is located within the Central Lowland Physiographic Province of Ohio, which covers the central and western portions of the state south of Lake Erie. The Central Lowland is characterized by

glacial till plains with gently rolling hills. Most hills are a series of moraines, which are glacier-created mounds of rock and soil that are up to 100 feet high and 6 miles wide (ODNR 1998). Elevations in the Central Lowlands range from 700 to 1,150 feet above mean sea level with moderate topographic relief (ODNR 1998²).

2.3 Hydric Soils

Project soil information was obtained from the Web Soil Survey, an application of the NRCS (USDA-NRCS 2018). As shown in Table 2-2, approximately 1.3 percent (265 acres) of the Survey Area was determined to be located in fully hydric soils. The poor draining qualities of hydric soils combined with local flat or bowl-shaped topography make these locations predisposed to containing wetland areas. Three different soil types in the Survey Area were considered fully hydric (i.e., soils contain 100 percent hydric components). The most common type of hydric soil was the Lenawee silty clay loam. The Lenawee series consists of very deep, poorly drained and very poorly drained soils formed in lacustrine deposits. These soils are on lake plains and in depressions on moraines, outwash plains, and glacial drainage ways. The Bono series consists of deep, very poorly drained soils formed in lacustrine sediments in flat or depressional areas of tilled plains. The Sebring series consists of deep, poorly drained, moderately slowly permeable soils formed on uplands in water laid deposits along drainageways. All soils occur along minor slopes ranging from 0 to 2 percent.

The remaining Survey Area is located in areas of non-hydric or predominantly non-hydric soils.

Table 2-2 Fully Hydric Soils within the Survey Area (USDA-NRCS 2018)

| Type | Map Unit Description | Hydric Rating | Acreage | Percentage of Delineated Acreage |
|--------------|-----------------------------------|---------------|------------|----------------------------------|
| Le | Lenawee silty clay loam | 100 | 117 | 0.6% |
| Bp | Bono silty clay, loamy substratum | 100 | 93 | 0.5% |
| Sb | Sebring silt loam | 100 | 55 | 0.3% |
| TOTAL | | | 265 | 1.3% |

2.4 Navigable Waters

The Survey Area is located entirely within the Sandusky River drainage basin, which drains northward toward Sandusky Bay and ultimately Lake Erie. No traditional navigable waterways are located within the Survey Area. However, tributaries of the Sandusky River include several streams that cross into the Project Area including Beaver Creek, Indian Creek, Morrison Creek, Noel Ditch, Owl Creek, Westerhouse Ditch, Pickerel Creek, and Royer Ditch. Other tributaries located nearby, but which do not cross into the Survey Area, include Emerson Creek, Hayward Ditch, Albright Ditch, Green Creek, and Raccoon Creek. All of the tributaries identified in the Study Area are designated as warm water habitat (WWH) in the Water Quality Standards, except for a portion of Beaver Creek/Green Creek which is listed as cold water habitat (CWH).³

The Survey Area can be categorized into 10 main drainage areas (12-Digit Hydrologic Unit Code), as shown in Table 2-3:

² ODNR 1998.

³ OEPA 2007.

Table 2-3 Drainage Areas Within the Project Area

| | |
|-------------------------------------|----------------------|
| Spicer Creek-Sandusky River | Westerhouse Ditch |
| Indian Creek-Sandusky River | Beaver Creek |
| Morrison Creek | Rock Creek |
| Raccoon Creek-Frontal Sandusky Bay | Frink Run |
| Pickerel Creek-Frontal Sandusky Bay | Flag Run-Green Creek |

2.5 Remote Wetland and Waterbody Identification

Prior to site investigations, the Survey Area was screened using the NRCS, ODNR OWI, USFWS NWI, and USGS NHD (2017) remote data for potential wetlands and waterbodies. The NWI and OWI data shows remotely identified wetlands, which may be based on previous aerial imagery interpretation and soils surveys, while the NHD uses digital stream information to identify potential waterways.

Multiple wetlands and waterbodies were identified within the Survey Area, with some additional streams and wetlands occurring in the vicinity of the Survey Area. The majority of the waterbodies remotely identified appeared to be manipulated agricultural ditches. Additionally, the Cardno team identified several NHD features that ran directly through active agricultural areas but were not visible in any aerial imagery. These relic NHD features may have been rerouted by previous land use manipulation or even tiled which would route them under crop areas. Most of the wetlands identified by ODNR occurred in isolated woodlots, with moderate overlap with NWI features.

2.6 Desktop Review Summary

The desktop review indicated potential for wetlands to be located in multiple woodlots in the Survey Area. The Survey Area also had a high number of ditches and streams that ran between crop areas which may or may not still be present. It is Cardno's experience that the NHD set can sometimes indicate features which are no longer present or have been moved underground via tiles by landowners. Much of the Survey Area was cultivated crops which limit the likelihood of wetlands in that land use.

3 Field Delineation Surveys

Between the fall of 2016 and fall of 2018, Cardno surveyed 20,286 acres which covered 315 parcels. The acreage surveyed for wetlands and waterbodies is considered the Survey Area, and it contains all areas of proposed facility infrastructure (e.g., turbines, collection lines, transmission lines, access roads, substation, and laydown yards).

3.1 Methodologies

Surface water delineation surveys were conducted in the Survey Area to determine the extent of wetlands and waterbodies during field surveys in accordance with applicable federal and state regulations and guidelines. A Trimble® Global Positioning System (GPS) with sub-meter accuracy was used to collect data points for mapping. As wetland and waterbody point features were collected, they were assigned a FEATURE_ID with the format of FFF-XXX-YY, where:

FFF = Feature Type

- DOH – Ditches
- SOH – Streams
- POH – Ponds
- WOH – Wetlands

XXX = Three-digit number as the unique identifier

YY = Flag number per each unique feature identified

The information collected in the field was post-processed using ArcGIS and verified by the field team for accuracy. If a feature continued out of the Survey Area, it was noted. Appendix A contains representative photo documentation of the delineated wetland and waterbody features. Appendix B contains maps depicting the delineated surface water features. Appendix C contains the completed routine wetland data and Ohio Rapid Assessment Methodology (ORAM) assessment forms from the field efforts. Appendix D contains the completed Headwater Habitat Evaluation Index (HHEI) and relevant Qualitative Habitat Evaluation Index (QHEI) forms.

3.1.1 Wetland Delineations

Wetland delineations were conducted according to the 1987 USACE *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* (USACE 2011) and *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (USACE 2010). These documents are cumulatively referred to as the Manual. The methodology outlined in the Manual requires the area being evaluated to meet the three wetland criteria in order for a wetland to be present; 1) dominance of hydrophytic vegetation, 2) hydric soils, and 3) sufficient hydrology.

Sampling points were taken at each suspected wetland, within the wetland and outside in the upland area. At each sampling point, Cardno:

- Recorded location using GPS equipment;
- Completed routine wetland determination forms in the wetland and upland area, including:
 - Evaluating sampling points for dominance of hydrophytic vegetation;
 - Evaluating soils for evidence of hydric conditions;
 - Evaluating presence of indicators of wetland hydrology;

- Recorded habitat notes for narrative descriptions and use in ORAM; and
- Documented the feature's current conditions with photos.

The boundaries of each wetland were recorded by GPS at intervals to accurately capture changes in profile. Physical flagging was hung along the wetland boundary in areas that would not interfere with farming and livestock operations or disturb private landowners.

3.1.1.1 *Hydrophytic Vegetation Criterion*

The hydrophytic vegetation criterion is met when more than 50 percent of the dominant plant community is hydrophytic, as determined by species dominance and the assigned species-specific indicator status of the identified species. The National Wetland Plant List (NWPL) is a list of wetland plants and their assigned indicator statuses. An indicator status reflects the likelihood that a particular plant occurs in a wetland or nonwetland. Table 3-1 shows the indicator status categories for plants.

Table 3-1 Plant Indicator Categories

| Indicator Category | Indicator Symbol | Definition |
|----------------------------|------------------|--|
| Obligate Wetland Plants | OBL | Plants that occur almost always (estimated probability >99 percent) in wetlands under natural conditions, but which may also occur rarely (estimated probability <1 percent) in nonwetlands. |
| Facultative Wetland Plants | FACW | Plants that occur usually (estimated probability >67 percent to 99 percent) in wetlands, but also occur (estimated probability 1 percent to 33 percent) in nonwetlands. |
| Facultative Plants | FAC | Plants with a similar likelihood (estimated probability 33 percent to 67 percent) of occurring in both wetlands and nonwetlands. |
| Facultative Upland Plants | FACU | Plants that occur sometimes (estimated probability 1 percent to <33 percent) in wetlands, but occur more often (estimated probability >67 percent to 99 percent) in nonwetlands. |
| Obligate Upland Plants | UPL | Plants that occur rarely (estimated probability <1 percent) in wetlands, but occur almost always (estimated probability >99 percent) in nonwetlands under natural conditions. |

Both the Northcentral/Northeast and the Midwest regional supplements evaluate vegetation in four different strata, including tree, sapling/shrub, herb, or woody vine. The tree stratum includes all woody plants with a diameter at breast height (DBH) of more than 3 inches. The sapling/shrub stratum includes all woody vegetation with a DBH less than 3 inches and greater than 1 meter tall. The herb stratum includes all herbaceous/non-woody plants and woody plants less than 1 meter tall. The woody vine stratum includes all the woody vines greater than 1 meter in height. Typically the vegetation in each stratum is evaluated within a uniform plot size at each sampling point. The plots are often nested, so that all trees and vines within a 30-foot radius are evaluated, then all sapling/shrubs within a 15-foot radius, and then all herbaceous plants within a 5-foot radius of the sampling point. The plot size and dimensions can be altered as needed. For example, if a wetland is identified as rectangular, the plots can be rectangular as well and of varying sizes for each of the stratum.

Dominant vegetation is assessed for hydrophytic preference. After identifying the plant species present within the sampling point of a potential wetland, the dominance and indicator status for each identified unique species was determined. Based on the results, the vegetation community being evaluated was determined to be indicative of either a wetland or nonwetland.

