

Appendix I

Natural Resources Data

This page is intentionally left blank.

USFWS IPaC April 13, 2026



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793



In Reply Refer To:

04/13/2026 20:59:11 UTC

Project Code: 2026-0075862

Project Name: North Rochester to Skyway High Voltage Transmission Line Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

Threatened and Endangered Species

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance

Please refer to our [Section 7 website](#) for guidance and technical assistance, including [step-by-step instructions](#) for making effects determinations for each species that might be present and for specific guidance on the following types of projects: projects in developed areas, HUD, CDBG, EDA, USDA Rural Development projects, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

We recommend running the project (if it qualifies) through our **Minnesota-Wisconsin Federal Endangered Species Determination Key (Minnesota-Wisconsin ("D-key"))**. A [demonstration video](#) showing how-to access and use the determination key is available. Please note that the Minnesota-Wisconsin D-key is the third option of 3 available d-keys. D-keys are tools to help Federal agencies and other project proponents determine if their proposed action has the potential to adversely affect federally listed species and designated critical habitat. The Minnesota-Wisconsin D-key includes a structured set of questions that assists a project proponent in determining whether a proposed project qualifies for a certain predetermined consultation outcome for all federally listed species found in Minnesota and Wisconsin (except for the northern long-eared bat- see below), which includes determinations of “no effect” or “may affect, not likely to adversely affect.” In each case, the Service has compiled and analyzed the best available information on the species’ biology and the impacts of certain activities to support these determinations.

If your completed d-key output letter shows a "No Effect" (NE) determination for all listed species, print your IPaC output letter for your files to document your compliance with the Endangered Species Act.

For Federal projects with a “Not Likely to Adversely Affect” (NLAA) determination, our concurrence becomes valid if you do not hear otherwise from us after a 30-day review period, as indicated in your letter.

If your d-key output letter indicates additional coordination with the Minnesota-Wisconsin Ecological Services Field Office is necessary (i.e., you get a “May Affect” determination), you will be provided additional guidance on contacting the Service to continue ESA coordination outside of the key; ESA compliance cannot be concluded using the key for “May Affect” determinations unless otherwise indicated in your output letter.

Note: Once you obtain your official species list, you are not required to continue in IPaC with d-keys, although in most cases these tools should expedite your review. If you choose to make an effects determination on your own, you may do so. If the project is a Federal Action, you may want to review our section 7 step-by-step instructions before making your determinations.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **no effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see below) – then project proponents must determine if proposed activities will have **no effect** on or **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain [Life History Information for Listed and Candidate Species](#) on our office website. If no impacts will occur to a species on the IPaC species list (e.g., there is no habitat present in the project area), the appropriate determination is **no effect**. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

For projects that intersect with or are adjacent to Tribal lands: The Service has federal Trust responsibilities and a strong commitment to working with Tribal governments to help sustain fish and wildlife resources for future generations. Tribal governments should be provided with sufficient opportunity to express their perspectives and/or concerns for proposed projects. If your project intersects with Tribal lands or impacts culturally sensitive resources, please engage with the federally recognized Tribe to ensure they have an opportunity to provide input on this project.

Northern Long-Eared Bats

Northern long-eared bats occur throughout Minnesota and Wisconsin and the information below may help in determining if your project may affect these species.

Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥ 3 inches dbh for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, northern long-eared bats could be affected. For bat activity dates, please review Appendix L in the [Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines](#).

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A monoculture stand of shrubby vegetation with no potential roost trees.

If IPaC returns a result that northern long-eared bats are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** this species **IF** one or more of the following activities are proposed:

- Clearing or disturbing suitable roosting habitat, as defined above, at any time of year,
- Any activity in or near the entrance to a cave or mine,
- Mining, deep excavation, or underground work within 0.25 miles of a cave or mine,
- Construction of one or more wind turbines, or

- Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on the northern long-eared bat. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

If any of the above activities are proposed, and the northern long-eared bat appears on the user's species list, the federal project user will be directed to either the northern long-eared bat and tricolored bat range-wide D-key or the Federal Highways Administration, Federal Railways Administration, and Federal Transit Administration Indiana bat/Northern long-eared bat D-key, depending on the type of project and federal agency involvement. Similar to the Minnesota-Wisconsin D-key, these d-keys help to determine if prohibited take might occur and, if not, will generate an automated verification letter. Additional information about available tools can be found on the Service's [northern long-eared bat website](#).

Whooping Crane

Whooping crane is designated as a non-essential experimental population in Wisconsin and consultation under Section 7(a)(2) of the Endangered Species Act is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, then you are not required to consult. For additional information on this designation and consultation requirements, please review "[Establishment of a Nonessential Experimental Population of Whooping Cranes in the Eastern United States](#)."

Other Trust Resources and Activities

Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. It is the responsibility of the project proponent to survey the area for any migratory bird nests. If there is an eagle nest on-site while work is on-going, eagles may be disturbed. We recommend avoiding and minimizing disturbance to eagles whenever practicable. If you cannot avoid eagle disturbance, you may seek a [permit](#). A [nest take permit](#) is always required for removal, relocation, or obstruction of an eagle nest. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of [recommendations that minimize potential impacts to migratory birds](#). Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed [voluntary guidelines for minimizing impacts](#).

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to [guidelines](#) developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's [Wind Energy Guidelines](#). In addition, please refer to the Service's [Eagle Conservation Plan Guidance](#), which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

State Department of Natural Resources Coordination

While it is not required for your Federal section 7 consultation, please note that additional state endangered or threatened species may also have the potential to be impacted. **Please contact the Minnesota or Wisconsin Department of Natural Resources for information on state listed species that may be present in your proposed project area.**

Minnesota

[Minnesota Department of Natural Resources - Endangered Resources Review Homepage](#)

Email: Review.NHIS@state.mn.us

Wisconsin

[Wisconsin Department of Natural Resources - Endangered Resources Review Homepage](#)

Email: DNRERReview@wi.gov

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
(952) 858-0793

PROJECT SUMMARY

Project Code: 2026-0075862
Project Name: North Rochester to Skyway High Voltage Transmission Line Project
Project Type: Transmission Line - New Constr - Above Ground
Project Description: The Project consists of a new, approximately 1.2-mile-long, double-circuit, 345-kilovolt high voltage transmission line that will connect to the existing North Rochester Substation to new substation facilities located at the proposed Pine Island Industrial Planned Unit Development site near the City of Pine Island in Goodhue County, Minnesota.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@44.221446,-92.6456372317197,14z>



Counties: Goodhue County, Minnesota

ENDANGERED SPECIES ACT SPECIES

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered

BIRDS

NAME	STATUS
Whooping Crane <i>Grus americana</i> Population: Eastern Migratory NEP - U.S.A. (AL, AR, FL, GA, IL, IN, IA, KY, LA, MI, MN, MS, MO, NC, OH, SC, TN, VA, WI, WV) No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/758	Experimental Population, Non- Essential

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> There is proposed critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

FLOWERING PLANTS

NAME	STATUS
Prairie Bush-clover <i>Lespedeza leptostachya</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4458	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act ² and the Migratory Bird Treaty Act (MBTA) ¹. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

1. The [Bald and Golden Eagle Protection Act](#) of 1940.
2. The [Migratory Birds Treaty Act](#) of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are Bald Eagles and/or Golden Eagles in your [project](#) area.

Measures for Proactively Minimizing Eagle Impacts

For information on how to best avoid and minimize disturbance to nesting bald eagles, please review the [National Bald Eagle Management Guidelines](#). You may employ the timing and activity-specific distance recommendations in this document when designing your project/activity to avoid and minimize eagle impacts. For bald eagle information specific to Alaska, please refer to [Bald Eagle Nesting and Sensitivity to Human Activity](#).

The FWS does not currently have guidelines for avoiding and minimizing disturbance to nesting Golden Eagles. For site-specific recommendations regarding nesting Golden Eagles, please consult with the appropriate Regional [Migratory Bird Office](#) or [Ecological Services Field Office](#).

If disturbance or take of eagles cannot be avoided, an [incidental take permit](#) may be available to authorize any take that results from, but is not the purpose of, an otherwise lawful activity. For assistance making this determination for Bald Eagles, visit the [Do I Need A Permit Tool](#). For assistance making this determination for golden eagles, please consult with the appropriate Regional [Migratory Bird Office](#) or [Ecological Services Field Office](#).

Ensure Your Eagle List is Accurate and Complete

If your project area is in a poorly surveyed area in IPaC, your list may not be complete and you may need to rely on other resources to determine what species may be present (e.g. your local FWS field office, state surveys, your own surveys). Please review the [Supplemental Information on Migratory Birds and Eagles](#), to help you properly interpret the report for your specified location, including determining if there is sufficient data to ensure your list is accurate.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to bald or golden eagles on your list, see the "Probability of Presence Summary" below to see when these bald or golden eagles are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "[Supplemental Information on Migratory Birds and Eagles](#)", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

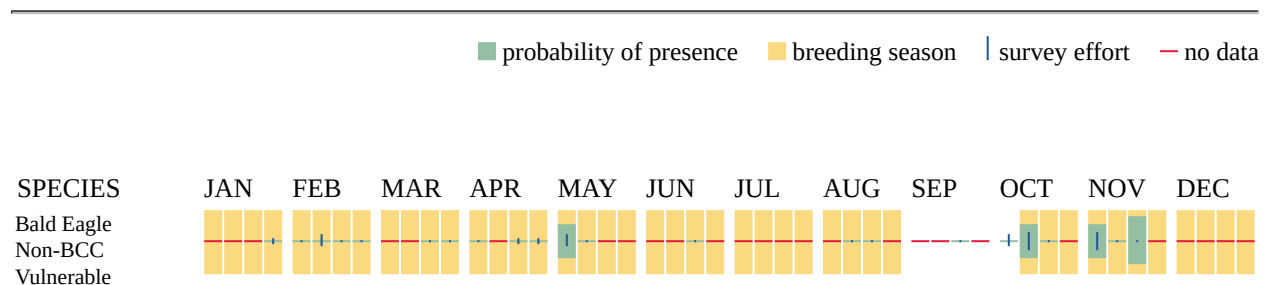
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (—)

A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>

- Nationwide avoidance and minimization measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) ¹ prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the Department of Interior U.S. Fish and Wildlife Service (Service).

1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Grasshopper Sparrow <i>Ammodramus savannarum perpallidus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "[Supplemental Information on Migratory Birds and Eagles](#)", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

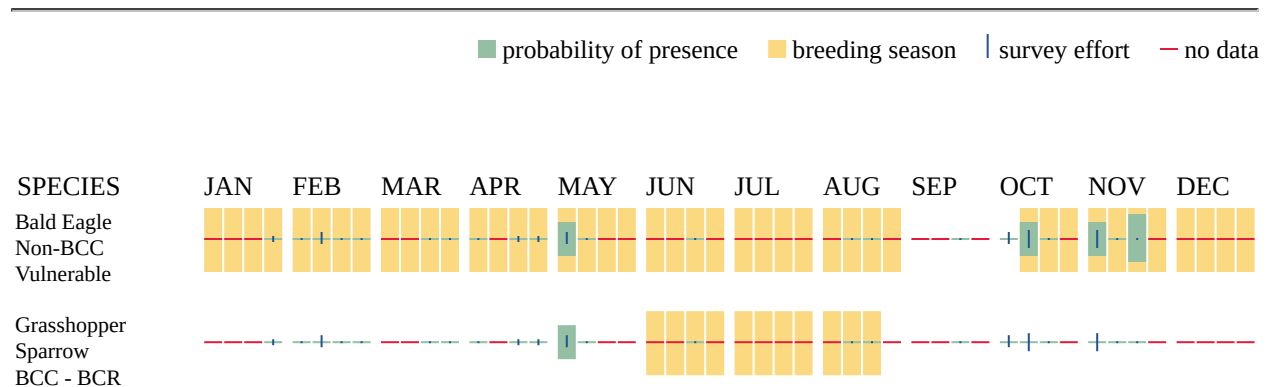
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (—)

A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

WETLANDS

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

IPAC USER CONTACT INFORMATION

Agency: HDR
Name: Lucas Wandrie
Address: 1601 Utica Avenue South
Address Line 2: Suite 600
City: St. Louis Park
State: MN
Zip: 55416
Email: lucas.wandrie@hdrinc.com
Phone: 6124968242

MN DNR Initial Response April 13, 2026



North Rochester to Skyway
MCE #: 2026-00341
Page 1 of 4

Formal Natural Heritage Review - Cover Page

See next page for results of review. A draft watermark means the project details have not been finalized and the results are not official.

Project Name: North Rochester to Skyway

Project Proposer: Northern States Power Company, Xcel Energy, and Skyway

Project Type: Utilities, Transmission (electric, cable, phone)

Project Type Activities: Tree Removal; Grading; Project activities/impacts will occur outside the road ROW

TRS: T109 R15 S19, T109 R15 S29, T109 R15 S30

County(s): Goodhue

DNR Admin Region(s): Central

Reason Requested: PUC Site or Route Application

Project Description: Construction typically progresses as follows: survey marking of the ROW; ROW clearing and access preparation; grading or filling if necessary; installation ...

Existing Land Uses: Landcover within the Project Area and Route Width is predominantly cultivated cropland, with minor portions of barren land and developed land.

Landcover / Habitat Impacted: Landcover types within the Project Area that will be impacted includes cultivated cropland, with minor portions of barren land and developed land.

Waterbodies Affected: There are a couple of small wetlands within the Project Area, it is expected that these will be avoided or spanned and that no direct impacts will occur, whether temporary or permanent.

Groundwater Resources Affected: Unknown at this time. Need for dewatering will be determined based on results from geotechnical analysis.

Previous Natural Heritage Review: No

Previous Habitat Assessments / Surveys: No

SUMMARY OF AUTOMATED RESULTS

Category	Results	Response By Category
Project Details	Comments	Tree Removal - Recommendations
Ecologically Significant Area	No Comments	No Further Review Required
State-Listed Endangered or Threatened Species	Needs Further Review	State-protected Species - Needs Further Review
State-Listed Species of Special Concern	Comments	Recommendations
Federally Listed Species	No Records	Visit IPaC For Federal Review



North Rochester to Skyway
MCE #: 2026-00341
Page 2 of 4

April 13, 2026

Project Name: North Rochester to Skyway

Project Proposer: Northern States Power Company, Xcel Energy, and Skyway

Project Type: Utilities, Transmission (electric, cable, phone)

Project ID: MCE #2026-00341

AUTOMATED RESULTS: FURTHER REVIEW IS NEEDED

As requested, the above project has undergone an automated review for potential impacts to rare features. Based on this review, one or more rare features may be impacted by the proposed project and further review by the Natural Heritage Review Team is needed. You will receive a separate notification email when the review process is complete and the Natural Heritage Review letter has been posted.

Please refer to the table on the cover page of this report for a summary of potential impacts to rare features. For additional information or planning purposes, use the Explore Page in Minnesota Conservation Explorer to view the potentially impacted rare features or to create a Conservation Planning Report for the proposed project.

If you have additional information to help resolve the potential impacts listed in the summary results, please attach related project documentation in the Edit Details tab of the Project page. Relevant information includes, but is not limited to, additional project details, completed habitat assessments, or survey results. This additional information will be considered during the project review.

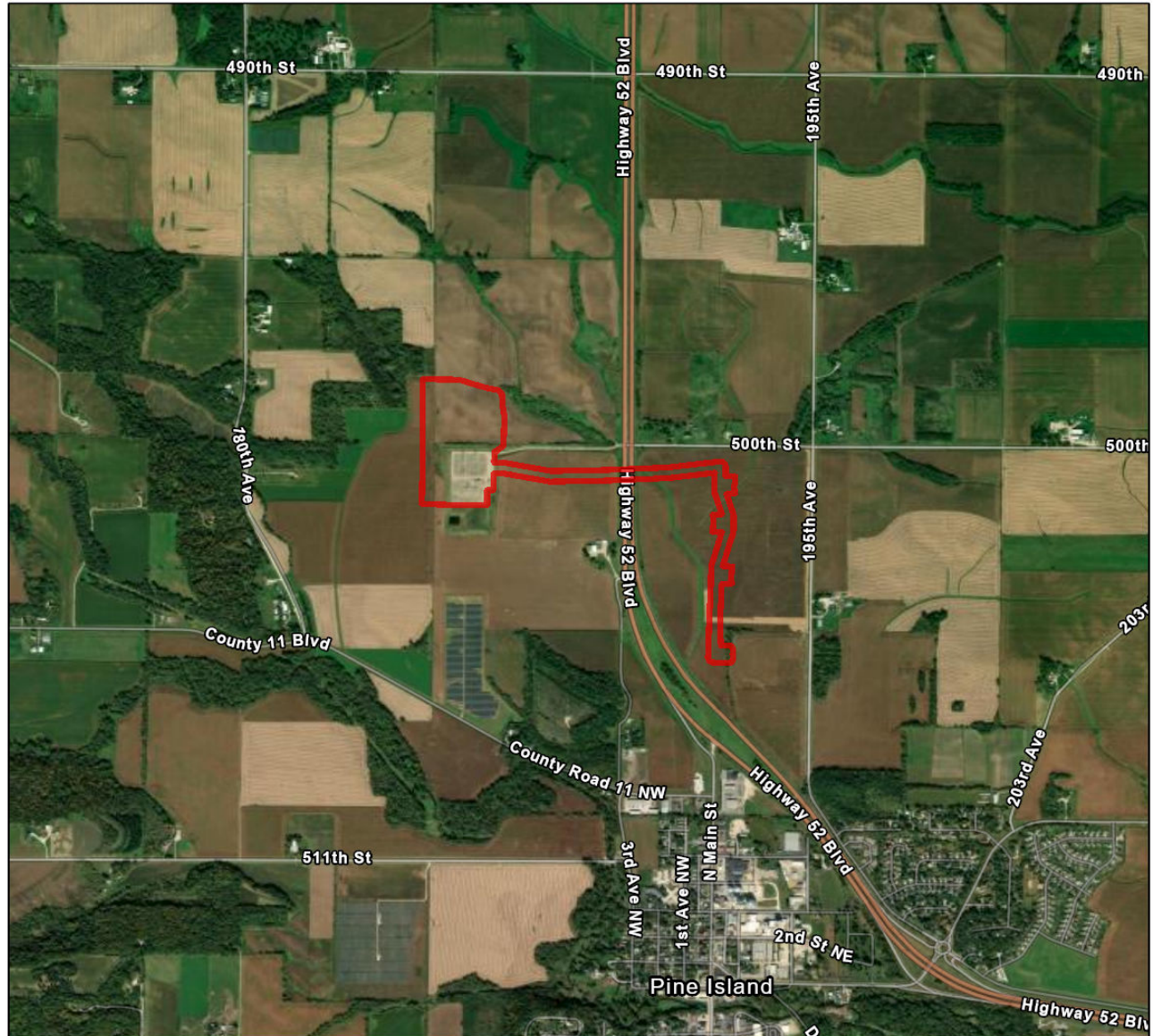
North Rochester to Skyway

Aerial Imagery With Locator Map

North Rochester to Skyway

MCE #: 2026-00341

Page 3 of 4



0 0.15 0.3 0.6 0.9 1.2 Miles

Project Boundary

Project Type: Utilities, Transmission (electric, cable, phone)

Project Size (acres): 64.93

County(s): Goodhue

TRS: T109 R15 S19, T109 R15 S29, T109 R15 S30

Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS
Vantor
MN Dept Natural Resources, Esri, TomTom, Garmin, SafeGraph,



4/13/2026 05:18 PM

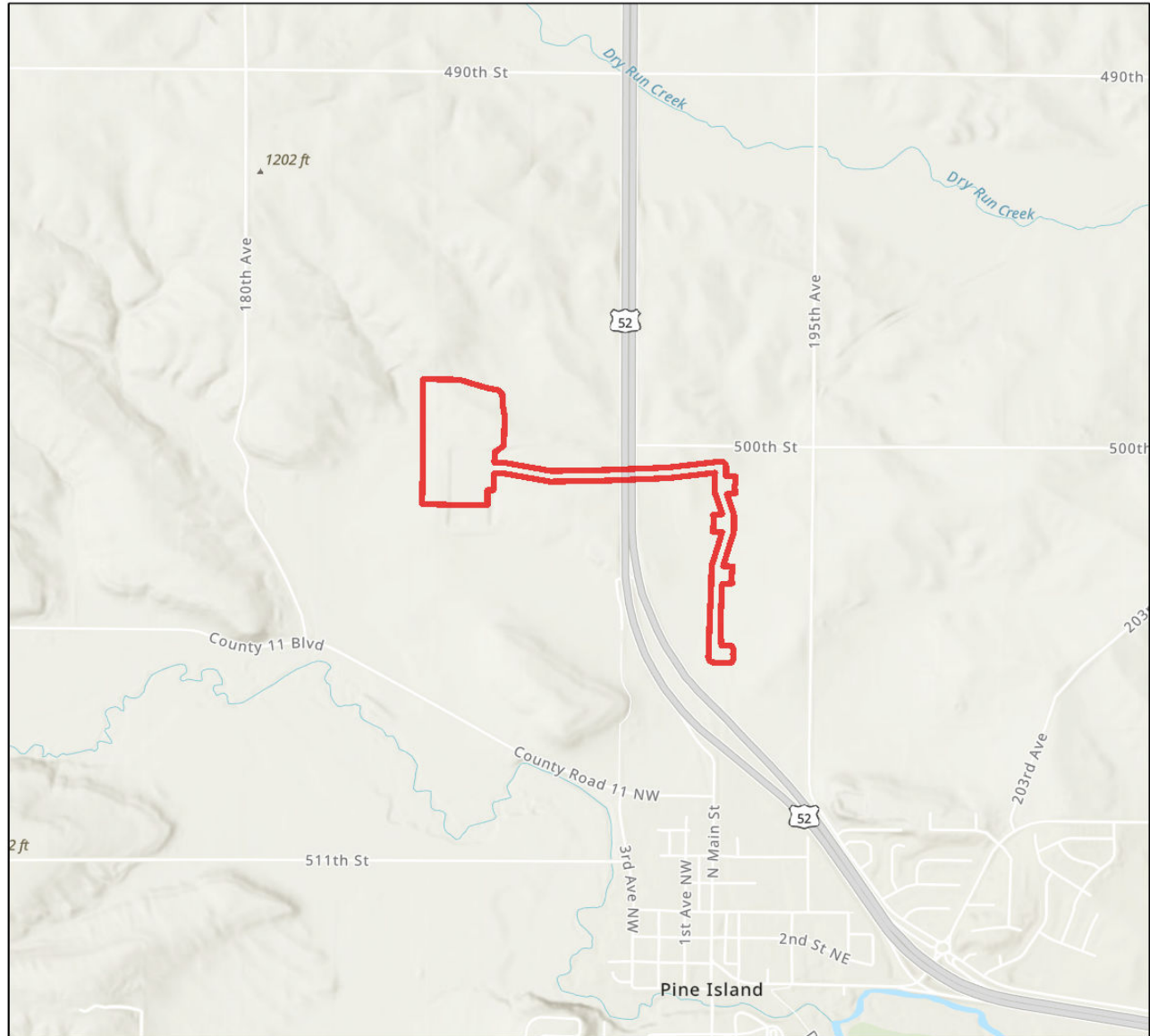
North Rochester to Skyway

USA Topo Basemap With Locator Map

North Rochester to Skyway

MCE #: 2026-00341

Page 4 of 4



0 0.15 0.3 0.6 0.9 1.2 Miles

Project Boundary

Project Type: Utilities, Transmission (electric, cable, phone)

Project Size (acres): 64.93

County(s): Goodhue

TRS: T109 R15 S19, T109 R15 S29, T109 R15 S30

Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, USFWS
Esri, NASA, NGA, USGS, FEMA
MN Dept Natural Resources, Esri, TomTom, Garmin, SafeGraph,



4/13/2026 05:18 PM

This page is intentionally left blank.

Appendix J

Greenhouse Gas Calculations

This page is intentionally left blank.