If the site is dominated by hydrophytic vegetation (OBL or FACW) only, then the site meets the criteria for the rapid test for hydrophytic vegetation. However, if the dominant vegetation is a mix of species and indicators, then a more detailed analysis of the dominance can be completed on the wetland determination data form. The dominance test is simply the number of dominant species that are rated as OBL, FACW, or FAC divided by the total number of dominant species. If the dominance test result is greater than 50 percent, then the hydrophytic vegetation criteria is met.

Additional methods can be used on the wetland determination form for areas where a suspected wetland has hydric soils and hydrology but fails the dominance test. Cardno utilized one such evaluation method that involves calculating a prevalence index which weights the coverage of a particular class of species (using its wetland indicator status) against the total coverage within the sampling area. If a sampling area passes this test (which requires the value to be less than or equal to 3), it can be considered a wetland. Cardno also noted the presence of morphological adaptations, which can include root buttressing, shallow roots, or multi-stemmed trunks. The presence of such adaptations is considered evidence that the plants (even FACU species) have adapted to survive in prolonged inundation or root saturation.

In rare instances, another method for identifying hydrophytic vegetation is to report “Problematic Hydrophytic Vegetation.” This method is used sparingly, and reflects the delineator’s opinion that conditions outside of those considered normal may be present, such as vegetation being bent or damaged to such a degree that identification to species level is impracticable. Damage to vegetation may be the result of recent severe weather, unseasonably cold conditions, or habitat destruction. Under this method, the vegetation present would be treated as consistent with a wetland, but the vegetation could not be reliably identified. This method was utilized by Cardno for one wetland that was recently cleared within the Survey Area.

3.1.1.2 Hydric Soils Criterion

The hydric soils criterion is met when the soils identified are officially listed as hydric soils or the soils demonstrate characteristics representative of soils in reducing (hydric) conditions. The latter is determined in the field by teams digging small test pits to evaluate the upper 12 to 16 inches of soil (or to a depth until refusal, bedrock, or large debris preventing further digging). Cardno evaluates if the soils fall within the hydric ranges on the Munsell Color Chart, examine soil profiles for other evidence of reducing conditions, and/or observe other indicators of anaerobic activity per the Manual. Under certain conditions, hydric soils can be assumed to be present without testing, including when a sampling point is dominated by hydrophytic vegetation (i.e., vegetation rated OBL or FACW) and obvious wetland hydrology is present such as direct observation of surface water or saturated soils.

3.1.1.3 Hydrology Criterion

The hydrology criterion is met when sufficient hydrologic indicators are present. The indicators must be representative of sufficient saturation or inundation occurring over the growing season sufficient to support a hydrophytic plant-dominated vegetative community. The Manual categorizes the wetland hydrology indicators into four groups which document different types of hydrologic observations:

- Group A indicators are based on direct observation of surface or ground water;
- Group B indicators identify the site as having evidence of potential flooding or ponding despite a lack of inundation at the time of a site visit;
- Group C indicators document evidence of soil saturation, either recent or current; and
- Group D indicators consist of landscape, soil, and vegetation features identifying contemporary wet conditions.

Each of the groups is further identified as either a primary or a secondary indicator for each group. Identification as primary or secondary is based on estimated reliability of an indicator to accurately identify

wetland conditions, and can vary by region. In all regions, a single primary indicator is needed to identify the presence of wetland hydrology, or at least two secondary indicators.

Regional indicators and their status as primary or secondary are identified in Table 3-2. If an indicator does not have an 'X' for a region, then it is not applicable to that area.

Table 3-2 Hydrology Indicators and Regional Manual Status

| Type of Indicator | Midwest ^a | | Northcentral/Northeast ^b | |
|---|----------------------|-----------|-------------------------------------|-----------|
| | Primary | Secondary | Primary | Secondary |
| Group A - Observation of Surface Water or Saturate Soils | | | | |
| A1 - Surface Water | X | | X | |
| A2 - High Water Table | X | | X | |
| A3 - Saturation | X | | X | |
| Group B - Evidence of Recent Inundation | | | | |
| B1 - Water Marks | X | | X | |
| B2 - Sediment Deposits | X | | X | |
| B3 - Drift Deposits | X | | X | |
| B4 - Algal Mat or Crust | X | | X | |
| B5 - Iron Deposits | X | | X | |
| B6 - Surface Soil Cracks | | X | | X |
| B7 - Inundation Visible on Aerial Imagery | X | | X | |
| B8 - Sparsely Vegetated Concave Surface | X | | X | |
| B9 - Water-stained Leaves | X | | X | |
| B10 - Drainage Patterns | | X | | X |
| B13 - Aquatic Fauna | X | | X | |
| B14 - True Aquatic Plants | X | | | |
| B15 - Marl Deposits | | | X | |
| B16 - Moss Trim Lines | | | | X |
| Group C - Evidence of Current or Recent Soil Saturation | | | | |
| C1 - Hydrogen Sulfide Odor | X | | X | |
| C2 - Dry-season Water Table | | X | | X |
| C3 - Oxidized Rhizospheres Along Living Roots | X | | X | |
| C4 - Presence of Reduced Iron | X | | X | |
| C6 - Recent Iron Reduction in Tilled Soils | X | | X | |
| C7 - Think Much Surface | X | | X | |
| C8 - Crayfish Burrows | | X | | X |
| C9 - Saturation Visible on Aerial Imagery | | X | | X |
| Group D - Evidence from Other Site Conditions or Data | | | | |
| D1 - Stunted or Stressed Plants | | X | | X |
| D2 - Geomorphic Position | | X | | X |

Table 3-2 Hydrology Indicators and Regional Manual Status

| Type of Indicator | Midwest ^a | | Northcentral/Northeast ^b | |
|------------------------------|----------------------|-----------|-------------------------------------|-----------|
| | Primary | Secondary | Primary | Secondary |
| D3 - Shallow Aquitard | | | | X |
| D4 - Microtopographic Relief | | | | |
| D5 - FAC-neutral Test | | X | | X |
| D9 - Gauge or Well Data | X | | | |

Notes:

^a *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)* (USACE 2010)^b *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)* (USACE 2011)**3.1.2 Ohio Environmental Protection Agency - Ohio Rapid Assessment Methodology**

After the field delineations were complete, the identified wetlands were scored using the OEPA's ORAM. The ORAM wetland functional assessment was developed to determine the ecological "quality" and level of function of a particular wetland in order to meet requirements under Section 401 of the CWA. Wetlands are scored on the basis of hydrology, upland buffer, habitat alteration, special wetland communities, and vegetation communities. Each of these subject areas is further divided into sub-categories under ORAM v5.0, resulting in a score that describes the wetland using a range from 0 (low quality and high disturbance) to 100 (high quality and low disturbance).

Wetlands that receive a score from between 0 to 29.9 are grouped into "Category 1," 30 to 59.9 are "Category 2" and 60 to 100 are "Category 3." Transitional zones exist between "Categories 1 and 2" from 30 to 34.9 and between "Categories 2 and 3" from 60 to 64.9. However, wetland scores that fall into one of these transitional ranges should be assigned to the higher Category unless collected data suggests the wetland should be placed in the lower category.

Category 1 consist of wetlands that are often isolated emergent marshes dominated by invasive species (such as cattails), with little or no upland buffers, and which are located in and around active agricultural fields. Category 2 consists of wetlands for which rare, threatened, or endangered species (RTE) and their habitat are absent, but may have well-developed habitat for other more common species. Category 2 wetlands constitute the broad middle category of "good" quality wetlands. A "Modified Category 2" wetland appears to have some signs of degradation but also has the potential to restore some of the lost functionality. Category 3 wetlands are typified by high levels of diversity, a high proportion of native species, and/or high functional values. Category 3 wetlands include wetlands that may contain or provide habitat for threatened or endangered species, are high quality mature forested wetlands, vernal pools, bogs, fens, or which are scarce regionally and/or statewide.

3.1.3 Waterbody Delineations

During field delineations, waterbodies were characterized into three categories including ditches (DOH), streams (SOH), and ponds (POH), defined as follows:

1. Ditches were identified as man-made or modified channels, which were manipulated by landowners or communities to improve drainage amongst farm fields. Modification to channels could include the mowing of bank vegetation, altering of channel morphology, or removal of debris to maintain flow conditions. Many ditches were identified as having ephemeral or intermittent flows and heavily vegetated channels. Most ditches also had trapezoidal cross sections, with a small bankfull width/channel at the bottom and a wider crossing distance at the

TOB. If a ditch crossed under a road, the deepest pools of water were normally located at the edges of the culvert which was a result of eddies and currents of stormwater flow creating erosion. Most ditches lacked flowing water throughout and were primarily either moist channels or had limited isolated pools along the reaches surveyed.

2. Streams were more often considered natural channels which had indications of significant recovery since any historic modification had occurred. Streams often had perennial or intermittent flows (with isolated pools and moist channel areas). Streams were more likely to have vegetated riparian buffers along the banks and pools of water which might support wildlife.
3. Ponds were features that appeared to hold water throughout the year. Many of the ponds observed in the vicinity of the Survey Area were man-made impoundments which may be used for holding water for irrigation or recreational fishing and aesthetics.

Waterbodies were delineated by taking GPS points along the Ordinary High Water Mark (OHWM) along the course of the channel. The OHWM is defined as the lateral extents over which agencies have regulation, and is defined in the CWA and the Code of Federal Regulations (CFR) as “*The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas*” (33 CFR 328.3(e)). The USACE has issued additional regulatory guidance, as a Regulatory Guidance Letter, which identifies physical characteristics which can be used to identify the OHWM in the field, including: shelving, changes in soil character, bed and bank, wracking, or natural line impressed on the bank (USACE 2005).

Measurements including bankfull width (OWHM to OWHM) and Top-of-Bank (TOB) to TOB were also recorded. Photos were taken along the waterbodies to capture the typical conditions. Observational notes about the characteristics of the waterbody (such as flow regime and substrate) were recorded by the field team for use in evaluating the stream quality. Table 3-3 identifies the definitions used in assigning flow categories.

Table 3-3 Flow Categories

| Flow Category | Definition |
|---------------|---|
| Perennial | Flow is continuous and likely permanent across the seasons (though it may vary). Such flow can be surface based or occur as interstitial flow, which would include the flow driving underground for a portion of the channel. |
| Intermittent | Flow is present during extended periods of time during some seasons, but gradually returns to a state of isolated pools in the channel or a dry channel. There may be indications of subsurface flow (interstitial). |
| Ephemeral | Flow is often not present during the majority of the year, and only occurs after a precipitation event. Channels of ephemeral streams will be dry with no evidence of isolated pools of water. |

3.1.4 Headwater Habitat Evaluation Index Assessments

All flowing streams and ditches, but not ponds delineated in the Survey Area were assessed using the OEPA’s HHEI. The HHEI allows for uniform scoring of various waterbodies using a standard methodology that identifies pertinent information about the waterbody including substrates, pool depths, and bankfull width.

Substrate is taken as an estimate of the types and abundance of substrate available in the sampled stream reach. The two dominant substrates are then used to calculate the score for the substrate metric.

Each substrate type is scored according to potential use by biota; an example being cobble is scored as 12 points while clay or hardpan scores 0 points. Evaluation is restricted to areas of substrate in wetted areas where water is present, or along the entire course of the channel for dry stream channels. Once the dominant substrates are scored, the number of substrates recorded is added for a final substrate metric score. The substrates cannot score more than 40 points.

Maximum pool depth is also evaluated to identify whether a stream reach can support a significant fish community. Identifying pool depth can also help in determining the flow type of the stream. Maximum pool depth avoids the measurements of plunge pools since they are not characteristic of overall stream morphology. Maximum pool depth cannot score more than 30 points.

The final metric evaluated by the HHEI is the average bankfull width. Bankfull width is defined in the HHEI Manual as “...the elevation on the stream banks where the flow is at bankfull discharge. The bankfull discharge is defined as follows ‘...the discharge at which channel maintenance is the most effective, that is, the discharge at which moving sediment, forming or removing bars, forming or changing bends and meanders, and generally doing work that results in the average morphological characteristics of channels.’ Dunne and Leopold (1978).” (OEPA 2009). The use of bankfull width is analogous to the OHWM which was previously defined in Section 3.1.3. Bankfull width can score up to 30 points.

Once all components are evaluated, a final score is tabulated. Typical score ranges and waterbody characterizations are found in Table 3-4. Additional information is recorded on the HHEI worksheet (Appendix D) including information on surrounding land use and riparian width, flow regime at time of evaluation, sinuosity, and gradient of the stream reach, and other current conditions such as turbidity and time since last rainfall.

Table 3-4 Headwater Habitat Evaluation Index Scoring

| Final HHEI Score | Definition |
|------------------|---|
| <30 | Class I PHWH (ephemeral streams, normally dry channel, little to no aquatic life) |
| 30 - 50 | Class II PHWH (intermittent flow, summery-dry, warm water streams) |
| >50 | Class II or III PHWH (depending on conditions) |
| >75 | Class III (perennial flow, cool-cold water streams) |

PHWH – Primary Headwater Stream

3.1.5 Qualitative Habitat Evaluation Index Assessments

Larger features were evaluated using the OEPA’s QHEI. The QHEI form is used to describe similar aspects of waterbodies, but is focused on larger (often higher quality) waterbodies. Typically, QHEI forms are completed only for those perennial features that meet two criteria: drainage areas greater than 1 square mile and pools deeper than 40 centimeters (approximately 16 inches). The maximum possible QHEI score is 100; waterbodies with a total score of 75 or more are characterized as potential exceptional WWH. In cases where a feature scored highly on the HHEI forms but failed to meet the QHEI criteria, it was still evaluated with the QHEI to better record the conditions present. Six principal metrics are used to score a feature.

1. Where the HHEI looks to identify the dominant substrates and overall amount, the QHEI identifies the types of substrates as well as their origin and quality as the first metric. The QHEI also identifies the type of cover as a percent of cover for both pools and riffles within the sampling reach. Similar to the HHEI, different types of substrate are scored differently; for example cobble is scored for 8 points where as silt bottoms are scored for 2 points. The QHEI attributes a maximum of 20 points for substrate.

2. Instream cover is the second metric evaluated under the QHEI, and identifies the presence or absence as well as amount of particular types of cover that could be used by aquatic fauna. Each cover type that is present is scored on a scale of 0 (absent) to 3 (highest quality in moderate or great amounts) which help to describe the cover available in the stream reach. A final category for amount determines the overall extent of all types of cover, such as sparse between 5 and 25 percent or extensive at greater than 75 percent. Instream cover can score a maximum of 20 points.
3. Channel morphology is evaluated in the QHEI by scoring the sinuosity, development, channelization, and stability of the stream reach. The sum of the components cannot exceed 20 points for channel morphology.
4. Bank erosion and riparian zone is the fourth category evaluated by the QHEI. The erosion is identified and scored by degree, for each bank. Riparian width and flood plain quality are also scored as part of this metric, and are tabulated on a per bank basis. Flood plain land use is identified as the area approximately 100 meters beyond the riparian boundary. This metric can score a maximum of 10 points.
5. Pool/glide and riffle/run quality is the next metric evaluated by QHEI. A variety of components are evaluated under this metric, including the maximum depth of pools or glides present, type/speed of current, morphology of channel, riffle depth, run depth, and substrate and embeddedness in riffle/run areas of the waterbody. The pool/glide and riffle/run quality cannot score more than 20 points.
6. The sixth and final metric evaluated under the QHEI is the gradient of the waterbody. The gradient is estimated as change in elevation as feet per mile. Low gradients can score between 2 and 4 points where as high gradient streams can score between 6 and 10 points. This metric can score a maximum of 10 points.

Table 3-5 provides an overview of the typical score ranges and waterbody classification under QHEI.

Table 3-5 Qualitative Habitat Evaluation Index Scoring

| Final QHEI Score | Definition |
|------------------|--|
| <32 | Limited Resource Water |
| 32 - 60 | Modified Warm Water Habitat (MWH) |
| 60 - 75 | Warm Water Habitat (WWH) |
| >75 | Possible Exceptional Warm Water Habitat (EW) |

3.1.6 Potential Jurisdictional Determinations

Cardno has identified features it considers potentially jurisdictional based on USACE/U.S. Environmental Protection Agency (USEPA) guidance material and makes a recommendation on the potential jurisdictional status of each feature. Guidance used for these determinations include documentation from the USEPA "Current Implementation of Waters of the United States"⁴ which refers to the original 1986/1988 promulgation and subsequent Supreme Court cases which further defined the term.

⁴ 40 CFR 230.3

The Supreme Court cases include those known as the Solid Waste Agency of Northern Cook County (SWANCC) case⁵ and the Rapanos Guidance⁶. In the 2001 SWANCC decision it was determined that the USACE could not extend CWA Section 404 jurisdiction over physically isolated wetlands using the Migratory Bird Treaty Act (MBTA). In the case, SWANCC had sought to fill isolated and non-navigable wetlands, but the USACE had extended CWA jurisdiction due to their use as habitat by migratory birds. Since the wetlands were non-navigable waters and isolated from any true navigable WOTUS, it was determined that the use of the MBTA to assert jurisdiction was improper. The Rapanos Guidance actually refers to two court cases which were consolidated, *Rapanos v. United States* and *Carabell v. United States*. The combined guidance document developed after the rulings from USEPA and USACE identified several key points regarding jurisdiction and when it would be exercised:

- Agencies would always assert jurisdiction over traditionally navigable waterways (TNWs), wetlands adjacent to TNWs, non-navigable tributaries of TNWs with relatively permanent flow (flow year round or have continuous flow at least seasonally), and wetlands abutting such tributaries;
- Agencies will evaluate the following waters for a significant nexus to a TNW before deciding jurisdiction: non-navigable tributaries that are not relatively permanent, wetlands adjacent to non-navigable tributaries that are not relatively permanent, or wetlands adjacent to but do not directly abut a relatively permanent non-navigable tributary; and
- Agencies will not assert jurisdiction over swales, erosional features, or those ditches excavated wholly in and draining only uplands that do not carry a relatively permanent flow of water.

Critical to the Rapanos Guidance was the definition of a *significant nexus*, which would be determined by assessing the flow characteristics of a tributary and functions performed by any adjacent wetlands. The function of a wetland or waterbody was the potential ability to alter the chemical, physical, or biological integrity of a down-stream TNW.

The Code of Federal Regulations (33 CFR 328.3), defines WOTUS as:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
 - a. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
 - b. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - c. Which are used or could be used for industrial purposes by industries in interstate commerce;
4. All impoundments of waters otherwise defined as WOTUS under this definition;
5. Tributaries of waters identified in paragraphs (s)(1) through (4) of this section;

⁵ 68 FR 10 (January 15, 2003) <https://www.gpo.gov/fdsys/pkg/FR-2003-01-15/pdf/03-960.pdf>

⁶ USEPA 2008.

6. The territorial sea;
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (s)(1) through (6) of this section; waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 423.11(m) which also meet the criteria of this definition) are not WOTUS.

4 Delineation Results

The following is a discussion of the results of field surveys completed within the Survey Area. Seasonal conditions in the Survey Area were typical for the area during both the fall 2016 and fall 2018 surveys; field teams experienced several rainy days during the surveys. Appendix A contains representative photo documentation of the delineated surface water features. Appendix B contains maps depicting the delineated surface water features. Appendix C contains the completed routine wetland data forms and ORAM forms from the field efforts. Appendix D contains the completed HHEI and QHEI forms.

4.1 Wetlands

A total of 106 wetlands were delineated during field surveys, for a total of 155.23 acres of wetland within the Survey Area. The majority of wetlands were identified as Palustrine Forested Wetlands (PFO; n=62), followed by Palustrine Emergent Wetlands (PEM; n=32). Only one wetland was identified as Palustrine Scrub/Shrub (PSS). The remaining 11 wetlands were a combination of PEM/PFO, PSS/PFO, or PEM/PSS. Table 4-1 provides a list of the delineated wetland acreages, category, and associated ORAM scoring (see Section 3.1.2 for details on this scoring system). ORAM scores varied widely throughout the Survey Area. The following provides a summary of each Category ranking.