Xcel Energy
4 substations
Total Emissions
Year:

2027

											Emission Factors (g/hp-hr) ^a or (g/mi) ^b					Emissions (ton / year)													
Equipment	MOVES Lookup ID	MN Climate Calculator Equipment Definition	Fuel	HP	Typical Hours per day	Typical Days/week	Weeks	Count	Total Hours Used	Load Factor ^c	CO	NO _x	SO ₂ ^d	VOC ^d	PM ₁₀	PM _{2.5}	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}							
ATV 4 TO 6 WHEEL W/ DUMP	Off-Highway Trucks	Cement and Mortar Mixers	Diesel	13.5	2	5	52	3	1560	0.59	4.9254	5.5970	0.0020	0.2799	0.5970	0.5970	6.75E-02	7.67E-02	2.74E-05	3.83E-03	8.18E-03	8.18E-03							
BACKHOE W/ LOADER 4X4	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	94	6	5	40	1	1200	0.21	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	9.74E-02	1.46E-01	5.22E-05	7.31E-03	7.79E-03	7.79E-03							
BUCKET 105' WORK HEIGHT	Aerial Lifts	Cranes	Diesel	300	8	5	52	3	6240	0.21	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	1.13E+00	2.13E+00	8.67E-04	1.07E-01	6.47E-02	6.47E-02							
BUCKET 124' WORK HEIGHT 8X6	Aerial Lifts	Cranes	Diesel	350	0	0	0	0	0	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
BUCKET 77' WORK HEIGHT SWAMP TRK MTD	Aerial Lifts	Cranes	Diesel	300	0	0	0	0	0	0.21	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
TRUCK MTD 4 T ARTICULATING BOOM W/ FORKS & CLAM	Cranes	Cranes	Diesel	450	0	0	0	0	0	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
CRANE TRUCK 45 T HYDRAULIC 6 AXLE	Cranes	Cranes	Diesel	450	3	5	12	1	180	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.09E-01	1.81E-01	7.68E-05	9.17E-03	1.73E-03	5.73E-03							
DOZER DERRICK 15 T CAP	Cranes	Cranes	Diesel	330	8	5	20	1	600	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	3.27E-01	5.19E-01	2.50E-04	2.99E-02	1.87E-02	1.87E-02							
DOZER DERRICK 15 T CAP SWAMP TRACK MTD	Cranes	Cranes	Diesel	300	0	0	0	0	0	0.43	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
DOZER 10 THRU 12 T W/ WINCH	Crawler Tractors/Dozers	Rubber Tired Dozers	Diesel	80	4	3	20	1	240	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	4.66E-02	6.99E-02	2.50E-05	3.49E-03	3.73E-03	3.73E-03							
DOZER 18 T W/ WINCH	Crawler Tractors/Dozers	Rubber Tired Dozers	Diesel	150	0	0	0	0	0	0.59	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
CRAWLER CARRIER W/ 360 DUMP BOX OR DOZER 18 T W/ WINCH	Crawler Tractors/Dozers	Rubber Tired Dozers	Diesel	80	0	0	0	0	0	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
EXCAVATOR 25 T	Excavators	Excavators	Diesel	172	6	5	20	1	600	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	2.50E-01	3.31E-01	1.34E-04	1.65E-02	1.50E-02	1.50E-02							
FORKLIFT 11,000 THRU 12,000 TELESCOPE BOOM	Forklifts	Forklifts	Diesel	142	4	5	52	1	1040	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	3.54E-01	4.73E-01	1.50E-04	2.37E-02	2.15E-02	2.15E-02							
FRONT END LOADER 68,000 LBS	Rubber Tire Loaders	Rubber Tire Loaders	Diesel	386	4	5	10	1	200	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.31E-01	2.40E-01	1.20E-04	1.20E-02	7.49E-03	7.49E-03							
GENERATOR 23KW THRU 60KW TRAILER MOUNTED TOW TYPE	Generator Sets	Generator Sets	Diesel	38	12	5	52	1	3120	0.43	4.1045	5.5970	0.0020	0.2799	0.4478	0.4478	2.31E-01	3.15E-01	1.12E-04	1.57E-02	2.52E-02	2.52E-02							
HYDRAULIC BULLWHEEL BUNDLE TENSIONER	Other Construction Equipment	Forklifts	Diesel	80	0	0	0	0	0	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
PULLER ROPE TRAILER 4,000+ CAP W/ SPIT REEL TOW TYPE TANDEM AXLE	Other Construction Equipment	Forklifts	Diesel	74	0	0	0	0	0	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
PULLER CABLE TRAILER 30,000+ CAP TOW TYPE TANDEM AXLE	Other Construction Equipment	Forklifts	Diesel	400	0	0	0	0	0	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
PULLER ROPE TRAILER 4 DRUM 3,500+ CAP TOW TYPE TANDEM AXLE	Other Construction Equipment	Forklifts	Diesel	115	0	0	0	0	0	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
300T AT Setting Crane	Cranes	Cranes	Diesel	577	0	0	0	0	0	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
60T RT Crane	Cranes	Cranes	Diesel	320	4	3	2	1	24	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	9.51E-03	1.74E-02	7.28E-06	8.69E-04	5.43E-04	5.43E-04							
SKID STEER LOADER TRACK MTD 80 > 75 HP	Skid Steer Loaders	Tractors/Loaders/Backhoes	Diesel	95	4	5	20	1	400	0.21	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	3.28E-02	4.92E-02	1.76E-05	2.46E-03	2.63E-03	2.63E-03							
DUMP BOX TRUCK 2-1/2 T 6X6	Dumpers/Tenders	Scrapers	Diesel	505	0	0	0	0	0	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
DUMP BOX TRUCK 1-1/4 & 1-1/2 T	Dumpers/Tenders	Scrapers	Diesel	420	0	0	0	0	0	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
FLATBED (FRAMING) TRUCK 1-1/4 & 1-1/2 T	Dumpers/Tenders	Scrapers	Diesel	420	0	0	0	0	0	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
TRUCK TRACTOR 2-1/2 T 6X4 & 5 T 6X6	Other Construction Equipment	Scrapers	Diesel	450	0	0	0	0	0	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							
PICKUP TRUCK 3/4 T	Off-Highway Trucks	Scrapers	Diesel	420	8	5	52	3	6240	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	4.45E+00	8.14E+00	3.43E-03	4.07E-01	2.54E-01	2.54E-01							
											CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}													
Fugitive Dust																		CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}						
Dust from On-Site Activities																		0	0	0	0	3.83E+00	3.83E-01						
																		CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}						
Onroad											CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}													
Re-suspended Road Dust																		0	0	0	0	4.01E-01	1.00E-01						
Worker Commute (Gas Passenger Truck)											31	Gasoline	312,000	1	2027			2.82805	0.14757	0.00289	0.11235	0.00266	0.00235	9.73E-01	5.08E-02	9.93E-04	3.86E-02	9.15E-04	8.10E-04
Material Hauling (Single Unit Truck)											52	Diesel	1,250	2	2027			1.08775	1.59200	0.00287	0.08801	6.02796	0.02572	1.50E-03	2.19E-03	3.95E-06	4.21E-04	3.85E-05	3.54E-05
*EPA Tier II Emissions																		CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}						
*Load Factors and Emission rates from MOVES																		CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}						
*EPA 420-P-04-009, Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression Ignition, USEPA, April 2004 - Tier 2 Engines.																		Equipment	7.24E+00	1.28E+01	5.27E-03	6.39E-01	4.36E-01	4.36E-01					
*NMEHC																		Fugitive Dust	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.83E+00	3.83E-01					
																			9.74E-01	5.25E-02	9.97E-04	3.86E-02	9.02E-01	1.02E-01					
																		CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}						
																		8.21	12.83	0.01	0.68	4.67	0.92						

^a EPA Tier II Emissions

^b Load Factors and emission rates from MOVES5

^c EPA 420-P-04-005, Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression Ignition, USEPA, April 2004 - Tier 2 Engines.

^d NMHC

Assumption:
1 kWh = 1.34 hp-hr

Appendix J

Greenhouse Gas Calculations

Xcel Energy
4 substations
Total Emissions
Year:

2028

											Emission Factors (g/hp-hr) ^a or (g/mi) ^b					Emissions (ton / year)					
Equipment	MOVES Lookup ID	Fuel	HP	Typical Hours per day	Typical Days/week	Weeks	Count	Total Hours Used	Load Factor ^c	CO	NO _x	SO ₂ ^d	VOC ^d	PM ₁₀	PM _{2.5}	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
ATV 4 TO 6 WHEEL W/ DUMP	Off-Highway Trucks	Diesel	13.5	2	5	52	3	1560	0.59	4.9254	5.5970	0.0020	0.2799	0.5970	0.5970	6.75E-02	7.67E-02	2.74E-03	3.83E-03	8.18E-03	8.18E-03
RACKHOE W/ LOADER 4X4	Tractors/Loaders/Backhoes	Diesel	94	6	5	40	1	1200	0.21	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	9.74E-02	1.46E-01	5.22E-05	7.31E-03	7.79E-03	7.79E-03
BUCKET 105' WORK HEIGHT	Aerial Lifts	Diesel	300	8	5	52	3	6240	0.21	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	1.13E+00	2.13E+00	8.67E-04	1.07E-01	6.47E-02	6.47E-02
BUCKET 122' WORK HEIGHT 4X6	Aerial Lifts	Diesel	350	0	0	0	0	0	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BUCKET 77' WORK HEIGHT SWAMP TRK MTD	Aerial Lifts	Diesel	300	0	0	0	0	0	0.21	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRUCK MTD 4 T ARTICULATING BOOM W/ FORKS & CLAM	Cranes	Diesel	450	0	0	0	0	0	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRANE TRUCK 45 T HYDRAULIC 6 AXLE	Cranes	Diesel	450	3	5	12	1	180	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.09E-01	1.81E-01	7.68E-05	9.17E-03	5.73E-03	5.73E-03
DIGGER DERRICK 15 T CAP	Cranes	Diesel	330	8	5	20	1	600	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	3.27E-01	5.98E-01	2.90E-04	2.99E-02	1.87E-02	1.87E-02
DIGGER DERRICK 15 T CAP SWAMP TRACK MTD	Cranes	Diesel	300	0	0	0	0	0	0.43	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DOZER 10 THRU 12 T W/ WINCH	Crawler Tractors/Dozers	Diesel	80	4	3	20	1	240	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	4.66E-02	6.99E-02	2.50E-05	3.49E-03	3.73E-03	3.73E-03
DOZER 18 T W/ WINCH	Crawler Tractors/Dozers	Diesel	150	0	0	0	0	0	0.59	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRAWLER CARRIER W/ 360 DUMP BOX OR DOZER 18 T W/ WINCH	Crawler Tractors/Dozers	Diesel	80	0	0	0	0	0	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EXCAVATOR 25 T	Excavators	Diesel	172	6	5	20	1	600	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	2.50E-01	3.31E-01	1.34E-04	1.65E-02	1.50E-02	1.50E-02
FORKLIFT 11,000 THRU 12,000 TELESCOPE BOOM	Forklifts	Diesel	142	4	5	52	1	1040	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	3.54E-01	4.73E-01	1.90E-04	2.37E-02	2.15E-02	2.15E-02
FRONT END LOADER 68,000 LBS	Rubber Tire Loaders	Diesel	386	4	5	10	1	200	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.31E-01	2.40E-01	1.20E-04	1.20E-02	7.49E-03	7.49E-03
GENERATOR 23kW THRU 60kW TRAILER MOUNTED TOW TYPE	Generator Sets	Diesel	38	12	5	52	1	3120	0.43	4.1045	5.5970	0.0020	0.2799	0.4478	0.4478	2.31E-01	3.15E-01	1.12E-04	1.17E-02	2.52E-02	2.52E-02
HYDRAULIC BULLWHEEL BUNDLE TENSIONER	Other Construction Equipment	Diesel	80	0	0	0	0	0	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PULLER ROPE TRAILER 4,000+ CAP W/ SPIT REEL TOW TYPE TANDEM AXLE	Other Construction Equipment	Diesel	74	0	0	0	0	0	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PULLER CABLE TRAILER 30,000+ CAP TOW TYPE TANDEM AXLE	Other Construction Equipment	Diesel	400	0	0	0	0	0	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PULLER ROPE TRAILER 4 DRUM 3,500+ CAP TOW TYPE TANDEM AXLE	Other Construction Equipment	Diesel	115	0	0	0	0	0	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DOT AT Setting Crane	Cranes	Diesel	177	0	0	0	0	0	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DOT RT Crane	Cranes	Diesel	320	4	3	2	1	24	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	9.51E-03	1.74E-02	7.28E-06	8.69E-04	5.43E-04	5.43E-04
SKID STEER LOADER TRACK MTD 80 > 75 HP	Skid Steer Loaders	Diesel	95	4	5	40	1	800	0.21	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	6.54E-02	9.85E-02	3.52E-05	4.92E-03	5.25E-03	5.25E-03
DUMP BOX TRUCK 2-1/2 T 6X6	Dumpsters/Tenders	Diesel	505	0	0	0	0	0	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DUMP BOX TRUCK 1-1/4 & 1-1/2 T	Dumpsters/Tenders	Diesel	420	0	0	0	0	0	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FLATBED (FRAMING) TRUCK 1-1/4 & 1-1/2 T	Dumpsters/Tenders	Diesel	420	0	0	0	0	0	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRUCK TRACTOR 2-1/2 T 6X4 & 5 T 6X6	Other Construction Equipment	Diesel	450	0	0	0	0	0	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PICKUP TRUCK 3/4 T	Off-Highway Trucks	Diesel	420	8	5	52	3	6240	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	4.45E+00	8.14E+00	3.43E-03	4.07E-01	2.54E-01	2.54E-01
																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Fugitive Dust																0	0	0	0	3.83E+00	3.83E-01
Dust from On-Site Activities																					
																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Onroad																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
MOVES Vehicle Class																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
VMT																					
Onroad Fuel ID																					
Year																					
Reuspended Road Dust																0	0	0	0	4.01E-01	1.00E-01
Worker Commute (Gas Passenger Truck)																9.20E-01	4.54E-02	9.78E-04	3.69E-02	8.71E-04	7.70E-04
Material Hauling (Single Unit Truck)																1.05E-03	1.444E-5	0.00278	0.07793	0.02304	0.02119
																1.45E-03	1.99E-03	3.83E-06	1.07E-04	3.17E-05	2.92E-05
																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Equipment																7.27E+00	1.28E+01	5.29E-03	6.41E-01	4.38E-01	4.38E-01
Fugitive Dust																0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.83E+00	3.83E-01
Onroad																9.22E-01	4.74E-02	9.82E-04	3.70E-02	5.02E-01	1.02E-01
Total																8.19	12.87	0.01	0.68	4.67	0.92

^a EPA Tier II Emissions

^b Load Factors and emission rates from MOVES5

^c EPA 420-P-04-005, Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression Ignition, USEPA, April 2004 - Tier 2 Engines.

^d NMHC

Assumption:
1 kWh = 1.34 hp-hr

Appendix J

Greenhouse Gas Calculations

Xcel Energy
4 substations
Total Emissions
Year:

2029

											Emission Factors [g/hp-hr] ^a or [g/mi] ^b					Emissions [ton / year]					
Equipment	MOVES Lookup ID	Fuel	HP	Typical Hours per day	Typical Days/week	Weeks	Count	Total Hours Used	Load Factor ^c	CO	NO _x	SO ₂ ^d	VOC ^d	PM ₁₀	PM _{2.5}	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
ATV 4 TO 6 WHEEL W/ DUMP	Off Highway Trucks	Diesel	13.5	2	5	38	3	1140	0.59	4.9254	5.5970	0.0020	0.2799	0.5970	0.5970	4.93E-02	5.60E-02	2.00E-03	2.80E-03	5.98E-03	5.98E-03
BACKHOE W/ LOADER 4X4	Tractors/Loaders/Backhoes	Diesel	94	6	5	15	1	450	0.21	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	3.65E-02	5.48E-02	1.96E-05	2.74E-03	2.92E-03	2.92E-03
BUCKET 105' WORK HEIGHT	Aerial Lifts	Diesel	300	8	5	25	3	3000	0.21	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	5.44E-01	1.03E+00	4.17E-04	5.13E-02	3.11E-02	3.11E-02
BUCKET 122' WORK HEIGHT 4X6	Aerial Lifts	Diesel	350	0	0	0	0	0	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BUCKET 77' WORK HEIGHT SWAMP TRK MTD	Aerial Lifts	Diesel	300	0	0	0	0	0	0.21	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRUCK MTD 4 T ARTICULATING BOOM W/ FORKS & CLAM	Cranes	Diesel	450	0	0	0	0	0	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRANE TRUCK 45 T HYDRAULIC 6 AXLE	Cranes	Diesel	450	3	5	12	1	180	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.09E-01	1.83E-01	7.68E-05	9.17E-03	5.73E-03	5.73E-03
DIGGER DERRICK 15 T CAP	Cranes	Diesel	330	8	5	20	1	600	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	3.27E-01	5.98E-01	2.92E-04	3.87E-02	1.87E-02	1.87E-02
DIGGER DERRICK 15 T CAP SWAMP TRACK MTD	Cranes	Diesel	300	0	0	0	0	0	0.43	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DOZER 10 THRU 12 T W/ WINCH	Crawler Tractors/Dozers	Diesel	80	4	3	20	1	240	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	4.66E-02	6.99E-02	2.50E-05	3.49E-03	3.73E-03	3.73E-03
DOZER 18 T W/ WINCH	Crawler Tractors/Dozers	Diesel	150	0	0	0	0	0	0.59	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CRAWLER CARRIER W/ 360 DUMP BOX OR DOZER 18 T W/ WINCH	Crawler Tractors/Dozers	Diesel	80	0	0	0	0	0	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EXCAVATOR 25 T	Excavators	Diesel	172	6	5	20	1	600	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	2.50E-01	3.31E-01	1.34E-04	1.65E-02	1.50E-02	1.50E-02
FORKLIFT 11,000 THRU 12,000+ TELESCOPE BOOM	Forklifts	Diesel	142	4	5	38	1	760	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	2.62E-01	3.46E-01	1.40E-04	1.73E-02	1.57E-02	1.57E-02
FRONT END LOADER 68,000+ LBS	Rubber Tire Loaders	Diesel	386	4	5	10	1	200	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.31E-01	2.40E-01	1.00E-04	1.20E-02	7.49E-03	7.49E-03
GENERATOR 23kW THRU 60kW TRAILER MOUNTED TOW TYPE	Generator Sets	Diesel	38	12	5	25	1	1500	0.43	4.1045	5.5970	0.0020	0.2799	0.4478	0.4478	1.51E-01	5.40E-01	7.56E-03	1.21E-02	1.21E-02	1.21E-02
HYDRAULIC BULLWHEEL BUNDLE TENSIONER	Other Construction Equipment	Diesel	80	0	0	0	0	0	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PULLER ROPE TRAILER 4,000+ CAP W/ SPIT REEL TOW TYPE TANDEM AXLE	Other Construction Equipment	Diesel	74	0	0	0	0	0	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PULLER CABLE TRAILER 30,000+ CAP TOW TYPE TANDEM AXLE	Other Construction Equipment	Diesel	400	0	0	0	0	0	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PULLER ROPE TRAILER 4 DRUM 3,500+ CAP TOW TYPE TANDEM AXLE	Other Construction Equipment	Diesel	115	0	0	0	0	0	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ROT AT Spinning Crane	Cranes	Diesel	577	0	0	0	0	0	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ROT RT Crane	Cranes	Diesel	320	4	3	2	1	24	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	9.51E-03	1.74E-02	7.38E-06	8.69E-04	5.43E-04	5.43E-04
SKID STEER LOADER TRACK MTD 80 > 75 HP	Skid Steer Loaders	Diesel	95	4	5	20	1	400	0.21	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	3.28E-02	4.92E-02	1.76E-05	2.46E-03	2.63E-03	2.63E-03
DUMP BOX TRUCK 2-1/2 T 6X6	Dumpers/Tenders	Diesel	505	0	0	0	0	0	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DUMP BOX TRUCK 1-1/4 & 1-1/2 T	Dumpers/Tenders	Diesel	420	0	0	0	0	0	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FLATBED (FRAMING) TRUCK 1-1/4 & 1-1/2 T	Dumpers/Tenders	Diesel	420	0	0	0	0	0	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TRUCK TRACTOR 2-1/2 T 6X4 & 5 T 6X6	Other Construction Equipment	Diesel	450	0	0	0	0	0	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PICKUP TRUCK 3/4 T	Off Highway Trucks	Diesel	420	8	5	38	3	4560	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	3.25E+00	5.95E+00	2.49E-03	2.97E-01	1.86E-01	1.86E-01
																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Fugitive Dust																0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.78E+00	2.78E+01
Dust from On Site Activities																					
																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Onroad																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
MOVES Vehicle Class																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
VMT																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Onroad Fuel ID																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Year																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Reuspended Road Dust																0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.68E-01	9.21E-02
Worker Commute (Gas Passenger Truck)																2.551E-09	0.11843	0.00280	0.10261	0.00242	0.00214
Material Hauling (Single Unit Truck)																1.02322	1.31884	0.00271	0.06957	0.03962	0.01805
EPA Tier II Emissions																2.551E-09	0.11843	0.00280	0.10261	0.00242	0.00214
Load Factors and emission rates from MOVES5																1.02322	1.31884	0.00271	0.06957	0.03962	0.01805
EPA 420 P-04-005, Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression Ignition, USEPA, April 2004 - Tier 2 Engines.																2.551E-09	0.11843	0.00280	0.10261	0.00242	0.00214
NMHC																1.02322	1.31884	0.00271	0.06957	0.03962	0.01805
																CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
																5.15E+00	9.07E+00	3.75E-03	4.54E-01	3.08E-01	3.08E-01
																0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.78E+00	2.78E-01
																8.11E-01	3.84E-02	8.95E-04	3.35E-02	3.69E-01	9.28E-02
																5.96	9.11	0.00	0.49	3.45	0.68

Assumption:
1 kWh = 1.34 hp-hr

Resuspended Road Dust
Year: 2027

SpeedBin	MOVES ID	Weight tons	Total Vehicle Miles Traveled (VMT) per Speed Bin					
			Low ADT Road			High ADT Road		
			5	6	7	12	13	16
Passenger Truck	31	5	0	0	62400	249600	0	0
Single Unit Truck	52	20	0	0	15	1235	0	0
Vehicle Type	Pollutant	Road Type	k (g/VMT)	sL	W	P	VMT	Emissions (tons)
Passenger Truck	PM _{2.5}	High ADT Road	0.25	0.12	5	110	249600	0.0477
Passenger Truck	PM ₁₀	High ADT Road	1	0.12	5	110	249600	0.1908
Passenger Truck	PM _{2.5}	Low ADT Road	0.25	0.6	5	110	62400	0.0516
Passenger Truck	PM ₁₀	Low ADT Road	1	0.6	5	110	62400	0.2063
Single Unit Truck	PM _{2.5}	High ADT Road	0.25	0.12	20	110	1234.939759	0.0010
Single Unit Truck	PM ₁₀	High ADT Road	1	0.12	20	110	1234.939759	0.0039
Single Unit Truck	PM _{2.5}	Low ADT Road	0.25	0.6	20	110	15.06024096	0.0001
Single Unit Truck	PM ₁₀	Low ADT Road	1	0.6	20	110	15.06024096	0.0002

Formula used from AP-42 Section 13.2.1 "Paved Roads"

$$E = k (sL)^{0.91} (W)^{1.02} (1 - P/4N)$$

E = particulate emission factor (having units matching the units of k)

k = particle size multiplier for particle size range and units of interest, From AP-42 Table 13.2-1.1

sL = road surface silt loading (grams per square meter) (g/m²), Assume winter time condition

W = average weight (tons) of the vehicles traveling the road

Figure 13.2.1-2 estimates that days of precipitation >0.01 inch per year (P) is approximately 110; N is 365 days.

Conservatively assumed pickup trucks are light duty type with GVWR of 10,000 pounds or 5 tons.

Assumed Single Unit Trucks weigh 20 tons each.

Silt Loading	AP-42 Roadway Category	sL (Winter)
High ADT Road	5000-10000 ADT	0.12
Low ADT Road	500-5000 ADT	0.6

Total		
PM _{2.5}	0.100296777 tons	
PM ₁₀	0.401187107 tons	

Resuspended Road Dust
Year: 2028

SpeedBin	MOVES ID	Weight tons	Total Vehicle Miles Traveled (VMT) per Speed Bin						16
			Low ADT Road		High ADT Road				
			5	6	7	12	13		
Passenger Truck		31	5	0	0	62400	249600	0	0
Single Unit Truck		52	20	0	0	15	1235	0	0
Vehicle Type	Pollutant	Road Type	k (g/VMT)	sL	W	P	VMT	Emissions (tons)	
Passenger Truck	PM _{2.5}	High ADT Road	0.25	0.12	5	110	249600	0.0477	
Passenger Truck	PM ₁₀	High ADT Road	1	0.12	5	110	249600	0.1908	
Passenger Truck	PM _{2.5}	Low ADT Road	0.25	0.6	5	110	62400	0.0516	
Passenger Truck	PM ₁₀	Low ADT Road	1	0.6	5	110	62400	0.2063	
Single Unit Truck	PM _{2.5}	High ADT Road	0.25	0.12	20	110	1234.939759	0.0010	
Single Unit Truck	PM ₁₀	High ADT Road	1	0.12	20	110	1234.939759	0.0039	
Single Unit Truck	PM _{2.5}	Low ADT Road	0.25	0.6	20	110	15.06024096	0.0001	
Single Unit Truck	PM ₁₀	Low ADT Road	1	0.6	20	110	15.06024096	0.0002	

Formula used from AP-42 Section 13.2.1 "Paved Roads"

$$E = k (sL)^{0.91} (W)^{1.02} (1 - P/4N)$$

E = particulate emission factor (having units matching the units of k)

k = particle size multiplier for particle size range and units of interest, From AP-42 Table 13.2-1.1

sL = road surface silt loading (grams per square meter) (g/m²), Assume winter time condition

W = average weight (tons) of the vehicles traveling the road

Figure 13.2.1-2 estimates that days of precipitation >0.01 inch per year (P) is approximately 110; N is 365 days.

Conservatively assumed pickup trucks are light duty type with GVWR of 10,000 pounds or 5 tons.

Assumed Single Unit Trucks weigh 20 tons each.

Silt Loading	AP-42 Roadway Category	sL (Winter)
High ADT Road	5000-10000 ADT	0.12
Low ADT Road	500-5000 ADT	0.6

Total	
PM _{2.5}	0.100296777 tons
PM ₁₀	0.401187107 tons

Resuspended Road Dust
Year: 2029

SpeedBin	MOVES ID	Weight tons	Total Vehicle Miles Traveled (VMT) per Speed Bin					
			Low ADT Road			High ADT Road		
			5	6	7	12	13	16
Passenger Truck	31	5	0	0	57600	230400	0	0
Single Unit Truck	52	20	0	0	7	543	0	0
Vehicle Type	Pollutant	Road Type	k (g/VMT)	sL	W	P	VMT	Emissions (tons)
Passenger Truck	PM _{2.5}	High ADT Road	0.25	0.12	5	110	230400	0.0440
Passenger Truck	PM ₁₀	High ADT Road	1	0.12	5	110	230400	0.1761
Passenger Truck	PM _{2.5}	Low ADT Road	0.25	0.6	5	110	57600	0.0476
Passenger Truck	PM ₁₀	Low ADT Road	1	0.6	5	110	57600	0.1904
Single Unit Truck	PM _{2.5}	High ADT Road	0.25	0.12	20	110	543.373494	0.0004
Single Unit Truck	PM ₁₀	High ADT Road	1	0.12	20	110	543.373494	0.0017
Single Unit Truck	PM _{2.5}	Low ADT Road	0.25	0.6	20	110	6.626506024	0.0000
Single Unit Truck	PM ₁₀	Low ADT Road	1	0.6	20	110	6.626506024	0.0001

Formula used from AP-42 Section 13.2.1 "Paved Roads"

$$E = k (sL)^{0.91} (W)^{1.02} (1 - P/4N)$$

E = particulate emission factor (having units matching the units of k)

k = particle size multiplier for particle size range and units of interest, From AP-42 Table 13.2-1.1

sL = road surface silt loading (grams per square meter) (g/m²), Assume winter time condition

W = average weight (tons) of the vehicles traveling the road

Figure 13.2.1-2 estimates that days of precipitation >0.01 inch per year (P) is approximately 110; N is 365 days.

Conservatively assumed pickup trucks are light duty type with GVWR of 10,000 pounds or 5 tons.

Assumed Single Unit Trucks weigh 20 tons each.

Silt Loading	AP-42 Roadway Category	sL (Winter)
High ADT Road	5000-10000 ADT	0.12
Low ADT Road	500-5000 ADT	0.6

Total	
PM _{2.5}	0.092088101 tons
PM ₁₀	0.368352404 tons

Fugitive Dust
Year: 2027

Activities	Construction Duration (Days)	Area Affected (ac) or <i>Mileage</i> ⁶	WRAP Level ¹	Duration or <i>Tonnage</i> ⁵	Emission Factor ^{2,3}			Control Efficiency ⁴	Emission (tons/year)	
					Emission Factor Unit	PM ₁₀	PM _{2.5}		PM ₁₀	PM _{2.5}
ROW (Soil Disturbance)	260	8.0	1	8.7	ton/ac-month	0.11	0.011	50%	3.828	0.383
Passenger Trucks Onsite Mileage (Passenger Truck)	260	15	4	5	lb/ton-mile	0.21	0.021	50%	0.004	0.000
Support Trucks Onsite Mileage (Heavy Vehicle)	260	15	4	20	lb/ton-mile	0.21	0.021	50%	0.016	0.002
Wind Erosion	260	8.0		0.71	ton/ac-year	0.38	0.057	50%	0.090	0.014
Fugitive Dust Total									3.832	0.383

¹ WRAP level from Table 3-2 Ch 3 of WRAP Fugitive Dust Handbook Sep/2006: https://www.wrapair.org/forums/dejff/fdh/content/FDHandbook_Rev_06.pdf

² PM2.5/PM10 is set at 0.1 per guideline listed on section 3.31 of WRAP handbook, 0.15 for Wind Erosion per Section 9.2 of WRAP handbook

³ Wind Erosion Emission Factor extracted from WRAP handbook Table 11-6, assumed 100% of TSP is PM10

⁴ 50% of Wet Suppression per WRAP handbook Page 8

⁵ The unit for Duration is either month or year depending on the Emission Factor Unit. 20 tons was assume for Heavy Truck, 5 tons for passenger trucks

⁶ On site VMT is 15 mile per day total for passenger trucks and 15 mile per day total for heavy vehicles.

Fugitive Dust
Year: 2028

Activities	Construction Duration (Days)	Area Affected (ac) or <i>Mileage</i> ⁶	WRAP Level ¹	Duration or <i>Tonnage</i> ⁵	Emission Factor ^{2,3}			Control Efficiency ⁴	Emission (tons/year)	
					Emission Factor Unit	PM ₁₀	PM _{2.5}		PM ₁₀	PM _{2.5}
ROW (Soil Disturbance)	260	8.0	1	8.7	ton/ac-month	0.11	0.011	50%	3.828	0.383
Passenger Trucks Onsite Mileage (Passenger Truck)	260	15	4	5	lb/ton-mile	0.21	0.021	50%	0.004	0.000
Support Trucks Onsite Mileage (Heavy Vehicle)	260	15	4	20	lb/ton-mile	0.21	0.021	50%	0.016	0.002
Wind Erosion	260	8.0		0.71	ton/ac-year	0.38	0.057	50%	0.090	0.014
Fugitive Dust Total									3.832	0.383

¹ WRAP level from Table 3-2 Ch 3 of WRAP Fugitive Dust Handbook Sep/2006: https://www.wrapair.org/forums/dejff/fdh/content/FDHandbook_Rev_06.pdf

² PM2.5/PM10 is set at 0.1 per guideline listed on section 3.31 of WRAP handbook, 0.15 for Wind Erosion per Section 9.2 of WRAP handbook

³ Wind Erosion Emission Factor extracted from WRAP handbook Table 11-6, assumed 100% of TSP is PM10

⁴ 50% of Wet Suppression per WRAP handbook Page 8

⁵ The unit for Duration is either month or year depending on the Emission Factor Unit. 20 tons was assume for Heavy Truck, 5 tons for passenger trucks

⁶ On site VMT is 15 mile per day total for passenger trucks and 15 mile per day total for heavy vehicles.

Fugitive Dust
Year: 2029

Activities	Construction Duration (Days)	Area Affected (ac) or <i>Mileage</i> ⁶	WRAP Level ¹	Duration or <i>Tonnage</i> ⁵	Emission Factor ^{2,3}			Control Efficiency ⁴	Emission (tons/year)	
					Emission Factor Unit	PM ₁₀	PM _{2.5}		PM ₁₀	PM _{2.5}
ROW (Soil Disturbance)	190	8.0	1	6.3	ton/ac-month	0.11	0.011	50%	2.772	0.277
Passenger Trucks Onsite Mileage (Passenger Truck)	190	15	4	5	lb/ton-mile	0.21	0.021	50%	0.004	0.000
Support Trucks Onsite Mileage (Heavy Vehicle)	190	15	4	20	lb/ton-mile	0.21	0.021	50%	0.016	0.002
Wind Erosion	190	8.0		0.52	ton/ac-year	0.38	0.057	50%	0.066	0.010
Fugitive Dust Total									2.776	0.278

¹ WRAP level from Table 3-2 Ch 3 of WRAP Fugitive Dust Handbook Sep/2006: https://www.wrapair.org/forums/dejff/fdh/content/FDHandbook_Rev_06.pdf

² PM2.5/PM10 is set at 0.1 per guideline listed on section 3.31 of WRAP handbook, 0.15 for Wind Erosion per Section 9.2 of WRAP handbook

³ Wind Erosion Emission Factor extracted from WRAP handbook Table 11-6, assumed 100% of TSP is PM10

⁴ 50% of Wet Suppression per WRAP handbook Page 8

⁵ The unit for Duration is either month or year depending on the Emission Factor Unit. 20 tons was assume for Heavy Truck, 5 tons for passenger trucks

⁶ On site VMT is 15 mile per day total for passenger trucks and 15 mile per day total for heavy vehicles.

Project Background (Step 1)

Project Information

Enter information into all yellow cells. Results may not calculate if fields are left blank, as highlighted by the red x marks. For building construction projects, select the Apply Defaults button to populate the Construction Duration with the default data from the grey cells.

Project Name	Xcel Skyway - 4 Substations	
Project Category (primary)	Subp. 6, Transmission lines	✓
Project Category (secondary)		
Location (County)	Goodhue	✓

Construction Start Date	3/1/2027	✓
Operational Year	2029	✓
Operational Lifetime (Years)	30	✓

Total Project Acreage	8.0	✓
Residential Building Area (sq ft)	-	●
Commercial Building Area (sq ft)	-	●
Industrial Building Area (sq ft)	-	●
Institutional Building Area (sq ft)	-	●
Other Building Area (sq ft)	-	●

Building Construction Project?	No
--------------------------------	----

Construction Stage	Duration (Days)	Default*	✓
Demolition	32.0	32.0	
Site Preparation	8.0	8.0	
Grading	12.8	12.8	
Building Construction	-	-	
Architectural Coatings	-	-	
Paving and Landscaping	28.8	28.8	

Apply Defaults

Reset Button

*Defaults are dependent on total project acreage and are only applicable to building construction projects.

Electricity Provider	Grid Average
Portion of Building Electricity Consumption to be Generated On-Site via Renewables or Supplied through the Purchase of Renewable Energy Credits (RECs)	0%
Portion of Building Natural Gas Consumption to be Supplied from Renewable Sources	0%

Tool Calculation Preferences

Please specify the preferred unit in which to present emissions in the Results tab.

Unit	tons
------	------

Applicable Emission Sources

Information is provided below on emission sources potentially applicable to your project depending on the project category selected in the section above. Select the 'Apply Defaults' button to include all applicable sources, or manually select "Yes" or "No" to indicate which emission sources to estimate GHG emissions for in this tool. The red x mark will appear until a selection is made for all emission sources.

Project Phase	Emission Source	Include Emission Source?	Applicable to Project Category? 
Construction	Material inputs	No	Yes
Construction	Transportation of material inputs		
Construction	Employee commuting	Yes	Yes
Construction	Construction equipment	Yes	Yes
Construction	Land use change (construction)	No	Yes
Construction	Construction waste	No	Yes
Operation	Building energy consumption	No	No
Operation	Coal production	No	No
Operation	Natural gas and oil products	No	No
Operation	Industrial processes	No	No
Operation	HFC leakage	No	No
Operation	Land use change (operations)	No	No
Operation	On-road vehicles	No	No
Operation	Treatment of waste on-site	No	No
Operation	Treatment of wastewater on-site	No	No
Operation	Treatment of waste off-site	No	No
Operation	Enteric fermentation	No	No
Operation	Manure management		

[Apply Defaults](#)
[Reset Button](#)

User Inputs (Step 2)

Enter data in the yellow cells for emission sources that are applicable to your project (as identified in the Project Background tab). Inputs for emission sources identified as not applicable are blacked out. Incomplete data are highlighted by the red x marks to the left of each table. Default values are available for select inputs. Click the 'Apply Defaults' button to populate the tool with default values. Select 'Hide Sources Not Applicable' or 'Show All Sources' to hide or view sources selected as not applicable on the Project Background tab.

Material Inputs

Transportation of Material Inputs

Employee Commuting

Construction Equipment

Land Use Change (Construction)

Construction Waste

Building Energy Consumption

Coal Production

Natural Gas and Oil Products

Industrial Processes

HFC Leakage

Land Use Change (Operations)

On-road Vehicles

Treatment of Waste On-Site

Treatment of Wastewater On-Site

Treatment of Waste Off-Site

Enteric Fermentation

Manure management

Go to Notes

Go to Project Background

Reset ALL Inputs

Construction Phase

Hide Sources Not Applicable

Show All Sources

Material inputs
Enter the total amount of material (in short tons) that will be used during the construction phase of your project. Concrete and wood products may instead be entered in cubic yards while insulation may be entered in square feet. Use the dropdown to select an alternate unit if data are not provided in short tons. Additionally, select the source of each material (i.e., domestic or imported). Select "Unknown" if you do not know the source of the material.

Material Type	Quantity	Unit	Geographical Sourcing
Aluminum		Tons	Unknown
Asphalt		Tons	Domestic
Brick		Tons	Unknown
Concrete		Tons	Domestic
Glass		Tons	Unknown
Insulation (residential)		Tons	Unknown
Insulation (commercial)		Tons	Unknown
Steel		Tons	Unknown
Wood Products		Tons	Unknown

Employee commuting
Enter the daily average number of employees that will commute to the construction site during each phase of construction. Enter the average one-way commuter distance and mode breakout or select the "Apply Defaults" button to the right of the table to populate these fields with default values.

Construction Stage	Daily Average Number of Employees Commuting
Demolition	24
Site Preparation	24
Grading	24
Building Construction	24
Architectural Coatings	24
Paving and Landscaping	24

	One-Way Distance (miles)	Default
Average One-Way Commute Length	25.0	13.2

Apply Defaults

Reset Button

Transportation Mode	Percent of Employees	Default
Single Occupancy Vehicle	81.7%	81.7%
Carpool	10.6%	10.6%
Motorcycle	0.2%	0.2%
Bus	1.9%	1.9%
Transit Rail	2.2%	2.2%
Bike/Walk	3.4%	3.4%
Total:	100%	

Construction equipment
Select the fuel type used by each type of equipment and enter the total number of hours each equipment type is used per day by construction phase. The total hours should account for multiple pieces of equipment being used each day. For example, if the project uses 3 forklifts for 6 hours/day during the building construction phase, then the total number of hours/day for forklifts during the building construction phase would equal 18 (i.e., 3 forklifts * 6 hours/day).

Apply Defaults

Reset Button

Equipment Type	Fuel Type	Number of Hours per Day by Construction Stage						Default*					
		Demolition	Site Preparation	Grading	Building Construction	Architectural Coatings	Paving and Landscaping	Demolition	Site Preparation	Grading	Building Construction	Architectural Coatings	Paving and Landscaping
Air Compressors	Diesel							0	0	0	0	0	0
Cement and Mortar Mixers	Diesel	6	2	2			2	0	0	0	0	0	0

Concrete/Industrial Saws	Diesel							8	0	0	0	0	0
Cranes	Diesel	39	48	48			48	0	0	0	0	0	0
Excavators	Diesel	6	4	4			4	24	0	8	0	0	0
Forklifts	Diesel	4	12	12			12	0	0	0	0	0	0
Generator Sets	Diesel	12	12	12			12	0	0	0	0	0	0
Graders	Diesel							0	0	8	0	0	0
Pavers	Diesel							0	0	0	0	0	16
Paving Equipment	Diesel							0	0	0	0	0	16
Rollers	Diesel							0	0	0	0	0	16
Rubber Tired Dozers	Diesel	8	18	18			18	16	24	8	0	0	0
Scrapers	Diesel	24	46	46			46	0	0	0	0	0	0
Tractors/Loaders/Backhoes	Diesel	10	6	6			6	0	32	24	0	0	0
Welders	Diesel							0	0	0	0	0	0

*Defaults are only applicable to building construction projects. Values are dependent on the number of project acres.

Land use change (construction)

Enter the number of acres by land cover type before and after development. Additionally, identify the number of trees removed during development and the number of new trees planted. This information should match the information reported in Question #8 of the EAW.

Land Use Type	Acres	
	Pre-Construction	Post-Construction
Wetlands, forested		
Wetlands, not forested		
Forest		
Rivers and streams		
Brush and grassland		
Cropland		
Livestock rangeland/pastureland		
Lawn/landscaping		
Green Infrastructure: Constructed wetlands, paved		
Green Infrastructure: Constructed wetlands, vegetated		
Green Infrastructure: Constructed green roofs		
Green Infrastructure: Constructed permeable pavements		
Impervious surface		
Stormwater pond (wet sedimentation basin)		
Total:	0.0	0.0

Trees	Number
Number of mature trees removed	
Number of new trees planted	

Construction waste

Enter the total amount of waste generated during construction in short tons. Default values are provided based on inputs entered under the Material Inputs section above. Select the "Apply Defaults" button to the right of the table to populate the table with default values. You may also enter an amount for other mixed waste generated during construction and demolition to account for other waste that is not covered by the material-specific values.

Material Type	Quantity (tons)	Default (tons)	Loss Rate (%)
Aluminum	0.00	0.00	0%
Asphalt	0.00	0.00	0%
Brick	0.00	0.00	4%
Concrete	0.00	0.00	5%
Glass	0.00	0.00	3%
Insulation	0.00	0.00	10%
Steel	0.00	0.00	0%
Wood Products	0.00	0.00	5%
Mixed Waste		NA	NA

Apply Defaults

Reset Button

Operational Phase

Building energy consumption

Enter the energy intensity of each building type that is applicable to your project in Btu per square foot per year. Applicability is determined based on the building square footage data entered in the Project Background tab. Select the "Apply Defaults" button to the right of the table to populate the table with default values. For "Other" building types, no default is available and must be provided, if applicable.

Building Type	Energy Intensity (Btu/sq ft/year)				Default*			
	Electricity	Natural Gas	Propane	Kerosene or Fuel Oil	Electricity	Natural Gas	Propane	Kerosene or Fuel Oil
Residential					18,096.91	24,460.01	3,619.38	233.51
Commercial					30,766.13	35,534.88	0.00	1,661.56
Industrial					229,952.20	656,392.90	0.00	8,191.66
Institutional					46,860.06	48,219.03	0.00	3,659.93
Other					NA	NA	NA	NA

*Refer to the Buildings tab for industry-specific default values for industrial buildings. These values may be manually entered in place of the default provided.

Apply Defaults

Reset Button

Coal production

Notes (Step 3)

Enter notes into the yellow cells below to document assumptions, data sources, notes for reviewers, special circumstances, or other helpful information specific to your project, if des.

General Notes	
---------------	--

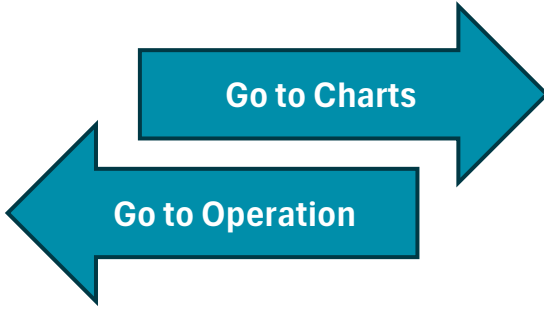
Construction	
Material inputs	No info provided
Transportation of material inputs	No info provided
Employee commuting	24 workers
Construction equipment	Converted from provided equipment list using similar horsepower equipment
Land use change (construction)	Assumed to be minimal so not included
Construction waste	No info provided

Operation	
Building energy consumption	
Coal production	
Natural gas and oil products	

Summary Results (Step 4b)

Cumulative and annualized GHG emissions are shown for all applicable emission sources in the table below. Results are calculated using AR5 global warming potentials and are shown in short tons, metric tons, or kilograms based on the unit selected in the Project Background tab. Emission sources indicated as not applicable in the Project Background tab that are excluded from the calculations are listed below.

Emission sources excluded from calculations and hidden below:	Material inputs, Land use change (construction), Construction waste, Building energy consumption, Coal production, Natural gas and oil products, Industrial processes, HFC leakage, Land use change (operations), On-road vehicles, Treatment of waste on-site, Treatment of wastewater on-site, Treatment of waste off-site, Enteric fermentation
---	--



Generate Summary Report

Lifetime Emissions

Unit: tons

Project Lifetime: 32

Phase	Cumulative CO ₂ e Emissions	Annualized CO ₂ e Emissions
Construction	972.74	30.40
Employee commuting	36.47	1.14
Construction equipment	936.27	29.26
Operation	-	-
Total	972.74	30.40

Emissions Equivalencies

To contextualize emissions, input emissions data into the [EPA GHG Equivalencies Calculator](#) (using corresponding units) to convert emissions into equivalent measures for communication purposes. Below are some example equivalencies for both cumulative and annualized emissions.

Cumulative emissions are equivalent to...

Emissions from	2,245,440	miles driven by an average gasoline-powered passenger vehicle
Emissions from	99,298	gallons of gasoline consumed
Emissions avoided by	312	tons of waste recycled instead of landfilled

Annualized emissions are equivalent to...

Emissions from	6	gasoline-powered passenger vehicles driven for one year
Emissions from	4	homes' energy use for one year
Carbon sequestered by	28	acres of U.S. forests in one year

Project Background (Step 1)

Project Information

Enter information into all yellow cells. Results may not calculate if fields are left blank, as highlighted by the red x marks. For building construction projects, select the Apply Defaults button to populate the Construction Duration with the default data from the grey cells.

Project Name	Xcel Skyway - Transmission line	
Project Category (primary)	Subp. 6, Transmission lines	✓
Project Category (secondary)		
Location (County)	Goodhue	✓

Construction Start Date	3/1/2027	✓
Operational Year	2029	✓
Operational Lifetime (Years)	30	✓

Total Project Acreage	82.0	✓
Residential Building Area (sq ft)	-	●
Commercial Building Area (sq ft)	-	●
Industrial Building Area (sq ft)	-	●
Institutional Building Area (sq ft)	-	●
Other Building Area (sq ft)	-	●

Building Construction Project?	No
--------------------------------	----

Construction Stage	Duration (Days)	Default*	✓
Demolition	76.5	76.5	
Site Preparation	43.7	43.7	
Grading	120.3	120.3	
Building Construction	-	-	
Architectural Coatings	-	-	
Paving and Landscaping	82.0	82.0	

Apply Defaults

Reset Button

*Defaults are dependent on total project acreage and are only applicable to building construction projects.

Electricity Provider	Grid Average
Portion of Building Electricity Consumption to be Generated On-Site via Renewables or Supplied through the Purchase of Renewable Energy Credits (RECs)	0%
Portion of Building Natural Gas Consumption to be Supplied from Renewable Sources	0%

Tool Calculation Preferences

Please specify the preferred unit in which to present emissions in the Results tab.

Unit	tons
------	------

Applicable Emission Sources

Information is provided below on emission sources potentially applicable to your project depending on the project category selected in the section above. Select the 'Apply Defaults' button to include all applicable sources, or manually select "Yes" or "No" to indicate which emission sources to estimate GHG emissions for in this tool. The red x mark will appear until a selection is made for all emission sources.

Project Phase	Emission Source	Include Emission Source?	Applicable to Project Category? 
Construction	Material inputs	No	Yes
Construction	Transportation of material inputs		
Construction	Employee commuting	Yes	Yes
Construction	Construction equipment	Yes	Yes
Construction	Land use change (construction)	No	Yes
Construction	Construction waste	No	Yes
Operation	Building energy consumption	No	No
Operation	Coal production	No	No
Operation	Natural gas and oil products	No	No
Operation	Industrial processes	No	No
Operation	HFC leakage	No	No
Operation	Land use change (operations)	No	No
Operation	On-road vehicles	No	No
Operation	Treatment of waste on-site	No	No
Operation	Treatment of wastewater on-site	No	No
Operation	Treatment of waste off-site	No	No
Operation	Enteric fermentation	No	No
Operation	Manure management		

[Apply Defaults](#)
[Reset Button](#)

User Inputs (Step 2)

Enter data in the yellow cells for emission sources that are applicable to your project (as identified in the Project Background tab). Inputs for emission sources identified as not applicable are blacked out. Incomplete data are highlighted by the red x marks to the left of each table. Default values are available for select inputs. Click the 'Apply Defaults' button to populate the tool with default values. Select 'Hide Sources Not Applicable' or 'Show All Sources' to hide or view sources selected as not applicable on the Project Background tab.

Material Inputs

Transportation of Material Inputs

Employee Commuting

Construction Equipment

Land Use Change (Construction)

Construction Waste

Building Energy Consumption

Coal Production

Natural Gas and Oil Products

Industrial Processes

HFC Leakage

Land Use Change (Operations)

On-road Vehicles

Treatment of Waste On-Site

Treatment of Wastewater On-Site

Treatment of Waste Off-Site

Enteric Fermentation

Manure management

Go to Notes

Go to Project Background

Reset ALL Inputs

Hide Sources Not Applicable

Show All Sources

Construction Phase

Material inputs

Enter the total amount of material (in short tons) that will be used during the construction phase of your project. Concrete and wood products may instead be entered in cubic yards while insulation may be entered in square feet. Use the dropdown to select an alternate unit if data are not provided in short tons. Additionally, select the source of each material (i.e., domestic or imported). Select "Unknown" if you do not know the source of the material.

Material Type	Quantity	Unit	Geographical Sourcing
Aluminum		Tons	Unknown
Asphalt		Tons	Domestic
Brick		Tons	Unknown
Concrete		Tons	Domestic
Glass		Tons	Unknown
Insulation (residential)		Tons	Unknown
Insulation (commercial)		Tons	Unknown
Steel		Tons	Unknown
Wood Products		Tons	Unknown

Employee commuting

Enter the daily average number of employees that will commute to the construction site during each phase of construction. Enter the average one-way commuter distance and mode breakout or select the "Apply Defaults" button to the right of the table to populate these fields with default values.