Table 4-1 Wetlands Delineated in the Survey Area

| Wetland ID | Latitude of Center Point | Longitude of Center Point | Area (acres) within Survey Area | Wetland Type | ORAM Score | Wetland Category | Jurisdictional Recommendation | Drainage Basin | Cardno Parcel | Mapbook Location |
|------------|--------------------------|---------------------------|---------------------------------|--------------|------------|------------------|-------------------------------|----------------------------------|---------------|------------------|
| WOH-002 | 41.201968 | -83.034263 | 0.28 | PEM | 10 | 1 | Yes | Beaver Creek | 157 | 92 |
| WOH-003 | 41.190625 | -83.012886 | 0.94 | PEM/ PFO | 41 | Modified 2 | No | Sugar Creek | 180 | 132 |
| WOH-004 | 41.1927 | -83.04389 | 0.84 | PFO | 47.5 | 2 | No | Beaver Creek, Sugar Creek | 173 | 116 |
| WOH-006 | 41.204589 | -83.020032 | 0.58 | PEM/ PFO | 48.5 | 2 | Yes | Westerhouse Ditch | 159 | 93 |
| WOH-007 | 41.205141 | -83.002509 | 0.83 | PEM/ PFO | 56 | 2 | No | Westerhouse Ditch | 162 | 94 |
| WOH-008 | 41.154758 | -82.944182 | 28.97 | PEM/ PFO | 78 | 3 | Yes | Westerhouse Ditch | 271, 279 | 204 & 205 |
| WOH-009 | 41.160548 | -82.959679 | 6.07 | PFO | 51 | 2 | No | Westerhouse Ditch | 269 | 182, 188, 196 |
| WOH-010 | 41.165705 | -82.948423 | 4.31 | PEM/ PFO | 49 | 2 | Yes | Westerhouse Ditch | 256, 259 | 179 & 190 |
| WOH-101 | 41.221805 | -83.709945 | 0.91 | PEM | 54 | 1 | Yes | Indian Creek - Sandusky River | 078, 079 | 44 & 57 |
| WOH-102 | 41.209362 | -83.090177 | 1.01 | PEM | 17 | 1 | No | Indian Creek - Sandusky River | 307 | 78 |
| WOH-105 | 41.227356 | -83.04171 | 0.24 | PFO | 38 | Modified 2 | No | Beaver Creek | 083 | 37 |
| WOH-106 | 41.216242 | -83.041332 | 0.10 | PEM | 5 | 1 | No | Beaver Creek | 306 | 61 |
| WOH-107 | 41.213152 | -83.039569 | 0.42 | PEM | 28 | 1 | Yes | Beaver Creek | 118 | 73 |
| WOH-108 | 41.207756 | -83.041203 | 4.20 | PFO | 55 | 2 | No | Beaver Creek | 134, 135 | 81 & 91 |
| WOH-109 | 41.205033 | -83.040217 | 0.14 | PFO | 48 | 2 | No | Beaver Creek | 135 | 91 |
| WOH-110 | 41.203937 | -83.045129 | 2.73 | PFO | 67 | 3 | No | Beaver Creek | 135 | 91 |
| WOH-111 | 41.202879 | -83.046153 | 2.13 | PFO | 67 | 3 | No | Beaver Creek | 135 | 91 |

Table 4-1 Wetlands Delineated in the Survey Area

| Wetland ID | Latitude of Center Point | Longitude of Center Point | Area (acres) within Survey Area | Wetland Type | ORAM Score | Wetland Category | Jurisdictional Recommendation | Drainage Basin | Cardno Parcel | Mapbook Location |
|------------|--------------------------|---------------------------|---------------------------------|--------------|------------|------------------|-------------------------------|--------------------------------------|---------------|------------------|
| WOH-122 | 41.195529 | -83.018252 | 4.16 | PFO | 60 | 2 | No | Beaver Creek, Westerhouse Ditch | 177, 178 | 118 |
| WOH-123 | 41.186764 | -83.026634 | 1.05 | PFO | 45 | 2 | No | Sugar Creek | 198 | 144 |
| WOH-124 | 41.18194 | -83.02611 | 0.15 | PFO | 43 | Modified 2 | No | Sugar Creek | 215 | 156 |
| WOH-125 | 41.180627 | -83.027909 | 3.84 | PFO | 56 | 2 | No | Sugar Creek | 215 | 156 |
| WOH-126 | 41.181471 | -83.024988 | 0.84 | PFO | 48 | 2 | No | Sugar Creek | 215 | 156 |
| WOH-127 | 41.179755 | -83.022584 | 0.16 | PFO | 51 | 2 | No | Sugar Creek | 216 | 156 |
| WOH-128 | 41.176205 | -83.018391 | 0.37 | PFO | 31 | 1 | No | Sugar Creek | 217, 235 | 164 |
| WOH-129 | 41.175564 | -83.005209 | 0.28 | PEM | 10 | 1 | No | Westerhouse Ditch | 238 | 166 |
| WOH-130 | 41.176763 | -83.004862 | 0.24 | PFO | 46 | 2 | No | Westerhouse Ditch | 220 | 158 |
| WOH-131 | 41.162911 | -82.990186 | 6.19 | PFO | 60 | 2 | No | Westerhouse Ditch | 251 | 187 |
| WOH-132 | 41.133728 | -82.964188 | 1.52 | PFO | 65 | 3 | No | Morrison Creek | 339, 340 | 222 |
| WOH-136 | 41.180942 | -82.87664 | 0.33 | PEM/ PFO | 42.5 | Modified 2 | No | Pickereel Creek-Frontal Sandusky Bay | 368 | 162 |
| WOH-137 | 41.185628 | -82.886756 | 0.86 | PEM | 30 | 1 | No | Beaver Creek | 365 | 154 |
| WOH-138 | 41.192356 | -82.89176 | 0.45 | PEM | 42.5 | Modified 2 | No | Beaver Creek | 362 | 141 |
| WOH-140 | 41.199828 | -82.922442 | 1.71 | PFO | 41 | Modified 2 | No | Beaver Creek | 368 | 65 |
| WOH-141 | 41.167043 | -82.954935 | 0.27 | PEM | 16 | 1 | No | Westerhouse Ditch | 365 | 49 |
| WOH-142 | 41.167209 | -82.957386 | 0.09 | PEM | 19 | 1 | No | Westerhouse Ditch | 362 | 70 |

Table 4-1 Wetlands Delineated in the Survey Area

| Wetland ID | Latitude of Center Point | Longitude of Center Point | Area (acres) within Survey Area | Wetland Type | ORAM Score | Wetland Category | Jurisdictional Recommendation | Drainage Basin | Cardno Parcel | Mapbook Location |
|------------|--------------------------|---------------------------|---------------------------------|--------------|------------|------------------|-------------------------------|---|---------------|------------------|
| WOH-143 | 41.142833 | -82.931199 | 0.41 | PFO | 41 | Modified 2 | No | Westerhouse Ditch | 169 | 35 |
| WOH-144 | 41.163863 | -82.95064 | 0.02 | PEM | 25.5 | 1 | No | Westerhouse Ditch | 255 | 55 |
| WOH-145 | 41.19581 | -82.898428 | 0.45 | PEM | 35 | Modified 2 | No | Beaver Creek | 255 | |
| WOH-200 | 41.266449 | -82.917019 | 0.59 | PFO | 19 | 1 | No | Pickerel Creek-Frontal Sandusky Bay, Raccoon Creek-Frontal Sandusky Bay | 282 | 64 |
| WOH-201 | 41.260036 | -82.908767 | 0.12 | PEM | 6 | 1 | No | Pickerel Creek-Frontal Sandusky Bay | 257 | 55 |
| WOH-202 | 41.232944 | -82.845721 | 0.28 | PFO | 28 | 1 | Yes | Pickerel Creek-Frontal Sandusky Bay | 057 | 34 |
| WOH-203 | 41.235834 | -82.847672 | 0.01 | PSS | 17 | 1 | No | Pickerel Creek-Frontal Sandusky Bay | 057 | 34 |
| WOH-204 | 41.225412 | -82.917667 | 1.03 | PFO | 23 | 1 | No | Beaver Creek | 087 | 48 |
| WOH-205 | 41.225558 | -82.914889 | 0.13 | PEM | 16 | 1 | No | Beaver Creek | 087 | 48 |
| WOH-206 | 41.220767 | -82.874662 | 0.17 | PEM | 19 | 1 | No | Pickerel Creek-Frontal Sandusky Bay | 094 | 65 |
| WOH-207 | 41.219078 | -82.87466 | 0.12 | PFO | 39 | Modified 2 | No | Pickerel Creek-Frontal Sandusky Bay | 094 | 65 |
| WOH-208 | 41.206005 | -82.922117 | 0.03 | PFO | 55 | 2 | No | Beaver Creek | 141 | 98 |