Construction Stage	Daily Average Number of Employees Commuting
Demolition	12
Site Preparation	12
Grading	12
Building Construction	12
Architectural Coatings	12
Paving and Landscaping	12

	One-Way Distance (miles)	Default
Average One-Way Commute Length	25.0	13.2

Apply Defaults

Reset Button

Transportation Mode	Percent of Employees	Default
Single Occupancy Vehicle	81.7%	81.7%
Carpool	10.6%	10.6%
Motorcycle	0.2%	0.2%
Bus	1.9%	1.9%
Transit Rail	2.2%	2.2%
Bike/Walk	3.4%	3.4%
Total:	100%	

Construction equipment

Select the fuel type used by each type of equipment and enter the total number of hours each equipment type is used per day by construction phase. The total hours should account for multiple pieces of equipment being used each day. For example, if the project uses 3 forklifts for 6 hours/day during the building construction phase, then the total number of hours/day for forklifts during the building construction phase would equal 18 (i.e., 3 forklifts * 6 hours/day).

Apply Defaults

Reset Button

Equipment Type	Fuel Type	Number of Hours per Day by Construction Stage						Default*					
		Demolition	Site Preparation	Grading	Building Construction	Architectural Coatings	Paving and Landscaping	Demolition	Site Preparation	Grading	Building Construction	Architectural Coatings	Paving and Landscaping
Air Compressors	Diesel							0	0	0	0	0	0
Cement and Mortar Mixers	Diesel	2	2	2			2	0	0	0	0	0	0

Concrete/Industrial Saws	Diesel							8	0	0	0	0	0
Cranes	Diesel	48	48	48			48	0	0	0	0	0	0
Excavators	Diesel	4	4	4			4	24	0	16	0	0	0
Forklifts	Diesel	12	12	12			12	0	0	0	0	0	0
Generator Sets	Diesel	12	12	12			12	0	0	0	0	0	0
Graders	Diesel							0	0	8	0	0	0
Pavers	Diesel							0	0	0	0	0	16
Paving Equipment	Diesel							0	0	0	0	0	16
Rollers	Diesel							0	0	0	0	0	16
Rubber Tired Dozers	Diesel	18	18	18			18	16	24	8	0	0	0
Scrapers	Diesel	46	46	46			46	0	0	16	0	0	0
Tractors/Loaders/Backhoes	Diesel	6	6	6			6	0	32	16	0	0	0
Welders	Diesel							0	0	0	0	0	0

*Defaults are only applicable to building construction projects. Values are dependent on the number of project acres.

Land use change (construction)

Enter the number of acres by land cover type before and after development. Additionally, identify the number of trees removed during development and the number of new trees planted. This information should match the information reported in Question #8 of the EAW.

Land Use Type	Acres	
	Pre-Construction	Post-Construction
Wetlands, forested		
Wetlands, not forested		
Forest		
Rivers and streams		
Brush and grassland		
Cropland		
Livestock rangeland/pastureland		
Lawn/landscaping		
Green Infrastructure: Constructed wetlands, paved		
Green Infrastructure: Constructed wetlands, vegetated		
Green Infrastructure: Constructed green roofs		
Green Infrastructure: Constructed permeable pavements		
Impervious surface		
Stormwater pond (wet sedimentation basin)		
Total:	0.0	0.0

Trees	Number
Number of mature trees removed	
Number of new trees planted	

Construction waste

Enter the total amount of waste generated during construction in short tons. Default values are provided based on inputs entered under the Material Inputs section above. Select the "Apply Defaults" button to the right of the table to populate the table with default values. You may also enter an amount for other mixed waste generated during construction and demolition to account for other waste that is not covered by the material-specific values.

Material Type	Quantity (tons)	Default (tons)	Loss Rate (%)
Aluminum	0.00	0.00	0%
Asphalt	0.00	0.00	0%
Brick	0.00	0.00	4%
Concrete	0.00	0.00	5%
Glass	0.00	0.00	3%
Insulation	0.00	0.00	10%
Steel	0.00	0.00	0%
Wood Products	0.00	0.00	5%
Mixed Waste		NA	NA

Apply Defaults

Reset Button

Operational Phase

Building energy consumption

Enter the energy intensity of each building type that is applicable to your project in Btu per square foot per year. Applicability is determined based on the building square footage data entered in the Project Background tab. Select the "Apply Defaults" button to the right of the table to populate the table with default values. For "Other" building types, no default is available and must be provided, if applicable.

Building Type	Energy Intensity (Btu/sq ft/year)				Default*			
	Electricity	Natural Gas	Propane	Kerosene or Fuel Oil	Electricity	Natural Gas	Propane	Kerosene or Fuel Oil
Residential					18,096.91	24,460.01	3,619.38	233.51
Commercial					30,766.13	35,534.88	0.00	1,661.56
Industrial					229,952.20	656,392.90	0.00	8,191.66
Institutional					46,860.06	48,219.03	0.00	3,659.93
Other					NA	NA	NA	NA

*Refer to the Buildings tab for industry-specific default values for industrial buildings. These values may be manually entered in place of the default provided.

Apply Defaults

Reset Button

Coal production

Notes (Step 3)

Enter notes into the yellow cells below to document assumptions, data sources, notes for reviewers, special circumstances, or other helpful information specific to your project, if des.

General Notes	
---------------	--

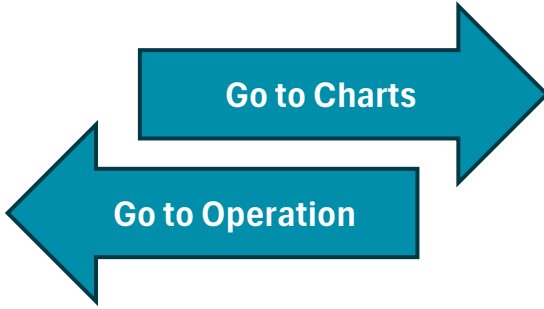
Construction	
Material inputs	No info provided
Transportation of material inputs	No info provided
Employee commuting	12 workers
Construction equipment	Converted from provided equipment list using similar horsepower equipment
Land use change (construction)	Assumed to be minimal so not included
Construction waste	No info provided

Operation	
Building energy consumption	
Coal production	
Natural gas and oil products	

Summary Results (Step 4b)

Cumulative and annualized GHG emissions are shown for all applicable emission sources in the table below. Results are calculated using AR5 global warming potentials and are shown in short tons, metric tons, or kilograms based on the unit selected in the Project Background tab. Emission sources indicated as not applicable in the Project Background tab that are excluded from the calculations are listed below.

Emission sources excluded from calculations and hidden below:	Material inputs, Land use change (construction), Construction waste, Building energy consumption, Coal production, Natural gas and oil products, Industrial processes, HFC leakage, Land use change (operations), On-road vehicles, Treatment of waste on-site, Treatment of wastewater on-site, Treatment of waste off-site, Enteric fermentation
---	--



Generate Summary Report

Lifetime Emissions

Unit: tons

Project Lifetime: 32

Phase	Cumulative CO ₂ e Emissions	Annualized CO ₂ e Emissions
Construction	4,436.13	138.63
Employee commuting	72.08	2.25
Construction equipment	4,364.05	136.38
Operation	-	-
Total	4,436.13	138.63

Emissions Equivalencies

To contextualize emissions, input emissions data into the [EPA GHG Equivalencies Calculator](#) (using corresponding units) to convert emissions into equivalent measures for communication purposes. Below are some example equivalencies for both cumulative and annualized emissions.

Cumulative emissions are equivalent to...

Emissions from	10,240,169	miles driven by an average gasoline-powered passenger vehicle
Emissions from	452,840	gallons of gasoline consumed
Emissions avoided by	1,422	tons of waste recycled instead of landfilled

Annualized emissions are equivalent to...

Emissions from	29	gasoline-powered passenger vehicles driven for one year
Emissions from	17	homes' energy use for one year
Carbon sequestered by	126	acres of U.S. forests in one year

Xcel Energy
Skyway T Line Project
Total Emissions
Year:

2027

											Emission Factors (g/hp-hr) ^a or (g/mi) ^b						Emissions (ton / year)					
Equipment	MOVES Lookup ID	MN Climate Calculator Equipment Definition	Fuel	HP	Typical Hours per day	Typical Days/week	Weeks	Count	Total Hours Used	Load Factor ^b	CO	NO _x	SO ₂ ^c	VOC ^d	PM ₁₀	PM _{2.5}	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Equipment																						
ATV 4 TO 6 WHEEL, W/ DUMP	Off-highway Trucks	Cement and Mortar Mixers	Diesel	13.5	2	3	35	1	210	0.59	4.9254	5.5970	0.0020	0.2799	0.5970	0.5970	9.08E-03	1.03E-02	3.69E-06	5.16E-04	1.10E-03	1.10E-03
BACKHOE W/ LOADER 4X4	Tractors/Loaders/Backhoes	Tractors/Loaders/Backhoes	Diesel	94	2	3	35	1	210	0.21	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	1.71E-02	2.56E-02	9.14E-06	1.28E-03	1.36E-03	1.36E-03
BUCKET 105' WORK HEIGHT	Aerial Lifts	Cranes	Diesel	300	4	3	35	1	420	0.21	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	7.62E-02	1.44E-01	5.83E-05	7.18E-03	4.35E-03	4.35E-03
BUCKET 125' WORK HEIGHT 8X6	Aerial Lifts	Cranes	Diesel	350	4	3	35	1	420	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	8.89E-02	1.63E-01	6.81E-05	8.13E-03	5.08E-03	5.08E-03
BUCKET 77' WORK HEIGHT SWAMP TRK MTD	Aerial Lifts	Cranes	Diesel	300	4	3	35	1	420	0.21	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	7.62E-02	1.44E-01	5.83E-05	7.18E-03	4.35E-03	4.35E-03
TRUCK MTD 4 T ARTICULATING BOOM W/ FORKS & CLAM	Cranes	Cranes	Diesel	450	2	3	35	1	210	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.17E-01	2.14E-01	8.96E-05	1.07E-02	6.69E-03	6.69E-03
CRANE TRUCK 45 T HYDRAULIC 6 AXLE	Cranes	Cranes	Diesel	450	8	5	35	1	1400	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	7.80E-01	1.43E+00	5.97E-04	7.13E-02	4.46E-02	4.46E-02
DIGGER DERRICK 15 T CAP	Cranes	Cranes	Diesel	330	8	5	35	1	1400	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	5.72E-01	1.05E+00	4.38E-04	5.23E-02	3.27E-02	3.27E-02
DIGGER DERRICK 15 T CAP SWAMP TRACK MTD	Cranes	Cranes	Diesel	300	8	3	35	1	840	0.43	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	3.12E-01	5.88E-01	2.39E-04	2.94E-02	1.78E-02	1.78E-02
DOZER 10 THRU 12 T, W/ WINCH	Crawler Tractor/Dozers	Rubber Tired Dozers	Diesel	80	4	3	35	1	420	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	8.15E-02	1.22E-01	4.37E-05	6.12E-03	6.52E-03	6.52E-03
DOZER 18 T W/ WINCH	Crawler Tractor/Dozers	Rubber Tired Dozers	Diesel	190	4	3	35	1	420	0.59	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	1.36E-01	2.56E-01	1.04E-04	1.28E-02	7.75E-03	7.75E-03
CRAWLER CARRIER W/ 360 DUMP BOX OR DOZER 18 T W/ WINCH	Crawler Tractor/Dozers	Rubber Tired Dozers	Diesel	80	6	3	35	1	630	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	1.22E-01	1.83E-01	6.56E-05	9.17E-03	9.78E-03	9.78E-03
EXCAVATOR 25 T	Excavators	Excavators	Diesel	172	4	3	35	1	420	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	1.75E-01	2.31E-01	9.40E-05	1.16E-02	1.05E-02	1.05E-02
FORKLIFT 11,000 THRU 12,000# TELESCOPIC BOOM	Forklifts	Forklifts	Diesel	142	4	5	35	1	700	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	2.41E-01	3.18E-01	1.29E-04	1.59E-02	1.45E-02	1.45E-02
FRONT END LOADER 68,000# 4X4	Rubber Tire Loaders	Rubber Tired Dozers	Diesel	386	4	5	35	1	700	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	4.59E-01	8.39E-01	3.51E-04	4.20E-02	2.62E-02	2.62E-02
GENERATOR 23KW THRU 60KW TRAILER MOUNTED TOW TYPE	Generator Sets	Generator Sets	Diesel	38	12	5	35	1	2100	0.43	4.1045	5.5970	0.0020	0.2799	0.4478	0.4478	1.55E-01	2.12E-01	7.56E-05	1.06E-02	1.69E-02	1.69E-02
HYDRAULIC BULLWHEEL BUNDLE TENSIONER	Other Construction Equipment	Forklifts	Diesel	80	2	3	5	1	30	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	5.82E-03	8.74E-03	3.12E-06	4.37E-04	4.66E-04	4.66E-04
PULLER ROPE TRAILER 4,000# CAP W/ SPLIT REEL TOW TYPE TANDEM AXLE	Other Construction Equipment	Forklifts	Diesel	74	2	3	5	1	30	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	5.39E-03	8.08E-03	2.89E-06	4.04E-04	4.31E-04	4.31E-04
PULLER CABLE TRAILER 30,000# CAP TOW TYPE TANDEM AXLE	Other Construction Equipment	Forklifts	Diesel	400	2	3	5	1	30	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	2.04E-02	3.73E-02	1.56E-05	1.86E-03	1.16E-03	1.16E-03
PULLER ROPE TRAILER 4 DRUM 3,500# CAP TOW TYPE TANDEM AXLE	Other Construction Equipment	Forklifts	Diesel	115	2	3	5	1	30	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	8.37E-03	1.11E-02	4.49E-06	5.53E-04	5.02E-04	5.02E-04
300T AT Setting Crane	Cranes	Cranes	Diesel	577	6	5	5	1	150	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.07E-01	1.96E-01	8.20E-05	9.80E-03	6.12E-03	6.12E-03
60T RT Crane	Cranes	Cranes	Diesel	320	4	5	35	1	700	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	2.77E-01	5.07E-01	2.12E-04	2.54E-02	1.58E-02	1.58E-02
SKID STEER LOADER TRACK MTD 80 > 75 HP	Skid Steer Loaders	Tractors/Loaders/Backhoes	Diesel	95	4	5	35	1	700	0.21	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	5.74E-02	8.62E-02	3.08E-05	4.31E-03	4.60E-03	4.60E-03
DUMP BOX TRUCK 2-1/2 T 6X6	Dumpers/Tenders	Scrapers	Diesel	505	2	5	35	1	350	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.07E-01	1.95E-01	8.18E-05	9.77E-03	6.11E-03	6.11E-03
DUMP BOX TRUCK 1-1/4 & 1-1/2 T	Dumpers/Tenders	Scrapers	Diesel	420	4	5	35	1	700	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.78E-01	3.25E-01	1.36E-04	1.63E-02	1.02E-02	1.02E-02
FLATBED (FRAMING) TRUCK 1-1/4 & 1-1/2 T	Dumpers/Tenders	Scrapers	Diesel	420	4	5	35	1	700	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.78E-01	3.25E-01	1.36E-04	1.63E-02	1.02E-02	1.02E-02
TRUCK TRACTOR 2-1/2 T 6X4 & 5 T 6X6	Other Construction Equipment	Scrapers	Diesel	450	4	3	35	1	420	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	3.21E-01	5.87E-01	2.46E-04	2.94E-02	1.83E-02	1.83E-02
PICKUP TRUCK 3/4 T	Off-highway Trucks	Scrapers	Diesel	420	8	5	35	4	5600	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	4.00E+00	7.31E+00	3.06E-03	3.65E-01	2.28E-01	2.28E-01

Fugitive Dust																	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Dust from On Site Activities																	0	0	0	0	2.62E+01	2.62E+00
Onroad	MOVES Vehicle Class		VMT	Onroad Fuel ID	Year						CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Resuspended Road Dust																	0	0	0	0	1.62E-01	4.06E-02
Worker Commute (Gas Passenger Truck)	31	Gasoline	105,000	1	2027						2.82865	0.14757	0.00289	0.11235	0.00266	0.00235	3.27E-01	1.71E-02	3.34E-04	1.30E-02	3.08E-04	2.72E-04
Material Hauling (Single Unit Truck)	52	Diesel	5,500	2	2027						1.08775	1.59200	0.00287	0.08801	0.02796	0.02572	6.59E-03	9.65E-03	1.74E-05	5.34E-04	1.70E-04	1.56E-04

^a EPA Tier II Emissions

^b Load Factors and emission rates from MOVES5

^c EPA 420-P-04-009, Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression Ignition, USEPA, April 2004 - Tier 2 Engines.

^d NMHC

	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Equipment	8.68E+00	1.55E+01	6.44E-03	7.76E-01	5.12E-01	5.12E-01
Fugitive Dust	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.62E+01	2.62E+00
Onroad	3.34E-01	2.67E-02	3.52E-04	1.35E-02	1.63E-01	4.10E-02
Total	9.01	15.54	0.01	0.79	26.84	3.17

Assumption:
1 kWh = 1.34 hp-hr

2028

Fugitive Dust																	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Dust from On Site Activities																	0	0	0	0	3.92E+01	3.92E+00
Onroad	MOVES Vehicle Class		VMT	Onroad Fuel ID	Year						CO	NO_x	SO₂	VOC	PM₁₀	PM_{2.5}	CO	NO_x	SO₂	VOC	PM₁₀	PM_{2.5}
Resuspended Road Dust																	0	0	0	0	2.27E-01	5.68E-02
Worker Commute (Gas Passenger Truck)	31	Gasoline	156,000	1	2028						2.67539	0.13195	0.00284	0.10730	0.00253	0.00224	4.60E-01	2.27E-02	4.89E-04	1.85E-02	4.35E-04	3.85E-04
Material Hauling (Single Unit Truck)	52	Diesel	5,500	2	2028						1.05323	1.44457	0.00278	0.07793	0.02304	0.02119	6.39E-03	8.76E-03	1.69E-05	4.72E-04	1.40E-04	1.28E-04

^b Load Factors and emission rates from MOVES5

^c EPA 420-P-04-009, Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression Ignition, USEPA, April 2004 - Tier 2 Engines.

^d NMHC

Assumption:
1 kWh = 1.34 hp-hr

Xcel Energy
Skyway T Line Project
Total Emissions
Year:

2029

											Emission Factors (g/hp-hr) ^a or (g/mi) ^b						Emissions (ton / year)					
Equipment	MOVES Lookup ID		Fuel	HP	Typical Hours per day	Typical Days/week	Weeks	Count	Total Hours Used	Load Factor ^b	CO	NO _x	SO ₂ ^c	VOC ^d	PM ₁₀	PM _{2.5}	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Equipment																						
ATV 4 TO 6 WHEEL, W/ DUMP	Off-Highway Trucks		Diesel	13.5	2	3	40	1	240	0.59	4.9254	5.5970	0.0020	0.2799	0.5970	0.5970	1.04E-02	1.18E-02	4.21E-06	5.90E-04	1.26E-03	1.26E-03
BACKHOE W/ LOADER 4X4	Tractors/Loaders/Backhoes		Diesel	94	2	3	40	1	240	0.21	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	1.95E-02	2.92E-02	1.04E-05	1.46E-03	1.56E-03	1.56E-03
BUCKET 105' WORK HEIGHT	Aerial Lifts		Diesel	300	4	3	40	1	480	0.21	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	8.71E-02	1.64E-01	6.67E-05	8.21E-03	4.98E-03	4.98E-03
BUCKET 125' WORK HEIGHT 8X6	Aerial Lifts		Diesel	350	4	3	40	1	480	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.02E-01	1.86E-01	7.78E-05	9.29E-03	5.80E-03	5.80E-03
BUCKET 77' WORK HEIGHT SWAMP TRK MTD	Aerial Lifts		Diesel	300	4	3	40	1	480	0.21	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	8.71E-02	1.64E-01	6.67E-05	8.21E-03	4.98E-03	4.98E-03
TRUCK MTD 4 T ARTICULATING BOOM W/ FORKS & CLAM	Cranes		Diesel	450	2	3	40	1	240	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.34E-01	2.44E-01	1.02E-04	1.22E-02	7.64E-03	7.64E-03
CRANE TRUCK 45 T HYDRAULIC 6 AXLE	Cranes		Diesel	450	8	5	40	1	1600	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	8.91E-01	1.63E+00	6.83E-04	8.15E-02	5.09E-02	5.09E-02
DIGGER DERRICK 15 T CAP	Cranes		Diesel	330	8	5	40	1	1600	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	6.54E-01	1.20E+00	5.01E-04	5.98E-02	3.74E-02	3.74E-02
DIGGER DERRICK 15 T CAP SWAMP TRACK MTD	Cranes		Diesel	300	8	3	40	1	960	0.43	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	3.57E-01	6.72E-01	2.73E-04	3.36E-02	2.04E-02	2.04E-02
DOZER 10 THRU 12 T, W/ WINCH	Crawler Tractor/Dozers		Diesel	80	4	3	40	1	480	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	9.32E-02	1.40E-01	4.99E-05	6.99E-03	7.45E-03	7.45E-03
DOZER 18 T W/ WINCH	Crawler Tractor/Dozers		Diesel	190	4	3	40	1	480	0.59	2.6119	4.9254	0.0020	0.2463	0.1493	0.1493	1.55E-01	2.92E-01	1.19E-04	1.46E-02	8.85E-03	8.85E-03
CRAWLER CARRIER W/ 360 DUMP BOX OR DOZER 18 T W/ WINCH	Crawler Tractor/Dozers		Diesel	80	6	3	40	1	720	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	1.40E-01	2.10E-01	7.49E-05	1.05E-02	1.12E-02	1.12E-02
EXCAVATOR 25 T	Excavators		Diesel	172	4	3	40	1	480	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	2.00E-01	2.64E-01	1.07E-04	1.32E-02	1.20E-02	1.20E-02
FORKLIFT 11,000 THRU 12,000# TELESCOPIC BOOM	Forklifts		Diesel	142	4	5	40	1	800	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	2.76E-01	3.64E-01	1.48E-04	1.82E-02	1.65E-02	1.65E-02
FRONT END LOADER 68,000# 4X4	Rubber Tire Loaders		Diesel	386	4	5	40	1	800	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	5.25E-01	9.59E-01	4.02E-04	4.80E-02	3.00E-02	3.00E-02
GENERATOR 23KW THRU 60KW TRAILER MOUNTED TOW TYPE	Generator Sets		Diesel	38	12	5	40	1	2400	0.43	4.1045	5.5970	0.0020	0.2799	0.4478	0.4478	1.77E-01	2.42E-01	8.65E-05	1.21E-02	1.94E-02	1.94E-02
HYDRAULIC BULLWHEEL BUNDLE TENSIONER	Other Construction Equipment		Diesel	80	2	3	3	1	18	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	3.49E-03	5.24E-03	1.87E-06	2.62E-04	2.80E-04	2.80E-04
PULLER ROPE TRAILER 4,000# CAP W/ SPLIT REEL TOW TYPE TANDEM AXLE	Other Construction Equipment		Diesel	74	2	3	3	1	18	0.59	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	3.23E-03	4.85E-03	1.73E-06	2.42E-04	2.59E-04	2.59E-04
PULLER CABLE TRAILER 30,000# CAP TOW TYPE TANDEM AXLE	Other Construction Equipment		Diesel	400	2	3	3	1	18	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.22E-02	2.24E-02	9.37E-06	1.12E-03	6.99E-04	6.99E-04
PULLER ROPE TRAILER 4 DRUM 3,500# CAP TOW TYPE TANDEM AXLE	Other Construction Equipment		Diesel	115	2	3	3	1	18	0.59	3.7313	4.9254	0.0020	0.2463	0.2239	0.2239	5.02E-03	6.63E-03	2.69E-06	3.32E-04	3.01E-04	3.01E-04
300T AT Setting Crane	Cranes		Diesel	577	6	5	3	1	90	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	6.43E-02	1.18E-01	4.92E-05	5.88E-03	3.67E-03	3.67E-03
60T RT Crane	Cranes		Diesel	320	4	5	40	1	800	0.43	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	3.17E-01	5.80E-01	2.43E-04	2.90E-02	1.81E-02	1.81E-02
SKID STEER LOADER TRACK MTD 80 > 75 HP	Skid Steer Loaders		Diesel	95	4	5	40	1	800	0.21	3.7313	5.5970	0.0020	0.2799	0.2985	0.2985	6.56E-02	9.85E-02	3.52E-05	4.92E-03	5.25E-03	5.25E-03
DUMP BOX TRUCK 2-1/2 T 6X6	Dumpers/Tenders		Diesel	505	2	5	40	1	400	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	1.22E-01	2.23E-01	9.35E-05	1.12E-02	6.98E-03	6.98E-03
DUMP BOX TRUCK 1-1/4 & 1-1/2 T	Dumpers/Tenders		Diesel	420	4	5	40	1	800	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	2.03E-01	3.71E-01	1.56E-04	1.86E-02	1.16E-02	1.16E-02
FLATBED (FRAMING) TRUCK 1-1/4 & 1-1/2 T	Dumpers/Tenders		Diesel	420	4	5	40	1	800	0.21	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	2.03E-01	3.71E-01	1.56E-04	1.86E-02	1.16E-02	1.16E-02
TRUCK TRACTOR 2-1/2 T 6X4 & 5 T 6X6	Other Construction Equipment		Diesel	450	4	3	40	1	480	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	3.67E-01	6.71E-01	2.81E-04	3.35E-02	2.10E-02	2.10E-02
PICKUP TRUCK 3/4 T	Off-highway Trucks		Diesel	420	8	5	40	4	6400	0.59	2.6119	4.7761	0.0020	0.2388	0.1493	0.1493	4.57E+00	8.35E+00	3.50E-03	4.17E-01	2.61E-01	2.61E-01

																	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Fugitive Dust																						
Dust from On Site Activities																	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.02E+01	3.02E+00
Onroad	MOVES Vehicle Class		VMT	Onroad Fuel ID	Year						CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Resuspended Road Dust																	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-01	4.54E-02
Worker Commute (Gas Passenger Truck)	31	Gasoline	120,000	1	2029						2.55149	0.11843	0.00280	0.10261	0.00242	0.00214	3.38E-01	1.57E-02	3.71E-04	1.36E-02	3.21E-04	2.84E-04
Material Hauling (Single Unit Truck)	52	Diesel	5,500	2	2029						1.02322	1.31884	0.00271	0.06957	0.01962	0.01805	6.20E-03	8.00E-03	1.64E-05	4.22E-04	1.19E-04	1.09E-04

^a EPA Tier II Emissions

^b Load Factors and emission rates from MOVES5

^c EPA 420-P-04-009, Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression Ignition, USEPA, April 2004 - Tier 2 Engines.

^d NMHC

	CO	NO _x	SO ₂	VOC	PM ₁₀	PM _{2.5}
Equipment	9.84E+00	1.76E+01	7.30E-03	8.79E-01	5.81E-01	5.81E-01
Fugitive Dust	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.02E+01	3.02E+00
Onroad	3.44E-01	2.37E-02	3.87E-04	1.40E-02	1.82E-01	4.58E-02
Total	10.18	17.61	0.01	0.89	30.98	3.65

Assumption:
1 kWh = 1.34 hp-hr

Resuspended Road Dust
Year: 2027

		Total Vehicle Miles Traveled (VMT) per Speed Bin									
SpeedBin	MOVES ID	Weight tons	Low ADT Road			High ADT Road			Silt Loading	AP-42 Roadway Category	sL (Winter)
			5	6	7	12	13	16			
Passenger Truck	31	5	0	0	21000	84000	0	0	High ADT Road	5000-10000 ADT	0.12
Single Unit Truck	52	20	0	0	1100	4400	0	0	Low ADT Road	500-5000 ADT	0.6
Vehicle Type	Pollutant	Road Type	k (g/VMT)	sL	W	P	VMT	Emissions (tons)			
Passenger Truck	PM _{2.5}	High ADT Road	0.25	0.12	5	110	84000	0.0161			
Passenger Truck	PM ₁₀	High ADT Road	1	0.12	5	110	84000	0.0642			
Passenger Truck	PM _{2.5}	Low ADT Road	0.25	0.6	5	110	21000	0.0174			
Passenger Truck	PM ₁₀	Low ADT Road	1	0.6	5	110	21000	0.0694			
Single Unit Truck	PM _{2.5}	High ADT Road	0.25	0.12	20	110	4400	0.0035	Total		
Single Unit Truck	PM ₁₀	High ADT Road	1	0.12	20	110	4400	0.0138		PM _{2.5}	0.040606866 tons
Single Unit Truck	PM _{2.5}	Low ADT Road	0.25	0.6	20	110	1100	0.0037		PM ₁₀	0.162427464 tons
Single Unit Truck	PM ₁₀	Low ADT Road	1	0.6	20	110	1100	0.0150			

Formula used from AP-42 Section 13.2.1 "Paved Roads"

$E = k (sL)^{0.91} (W)^{1.02} (1 - P/4N)$

E = particulate emission factor (having units matching the units of k)
k = particle size multiplier for particle size range and units of interest, From AP-42 Table 13.2-1.1
sL = road surface silt loading (grams per square meter) (g/m2), Assume winter time condition
W = average weight (tons) of the vehicles traveling the road
Figure 13.2.1-2 estimates that days of precipitation >0.01 inch per year (P) is approximately 110; N is 365 days.

Conservatively assumed pickup trucks are light duty type with GVWR of 10,000 pounds or 5 tons.
Assumed Single Unit Trucks weigh 20 tons each.

Resuspended Road Dust
Year: 2028

		Total Vehicle Miles Traveled (VMT) per Speed Bin									
SpeedBin	MOVES ID	Weight tons	Low ADT Road			High ADT Road			Silt Loading High ADT Road Low ADT Road	AP-42 Roadway Category	sL (Winter)
			5	6	7	12	13	16			
Passenger Truck	31	5	0	0	31200	124800	0	0			
Single Unit Truck	52	20	0	0	1100	4400	0	0			
Vehicle Type	Pollutant	Road Type	k (g/VMT)	sL	W	P	VMT	Emissions (tons)			
Passenger Truck	PM _{2.5}	High ADT Road	0.25	0.12	5	110	124800	0.0238			
Passenger Truck	PM ₁₀	High ADT Road	1	0.12	5	110	124800	0.0954			
Passenger Truck	PM _{2.5}	Low ADT Road	0.25	0.6	5	110	31200	0.0258			
Passenger Truck	PM ₁₀	Low ADT Road	1	0.6	5	110	31200	0.1032			
Single Unit Truck	PM _{2.5}	High ADT Road	0.25	0.12	20	110	4400	0.0035	Total		
Single Unit Truck	PM ₁₀	High ADT Road	1	0.12	20	110	4400	0.0138			
Single Unit Truck	PM _{2.5}	Low ADT Road	0.25	0.6	20	110	1100	0.0037			
Single Unit Truck	PM ₁₀	Low ADT Road	1	0.6	20	110	1100	0.0150			

Formula used from AP-42 Section 13.2.1 "Paved Roads"

$E = k (sL)^{0.91} (W)^{1.02} (1 - P/4N)$

E = particulate emission factor (having units matching the units of k)
k = particle size multiplier for particle size range and units of interest, From AP-42 Table 13.2-1.1
sL = road surface silt loading (grams per square meter) (g/m2), Assume winter time condition
W = average weight (tons) of the vehicles traveling the road
Figure 13.2.1-2 estimates that days of precipitation >0.01 inch per year (P) is approximately 110; N is 365 days.

Conservatively assumed pickup trucks are light duty type with GVWR of 10,000 pounds or 5 tons.
Assumed Single Unit Trucks weigh 20 tons each.

Resuspended Road Dust
Year: 2029

		Total Vehicle Miles Traveled (VMT) per Speed Bin									
SpeedBin	MOVES ID	Weight tons	Low ADT Road			High ADT Road			Silt Loading	AP-42 Roadway Category	sL (Winter)
			5	6	7	12	13	16			
Passenger Truck	31	5	0	0	24000	96000	0	0	High ADT Road	5000-10000 ADT	0.12
Single Unit Truck	52	20	0	0	1100	4400	0	0	Low ADT Road	500-5000 ADT	0.6
Vehicle Type	Pollutant	Road Type	k (g/VMT)	sL	W	P	VMT	Emissions (tons)			
Passenger Truck	PM _{2.5}	High ADT Road	0.25	0.12	5	110	96000	0.0183			
Passenger Truck	PM ₁₀	High ADT Road	1	0.12	5	110	96000	0.0734			
Passenger Truck	PM _{2.5}	Low ADT Road	0.25	0.6	5	110	24000	0.0198			
Passenger Truck	PM ₁₀	Low ADT Road	1	0.6	5	110	24000	0.0794			
Single Unit Truck	PM _{2.5}	High ADT Road	0.25	0.12	20	110	4400	0.0035	Total		
Single Unit Truck	PM ₁₀	High ADT Road	1	0.12	20	110	4400	0.0138			
Single Unit Truck	PM _{2.5}	Low ADT Road	0.25	0.6	20	110	1100	0.0037			
Single Unit Truck	PM ₁₀	Low ADT Road	1	0.6	20	110	1100	0.0150			
									PM _{2.5}	0.045379708 tons	
									PM ₁₀	0.181518833 tons	

Formula used from AP-42 Section 13.2.1 "Paved Roads"

$E = k (sL)^{0.91} (W)^{1.02} (1 - P/4N)$

E = particulate emission factor (having units matching the units of k)
k = particle size multiplier for particle size range and units of interest, From AP-42 Table 13.2-1.1
sL = road surface silt loading (grams per square meter) (g/m2), Assume winter time condition
W = average weight (tons) of the vehicles traveling the road
Figure 13.2.1-2 estimates that days of precipitation >0.01 inch per year (P) is approximately 110; N is 365 days.

Conservatively assumed pickup trucks are light duty type with GVWR of 10,000 pounds or 5 tons.
Assumed Single Unit Trucks weigh 20 tons each.

Fugitive Dust
Year: 2027

Activities	Construction Duration (Days)	Area Affected (ac) or <i>Mileage</i> ⁶	WRAP Level ¹	Duration or <i>Tonnage</i> ⁵	Emission Factor ^{2,3}			Emission (tons/year)		
					Emission Factor Unit	PM ₁₀	PM _{2.5}	Control Efficiency ⁴	PM ₁₀	PM _{2.5}
ROW (Soil Disturbance)	175	82.0	1	5.8	ton/ac-month	0.11	0.011	50%	26.158	2.616
Passenger Trucks Onsite Mileage (Passenger Truck)	175	<i>12</i>	<i>4</i>	<i>5</i>	<i>lb/ton-mile</i>	<i>0.21</i>	<i>0.021</i>	<i>50%</i>	<i>0.003</i>	<i>0.000</i>
Support Trucks Onsite Mileage (Heavy Vehicle)	175	<i>12</i>	<i>4</i>	<i>20</i>	<i>lb/ton-mile</i>	<i>0.21</i>	<i>0.021</i>	<i>50%</i>	<i>0.013</i>	<i>0.001</i>
Wind Erosion	175	82.0		0.48	ton/ac-year	0.38	0.057	50%	0.622	0.093
Fugitive Dust Total									26.161	2.616

¹ WRAP level from Table 3-2 Ch 3 of WRAP Fugitive Dust Handbook Sep/2006: https://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf

² PM2.5/PM10 is set at 0.1 per guideline listed on section 3.31 of WRAP handbook, 0.15 for Wind Erosion per Section 9.2 of WRAP handbook

³ Wind Erosion Emission Factor extracted from WRAP handbook Table 11-6, assumed 100% of TSP is PM10

⁴ 50% of Wet Suppression per WRAP handbook Page 8

⁵ The unit for Duration is either month or year depending on the Emission Factor Unit. 20 tons was assume for Heavy Truck, 5 tons for passenger trucks

⁶ On site VMT is 12 mile per day total for passenger trucks and 12 mile per day total for heavy vehicles.

Fugitive Dust
Year: 2028

Activities	Construction Duration (Days)	Area Affected (ac) or <i>Mileage</i> ⁶	WRAP Level ¹	Duration or <i>Tonnage</i> ⁵	Emission Factor ^{2,3}			Control Efficiency ⁴	Emission (tons/year)	
					Emission Factor Unit	PM ₁₀	PM _{2.5}		PM ₁₀	PM _{2.5}
ROW (Soil Disturbance)	260	82.0	1	8.7	ton/ac-month	0.11	0.011	50%	39.237	3.924
<i>Passenger Trucks Onsite Mileage (Passenger Truck)</i>	260	<i>12</i>	<i>4</i>	<i>5</i>	<i>lb/ton-mile</i>	<i>0.21</i>	<i>0.021</i>	<i>50%</i>	<i>0.003</i>	<i>0.000</i>
<i>Support Trucks Onsite Mileage (Heavy Vehicle)</i>	260	<i>12</i>	<i>4</i>	<i>20</i>	<i>lb/ton-mile</i>	<i>0.21</i>	<i>0.021</i>	<i>50%</i>	<i>0.013</i>	<i>0.001</i>
Wind Erosion	260	82.0		0.71	ton/ac-year	0.38	0.057	50%	0.925	0.139
Fugitive Dust Total									39.240	3.924

¹ WRAP level from Table 3-2 Ch 3 of WRAP Fugitive Dust Handbook Sep/2006: https://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf

² PM2.5/PM10 is set at 0.1 per guideline listed on section 3.31 of WRAP handbook, 0.15 for Wind Erosion per Section 9.2 of WRAP handbook

³ Wind Erosion Emission Factor extracted from WRAP handbook Table 11-6, assumed 100% of TSP is PM10

⁴ 50% of Wet Suppression per WRAP handbook Page 8

⁵ The unit for Duration is either month or year depending on the Emission Factor Unit. 20 tons was assume for Heavy Truck, 5 tons for passenger trucks

⁶ On site VMT is 12 mile per day total for passenger trucks and 12 mile per day total for heavy vehicles.

Fugitive Dust
Year: 2029

Activities	Construction Duration (Days)	Area Affected (ac) or <i>Mileage</i> ⁶	WRAP Level ¹	Duration or <i>Tonnage</i> ⁵	Emission Factor ^{2,3}			Emission (tons/year)		
					Emission Factor Unit	PM ₁₀	PM _{2.5}	Control Efficiency ⁴	PM ₁₀	PM _{2.5}
ROW (Soil Disturbance)	200	82.0	1	6.7	ton/ac-month	0.11	0.011	50%	30.217	3.022
<i>Passenger Trucks Onsite Mileage (Passenger Truck)</i>	200	<i>12</i>	<i>4</i>	<i>5</i>	<i>lb/ton-mile</i>	<i>0.21</i>	<i>0.021</i>	<i>50%</i>	<i>0.003</i>	<i>0.000</i>
<i>Support Trucks Onsite Mileage (Heavy Vehicle)</i>	200	<i>12</i>	<i>4</i>	<i>20</i>	<i>lb/ton-mile</i>	<i>0.21</i>	<i>0.021</i>	<i>50%</i>	<i>0.013</i>	<i>0.001</i>
Wind Erosion	200	82.0		0.55	ton/ac-year	0.38	0.057	50%	0.711	0.107
Fugitive Dust Total									30.220	3.022

¹ WRAP level from Table 3-2 Ch 3 of WRAP Fugitive Dust Handbook Sep/2006: https://www.wrapair.org/forums/dejf/fdh/content/FDHandbook_Rev_06.pdf

² PM2.5/PM10 is set at 0.1 per guideline listed on section 3.31 of WRAP handbook, 0.15 for Wind Erosion per Section 9.2 of WRAP handbook

³ Wind Erosion Emission Factor extracted from WRAP handbook Table 11-6, assumed 100% of TSP is PM10

⁴ 50% of Wet Suppression per WRAP handbook Page 8

⁵ The unit for Duration is either month or year depending on the Emission Factor Unit. 20 tons was assume for Heavy Truck, 5 tons for passenger trucks

⁶ On site VMT is 12 mile per day total for passenger trucks and 12 mile per day total for heavy vehicles.

Appendix K

Wetland Delineation Reports

This page is intentionally left blank.

HDR, Inc.
Wetland Delineation Report
December 12, 2025

This page is intentionally left blank.



Wetland Delineation Report

North Rochester to Skyway High
Voltage Transmission Line Project
Goodhue County, Minnesota

December 12, 2025



Contents

Introduction.....	1
Methods.....	2
Offsite Review	2
Onsite Review	2
Site Description	3
Precipitation History Prior to Field Delineations	3
Soils	4
Results	4
Conclusions.....	5
References.....	7

Tables

Table 1. Mapped Soil Types Onsite	4
Table 2. Summary of Delineated Features	4

Figures

Figure 1. Project Location Map
Figure 2. NWI, Soils, and Topography
Figure 3. Delineated Wetlands
Figure 4. Delineated Wetlands Detail

Appendices

Appendix A – Data Sheets
Appendix B – Photo Log
Appendix C – Antecedent Precipitation

Introduction

The purpose of this report is to summarize wetland delineation survey results completed by HDR Engineering, Inc. (HDR) on behalf of Xcel Energy, Inc. (Xcel Energy) concerning the proposed North Rochester to Skyway High Voltage Transmission Line Project (Project). Results of the wetland delineation will be used to inform applicable portions of the Route Permit Application (RPA) being prepared for the Project described herein.

Xcel Energy is proposing to permit, construct, and operate a new, approximately 1.3 mile long, double-circuit, 345-kilovolt (kV) high voltage transmission line that will connect Xcel Energy's existing North Rochester Substation to new substation facilities located at a proposed technology center/mixed use industrial development site (development site) near the City of Pine Island in portions of Sections 29 and 30, Township 109N, Range 15E, Goodhue County, Minnesota (**Figure 1**). The development site (known as the Skyway Project¹) is undergoing permitting and approval processes with the City of Pine Island separate from this 345 kV transmission line Project.

The existing substation site/proposed expansion area is located on the west side of Highway 52 and the proposed development site/mini-substations is located on the east side of Highway 52. To accommodate the proposed 345/345-kV high voltage transmission line, Xcel Energy's existing North Rochester Substation will be expanded to the north by approximately 17.9 acres and additional mini-substation facilities will be constructed within the development site. The substation expansion will involve site preparation, grading and installation of substation equipment, transmission line termination, associated facilities, and security fencing, and connection to the existing substation. The substation expansion is necessary to address current and future planned transmission line operational needs as part of the proposed development project.

The transmission line is proposed to have a 150-foot-wide right-of-way (ROW). Xcel Energy will own and operate the transmission line to where it terminates at the mini-substations located at the development site. The mini-substations will be constructed, owned and operated by the proposer of the development site.

Figures 1-3 show the location of the proposed Project facilities and wetland delineation survey area (Project Area) completed as a part of this report. The Project Area consists of the existing North Rochester Substation site and planned expansion area, the proposed 345/345 kV transmission line right-of-way, and the mini-substations located within the development site and is approximately 82 acres. The proposed transmission line, substation expansion, and mini-substations would be constructed primarily on land currently being farmed for corn and soybeans.

Xcel Energy plans to submit a Route Permit Application (RPA) with the Minnesota Public Utilities Commission (PUC) in the first quarter of 2026. The RPA will be filed in accordance with Minnesota Statutes (Minn. Stat.) 216I.07 under the standard review process.

HDR conducted a field delineation within the Project Area on October 29, 2025, to identify wetlands and other Waters of the U.S. within the Project Area. The purpose of this report is to provide methods used and

¹ The Skyway Project is being proposed by Ryan Companies US, Inc. An Alternative Urban Areawide Review (AUAR) has been completed for the development site project and the City of Pine Island is currently reviewing that project for applicable permits and approvals.

results of the wetland delineation work completed at the proposed expansion area of the North Rochester Substation and new double-circuit 345/345 kV ROW, and mini-substation areas.

Wetland delineations were completed by HDR Environmental Scientist Katie Lueth. Ms. Lueth holds a Bachelor of Science degree in Ecology and Environmental Biology from the University of Wisconsin Eau Claire in Eau Claire, Wisconsin, and has 9 years of experience with HDR in wetland delineation across the Midwest. Ms. Lueth is a Certified Minnesota Wetland Professional (1407) through the Minnesota Wetland Professional Certification Program.

Methods

The wetland delineation was conducted using the “Routine Determination, Onsite Inspection Necessary” method outlined in the *1987 Corps of Engineers Wetlands Delineation Manual* (1987 Manual) (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Determination Manual: Midwest Region* (Midwest Regional Supplement) (USACE 2010). The U.S. Army Corps of Engineers (USACE) defines areas as wetlands based on the following:

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. (33 Code of Federal Regulations [CFR] 328 3.b)

Wetland delineations are based on the presence of the following three parameters:

- The area must exhibit indicators of wetland hydrology;
- The area must have a predominance of hydrophytic vegetation; and
- The area must have a presence of hydric soils.

Atypical areas or problem areas may be missing one or more of the three parameters, and those areas can still be classified as wetlands.

Offsite Review

Initial offsite evaluation for the presence of wetlands within the Project Area was performed using available information including: U.S. Geological Survey (USGS) topographic maps; Minnesota Department of Natural Resources (MNDNR) National Wetland Inventory (NWI) maps; and, USDA NRCS Web Soil Survey information (**Figure 2**). This information is also included in the delineated wetlands mapping (**Figures 3 and 4**). Historic and high-resolution aerial photographs of the Project Area were also reviewed within the context of precipitation history. This analysis generated potential wetland boundaries within the Project Area that were used to determine focus areas for field review.

Onsite Review

The “Routine Determination, Onsite Inspection Necessary” delineations included a search of the entire 82-acre Project Area. Onsite review focused on wetlands identified as part of the offsite review as well as all low-lying and/or wet areas not identified by the offsite data sources. Maps of all delineated wetland boundaries are shown in **Figures 3 and 4**. Data sheets for representative wetland areas were collected according to the 1987 Manual and Midwest Regional Supplements and are included in **Appendix A**.

Upland and wetland data plots were collected at representative wetland features (**Figures 3 and 4**). At each plot location, a soil pit was dug for observation of soil and hydrology characteristics. Hydric soil and wetland hydrology characteristics were identified using methods described in the 1987 Manual and

applicable Regional Supplement. The vegetation was analyzed for plant species dominance in a 5-foot radius from the sample pit for the herbaceous layer, in a 15-foot radius for shrub layer, and in a 30-foot radius for overstory trees. The wetland indicator status of plants was identified using the National Wetland Plant List 2022.

Data collection points and the wetland boundaries were mapped using a Global Positioning System (GPS) unit with sub-meter accuracy. Using geographic information system (GIS), an accurate delineation map (**Figures 3 and 4**) was created from the GPS data and field drawings, providing a permanent record of the onsite wetland delineation boundaries for the proposed Project.

Site Description

The proposed Project is located in southern Goodhue County, Minnesota (**Figure 1**). The proposed substation expansion area and 345/345 kV transmission line route are located in the Oak Savanna Subsection (Subsection) as defined by the Minnesota Department of Natural Resources (MNDNR 2025). This Subsection is characterized by gently rolling topography and few lakes. Soils in the region correlate with upland or wetland prairies and savanna and forest vegetation. The Project Area has a fairly well-developed drainage network due to the nature of landforms within the unit. Pre-settlement vegetation included bur oak savanna and areas of tallgrass prairie and maple-basswood forest. Current land uses within the subregion include cropland and pasture, with urban development accelerating along the northern boundary of the Project.

Due to the active agricultural nature of the Project Area, several tile drainage features were observed within the Project Area. These drainage features did not meet wetland indicators (**see Appendix A**).

Mapped wetlands delineated by Merjent Inc. (Merjent) and approved by Goodhue County Soil and Water Conservation District were provided by Ben Dvorak, Natural Resource Specialist with Merjent on November 7, 2025 (**Figure 3**). These previously identified wetlands by Merjent are mapped outside of the Project Area boundary and provided here as supplemental information. As these wetlands are outside of the Project Area, they have not been included in the results of this report and included as additional information.

Precipitation History Prior to Field Delineations

The USACE Antecedent Precipitation Tool (APT) (v1.0.23) is typically used to document antecedent precipitation conditions for the time of the delineation that HDR completed on October 29, 2025. Antecedent precipitation is defined by the USACE as precipitation occurring on-site prior to the field reviews. Antecedent precipitation is an important factor to consider when evaluating potential wetland hydrology indicators. Additionally, antecedent precipitation helps to determine whether a site review is conducted during “normal environmental conditions” for that time of year. HDR attempted to use the APT tool on November 24, 2025 and December 10, 2025. The APT tool lacked sufficient data for the geographical area to produce a report, so manual methods were used as described below..

The Precipitation History is supplemented by the MNDNR Minnesota State Climatology Office Minnesota Climatology Working Group – Monthly Precipitation Data from Gridded Database. Precipitation data for the Project Area was identified as having a three-month-prior rating of “Normal Conditions” at the time of the field delineation work, with a three-month-prior score of 12, July 2025 - September 2025. The Minnesota Climatology Working Group Monthly Precipitation output is included as **Appendix C**.

Soils

Table 1 lists the USDA NRCS soil map units that occur within the Project Area along with their corresponding hydric rating. Locations of soil map units are shown in **Figures 2, 3, and 4**.

Table 1. USDA NRCS - Mapped Soil Types Onsite			
Map Unit Symbol	Map Unit Name	Acres In Project Area	Percentage Hydric Rating
N578B	Barremills silt loam, drainageway, 1 to 5 percent slopes, occasionally flooded	3.7	0
N579A	Downs-Hersey complex, 12 to 18 percent slopes, moderately eroded	4.1	0
N574B	Downs-Hersey complex, 2 to 6 percent slopes	17.7	0
N574C2	Downs-Hersey complex, 6 to 12 percent slopes, moderately eroded	12.7	0
N572D2	Downs Hersey, bedrock substratum, complex, 12 to 18 percent slopes, moderately eroded	0.9	0
N602A	Joy silt loam, 1 to 3 percent slopes	8.5	5
N606B	Richwood silt loam, 1 to 6 percent slopes	3.9	0
N519B	Vasa silt loam, 1 to 4 percent slopes	3.6	0

Source: USDA NRCS Web Soil Survey, 2026

Results

Two wetlands totaling approximately 0.073 acres were identified within the Project Area (see **Figures 3 and 4**). The wetlands are located to the east and west of Highway 52. Wetland 1 is approximately 20 feet wide and Wetland 2 is approximately 5 feet wide. Both wetlands can be characterized as roadside ditches that follow the Highway 52 ROW.