Table 4-1 Wetlands Delineated in the Survey Area

| Wetland ID | Latitude of Center Point | Longitude of Center Point | Area (acres) within Survey Area | Wetland Type | ORAM Score | Wetland Category | Jurisdictional Recommendation | Drainage Basin | Cardno Parcel | Mapbook Location |
|------------|--------------------------|---------------------------|---------------------------------|--------------|------------|------------------|-------------------------------|------------------------------------|---------------|------------------|
| WOH-209 | 41.205893 | -82.924472 | 0.02 | PFO | 55 | 2 | No | Beaver Creek | 141 | 98 |
| WOH-210 | 41.203101 | -82.917019 | 5.19 | PEM | 22 | 1 | Yes | Beaver Creek | 171 | 98 & 112 |
| WOH-211 | 41.201617 | -82.914577 | 13.31 | PEM | 28 | 1 | Yes | Beaver Creek | 171 | 99 & 113 |
| WOH-212 | 41.206968 | -82.901503 | 4.75 | PEM | 11 | 1 | Yes | Beaver Creek | 131 | 86 & 100 |
| WOH-213 | 41.191198 | -82.905287 | 0.17 | PEM | 7 | 1 | Yes | Beaver Creek | 196 | 140 |
| WOH-214 | 41.208456 | -82.890704 | 0.15 | PFO | 47 | 2 | No | Pickrel Creek-Frontal Sandusky Bay | 147 | 87 |
| WOH-215 | 41.186207 | -82.904105 | 0.09 | PFO | 37 | Modified 2 | No | Beaver Creek | 213, 214 | 152 |
| WOH-216 | 41.185239 | -82.902825 | 0.02 | PEM | 27 | 1 | No | Beaver Creek | 214 | 153 |
| WOH-217 | 41.184766 | -82.903232 | 0.04 | PEM | 26 | 1 | No | Beaver Creek | 214 | 153 |
| WOH-218 | 41.184187 | -82.902918 | 0.09 | PEM | 24 | 1 | No | Beaver Creek | 214 | 153 |
| WOH-219 | 41.183859 | -82.906944 | 0.43 | PFO | 27 | 1 | No | Beaver Creek | 214 | 152 |
| WOH-220 | 41.183608 | -82.908781 | 0.87 | PFO | 31 | 1 | No | Beaver Creek | 212, 214 | 152 |
| WOH-221 | 41.188515 | -82.935231 | 8.29 | PEM | 20 | 1 | No | Beaver Creek | 210 | 138 |
| WOH-222 | 41.183686 | -82.937197 | 1.32 | PSS/ PFO | 52 | 2 | Yes | Beaver Creek | 210, 228 | 151 |
| WOH-223 | 41.183172 | -82.935594 | 0.04 | PFO | 48 | 2 | Yes | Beaver Creek | 210 | 151 |
| WOH-224 | 41.182743 | -82.935499 | 0.01 | PFO | 48 | 2 | Yes | Beaver Creek | 228 | 151 |
| WOH-225 | 41.184502 | -82.935621 | 1.09 | PEM | 53 | 2 | Yes | Beaver Creek | 210 | 151 |
| WOH-226 | 41.191774 | -82.945462 | 0.01 | PFO | 42 | Modified 2 | No | Westerhouse Ditch | 190 | 124 |
| WOH-226A | 41.191749 | -82.94549 | 0.16 | PFO | 42 | Modified 2 | No | Westerhouse Ditch | 190 | 137 |

Table 4-1 Wetlands Delineated in the Survey Area

| Wetland ID | Latitude of Center Point | Longitude of Center Point | Area (acres) within Survey Area | Wetland Type | ORAM Score | Wetland Category | Jurisdictional Recommendation | Drainage Basin | Cardno Parcel | Mapbook Location |
|------------|--------------------------|---------------------------|---------------------------------|--------------|------------|------------------|-------------------------------|-------------------|---------------|------------------|
| WOH-227 | 41.189647 | -82.967763 | 2.48 | PFO | 68 | 3 | No | Westerhouse Ditch | 206 | 135 |
| WOH-228 | 41.184633 | -82.937129 | 0.05 | PEM | 31 | 1 | Yes | Beaver Creek | 210 | 151 |
| WOH-229 | 41.18445 | -82.93328 | 5.58 | PFO | 70 | 3 | Yes | Beaver Creek | 210, 211 | 151 |
| WOH-230 | 41.186033 | -82.932719 | 0.84 | PFO | 52 | 2 | Yes | Beaver Creek | 210, 211 | 151 |
| WOH-231 | 41.18339 | -82.931626 | 0.19 | PFO | 43 | Modified 2 | Yes | Beaver Creek | 211 | 151 |
| WOH-232 | 41.183836 | -82.93145 | 0.07 | PFO | 45 | 2 | Yes | Beaver Creek | 211 | 151 |
| WOH-233 | 41.184964 | -82.931828 | 0.66 | PFO | 44 | Modified 2 | Yes | Beaver Creek | 211 | 151 |
| WOH-234 | 41.184867 | -82.931222 | 0.10 | PFO | 47 | 2 | Yes | Beaver Creek | 211 | 151 |
| WOH-235 | 41.185779 | -82.931123 | 0.21 | PFO | 47 | 2 | Yes | Beaver Creek | 211 | 138 |
| WOH-236 | 41.182012 | -82.932628 | 5.93 | PFO | 62 | 3 | Yes | Beaver Creek | 210, 228, 232 | 151 & 160 |
| WOH-237 | 41.182189 | -82.936031 | 0.19 | PEM/ PSS | 39 | Modified 2 | Yes | Beaver Creek | 228 | 151 |
| WOH-238 | 41.180698 | -82.929741 | 0.04 | PEM/ PSS | 47 | 2 | Yes | Beaver Creek | 232 | 150 & 160 |
| WOH-239 | 41.182078 | -82.929576 | 4.39 | PFO | 80 | 3 | Yes | Beaver Creek | 211, 232 | 150 & 161 |
| WOH-240 | 41.18406 | -82.928561 | 0.79 | PFO | 52 | 2 | No | Beaver Creek | 211 | 150 |
| WOH-241 | 41.179328 | -82.928861 | 0.25 | PEM/ PSS | 46 | 2 | Yes | Beaver Creek | 232 | 160 & 161 |
| WOH-242 | 41.178186 | -82.928454 | 2.84 | PFO | 40 | Modified 2 | Yes | Beaver Creek | 232, 233 | 160 & 161 |
| WOH-243 | 41.178971 | -82.932631 | 0.15 | PEM | 27 | 1 | No | Beaver Creek | 232 | 160 |
| WOH-244 | 41.174513 | -82.960147 | 0.02 | PFO | 36 | Modified 2 | Yes | Westerhouse Ditch | 241 | 167 |

Table 4-1 Wetlands Delineated in the Survey Area

| Wetland ID | Latitude of Center Point | Longitude of Center Point | Area (acres) within Survey Area | Wetland Type | ORAM Score | Wetland Category | Jurisdictional Recommendation | Drainage Basin | Cardno Parcel | Mapbook Location |
|------------|--------------------------|---------------------------|---------------------------------|--------------|------------|------------------|-------------------------------|-------------------|---------------|------------------|
| WOH-245 | 41.177343 | -82.960023 | 0.12 | PFO | 59 | 2 | No | Westerhouse Ditch | 222 | 159 |
| WOH-246 | 41.167633 | -82.927007 | 0.04 | PEM | 34 | Modified 2 | Yes | Beaver Creek | 325 | 181 |
| WOH-247 | 41.164786 | -82.926576 | 0.18 | PFO | 32 | 1 | No | Beaver Creek | 324, 325 | 191 |
| WOH-248 | 41.160245 | -82.928326 | 0.03 | PFO | 25 | 1 | Yes | Beaver Creek | 326 | 199 |
| WOH-249 | 41.159074 | -82.923732 | 0.11 | PFO | 32 | 1 | No | Beaver Creek | 273 | 199 |
| WOH-250 | 41.154426 | -82.924118 | 0.35 | PEM | 28 | 1 | Yes | Beaver Creek | 273 | 206 |
| WOH-251 | 41.15388 | -82.924975 | 0.01 | PEM | 25 | 1 | Yes | Beaver Creek | 273 | 206 |
| WOH-252 | 41.155938 | -82.926091 | 0.10 | PEM | 18 | 1 | No | Beaver Creek | 273 | 206 |
| WOH-253 | 41.158514 | -82.926236 | 0.01 | PFO | 31 | 1 | No | Beaver Creek | 273 | 199 |
| WOH-254 | 41.154433 | -82.92849 | 0.15 | PFO | 33 | 1 | No | Beaver Creek | 272 | 206 |
| WOH-255 | 41.167565 | -82.944848 | 4.32 | PFO | 66 | 3 | No | Beaver Creek | 259 | 179 |
| WOH-256 | 41.167389 | -82.946499 | 0.18 | PEM/ PFO | 57 | 2 | No | Beaver Creek | 259 | 179 |
| WOH-257 | 41.16827 | -82.94348 | 0.84 | PFO | 66 | 3 | No | Beaver Creek | 259 | 179 |
| WOH-259 | 41.147422 | -82.942959 | 2.69 | PEM | 38 | Modified 2 | No | Westerhouse Ditch | 279 | 210 |
| WOH-260 | 41.154244 | -82.954963 | 0.06 | PEM | 12 | 1 | No | Morrison Creek | 327 | 204 |
| WOH-262 | 41.160385 | -82.962193 | 2.29 | PFO | 67 | 3 | No | Westerhouse Ditch | 269 | 182, 188, 196 |
| WOH-263 | 41.161735 | -82.960222 | 0.80 | PFO | 55 | 2 | No | Westerhouse Ditch | 252 | 182 & 188 |
| WOH-264 | 41.168648 | -82.892613 | 0.98 | PFO | 65 | 3 | Yes | Beaver Creek | 375, 401, 402 | 183 |
| WOH-265 | 41.169335 | -82.892875 | 0.12 | PFO | 51 | 2 | Yes | Beaver Creek | 401 | 183 |

Table 4-1 Wetlands Delineated in the Survey Area

| Wetland ID | Latitude of Center Point | Longitude of Center Point | Area (acres) within Survey Area | Wetland Type | ORAM Score | Wetland Category | Jurisdictional Recommendation | Drainage Basin | Cardno Parcel | Mapbook Location |
|----------------------|--------------------------|---------------------------|---------------------------------|--------------|------------|------------------|-------------------------------|----------------|---------------|------------------|
| WOH-266 | 41.169448 | -82.891286 | 0.09 | PFO | 53 | 2 | No | Beaver Creek | 402 | 183 |
| WOH-267 | 41.168639 | -82.889729 | 0.10 | PFO | 53 | 2 | No | Beaver Creek | 402 | 183 |
| WOH-268 | 41.168221 | -82.890955 | 0.18 | PFO | 54 | 2 | No | Beaver Creek | 375, 402 | 183 |
| WOH-269 | 41.170457 | -82.893063 | 0.08 | PFO | 52 | 2 | Yes | Beaver Creek | 401 | 183 |
| Total Acreage | | | 155.23 | | | | | | | |

4.1.1 Category 1 Wetlands

Thirty-nine (39) wetlands were scored as Category 1 using the ORAM. Twenty-seven (27) of these wetlands were isolated emergent wetlands without any significant habitat. Another 11 wetlands were identified as forested, but were typically sparsely vegetated concave surfaces within the woodlots. One wetland (WOH-203) was a small scrub/shrub wetland dominated by gray dogwood (*Cornus racemosa*).