Wetlands were classified based on the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979) wetland types. Narratives describing each of delineated resource types are

discussed below. **Table 2** summarizes the acreages of wetland features delineated within the Project Area. The locations of each delineated feature are shown in **Figures 3 and 4**. USACE routine wetland determination data forms for representative wetlands are included as **Appendix A**.

Ground level photograph locations of delineated wetland features are included in **Appendix B**. Photo 1 and 2 depict the wet roadside ditch and upslope bank on the west side of Highway 52. Photo 3 depicts an agricultural field drainage ditch located on the east side of Highway 52 that drains into a culvert system beneath the roadway. Photo 4 and 5 depict the agricultural field and a vegetated field edge north of the North Rochester Substation, Photo 6 and 7 depict agricultural drain tile lines in the field east of Highway 52. These artificial drains have been placed to drain excess water from the fields and did not meet wetland indicators of hydrophytic vegetation, hydric soil, or signs on hydrology. Photo 8 depicts a wooded windbreak at the field edge.

Table 2. Summary of Delineated Wetland Features

Feature ID	Cowardin Type	Acreage (acres)	Corresponding Data Form	Wetland Location (Latitude, Longitude)
Wetland 1	PEM	0.069	WDP1	44.223464, -92.650917
Wetland 2	PEM	0.004	WDP2	44.223354, -92.650394

PEM WETLANDS

Data Points: Wetland Data Plot 1 (WDP1)

A total of 0.069 acres of wetland was delineated within the Project Area. Dominant herbaceous and shrub vegetation that characterizes these wetlands included Reed Canary Grass (*Phalaris arundinacea*) and Sandbar Willow (*Salix interior*). Hydric soils observed at this site included 2cm Muck (A10). Hydrology indicators observed included Geomorphic Position (D2), and FAC-Neutral Test (D5).

Data Points: Wetland Data Plot 2 (WDP2)

A total of 0.004 acres of wetland was delineated within the Project Area. Dominant herbaceous vegetation that characterizes the wetland included Reed Canary Grass (*Phalaris arundinacea*). Hydric soils observed at this site included 2cm Muck (A10). Hydrology indicators observed included Geomorphic Position (D2), and FAC-Neutral Test (D5).

Conclusions

Two wetland areas totaling 0.073 acres were delineated within the Project Area. The wetlands are located to the east and west of Highway 52. Wetland 1 is approximately 20 ft wide, and Wetland 2 is approximately 5 ft wide. Both wetlands can be characterized as

roadside ditches that follow the Highway 52 ROW. No temporary or permanent impacts to either wetland are anticipated as a result of the Project.

The wetland boundaries were delineated in accordance with the *1987 Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2)* (USACE 2010) and are subject to review and approval by the USACE and Goodhue County Soil and Water Conservation District (Local Government Unit [LGU] responsible for implementing the Minnesota Wetland Conservation Act). Any proposed impacts to the wetlands will require additional coordination with and authorization from these agencies.

References

Cowardin, Lewis M., et al. "Classification of Wetlands and Deepwater Habitats of the United States." *Water Encyclopedia*, 2005, doi:10.1002/047147844x.sw2162.

Google Earth™. 2025. Historic Satellite Images. Google Earth™ mapping service.

MNDNR Ecological Classification System. 2022. Ecological Subsections
<https://www.dnr.state.mn.us/ecs/index.html>

MNDNR Past Climate Data for Minnesota. 2025. Monthly Precipitation Data from Gridded Database (for Wetland Delineators)
https://climateapps.dnr.state.mn.us/gridded_data/precip/wetland/wetland.asp

Mitsch, William and James Gosselink. 2000. *Wetlands*: 3rd Ed. New York. 920 pp.

National Climatic Data Center. 2025. Daily Precipitation Summary. National Oceanic and Atmospheric Administration.

Robert W. Lichvar and John T. Kartesz. 2017. North American Digital Flora: National Wetland Plant List, version 2.4.0 (https://wetland_plants.usace.army.mil). U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH, and BONAP, Chapel Hill, NC.

U.S. Department of Agriculture, NRCS. 2025. Web Soil Survey for Goodhue County, Minnesota. <http://websoilsurvey.nrcs.usda.gov/app/>

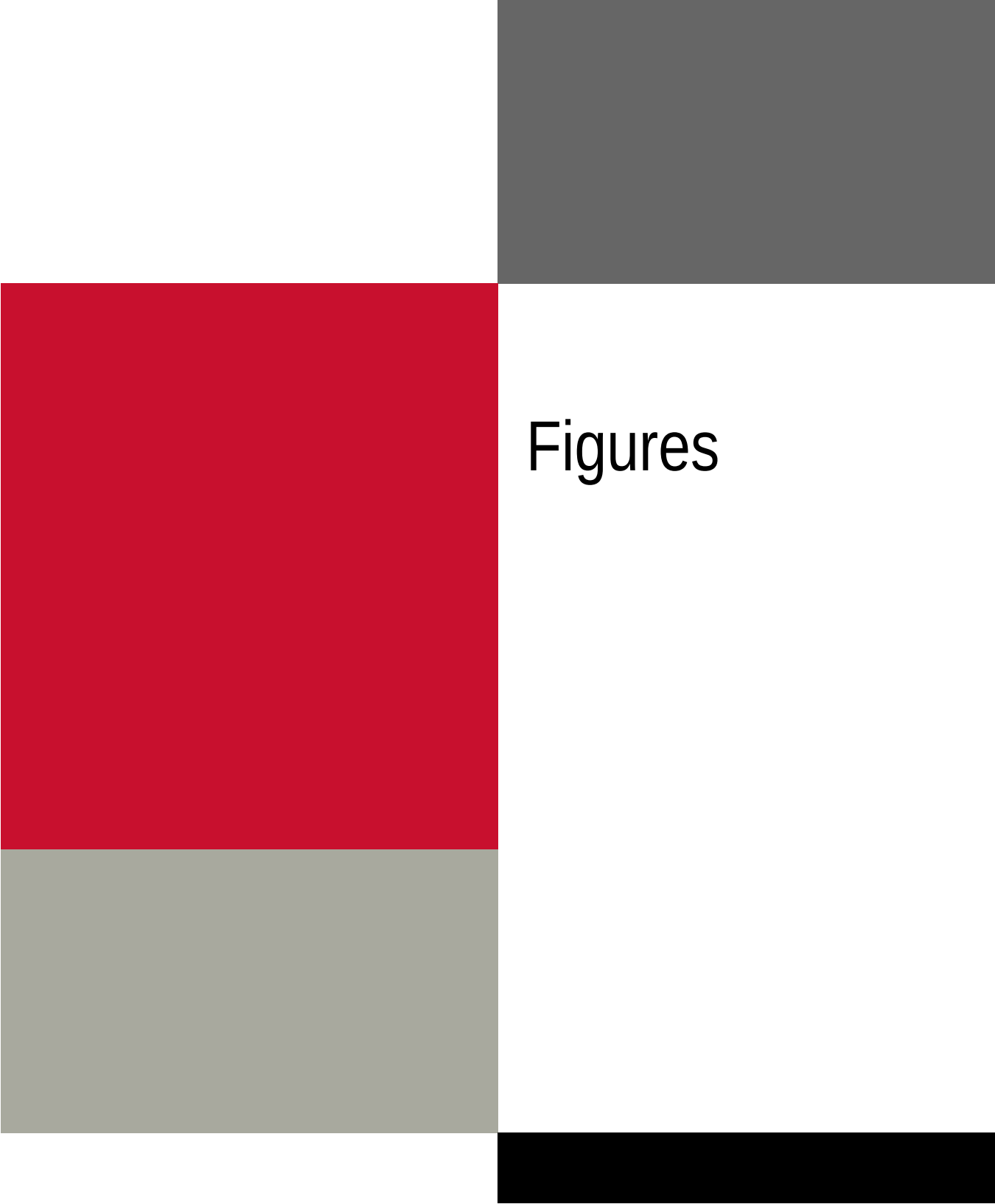
U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS, 100 pp. and appendices.

2025 Antecedent Precipitation Tool (ATP) Accessed Nov 19, 2025.

2005. Regulatory Guidance Letter No. 05-05 Ordinary High Water Mark Identification. December 7, 2005.

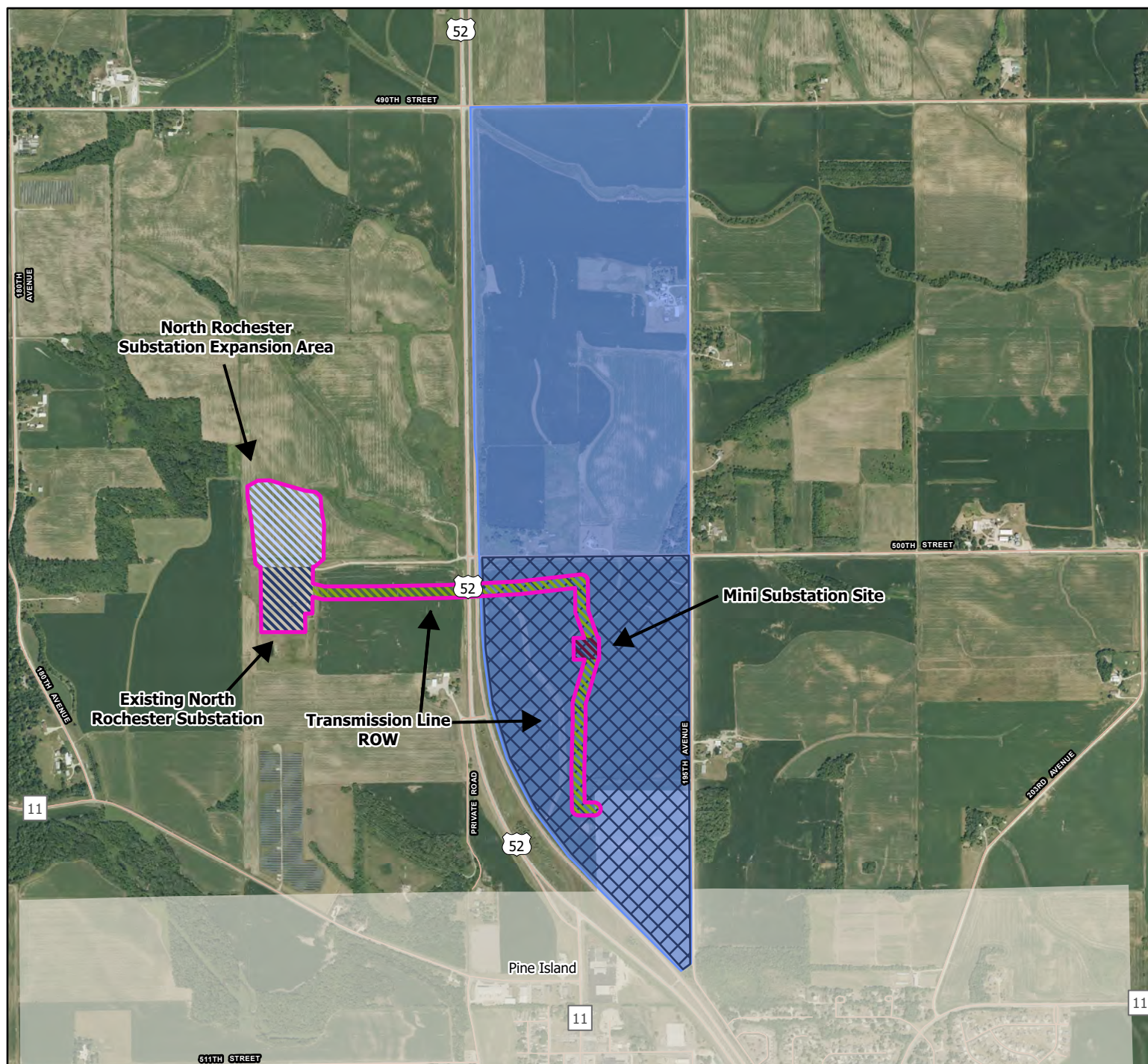
2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0). ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

2022 National Wetland Plant List. 18 FR 15656. Washington, DC: U.S. Army Corps of Engineers Operations and Regulatory Community of Practice.



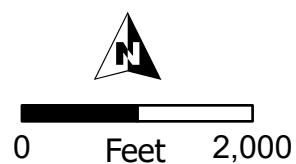
Figures

FIGURE 1: PROJECT OVERVIEW



LEGEND

- Project Area
- Existing North Rochester Substation
- North Rochester Substation Expansion Area
- Transmission Line ROW
- Mini Substation Site
- Proposed Development Site
- AUAR Area
- City Boundary

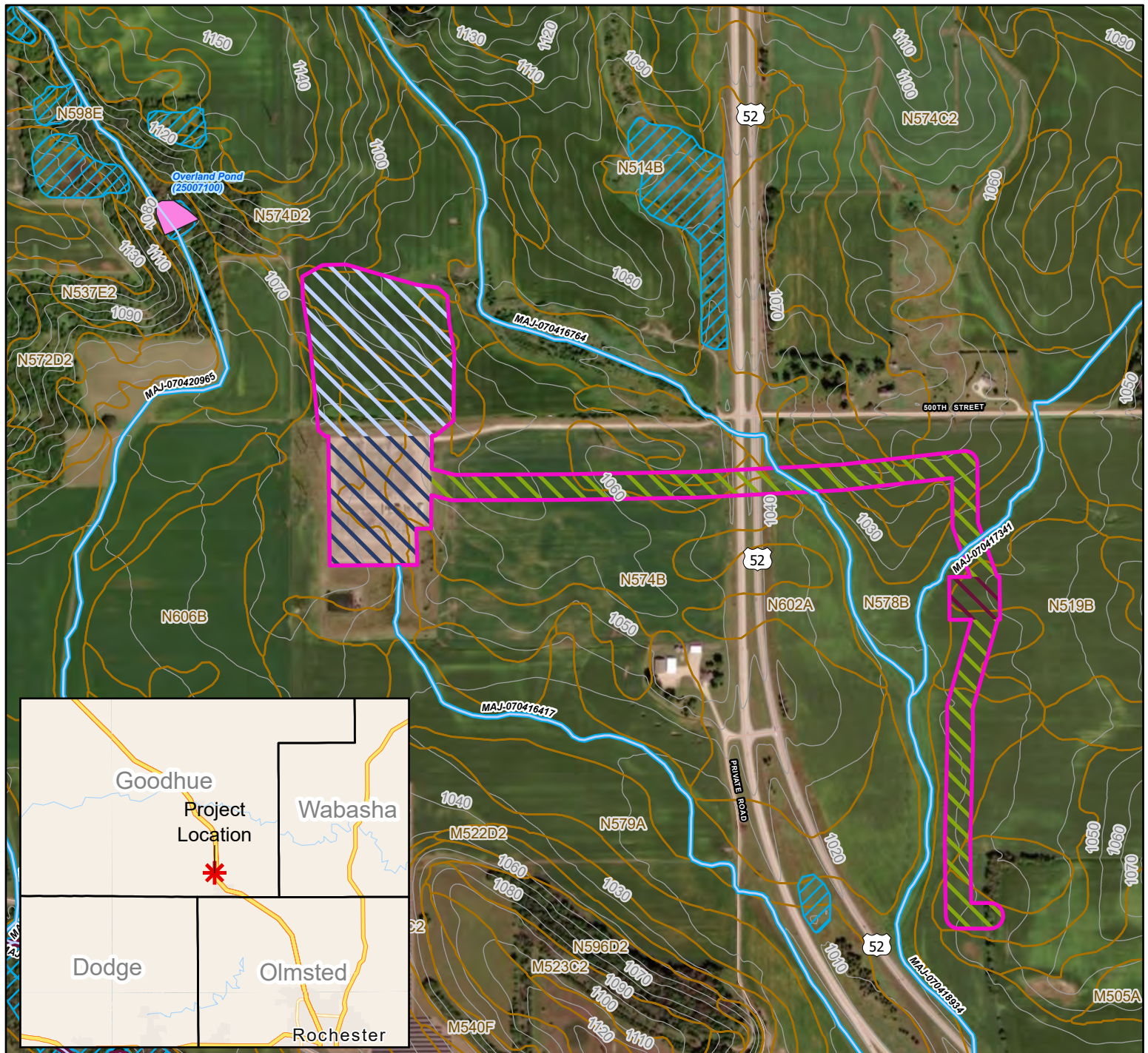


Scale: 1:20,000
Center: 92°38'45"W 44°13'29"N



DATE EXPORTED: 12/11/2025

FIGURE 2: NWI, SOILS, AND TOPOGRAPHY



LEGEND

- | | |
|---|--|
| Project Area | Soils |
| Existing North Rochester Substation | 10ft Contour |
| North Rochester Substation Expansion Area | MNDNR Rivers and Streams |
| Transmission Line ROW | Public Watercourses |
| Mini Substation Site | MNDNR Hydrography - All Water Features |
| | NWI Wetlands |

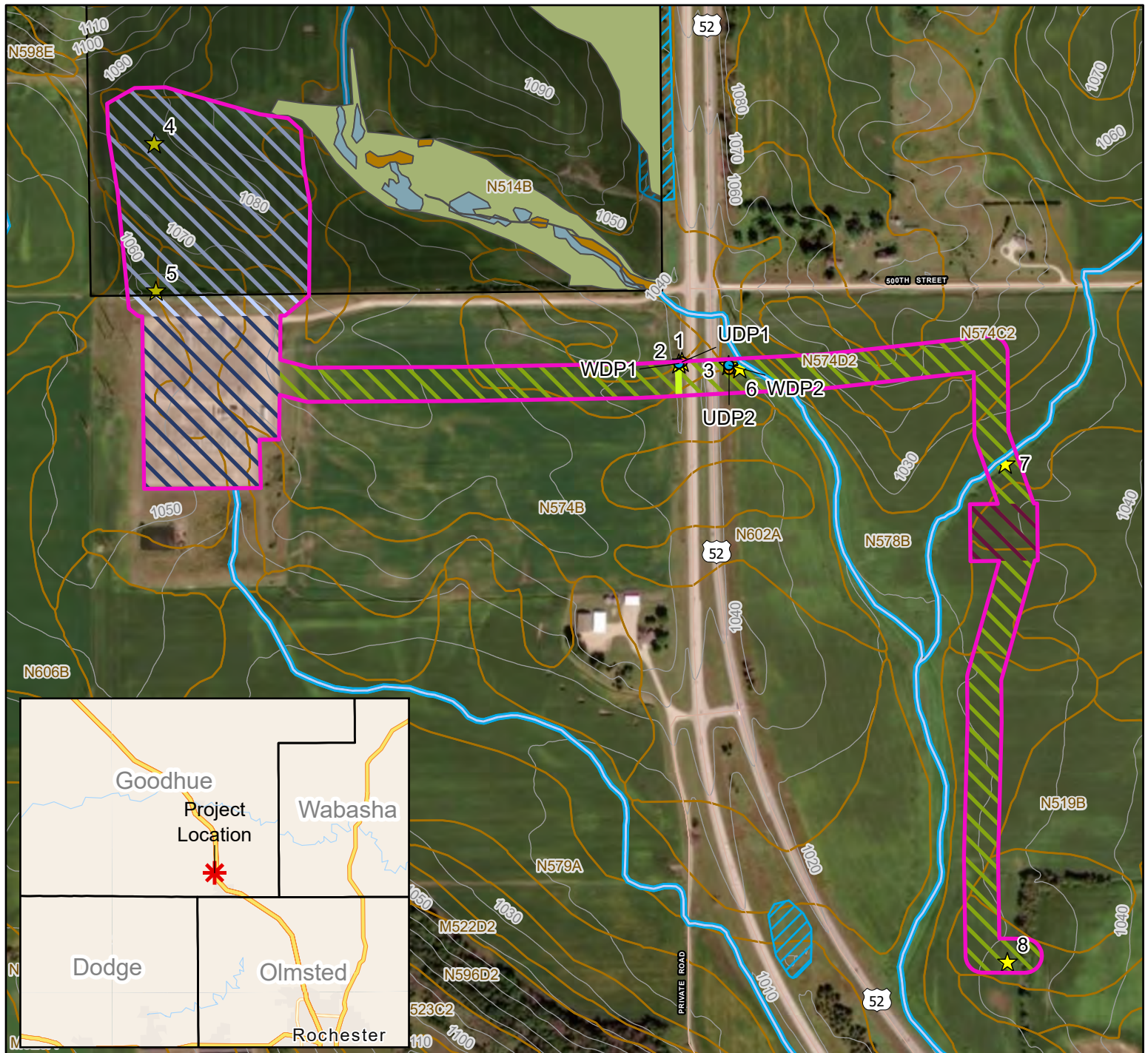


0 Feet 1,000

Scale: 1:10,000

Center: 92°39'16"W 44°13'21"N

FIGURE 3: DELINEATED WETLANDS



LEGEND

- █ Project Area
- █ Existing North Rochester Substation
- █ North Rochester Substation Expansion Area
- █ Transmission Line ROW
- █ Mini Substation Site
- █ 10ft Contour
- █ Soils
- █ NWI Wetlands
- █ MNDNR Rivers and Streams
- ★ Photos
- Upland Data Points
- Wetland Data Points
- █ Delineated Wetlands
- █ Previously Delineated Area
- █ Previously Delineated Waterway
- █ Previously Delineated Wetlands'
- █ Fresh (Wet) Meadow
- █ Hardwood Swamp
- █ Shrub-Carr



0 Feet 1,000

Scale: 1:7,500

Center: 92°39'10"W 44°13'17"N

DATE EXPORTED: 12/11/2025

FIGURE 4: DELINEATED WETLANDS DETAIL**LEGEND**

- | | |
|--------------------------|---------------------|
| Project Area | NWI Wetlands |
| Transmission Line ROW | Photos |
| 10ft Contour | Upland Data Points |
| Soils | Wetland Data Points |
| MNDNR Rivers and Streams | Delineated Wetlands |



0 Feet 50

Scale: 1:500

Center: 92°39'2"W 44°13'24"N



Appendix A Data Sheets

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp: 9/30/2027 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
--	---

Project/Site: Skyway City/County: Goodhue Sampling Date: 10/29/2025
 Applicant/Owner: Xcel Energy State: MN Sampling Point: UPD1
 Investigator(s): Katie Lueth Section, Township, Range: Sec 30, Town 109N, Rng 15E
 Landform (hillside, terrace, etc.): Drainage ditch Local relief (concave, convex, none): Convex
 Slope (%): 2 Lat: 44.223464 Long: -92.650917 Datum: USGS 1984
 Soil Map Unit Name: Joy silt loam, 1 to 3 percent slopes NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No X
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u> Hydric Soil Present? Yes <u> </u> No <u>X</u> Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Remarks: Hillside upslope of a roadside ditch	

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
5.				
=Total Cover				
Sapling/Shrub Stratum	(Plot size: <u>15</u>)			
1.				
2.				
3.				
4.				
5.				
=Total Cover				
Herb Stratum	(Plot size: <u>5</u>)			
1.	<u>Bromus inermis</u>	80	Yes	FACU
2.	<u>Poa pratensis</u>	15	No	FAC
3.	<u>Heracleum mantegazzianum</u>	5	No	FAC
4.				
5.				
6.				
7.				
8.				
9.				
10.				
100 =Total Cover				
Woody Vine Stratum	(Plot size: <u> </u>)			
1.				
2.				
=Total Cover				

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>20</u>	x 3 = <u>60</u>
FACU species <u>80</u>	x 4 = <u>320</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>100</u> (A)	<u>380</u> (B)
Prevalence Index = B/A = <u>3.80</u>	

Hydrophytic Vegetation Indicators:

 1 - Rapid Test for Hydrophytic Vegetation

 2 - Dominance Test is >50%

 3 - Prevalence Index is ≤3.0¹

 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation not present.
 ENG FORM 6116-7, SEP 2024

SOIL

Sampling Point: UPD1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 2/2	100					Loamy/Clayey	
10-20	10YR 2/2	90	10YR 3/1	10	D		Loamy/Clayey	Sand deposits

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
☐ Histosol (A1)	☐ Iron-Manganese Masses (F12)
☐ Histic Epipedon (A2)	☐ Red Parent Material (F21)
☐ Black Histic (A3)	☐ Very Shallow Dark Surface (F22)
☐ Hydrogen Sulfide (A4)	☐ Other (Explain in Remarks)
☐ Stratified Layers (A5)	
☐ 2 cm Muck (A10)	
☐ Depleted Below Dark Surface (A11)	
☐ Thick Dark Surface (A12)	
☐ Iron Monosulfide (A18)	
☐ Sandy Mucky Mineral (S1)	
☐ 5 cm Mucky Peat or Peat (S3)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <u>X</u>
---	---

Remarks:
Plot does not meet hydric soil indicator.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ True Aquatic Plants (B14)	☐ Dry-Season Water Table (C2)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Crayfish Burrows (C8)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres on Living Roots (C3)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Stunted or Stressed Plants (D1)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Geomorphic Position (D2)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ FAC-Neutral Test (D5)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Gauge or Well Data (D9)		
☐ Sparsely Vegetated Concave Surface (B8)	☐ Other (Explain in Remarks)		

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology not present.