4.1.2 Category 2 Wetlands

Fifty-five (55) wetlands were scored as Category 2 or Modified Category 2 according to the ORAM. Nineteen (19) were considered Modified Category 2, which indicates past manipulation of the wetland resulting in decreased habitat viability. Twelve (12) of the Modified Category 2 wetlands were considered forested, with the historic manipulations often related to selective logging or development of utility terrain vehicle (UTV) paths through them. Thirty-six wetlands were identified as Category 2; of which 28 were identified as forested.

4.1.3 Category 3 Wetlands

Twelve (12) wetlands were scored as Category 3 using the ORAM. The majority were relatively large forested wetlands with well-developed habitat and specific descriptions are provided below.

WOH-008 is a relatively large (28.97 acres) forested wetland that was located along a segment of Westerhouse Ditch (DOH-040) at the bottom of a minor valley between cultivated crop areas. The wetland itself contains relic oxbows of the Westerhouse Ditch as well. The wetland had pockets of open emergent areas where it appears the trees had either died from historic storm damage or inundation, as well as forested portions along the relic stream channel that had isolated pools of water. The surrounding landscape sloped into the wetland which meant any runoff naturally flowed into and was retained by the wetland. Wetland WOH-008 extends outside of the Survey Area to the west. The large size, lack of disturbance and development of quality habitat led to the wetland scoring highly on the ORAM. Due to its proximity to Westerhouse Ditch it was considered jurisdictional.

WOH-110 is a 2.73-acre forested wetland located inside of a woodlot. It was characterized by a shallow, sparsely vegetated concave surface which likely retained water for a large portion of the year as evidenced by stained leaves. The vegetation along the perimeter of the wetland was predominately FACU species such as shagbark hickory and basswood (*Tillia americana*) with morphological adaptations (primarily root buttressing). The presence of these adaptations indicated seasonal inundation. The concave nature of the wetland also allowed the wetland to retain runoff. The wide buffers between WOH-110 and surrounding land use, moderate amounts of microtopographic habitat, and a lack of any observable disturbance led to the wetland scoring highly on the ORAM. Due to its location within a woodlot, and lack of connection to a WOTUS, it is not considered jurisdictional.

WOH-111 is a 2.13-acre forested wetland. Wetland WOH-111 was characterized by a shallow, sparsely vegetated concave surface with significant presence of FACU species along the perimeter. Moderate amounts of dead standing wood and woody debris could provide habitat value, but it is likely that the inconsistent water levels would limit development. The wide buffers between WOH-111 and surrounding land use, moderate amounts of microtopographic habitat, and a lack of any observable disturbance led to the wetland scoring highly on the ORAM. Due to the lack of proximity to a WOTUS, wetland WOH-111 is not considered jurisdictional.

WOH-132 is a 1.52-acre forested wetland located along an ephemeral seep that runs the width of an isolated woodlot. Vegetation within the wetland is dominated by marsh marigold (*Caltha palustris*) and OBL species, with FACW species in the shrub/sapling layer such as American beech and spicebush (*Lindera benzoin*). The wide buffers between WOH-132 and surrounding land use, as well as a lack of any observable disturbance, led to the wetland scoring highly on the ORAM. Due to the lack of connection with a WOTUS, wetland WOH-132 is not considered jurisdictional.

WOH-227 is a 2.48-acre forested wetland located in an isolated woodlot surrounded by cultivated crop areas. The wetland was dominated by FACW species such as silver maple and green ash in the tree and sapling stratum, and Muskigum sedge (*Carex muskingumensis*) and sweet wood-reed (*Cinna arundinacea*) dominating the herb stratum. A lack of noticeable habitat alteration and significant habitat development led to a high score on the ORAM. Due to the wetland occurring in an isolated woodlot with no connection to any WOTUS, WOH-227 is not considered jurisdictional.

WOH-229 is a relatively large 5.58-acre forested wetland located in a forested wetland complex just east of the intersection of County Road (CR) 27 and Township Road (TR) 0138. The wetland occurs in a woodlot between two unnamed tributaries to Royer Ditch. The wetland was characterized by a shallow, sparsely vegetated concave surface, which allowed for retention of water for extended periods of time. Vegetation in the wetland included eastern cottonwood (*Populus deltoides*), pin oak, American elm, and creeping-jenny (*Lysimachia nummularia*). The wide buffers, lack of disturbance, and habitat development led to the wetland scoring highly on the ORAM. Due to the location adjacent to Royer Ditch (a WOTUS), it is considered jurisdictional.

WOH-236 is another relatively large forested wetland (5.93 acres). The wetland appeared to be only seasonally inundated, with evidence of seasonal hydrology including water marks and drift deposits along the sparsely vegetated concave surface. The vegetation was dominated by boxelder in the tree and sapling stratum. The large size of the wetland, relative lack of disturbance and development of plant communities and microtopography led to the wetland scoring highly on the ORAM. Wetland WOH-236 is considered jurisdictional due to the connection to Royer Ditch.

WOH-239 is a 4.39-acre forested wetland located on the eastern side of Royer Ditch. The wetland was dominated by silver maple in the tree stratum, with green ash and American elm in sapling stratum. The large size of the wetland, relative lack of disturbance, and development of plant communities and microtopography led to the wetland scoring highly on the ORAM. Wetland WOH-239 is considered jurisdictional due to the connection to Royer Ditch.

WOH-255 is a 4.32-acre forested wetland located in a forest/wetland complex. Vegetation within the wetland was dominated by pin oak and swamp white oak (*Quercus bicolor*). The herb stratum also had significant compositions of OBL species including blunt broom sedge (*Carex tribuloides*) and stiff marsh bedstraw (*Galium tinctorium*). This wetland showed a relative lack of disturbance, includes wide buffers from the surrounding land use, and provides high quality habitat (including large mature trees, moderate quality vernal pools, and coarse woody debris); these contributing factors led to the wetland scoring highly on the ORAM. Due to the wetland lacking a connection to a WOTUS, WOH-255 is not considered jurisdictional.

WOH-257 is 0.84-acre forested wetland. Vegetation was dominated by red maple in the tree stratum and a variety of FACW species in the herb stratum including sweet wood-reed (*Cinna arundinacea*), spotted ladysthumb (*Persicaria maculosa*), and whitegrass (*Leersia virginica*). This wetland showed a relative lack of disturbance, includes wide buffers from the surrounding land use, and provides high quality habitat (including large mature trees, moderate quality vernal pools, and coarse woody debris); these contributing factors led to the wetland scoring highly on the ORAM. Due to the wetland lacking a connection to a WOTUS, it is not considered jurisdictional.

WOH-262 is a 2.29-acre forested wetland. The wetland was dominated by pin oak, red maple, and silver maple with a diverse herbaceous understory. Herbaceous plants included the blunt broom sedge, woodland sedge, and stiff marsh bedstraw. The wetland's recovery from disturbance, wide buffers, and well-developed habitat led to the wetland scoring highly on the ORAM. Due to the location in an isolated woodlot lacking a connection to a WOTUS, it is not considered jurisdictional.

WOH-264 is a 0.98-acre forested wetland. The wetland was dominated by pin oak, Virginia wild rye (*Elymus virginicus*), and lakebank sedge (*Carex lacustris*). The wetland's recovery from disturbance,

wide buffers, and well-developed habitat led to the wetland scoring highly on the ORAM. Due to its proximity to Royer Ditch it is considered jurisdictional.

4.1.4 Potentially Jurisdictional Delineated Wetlands in the Survey Area

Of the 106 wetlands, 37 are considered potentially jurisdictional according to the USACE guidance based on a hydrologic connection to a WOTUS or tributary to a WOTUS. The remaining wetlands are considered non-jurisdictional, isolated wetlands and are classified as Waters of the State.

4.2 Waterbodies

A total of 123 waterbodies were delineated in the Survey Area, see Figure 4-2: 83 ditches, 32 streams, and 8 ponds. The OEPA's HHEI forms were completed for each stream and ditch and serve to record and score a variety of aspects about the feature as detailed in Section 3.1.4, (see Appendix D for forms). Thirty-six (36) of the waterbodies were identified as Class I according to the HHEI scoring matrix, with an additional 61 scoring as Class II. A total of 18 features were considered Class III waterbodies. Five features (all ditches) scored highly on the HHEI score, however, lacked the required cool/cold water habitat to be identified as Class III. The eight (8) ponds were not scored on the HHEI since it is not a flowing linear waterbody. The majority of the waterbodies were considered modified (n=105; see Table 4-2).