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	<i>OMB Control #: 0710-0024, Exp: 9/30/2027</i> <i>Requirement Control Symbol EXEMPT:</i> <i>(Authority: AR 335-15, paragraph 5-2a)</i>
--	--

Project/Site: Skway City/County: Goodhue Sampling Date: 10/29/2025

Applicant/Owner: Xcel Energy State: MN Sampling Point: WDP1

Investigator(s): Katie Lueth Section, Township, Range: Sec 30, Town 109N, Rng 15E

Landform (hillside, terrace, etc.): Drainage ditch Local relief (concave, convex, none): Concave

Slope (%): 45 Lat: 44.223464 Long: -92.650917 Datum: USGS 1984

Soil Map Unit Name: Downs-Hersey complex, 6 to 12 percent slopes, moderately eroded NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u>	No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u>	No <u> </u>
Hydric Soil Present?	Yes <u>X</u>	No <u> </u>			
Wetland Hydrology Present?	Yes <u>X</u>	No <u> </u>			
Remarks: Plot is located in 10 ft wide drainage ditch.					

VEGETATION – Use scientific names of plants.

Tree Stratum		Absolute % Cover	Dominant Species?	Indicator Status
(Plot size: 30)				
1.				
2.				
3.				
4.				
5.				
			=Total Cover	
Sapling/Shrub Stratum		Absolute % Cover	Dominant Species?	Indicator Status
(Plot size: 15)				
1.	<i>Salix interior</i>	15	Yes	FACW
2.				
3.				
4.				
5.				
		15	=Total Cover	
Herb Stratum		Absolute % Cover	Dominant Species?	Indicator Status
(Plot size: 5)				
1.	<i>Phalaris arundinacea</i>	70	Yes	FACW
2.	<i>Scirpus atrovirens</i>	10	No	FAC
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
		80	=Total Cover	
Woody Vine Stratum		Absolute % Cover	Dominant Species?	Indicator Status
(Plot size:)				
1.				
2.				
			=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 0	x 1 = 0
FACW species 85	x 2 = 170
FAC species 10	x 3 = 30
FACU species 0	x 4 = 0
UPL species 0	x 5 = 0
Column Totals: 95 (A)	200 (B)
Prevalence Index = B/A = 2.11	

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0¹

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation

Present?	Yes	X	No

Remarks: (Include photo numbers here or on a separate sheet.)

Plot meets hydrophytic vegetation.

SOIL

Sampling Point: WDP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/1	100					Muck	
2-12	10YR 2/1	80	5YR 5/6	20	RM	M	Sandy	Silty loam matrix texture
12-20	10YR 6/2	80	5YR 5/6	20	RM	M	Sandy	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
☐ Histosol (A1)	☐ Iron-Manganese Masses (F12)
☐ Histic Epipedon (A2)	☐ Red Parent Material (F21)
☐ Black Histic (A3)	☐ Very Shallow Dark Surface (F22)
☐ Hydrogen Sulfide (A4)	☐ Other (Explain in Remarks)
☐ Stratified Layers (A5)	
☒ 2 cm Muck (A10)	
☐ Depleted Below Dark Surface (A11)	
☐ Thick Dark Surface (A12)	
☐ Iron Monosulfide (A18)	
☐ Sandy Mucky Mineral (S1)	
☐ 5 cm Mucky Peat or Peat (S3)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes ☒ No ☒
---	--

Remarks:
Plot meets hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ True Aquatic Plants (B14)	☐ Dry-Season Water Table (C2)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Crayfish Burrows (C8)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres on Living Roots (C3)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Stunted or Stressed Plants (D1)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☒ Geomorphic Position (D2)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☒ FAC-Neutral Test (D5)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Gauge or Well Data (D9)		
☐ Sparsely Vegetated Concave Surface (B8)	☐ Other (Explain in Remarks)		

Field Observations: Surface Water Present? Yes _____ No ☒ Depth (inches): _____ Water Table Present? Yes _____ No ☒ Depth (inches): _____ Saturation Present? Yes _____ No ☒ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No _____
---	--

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Plot meets hydrology indicators.

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp: 9/30/2027 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
--	---

Project/Site: Skyway City/County: Goodhue Sampling Date: 10/29/2025

Applicant/Owner: Xcel Energy State: MN Sampling Point: UPD2

Investigator(s): Katie Lueth Section, Township, Range: Sec 29, Town 109N, Rng 15E

Landform (hillside, terrace, etc.): Drainage ditch Local relief (concave, convex, none): Convex

Slope (%): 2 Lat: 44.223296 Long: -92.650394 Datum: USGS 1984

Soil Map Unit Name: Barremills silt loam, drainageway, 1 to 5 percent slopes, occasionally flooded NWI classification: NA

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u> Hydric Soil Present? Yes <u> </u> No <u>X</u> Wetland Hydrology Present? Yes <u> </u> No <u>X</u>	Is the Sampled Area within a Wetland? Yes <u> </u> No <u>X</u>
Remarks: Plot is located upslope of roadside ditch.	

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1.				
2.				
3.				
4.				
5.				
=Total Cover				
Sapling/Shrub Stratum	(Plot size: <u>15</u>)			
1. <u>Rhamnus cathartica</u>		5	Yes	
2.				
3.				
4.				
5.				
5 =Total Cover				
Herb Stratum	(Plot size: <u>5</u>)			
1. <u>Bromus inermis</u>		100	Yes	FACU
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
100 =Total Cover				
Woody Vine Stratum	(Plot size: <u> </u>)			
1.				
2.				
=Total Cover				

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 2 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>0</u>	x 2 = <u>0</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>100</u>	x 4 = <u>400</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>100</u> (A)	<u>400</u> (B)
Prevalence Index = B/A = <u>4.00</u>	

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)
¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation not present -- mowed brome.

ENG FORM 6116-7, SEP 2024

SOIL

Sampling Point: UPD2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-10	10YR 2/2	100					Loamy/Clayey	
10-20	10YR 2/2	90	10YR 3/1	10	C	M	Loamy/Clayey	Sand deposits

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
☐ Histosol (A1)	☐ Iron-Manganese Masses (F12)
☐ Histic Epipedon (A2)	☐ Red Parent Material (F21)
☐ Black Histic (A3)	☐ Very Shallow Dark Surface (F22)
☐ Hydrogen Sulfide (A4)	☐ Other (Explain in Remarks)
☐ Stratified Layers (A5)	
☐ 2 cm Muck (A10)	
☐ Depleted Below Dark Surface (A11)	
☐ Thick Dark Surface (A12)	
☐ Iron Monosulfide (A18)	
☐ Sandy Mucky Mineral (S1)	
☐ 5 cm Mucky Peat or Peat (S3)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No <u>X</u>
---	---

Remarks:
Roadfill with gravel. Plot does not meet hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ True Aquatic Plants (B14)	☐ Dry-Season Water Table (C2)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Crayfish Burrows (C8)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres on Living Roots (C3)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Stunted or Stressed Plants (D1)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☐ Geomorphic Position (D2)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☐ FAC-Neutral Test (D5)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Gauge or Well Data (D9)		
☐ Sparsely Vegetated Concave Surface (B8)	☐ Other (Explain in Remarks)		

Field Observations: Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (inches): _____ Saturation Present? Yes _____ No <u>X</u> Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes _____ No <u>X</u>
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Wetland hydrology not present.

U.S. Army Corps of Engineers WETLAND DETERMINATION DATA SHEET – Midwest Region See ERDC/EL TR-10-16; the proponent agency is CECW-CO-R	OMB Control #: 0710-0024, Exp: 9/30/2027 Requirement Control Symbol EXEMPT: (Authority: AR 335-15, paragraph 5-2a)
--	---

Project/Site: Skyway City/County: Goodhue Sampling Date: 10/29/2025

Applicant/Owner: Xcel Energy State: MN Sampling Point: WDP2

Investigator(s): Katie Lueth Section, Township, Range: Sec 29, Town 109N, Rng 15E

Landform (hillside, terrace, etc.): Drainage ditch Local relief (concave, convex, none): Concave

Slope (%): 45 Lat: 44.223354 Long: -92.650394 Datum: USGS 1984

Soil Map Unit Name: Barremills silt loam, drainageway, 1 to 5 percent slopes, occasionally flooded NWI classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u> Hydric Soil Present? Yes <u>X</u> No <u> </u> Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Remarks: Plot is located in 2 ft wide drainage ditch.	

VEGETATION – Use scientific names of plants.

<table style="width: 100%;"> <tr> <th style="text-align: left;">Tree Stratum</th> <th style="text-align: center;">(Plot size: <u>30</u>)</th> <th style="text-align: center;">Absolute % Cover</th> <th style="text-align: center;">Dominant Species?</th> <th style="text-align: center;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td colspan="5" style="text-align: right;">=Total Cover</td></tr> </table> <table style="width: 100%;"> <tr> <th style="text-align: left;">Sapling/Shrub Stratum</th> <th style="text-align: center;">(Plot size: <u>15</u>)</th> <th style="text-align: center;">Absolute % Cover</th> <th style="text-align: center;">Dominant Species?</th> <th style="text-align: center;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td colspan="5" style="text-align: right;">=Total Cover</td></tr> </table> <table style="width: 100%;"> <tr> <th style="text-align: left;">Herb Stratum</th> <th style="text-align: center;">(Plot size: <u>5</u>)</th> <th style="text-align: center;">Absolute % Cover</th> <th style="text-align: center;">Dominant Species?</th> <th style="text-align: center;">Indicator Status</th> </tr> <tr><td>1.</td><td><u>Phalaris arundinacea</u></td><td><u>100</u></td><td><u>Yes</u></td><td><u>FACW</u></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td>3.</td><td></td><td></td><td></td><td></td></tr> <tr><td>4.</td><td></td><td></td><td></td><td></td></tr> <tr><td>5.</td><td></td><td></td><td></td><td></td></tr> <tr><td>6.</td><td></td><td></td><td></td><td></td></tr> <tr><td>7.</td><td></td><td></td><td></td><td></td></tr> <tr><td>8.</td><td></td><td></td><td></td><td></td></tr> <tr><td>9.</td><td></td><td></td><td></td><td></td></tr> <tr><td>10.</td><td></td><td></td><td></td><td></td></tr> <tr><td colspan="5" style="text-align: right;">=Total Cover</td></tr> </table> <table style="width: 100%;"> <tr> <th style="text-align: left;">Woody Vine Stratum</th> <th style="text-align: center;">(Plot size: <u> </u>)</th> <th style="text-align: center;">Absolute % Cover</th> <th style="text-align: center;">Dominant Species?</th> <th style="text-align: center;">Indicator Status</th> </tr> <tr><td>1.</td><td></td><td></td><td></td><td></td></tr> <tr><td>2.</td><td></td><td></td><td></td><td></td></tr> <tr><td colspan="5" style="text-align: right;">=Total Cover</td></tr> </table>	Tree Stratum	(Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status	1.					2.					3.					4.					5.					=Total Cover					Sapling/Shrub Stratum	(Plot size: <u>15</u>)	Absolute % Cover	Dominant Species?	Indicator Status	1.					2.					3.					4.					5.					=Total Cover					Herb Stratum	(Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status	1.	<u>Phalaris arundinacea</u>	<u>100</u>	<u>Yes</u>	<u>FACW</u>	2.					3.					4.					5.					6.					7.					8.					9.					10.					=Total Cover					Woody Vine Stratum	(Plot size: <u> </u>)	Absolute % Cover	Dominant Species?	Indicator Status	1.					2.					=Total Cover					Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A) Total Number of Dominant Species Across All Strata: <u>1</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100.0%</u> (A/B)
Tree Stratum	(Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status																																																																																																																																																			
1.																																																																																																																																																							
2.																																																																																																																																																							
3.																																																																																																																																																							
4.																																																																																																																																																							
5.																																																																																																																																																							
=Total Cover																																																																																																																																																							
Sapling/Shrub Stratum	(Plot size: <u>15</u>)	Absolute % Cover	Dominant Species?	Indicator Status																																																																																																																																																			
1.																																																																																																																																																							
2.																																																																																																																																																							
3.																																																																																																																																																							
4.																																																																																																																																																							
5.																																																																																																																																																							
=Total Cover																																																																																																																																																							
Herb Stratum	(Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status																																																																																																																																																			
1.	<u>Phalaris arundinacea</u>	<u>100</u>	<u>Yes</u>	<u>FACW</u>																																																																																																																																																			
2.																																																																																																																																																							
3.																																																																																																																																																							
4.																																																																																																																																																							
5.																																																																																																																																																							
6.																																																																																																																																																							
7.																																																																																																																																																							
8.																																																																																																																																																							
9.																																																																																																																																																							
10.																																																																																																																																																							
=Total Cover																																																																																																																																																							
Woody Vine Stratum	(Plot size: <u> </u>)	Absolute % Cover	Dominant Species?	Indicator Status																																																																																																																																																			
1.																																																																																																																																																							
2.																																																																																																																																																							
=Total Cover																																																																																																																																																							
Prevalence Index worksheet: <table style="width: 100%;"> <tr> <th style="text-align: left;">Total % Cover of:</th> <th style="text-align: left;">Multiply by:</th> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>100</u></td> <td>x 2 = <u>200</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>0</u></td> <td>x 4 = <u>0</u></td> </tr> <tr> <td>UPL species <u>0</u></td> <td>x 5 = <u>0</u></td> </tr> <tr> <td>Column Totals: <u>100</u> (A)</td> <td><u>200</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>2.00</u></td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species <u>0</u>	x 1 = <u>0</u>	FACW species <u>100</u>	x 2 = <u>200</u>	FAC species <u>0</u>	x 3 = <u>0</u>	FACU species <u>0</u>	x 4 = <u>0</u>	UPL species <u>0</u>	x 5 = <u>0</u>	Column Totals: <u>100</u> (A)	<u>200</u> (B)	Prevalence Index = B/A = <u>2.00</u>		Hydrophytic Vegetation Indicators: <u> </u> 1 - Rapid Test for Hydrophytic Vegetation <u>X</u> 2 - Dominance Test is >50% <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ <u> </u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																																																																																																																																						
Total % Cover of:	Multiply by:																																																																																																																																																						
OBL species <u>0</u>	x 1 = <u>0</u>																																																																																																																																																						
FACW species <u>100</u>	x 2 = <u>200</u>																																																																																																																																																						
FAC species <u>0</u>	x 3 = <u>0</u>																																																																																																																																																						
FACU species <u>0</u>	x 4 = <u>0</u>																																																																																																																																																						
UPL species <u>0</u>	x 5 = <u>0</u>																																																																																																																																																						
Column Totals: <u>100</u> (A)	<u>200</u> (B)																																																																																																																																																						
Prevalence Index = B/A = <u>2.00</u>																																																																																																																																																							
Remarks: (Include photo numbers here or on a separate sheet.) Plot meets hydrophytic vegetation indicator.	Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u>																																																																																																																																																						

SOIL

Sampling Point: WDP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-2	10YR 2/1	100					Muck	
2-12	10YR 2/1	80	5YR 5/6	20	RM	M	Sandy	Silty loam matrix texture
12-20	10YR 6/2	80	5YR 5/6	20	RM	M	Sandy	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. ²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils ³ :
☐ Histosol (A1)	☐ Iron-Manganese Masses (F12)
☐ Histic Epipedon (A2)	☐ Red Parent Material (F21)
☐ Black Histic (A3)	☐ Very Shallow Dark Surface (F22)
☐ Hydrogen Sulfide (A4)	☐ Other (Explain in Remarks)
☐ Stratified Layers (A5)	
☒ 2 cm Muck (A10)	
☐ Depleted Below Dark Surface (A11)	
☐ Thick Dark Surface (A12)	
☐ Iron Monosulfide (A18)	
☐ Sandy Mucky Mineral (S1)	
☐ 5 cm Mucky Peat or Peat (S3)	

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes ☒ No ☐
---	---

Remarks:
Plot meets hydric soil indicator.

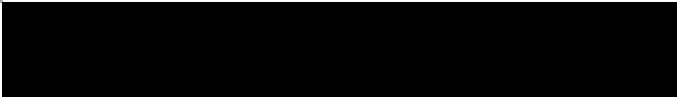
HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one is required; check all that apply)		Secondary Indicators (minimum of two required)	
☐ Surface Water (A1)	☐ Water-Stained Leaves (B9)	☐ Surface Soil Cracks (B6)	
☐ High Water Table (A2)	☐ Aquatic Fauna (B13)	☐ Drainage Patterns (B10)	
☐ Saturation (A3)	☐ True Aquatic Plants (B14)	☐ Dry-Season Water Table (C2)	
☐ Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Crayfish Burrows (C8)	
☐ Sediment Deposits (B2)	☐ Oxidized Rhizospheres on Living Roots (C3)	☐ Saturation Visible on Aerial Imagery (C9)	
☐ Drift Deposits (B3)	☐ Presence of Reduced Iron (C4)	☐ Stunted or Stressed Plants (D1)	
☐ Algal Mat or Crust (B4)	☐ Recent Iron Reduction in Tilled Soils (C6)	☒ Geomorphic Position (D2)	
☐ Iron Deposits (B5)	☐ Thin Muck Surface (C7)	☒ FAC-Neutral Test (D5)	
☐ Inundation Visible on Aerial Imagery (B7)	☐ Gauge or Well Data (D9)		
☐ Sparsely Vegetated Concave Surface (B8)	☐ Other (Explain in Remarks)		

Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No ☐
---	---

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Plot meets hydrology indicator.



Appendix B Photo Log

**Photo 1: UDP1**

Upland Plot 1 located on hillside upslope of wet roadside ditch.

**Photo 2: WDP1**

Wetland Plot 1 located in wet roadside ditch.

**Photo 3: Wetland 2**

Upland Plot 2 located upslope of drainage ditch. Wetland Plot 2 located within drainage ditch.

**Photo 4**

View of agricultural field and North Rochester Substation, facing south.

**Photo 5**

Upland data plot taken on field edge southwest of North Rochester Substation.

**Photo 6**

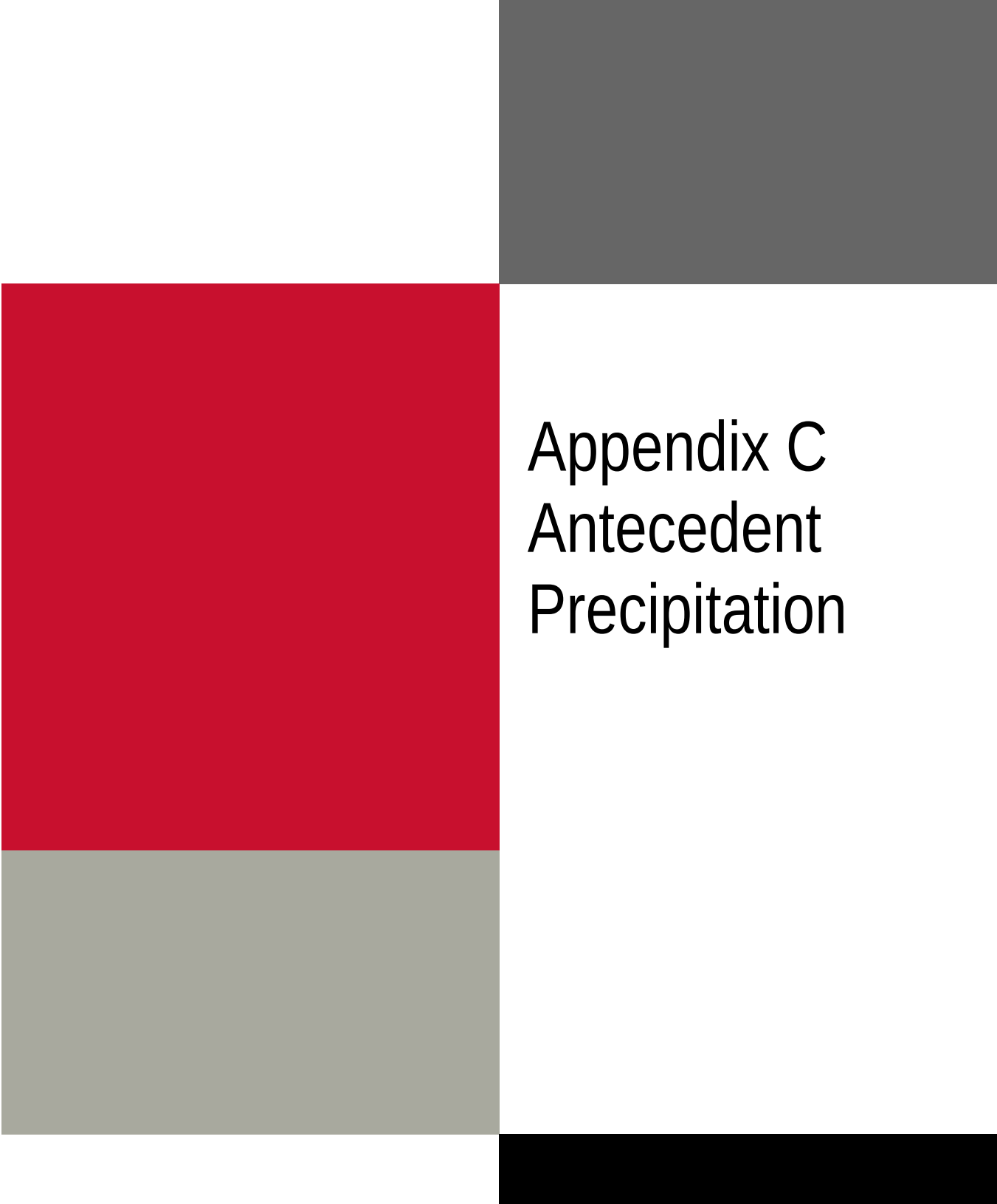
A drain tile running through an agricultural field located east of Wetland 2 and Highway 52 Blvd, facing southeast. Plot did not meet wetland hydrology and hydric soil indicators.

**Photo 7**

Drain tile running through an agricultural field located east of Highway 52 Blvd, facing southwest. Plot did not meet wetland hydrology and hydric soil indicators.

**Photo 8**

Tree windbreak at field edge.



Appendix C Antecedent Precipitation

Minnesota State Climatology Office

State Climatology Office - DNR Division of Ecological and Water Resources

[home](#) | [current conditions](#) | [journal](#) | [past data](#) | [summaries](#) | [agriculture](#) | [other sites](#) | [about us](#) 

Precipitation Worksheet Using Gridded Database

Precipitation data for target wetland location:

county: **Goodhue** township number: **109N**
 township name: **Pine Island** range number: **15W**
 nearest community: **Pine Island** section number: **29**

Aerial photograph or site visit date:

Wednesday, October 29, 2025

Score using 1991-2020 normal period

values are in inches A 'R' following a monthly total indicates a provisional value derived from radar-based estimates.	first prior month: September 2025	second prior month: August 2025	third prior month: July 2025
estimated precipitation total for this location:	2.54	3.97	3.80R
there is a 30% chance this location will have less than:	2.05	3.10	2.80
there is a 30% chance this location will have more than:	3.76	5.22	4.69
type of month: dry normal wet	normal	normal	normal
monthly score	3 * 2 = 6	2 * 2 = 4	1 * 2 = 2
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)			
12 (Normal)			

Other Resources:

- [retrieve daily precipitation data](#)
- [view radar-based precipitation estimates](#)
- [view weekly precipitation maps](#)
- [Evaluating Antecedent Precipitation Conditions](#) (BWSR)

Kjohlaug Environmental Services Company, Inc
Wetland Delineation Report
May 15, 2025

This page is intentionally left blank.

312 CR 11 NW

Pine Island Township, Goodhue County, Minnesota

Wetland Delineation Report

Prepared for

Ryan Companies

by

Kjolhaug Environmental Services Company, Inc.

(KES Project No. 2024-043)

May 15, 2024

312 CR 11 NW

Pine Island Township, Goodhue County, Minnesota

Wetland Delineation Report

TABLE OF CONTENTS

Title	Page
1. WETLAND DELINEATION SUMMARY	2
2. OVERVIEW	3
3. METHODS	3
4. RESULTS	4
4.1 Review of NWI, Soils, Public Waters, and NHD Information	4
4.2 Wetland Determinations and Delineations.....	5
4.3 Aerial Review for Offsite Hydrology Determinations.....	5
4.4 Other Areas	7
4.5 Request for Wetland Boundary and Jurisdictional Determination	8
5. CERTIFICATION OF DELINEATION.....	9

FIGURES

1. Site Location
2. Existing Conditions
3. National Wetlands Inventory
4. Soil Survey
5. DNR Public Waters Inventory
6. National Hydrography Dataset
7. Offsite Hydrology Assessment Areas

APPENDICES

- A. Joint Application Form for Activities Affecting Water Resources in Minnesota
- B. Wetland Delineation Data Forms
- C. Precipitation Data
- D. Offsite Hydrology Review Recording Form and Aerial Photos
- E. Site Photos

312 CR 11 NW

Pine Island Township, Goodhue County, Minnesota

Wetland Delineation Report

1. WETLAND DELINEATION SUMMARY

- The 189.58-acre 312 CR 11 NW site was inspected on April 15 and May 5, 2024 for the presence and extent of wetland.
- The National Wetlands Inventory (NWI) map showed two R4SCB (surface flooding, seasonal) riverine features within site boundaries.
- The soil survey showed Joy silt loam as the mapped Predominantly Non-Hydric soil type within site boundaries. All other soil types on the site are mapped as Not Hydric.
- The DNR Public Waters Inventory did not show any DNR Public Waters or Wetlands within 1000 feet of site boundaries. The Zumbro River (a DNR Public Watercourse) is located more than 2000 feet southwest of the site.
- The National Hydrography Dataset showed two Stream/River surface water features within site boundaries.
- One (1) Type 1 (PEMAd) partially drained wet meadow wetland was delineated along the northwest site boundary as shown on **Figure 2**.