Table 4-2 Waterbodies Delineated in Survey Area

| Stream ID | County | Linear Feet in Project Corridor | HHEI Score | QHEI Score | PHWH Class Designation | Flow Regime | Drainage Basin | Potentially Jurisdictional | Potential RTE Habitat | Mussels Observed | SRW | Water Quality Classification | | | | Mapbook Location |
|-----------|----------|---------------------------------|------------|------------|------------------------|--------------|--------------------------|----------------------------|-----------------------|------------------|-----|------------------------------|---|---|---|-------------------------|
| DOH-001 | Seneca | 2,612 | 28 | NA | I | Ephemeral | UNT to Sandusky River | Yes | Low | No | | | | | | 57 & 70 |
| DOH-002 | Seneca | 1,831 | 32 | NA | II | Intermittent | UNT to Sandusky River | Yes | Low | No | | | | | | 68 |
| DOH-005 | Seneca | 1,440 | 43 | NA | II | Perennial | Indian Creek | Yes | Low | No | X | | X | X | X | 44 & 58 |
| DOH-006 | Seneca | 1,274 | 17 | NA | I | Ephemeral | UNT to Sandusky River | No | Low | No | | | | | | 57 |
| DOH-008 | Seneca | 85 | 17 | NA | I | Ephemeral | Owl Creek | No | Low | No | | | | | | 60 |
| DOH-010 | Seneca | 2,189 | 43 | NA | II | Intermittent | Owl Creek | Yes | Low | No | X | | X | X | X | 104 & 105 |
| DOH-011 | Seneca | 393 | 22 | NA | I | Intermittent | UNT to Owl Creek | No | Low | No | | | | | | 105 |
| DOH-016 | Seneca | 896 | 17 | NA | I | Ephemeral | UNT to Green Creek | No | Low | No | | | | | | 36 |
| DOH-023 | Seneca | 906 | 53 | NA | II | Perennial | UNT to Sugar Creek | Yes | Low | No | | | | | | 185 |
| DOH-024 | Seneca | 3,284 | 32 | NA | II | Intermittent | UNT to Westerhouse Ditch | Yes | Low | No | | | | | | 166, 176, 186 |
| DOH-027 | Seneca | 6,118 | 43 | NA | II | Intermittent | UNT to Sugar Creek | Yes | Low | No | | | | | | 131 & 132 |
| DOH-028 | Seneca | 1,263 | 18 | NA | I | Ephemeral | UNT to Noel Ditch | Yes | Low | No | | | | | | 136 |
| DOH-035 | Seneca | 1,482 | 18 | NA | I | Intermittent | Noel Ditch | Yes | Low | No | X | | X | X | X | 106 & 107 |
| DOH-036 | Seneca | 729 | 17 | NA | I | Ephemeral | Noel Ditch | No | Low | No | | | | | | 107 |
| DOH-037 | Seneca | 9,095 | 33 | NA | II | Intermittent | Morrison Creek | Yes | Low | No | X | | X | X | X | 201, 202, 203, 207, 209 |
| DOH-038 | Seneca | 4,535 | 54 | NA | II | Intermittent | UNT to Royer Ditch | Yes | Low | No | | | | | | 190, 198, 199 |
| DOH-040 | Seneca | 7,873 | 64 | NA | III | Perennial | Westerhouse ditch | Yes | Low | No | X | | X | X | X | 189, 197, 204, 205 |
| DOH-041 | Seneca | 6,838 | 58 | NA | III | Perennial | Westerhouse ditch | Yes | Low | No | X | | X | X | X | 167, 168 |
| DOH-042 | Seneca | 795 | 44 | NA | II | Intermittent | Westerhouse ditch | No | Low | No | X | | X | X | X | 179 |
| DOH-043 | Seneca | 904 | 39 | NA | II | Intermittent | UNT to Royer Ditch | Yes | Low | No | | | | | | 180 |
| DOH-044 | Seneca | 3,704 | 38 | NA | II | Ephemeral | UNT to Royer Ditch | Yes | Low | No | | | | | | 169, 170, 181 |
| DOH-047 | Seneca | 3,168 | 48 | NA | II | Intermittent | UNT to Royer Ditch | Yes | Low | No | | | | | | 169 |
| DOH-051 | Seneca | 3,091 | 27 | NA | I | Intermittent | UNT to Royer Ditch | Yes | Low | No | | | | | | 126 & 140 |
| DOH-055 | Seneca | 4,033 | 17 | NA | I | Intermittent | Noel Ditch | Yes | Low | No | X | | X | X | X | 109, 123, 136 |
| DOH-057 | Seneca | 914 | 18 | NA | I | Intermittent | Noel Ditch | Yes | Low | No | X | | X | X | X | 137 |
| DOH-058 | Seneca | 3,753 | 33 | NA | II | Ephemeral | Royer Ditch | Yes | Low | No | X | | X | X | X | 62 & 63 |
| DOH-059 | Sandusky | 4,369 | 33 | NA | II | Intermittent | Pickereel Creek | Yes | Low | No | X | | X | X | X | 1,2,3 |
| DOH-100 | Seneca | 460 | 52 | NA | II | Perennial | UNT to Sandusky River | Yes | Low | No | | | | | | 67 |
| DOH-101 | Seneca | 2,635 | 37 | NA | II | Intermittent | UNT to Indian Creek | Yes | Low | No | | | | | | 43 & 55 |

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| Stream ID | County | Linear Feet in Project Corridor | HHEI Score | QHEI Score | PHWH Class Designation | Flow Regime | Drainage Basin | Potentially Jurisdictional | Potential RTE Habitat | Mussels Observed | SRW | Water Quality Classification | | | | Mapbook Location |
|-----------|--------|---------------------------------|------------|------------|------------------------|--------------|--------------------------|----------------------------|-----------------------|------------------|-----|------------------------------|---|---|---|--------------------|
| DOH-102 | Seneca | 2,791 | 35 | NA | II | Intermittent | UNT to Indian Creek | Yes | Low | No | | | | | | 43 & 56 |
| DOH-104 | Seneca | 1,355 | 45 | NA | II | Intermittent | UNT to Sandusky River | No | Low | No | | | | | | 70 |
| DOH-105 | Seneca | 2,119 | 52 | NA | II | Intermittent | UNT to Sugar Creek | Yes | Low | No | | | | | | 91 |
| DOH-106 | Seneca | 664 | 22 | NA | I | Ephemeral | UNT to Sugar Creek | No | Low | No | | | | | | 102 |
| DOH-107 | Seneca | 660 | 22 | NA | I | Ephemeral | UNT to Sugar Creek | No | Low | No | | | | | | 102 |
| DOH-108 | Seneca | 279 | 47 | NA | II | Intermittent | Beaver Creek | No | Low | No | | | | | | 37 |
| DOH-109 | Seneca | 401 | 42 | NA | II | Intermittent | UNT to Beaver Creek | No | Low | No | | | | | | 29 |
| DOH-110 | Seneca | 110 | 21 | NA | I | Ephemeral | UNT to Owl Creek | No | Low | No | | | | | | 73 |
| DOH-111 | Seneca | 929 | 42 | NA | II | Intermittent | UNT to Owl Creek | Yes | Low | No | | | | | | 73 |
| DOH-113 | Seneca | 3,190 | 57 | NA | II | Intermittent | Noel Ditch | Yes | Low | No | X | | X | X | X | 95 & 107 |
| DOH-114 | Seneca | 4,667 | 42 | NA | II | Intermittent | UNT to Noel Ditch | Yes | Low | No | | | | | | 106, 107, 121 |
| DOH-115 | Seneca | 1,732 | 58 | NA | II | Intermittent | UNT to Westerhouse Ditch | No | Low | No | | | | | | 106 |
| DOH-116 | Seneca | 6,657 | 57 | NA | III | Perennial | UNT to Sugar Creek | Yes | Low | No | | | | | | 156, 158, 163, 164 |
| DOH-117 | Seneca | 2,199 | 42 | NA | II | Intermittent | UNT to Sugar Creek | No | Low | No | | | | | | 158, 164, 165 |
| DOH-118 | Seneca | 834 | 13 | NA | I | Ephemeral | N/A | No | Low | No | | | | | | 194 |
| DOH-119 | Seneca | 661 | 59 | NA | II | Intermittent | UNT to Morrison Creek | Yes | Low | No | | | | | | 207 |
| DOH-120 | Seneca | 2,783 | 55 | NA | II | Intermittent | UNT to Morrison Creek | Yes | Low | No | | | | | | 202 & 208 |
| DOH-121 | Seneca | 543 | 17 | NA | I | Ephemeral | UNT to Morrison Creek | No | Low | No | | | | | | 208 |
| DOH-122 | Seneca | 410 | 20 | NA | I | Ephemeral | UNT to Morrison Creek | No | Low | No | | | | | | 208 |
| DOH-123 | Seneca | 4,003 | 58 | NA | II | Intermittent | UNT to Morrison Creek | Yes | Low | No | | | | | | 221 & 222 |
| DOH-124 | Seneca | 164 | 17 | NA | I | Ephemeral | UNT to Morrison Creek | No | Low | No | | | | | | 222 |
| DOH-125 | Seneca | 4,861 | 18 | NA | I | Ephemeral | UNT to Westerhouse Ditch | No | Low | No | | | | | | 213, 217, 218, 223 |
| DOH-126 | Seneca | 5,829 | 18 | NA | I | Ephemeral | UNT to Westerhouse Ditch | No | Low | No | | | | | | 213, 217, 218 |
| DOH-127 | Seneca | 2,828 | 30 | NA | II | Intermittent | UNT to Westerhouse Ditch | Yes | Low | No | | | | | | 216, 218, 219, 223 |
| DOH-128 | Seneca | 1,469 | 54 | NA | II | Intermittent | UNT to Westerhouse Ditch | Yes | Low | No | | | | | | 213 & 218 |
| DOH-150 | Seneca | 285 | 13 | NA | I | Ephemeral | UNT to Westerhouse Ditch | Yes | Low | No | | | | | | 194 |
| DOH-152 | Seneca | 1,924 | 17 | NA | I | Ephemeral | UNT to Royer Ditch | No | Low | No | | | | | | 171 |
| DOH-153 | Seneca | 2,284 | 61 | NA | III | Perennial | UNT to Royer Ditch | Yes | Low | No | X | | X | X | X | 192 |
| DOH-156 | Seneca | 961 | 18 | NA | I | Intermittent | UNT to Royer Ditch | No | Low | No | | | | | | 184 & 193 |
| DOH-159 | Seneca | 2,442 | 38 | NA | II | Intermittent | N/A | Yes | Low | No | | | | | | 155 |

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|-----------|----------|---------------------------------|------------|------------|------------------------|--------------|--------------------------|----------------------------|-----------------------|------------------|-----|------------------------------|---|---|---|------------------|
| DOH-160 | Seneca | 1,314 | 44 | NA | II | Intermittent | N/A | No | Low | No | | | | | | 154 |
| DOH-161 | Seneca | 617 | 32 | NA | II | Ephemeral | UNT to Royer Ditch | Yes | Low | No | X | | X | X | X | 141 |
| DOH-165 | Seneca | 1,468 | 32 | NA | II | Ephemeral | UNT to Morrison Creek | Yes | Low | No | | | | | | 211 |
| DOH-166 | Seneca | 1,563 | 52 | NA | II | Ephemeral | UNT to Morrison Creek | Yes | Low | No | | | | | | 211 & 216 |
| DOH-168 | Seneca | 2,679 | 35 | NA | II | Intermittent | UNT to Westerhouse Ditch | Yes | Low | No | | | | | | 215 & 220 |
| DOH-169 | Seneca | 400 | 19 | NA | I | Ephemeral | N/A | No | Low | No | | | | | | 219 |
| DOH-171 | Seneca | 507 | 16 | NA | I | Intermittent | UNT to Morrison Creek | Yes | Low | No | | | | | | 204 |
| DOH-204 | Sandusky | 135 | 47 | NA | II | Ephemeral | N/A | No | Low | No | | | | | | 4 |
| DOH-205 | Sandusky | 1,323 | 37 | NA | II | Ephemeral | N/A | No | Low | No | | | | | | 4 |
| DOH-206 | Seneca | 2,914 | 52 | NA | II | Intermittent | UNT to Hayward Ditch | Yes | Low | No | | | | | | 34, 42, 53 |
| DOH-207 | Seneca | 4,443 | 42 | NA | II | Intermittent | UNT to Royer Ditch | Yes | Low | No | | | | | | 98 & 99 |
| DOH-208 | Seneca | 281 | 40 | NA | II | Ephemeral | UNT to Royer Ditch | No | Low | No | | | | | | 99 |
| DOH-209 | Seneca | 2,842 | 56 | NA | II | Intermittent | UNT to Royer Ditch | Yes | Low | No | X | | X | X | X | 100 & 114 |
| DOH-210 | Seneca | 1,573 | 18 | NA | I | Ephemeral | UNT to Royer Ditch | Yes | Low | No | | | | | | 141 |
| DOH-211 | Seneca | 2,791 | 47 | NA | II | Intermittent | UNT to Royer Ditch | Yes | Low | No | | | | | | 151 |
| DOH-212 | Seneca | 1,148 | 37 | NA | II | Intermittent | UNT to Noel Ditch | Yes | Low | No | | | | | | 123 & 135 |
| DOH-213 | Seneca | 1,065 | 27 | NA | I | Ephemeral | N/A | No | Low | No | | | | | | 123 & 136 |
| DOH-214 | Seneca | 1,211 | 24 | NA | I | Ephemeral | UNT to Royer Ditch | No | Low | No | | | | | | 170 & 181 |
| DOH-215 | Seneca | 60 | 28 | NA | I | Ephemeral | UNT to Royer Ditch | No | Low | No | | | | | | 199 |
| DOH-216 | Seneca | 394 | 57 | NA | III | Perennial | UNT to Royer Ditch | Yes | Low | No | | | | | | 206 |
| DOH-217 | Seneca | 1,440 | 37 | NA | II | Ephemeral | UNT to Royer Ditch | No | Low | No | | | | | | 199 & 206 |
| DOH-218 | Seneca | 954 | 47 | NA | II | Perennial | UNT to Westerhouse Ditch | Yes | Low | No | | | | | | 204 |
| DOH-219 | Seneca | 2,032 | 47 | NA | II | Perennial | UNT to Westerhouse Ditch | Yes | Low | No | | | | | | 210 |
| DOH-220 | Seneca | 963 | 57 | NA | III | Perennial | UNT to Westerhouse Ditch | Yes | Low | No | X | | X | X | X | 210 |
| POH-001 | Seneca | NA | NA | NA | NA | Perennial | N/A | Yes | Low | No | | | | | | 67 |
| POH-100 | Seneca | NA | NA | NA | NA | Perennial | N/A | No | Low | No | | | | | | 107 |
| POH-101 | Seneca | NA | NA | NA | NA | Perennial | N/A | No | Low | No | | | | | | 187 |
| POH-157 | Seneca | NA | NA | NA | NA | Perennial | N/A | No | Low | No | | | | | | 184 |
| POH-164 | Seneca | NA | NA | NA | NA | Perennial | N/A | No | Low | No | | | | | | 98 |
| POH-170 | Seneca | NA | NA | NA | NA | Perennial | N/A | No | Low | No | | | | | | 106 |
| POH-171 | Seneca | NA | NA | NA | NA | Perennial | N/A | No | Low | No | | | | | | 128 |
| POH-200 | Seneca | NA | NA | NA | NA | Perennial | N/A | No | Low | No | | | | | | 50 & 64 |
| SOH-001 | Seneca | 1,486 | 33 | NA | II | Intermittent | UNT to Sandusky River | Yes | Low | No | | | | | | 67 |
| SOH-002 | Seneca | 166 | 74 | 60 | III | Perennial | Beaver Creek | Yes | Moderate | No | | X | X | X | X | 36 |

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|-----------|--------|---------------------------------|------------|------------|------------------------|--------------|--------------------------|----------------------------|-----------------------|------------------|-----|------------------------------|---|---|---|--------------------|
| SOH-003 | Seneca | 5,500 | 76 | 70 | III | Perennial | Beaver Creek | Yes | Moderate | No | | X | X | X | X | 29 & 37 |
| SOH-004 | Seneca | 2,529 | 39 | NA | II | Intermittent | UNT to Beaver Creek | Yes | Low | No | | | | | | 47 & 61 |
| SOH-005 | Seneca | 239 | 78 | NA | III | Intermittent | Owl Creek | Yes | Moderate | No | X | | X | X | X | 60 |
| SOH-006 | Seneca | 85 | 52 | 38.5 | III | Perennial | Owl Creek | Yes | Moderate | No | X | | X | X | X | 72 |
| SOH-009 | Seneca | 71 | 44 | NA | II | Intermittent | UNT to Westerhouse Ditch | No | Low | No | | | | | | 186 |
| SOH-010 | Seneca | 6,114 | 66 | 51 | III | Perennial | Westerhouse Ditch | Yes | Moderate | No | X | | X | X | X | 146, 158, 166, 176 |
| SOH-011 | Seneca | 2,876 | 71 | 61.5 | III | Perennial | Westerhouse Ditch | Yes | Moderate | No | X | | X | X | X | 119 & 134 |
| SOH-014 | Seneca | 4,214 | 60 | 63 | III | Perennial | Westerhouse Ditch | Yes | Moderate | No | X | | X | X | X | 93 & 106 |
| SOH-015 | Seneca | 2,385 | 60 | NA | III | Perennial | Noel Ditch | Yes | Moderate | No | X | | X | X | X | 107 |
| SOH-016 | Seneca | 2,643 | 45 | NA | II | Intermittent | Royer Ditch | Yes | Moderate | No | X | | X | X | X | 86 |
| SOH-017 | Seneca | 3,094 | 32 | NA | II | Intermittent | Noel Ditch | Yes | Low | No | X | | X | X | X | 149 & 150 |
| SOH-018 | Seneca | 5,872 | 27 | NA | I | Intermittent | UNT to Royer Ditch | Yes | Low | No | | | | | | 99 & 100 |
| SOH-019 | Seneca | 308 | 61 | NA | III | Perennial | Owl Creek | Yes | Moderate | No | X | | X | X | X | 72 |
| SOH-100 | Seneca | 117 | 24 | NA | I | Ephemeral | UNT to Sugar Creek | Yes | Low | No | | | | | | 102 |
| SOH-101 | Seneca | 1,610 | 43 | NA | II | Intermittent | UNT to Beaver Creek | Yes | Low | No | | | | | | 37 |
| SOH-102 | Seneca | 192 | 48 | NA | II | Intermittent | UNT to Beaver Creek | Yes | Low | No | | | | | | 29 |
| SOH-103 | Seneca | 733 | 70 | NA | III | Perennial | UNT to Owl Creek | Yes | Moderate | No | | | | | | 73 |
| SOH-104 | Seneca | 343 | 34 | NA | II | Intermittent | UNT to Owl Creek | No | Low | No | | | | | | 73 |
| SOH-105 | Seneca | 139 | 34 | NA | II | Intermittent | UNT to Owl Creek | No | Low | No | | | | | | 91 |
| SOH-106 | Seneca | 458 | 24 | NA | I | Ephemeral | UNT to Owl Creek | No | Low | No | | | | | | 91 |
| SOH-107 | Seneca | 258 | 38 | NA | II | Intermittent | N/A | No | Low | No | | | | | | 201 |
| SOH-108 | Seneca | 333 | 29 | NA | I | Ephemeral | N/A | No | Low | No | | | | | | 118 |
| SOH-109 | Seneca | 327 | 18 | NA | I | Ephemeral | N/A | No | Low | No | | | | | | 156 |
| SOH-154 | Seneca | 3,781 | 74 | NA | III | Perennial | UNT to Westerhouse Ditch | Yes | Moderate | No | X | | X | X | X | 172 & 183 |
| SOH-158 | Seneca | 234 | 16 | NA | I | Ephemeral | N/A | No | Low | No | | | | | | 162 |
| SOH-167 | Seneca | 1,915 | 52 | NA | II | Intermittent | UNT to Westerhouse Ditch | Yes | Low | No | X | | X | X | X | 215 |
| SOH-200 | Seneca | 102 | 52 | NA | II | Intermittent | N/A | No | Moderate | No | | | | | | 66 & 169 |
| SOH-201 | Seneca | 5,373 | 59 | NA | III | Perennial | UNT to Royer Ditch | Yes | Moderate | No | | | | | | 151 & 160 |
| SOH-202 | Seneca | 153 | 26 | NA | I | Ephemeral | UNT to Royer Ditch | Yes | Low | No | | | | | | 151 |
| SOH-203 | Seneca | 255 | 36 | NA | II | Ephemeral | UNT to Royer Ditch | Yes | Low | No | | | | | | 160 |
| TOTAL | | 228,713 | | | | | | | | | | | | | | |

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Case No(s). 17-2295-EL-BGN

Summary: Application Exhibit J Part 19 of 33 electronically filed by Teresa Orahod on behalf of Dylan F. Borchers