2. OVERVIEW

The 189.58-acre 312 CR 11 NW site was inspected on April 15, and May 5, 2024 for the presence and extent of wetland. The property was located in Section 29, Township 109 North, Range 15 West, Pine Island Township, Goodhue County, Minnesota. The site was located southeast of the intersection of Highway 52 and 500th Street (**Figure 1**). The property corresponded to the Goodhue County PID 390290500 (312 CR 11 NW; 189.58 acres).

The parcel was comprised of row crop land not yet planted for the 2024 season. A number of vegetated swales were present throughout the site. Topography on the site was generally highest along the east, northwest, and west site boundaries and from there sloped downhill toward the center of the site. Topography was lowest within two grass swale features running from north to south through the generally center part of the site. However, the swale features were also sloping. Grass Swale 1 dropped from 1032 ft to 1012 ft from north to south (20 ft elevation change), and Grass Swale 2 dropped from 1034 ft to 1022 feet from north to south (12 ft elevation change).

One (1) wetland was delineated within the site boundaries. The delineated wetland boundary and existing conditions are shown on **Figure 2**. Figure 2 does not represent an official survey.

Appendix A of this report includes a Joint Application Form for Activities Affecting Water Resources in Minnesota, which is submitted in request for: (1) a wetland boundary and type determination approval from the Goodhue County SWCD under the Minnesota Wetland Conservation Act (WCA), and (2) delineation concurrence plus Approved Jurisdiction Determinations (AJDs) for Grass Swale 1 and Grass Swale 2 under Section 404 of the Federal Clean Water Act from the U.S. Army Corps of Engineers (USACE).

3. METHODS

Wetlands were identified using the Routine Determination method described in the Corps of Engineers Wetlands Delineation Manual (Waterways Experiment Station, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) as required under Section 404 of the Clean Water Act and the Minnesota Wetland Conservation Act.

Wetland boundaries were identified as the upper-most extent of wetland that met criteria for hydric soils, hydrophytic vegetation, and wetland hydrology. The wetland-upland boundary was largely offsite and was therefore located using a sub-meter accuracy GPS unit. Figure 2 does not constitute an official survey product.

Soils, vegetation, and hydrology were documented at a representative location along the wetland-upland boundary. Plant species dominance was estimated based on the percent aerial or basal coverage visually estimated within a 30-foot radius for trees and vines, a 15-foot radius for the shrub layer, and a 5-foot radius for the herbaceous layer within the community type sampled.

Soils were characterized to a minimum depth of 24 inches (unless otherwise noted) using a Munsell Soil Color Book and standard soil texturing methodology. Hydric soil indicators used are from Field Indicators of Hydric Soils in the United States (USDA Natural Resources Conservation Service (NRCS) in cooperation with the National Technical Committee for Hydric Soils, Version 8.1, 2017).

Mapped soils are separated into five classes based on the composition of hydric components and the Hydric Rating by Map Unit color classes utilized on Web Soil Survey. The five classes include Hydric (100 percent hydric components), Predominantly Hydric (66 to 99 percent hydric components), Partially Hydric (33 to 65 percent hydric components), Predominantly Non-Hydric (1 to 32 percent hydric components), and Non-Hydric (less than one percent hydric components).

Plants were identified using standard regional plant keys. Taxonomy and indicator status of plant species was taken from the 2018 National Wetland Plant List (U.S. Army Corps of Engineers 2018. National Wetland Plant List, version 3.3, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH).

4. RESULTS

4.1 Review of NWI, Soils, Public Waters, and NHD Information

The National Wetlands Inventory (NWI) (Minnesota Geospatial Commons 2009-2014 and U.S. Fish and Wildlife Service) showed two R4SCB (surface flooding, seasonal) riverine features within site boundaries (**Figure 3**).

The Soil Survey (USDA NRCS 2015) showed Joy silt loam as the mapped Predominantly Non-Hydric soil type within site boundaries. All other soil types on the site are mapped as Not Hydric. Soil types mapped on the property are listed in **Table 2** and a map showing soil types is included in **Figure 4**.

Table 2. Soil types mapped on the 312 CR 11 NW site.

Symbol	Soil Name	Acres	% of Area	% Hydric	Hydric Category
M523C 2	Bassett-Kasson complex, 6 to 12 percent slopes, eroded	0.2	0.10%	0	Not Hydric
N519B	Vasa silt loam, 1 to 4 percent slopes	28.9	20.20%	0	Not Hydric
N574B	Downs-Hersey complex, 2 to 6 percent slopes	21.6	15.10%	0	Not Hydric
N574C2	Downs-Hersey complex, 6 to 12 percent slopes, moderately eroded	28.8	20.10%	0	Not Hydric
N574D2	Downs-Hersey complex, 12 to 18 percent slopes, moderately eroded	4.7	3.30%	0	Not Hydric
N578B	Barremills silt loam, drainageway, 1 to 5 percent slopes, occasionally flooded	25.2	17.60%	0	Not Hydric

Table 2. Soil types mapped on the 312 CR 11 NW site.

Symbol	Soil Name	Acres	% of Area	% Hydric	Hydric Category
N579A	Dakota silt loam, 0 to 3 percent slopes	19.1	13.40%	0	Not Hydric
N602A	Joy silt loam, 1 to 3 percent slopes	14.7	10.30%	5	Predominantly Non-Hydric

The Minnesota DNR Public Waters Inventory (Minnesota Department of Natural Resources 2015) did not show any DNR Public Waters or Wetlands within 1000 feet of site boundaries. The Zumbro River (a DNR Public Watercourse) is located more than 2000 feet southwest of the site (**Figure 5**).

The National Hydrography Dataset (U.S. Geological Survey 2015) showed two Stream/River surface water features within site boundaries (**Figure 6**).

4.2 Wetland Determinations and Delineations

Potential wetlands were evaluated during field observations on April 15 and May 5, 2024. One (1) wetland was identified and delineated on the property (**Figure 2**). Corresponding data forms are included in **Appendix B**. The following description of the wetland and its adjacent upland reflects conditions observed at the time of the May 5th field visit. At that time, the field was plowed but not yet seeded. Vegetation present in the grass swales was actively growing. Precipitation conditions were normal (typical) based on the three-month antecedent precipitation data for the dates of April 15 and May 5, 2024, and wetter than or at the high end of the normal range based on the 30-day rolling total (**Appendix C**).

Wetland 1 was a Type 1 (PEMAd) partially drained, wet meadow wetland dominated by reed canary grass that began at a large box culvert located underneath Highway 55. The wetland continued to the south and then slightly east where it terminated at a functioning drain tile inlet. All flowing surface water that was discharging from the highway culvert was observed flowing into this tile inlet. In addition to free-flowing surface water (primary hydrology indicator), a secondary hydrology indicator observed was the FAC-Neutral test. Geomorphic position does not apply when a functioning outlet is present.

Adjacent upland was dominated by reed canary grass with lesser amounts of smooth brome, Kentucky bluegrass, and yellow foxtail. No primary hydrology indicators were observed in the upland. A secondary hydrology indicator observed was the FAC-Neutral test (dominance by reed canary grass).

4.3 Aerial Review for Offsite Hydrology Determinations

Areas in agricultural cropland that exhibited potential wetland signatures on aerial photography and with low or depressional topography were reviewed generally following methods described in Using Aerial Imagery to Assess Wetland Hydrology (Minnesota Board of Water and Soil Resources (BWSR) 2010) and Guidance for Submittal of Delineation Reports to the St. Paul

District Corps of Engineers and Wetland Conservation Act Local Governmental Units in Minnesota, Version 2.0 (USACE 2015).

Signatures at locations of potential wetlands on aerial photographs were interpreted and classified using seven codes (**Table 4**).

Table 4. Aerial photograph interpretation codes

Code	Classification
CS	Crop stress
DO	Drowned out
NC	Not cropped
SW	Standing water
WS	Wetland signature
AP	Altered pattern
NV	Normal vegetation

This analysis used only aerial photographs taken following periods of average normal antecedent precipitation within the normal range as determined using the Wetland Delineation Precipitation Data Retrieval tool (Minnesota Climatology Office 2015). This tool classifies antecedent precipitation as Normal (N), Wet (W) or Dry (D) by comparing precipitation during the three months preceding the estimated date of aerial photography to the 30-year average from 1981-2010.

All available Google Earth and MnGEO FSA photo years were assessed for wet/normal/dry climatic conditions using the Wetland Delineation Precipitation Data Retrieval. The 6 most recent normal photos used for the assessment included the 2003 FSA photo, the 2008 FSA photo, the 2011 Google earth photo, the 2013 FSA photo, the 2015 FSA photo, and the 2017 FSA photo.

Five areas showing a wet signature on the 2019 FSA photo (most recent “wet” photo) were included in the review. The locations of **Area A through Area E** are shown on **Figure 7**. Photographs for each year of review and the Wetland Hydrology Recording from Aerial Imagery - Recording Form are included in **Appendix D**.

Area A exhibited wetland signatures in 0% of normal photos, did not require field verification, and is not a wetland based on the recording form decision matrix. In the field, Area A was a partly farmed and partly vegetated erosion control swale. A box structure covered with fill was also located in this area. No primary or secondary indicators of hydrology were observed during the 5-5-2024 site visit which occurred after a significant precipitation event. **Area A was determined to be non-wetland based on the results of the offsite hydrology review and field observations following a significant precipitation event (Appendix C).**

Area B exhibited wetland signatures in 17% of normal photos, did not require field verification, and is not a wetland based on the recording form decision matrix. In the field, Area B was a partly farmed and partly vegetated erosion control swale. No primary or secondary indicators of

hydrology were observed during the 5-5-2024 site visit which occurred after a significant precipitation event. ***Area B was determined to be non-wetland based on the results of the offsite hydrology review and field observations following a significant precipitation event (Appendix C).***

Area C exhibited wetland signatures in 33% of normal photos, and therefore required field verification based on the recording form decision matrix. In the field, Area C was flat plowed land with no primary or secondary indicators of hydrology observed. ***Area C was determined to be non-wetland based on field observations that lacked primary or secondary indicators of hydrology.***

Area D exhibited wetland signatures in 17% of normal photos, did not require field verification, and is not a wetland based on the recording form decision matrix. In the field, Area D was flat plowed land with no primary or secondary indicators of hydrology observed. ***Area D was determined to be non-wetland based on the results of the offsite hydrology review and field observations that lacked primary or secondary indicators of hydrology.***

Area E exhibited wetland signatures in 0% of normal photos, did not require field verification, and is not a wetland based on the recording form decision matrix. In the field, Area E was a farmed hillslope that may washout during high runoff events when bare soil is present. ***Area E was determined to be non-wetland based on the results of the offsite hydrology review and field observations that lacked primary or secondary indicators of hydrology.***

4.4 Other Areas

Grass Swale 1 (Figure 2) began at the southeast terminus of Wetland 1 and continued to the south site boundary. Grass Swale 1 was a concave swale located at an elevation of 1032 ft at its north end and an elevation of 1012 at its south end (drop in elevation of 20 ft).

Its parabolic bottom was completely vegetated with grasses including Kentucky bluegrass (FAC), smooth brome (FACU), orchardgrass (FACU), yellow foxtail (FAC), fescue (FACU), and reed canary grass (FACU) with lesser amounts of dandelion (FACU), red clover (FACU), annual ragweed (FACU), and Queen Anne's lace (UPL). No areas were dominated by > 50% reed canary grass cover.

This feature was not located in a mapped hydric soil unit. The secondary indicator of Geomorphic Position is not applicable in areas with functioning drainage systems (underlying tile and sloped feature with open outlet). Although this area was mapped as an R4SCB (riverine/surface flooding/seasonal) feature by the NWI map, the feature lacked a defined channel, bed, or bank. The feature lacked erosional gullies or other preferential surface flow pathways. The feature also lacked surface water/saturation during both the April 15 and May 5 site visits, which both occurred during a normal period, and immediately after a significant precipitation event (~1.8" within prior 4 days) for the May 5th visit (**Appendix C**). Grass Swale 1 began at the tile inlet that drained Wetland 1. Grass Swale 1 terminated where the underlying tile discharged at the south edge of the site. See photos in **Appendix E**.

Grass Swale 1 was determined to be non-wetland back on the lack of a dominant hydrophytic plant community and the lack of one primary or two secondary indicators of wetland hydrology.

Grass Swale 2 (Figure 2) began at the north-central site boundary and continued to the south/southwest. Grass Swale 2 was a relatively flat to slightly concave swale located at an elevation of 1034 ft at its north end and an elevation of 1022 at its south end (drop in elevation of 12 ft). The swale terminated at flat, plowed cropland and did not connect with Grass Swale 1.

Its slightly concave/parabolic to flat bottom was completely vegetated with grasses including Kentucky bluegrass (FAC), smooth brome (FACU), orchardgrass (FACU), yellow foxtail (FAC), and reed canary grass (FACW) with lesser amounts of dandelion (FACU) and red clover (FACU). No areas were dominated by > 50% reed canary grass cover.

This feature was not located in a mapped hydric soil unit. The secondary indicator of Geomorphic Position is not applicable in areas with functioning drainage systems (sloped feature with open outlet). Although this area was mapped as an R4SCB (riverine/surface flooding/seasonal) feature by the NWI map, the feature lacked a defined channel, bed, or bank. The feature lacked erosional gullies or other preferential surface flow pathways. The feature also lacked surface water/saturation during both the April 15 and May 5 site visits, which both occurred during a normal period, and immediately after a significant precipitation event (~1.8" within prior 4 days) for the May 5th visit (**Appendix C**). Grass Swale 2 terminated at flat, plowed cropland and did not connect with Grass Swale 1. See photos in **Appendix E**.

Grass Swale 2 was determined to be non-wetland back on the lack of a dominant hydrophytic plant community and the lack of one primary or two secondary indicators of wetland hydrology.

No other depressional areas with hydrophytic vegetation or wetland hydrology were observed on the site. No other areas were shown as hydric soil on the soil survey or as wetland on the NWI map.

4.5 Request for Wetland Boundary and Jurisdictional Determination

Appendix A of this report includes a Joint Application Form for Activities Affecting Water Resources in Minnesota, which is submitted in request for: (1) a wetland boundary and type determination approval from the Goodhue County SWCD under the Minnesota Wetland Conservation Act (WCA), and (2) delineation concurrence plus Approved Jurisdiction Determinations (AJDs) for Grass Swale 1 and Grass Swale 2 under Section 404 of the Federal Clean Water Act from the U.S. Army Corps of Engineers (USACE).

312 CR 11 NW, Pine Island Township

Wetland Delineation Report

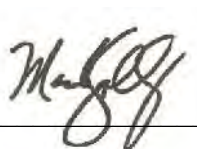
5. CERTIFICATION OF DELINEATION

The procedures utilized in the described delineation are based on the U.S. Army Corps of Engineers 1987 Wetlands Delineation Manual as required under Section 404 of the Clean Water Act and the Minnesota Wetland Conservation Act. This wetland delineation and report were prepared in compliance with the regulatory standards in place at the time the work was performed.

Site boundaries indicated on figures within this report are approximate and do not constitute an official survey product.

Delineation completed by: Melissa Lauterbach-Barrett, Wetland Specialist
Minnesota Certified Wetland Delineator No. 1085

Report prepared by: Melissa Lauterbach-Barrett, Wetland Specialist
Minnesota Certified Wetland Delineator No. 1085

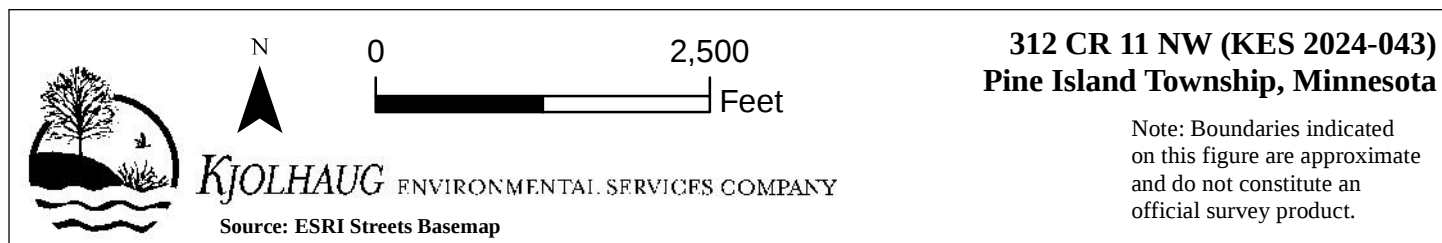
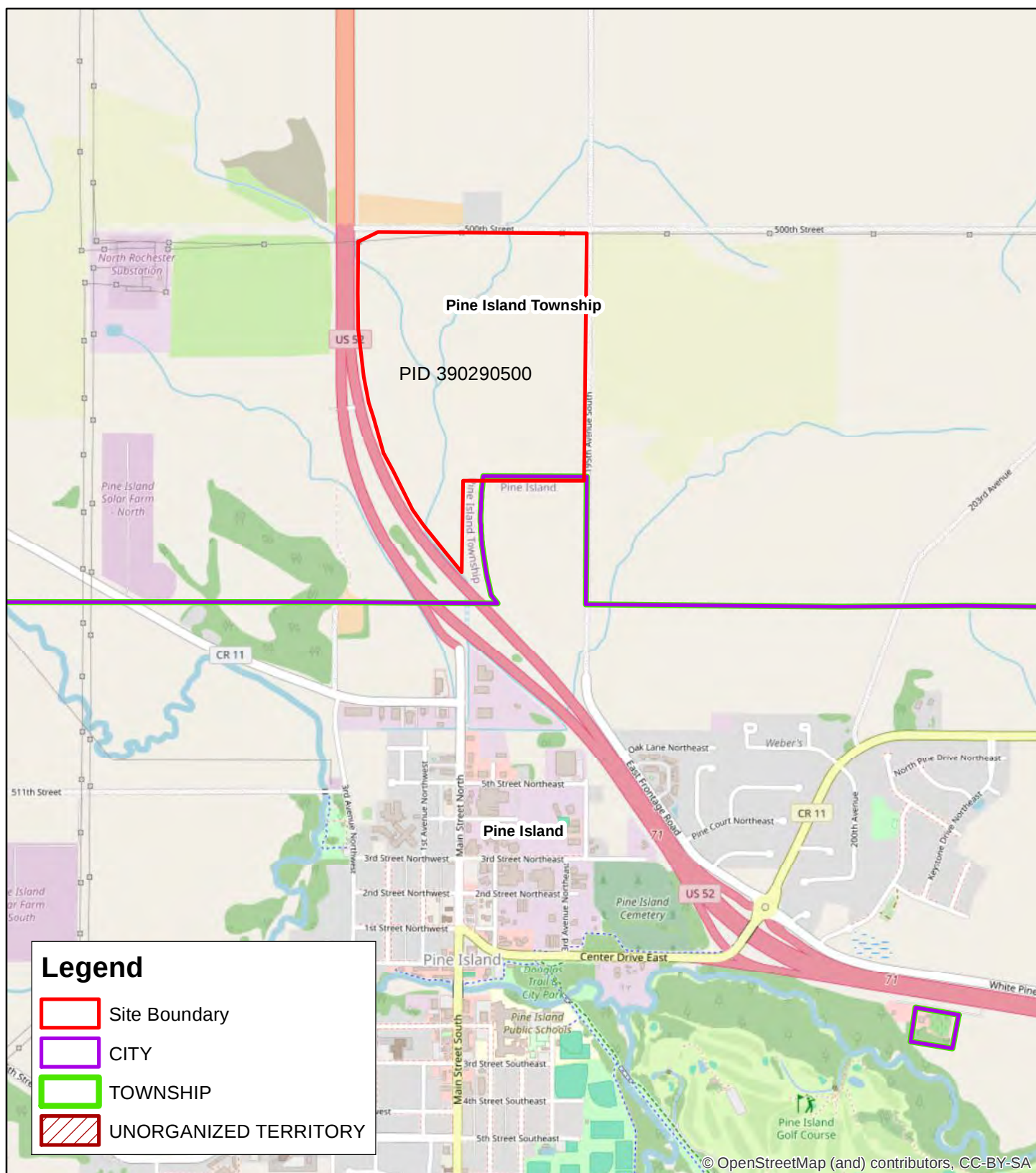
Report reviewed by:  Date: May 15, 2024
Mark Kjolhaug, Professional Wetland Scientist No. 000845

312 CR 11 NW, Pine Island Township

Wetland Delineation Report

FIGURES

1. Site Location
2. Existing Conditions
3. National Wetlands Inventory
4. Soil Survey
5. DNR Protected Waters Inventory
6. National Hydrography Dataset
7. Offsite Hydrology Assessment Areas



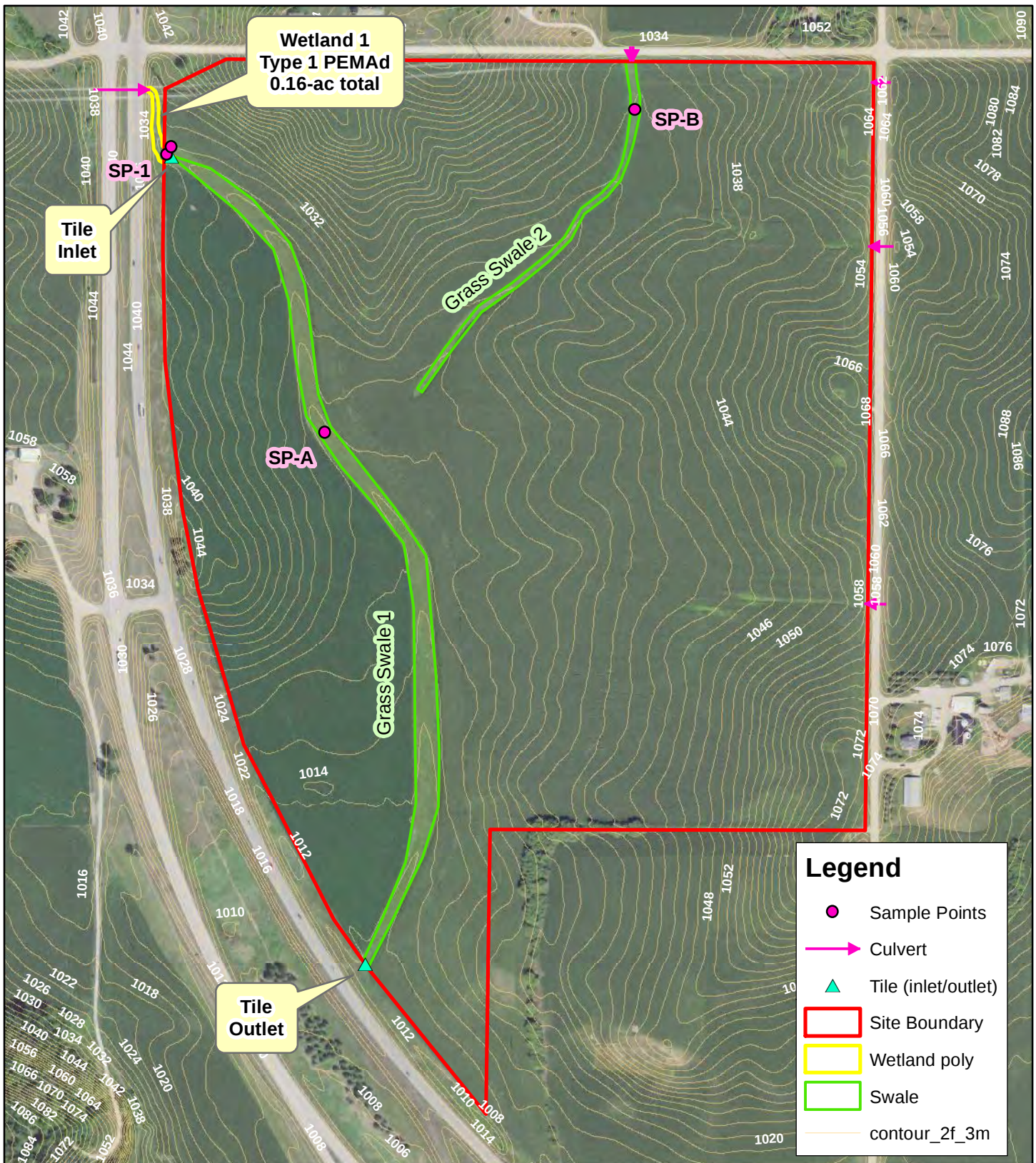


Figure 2 - Existing Conditions (8-13-2021 FSA Photo)



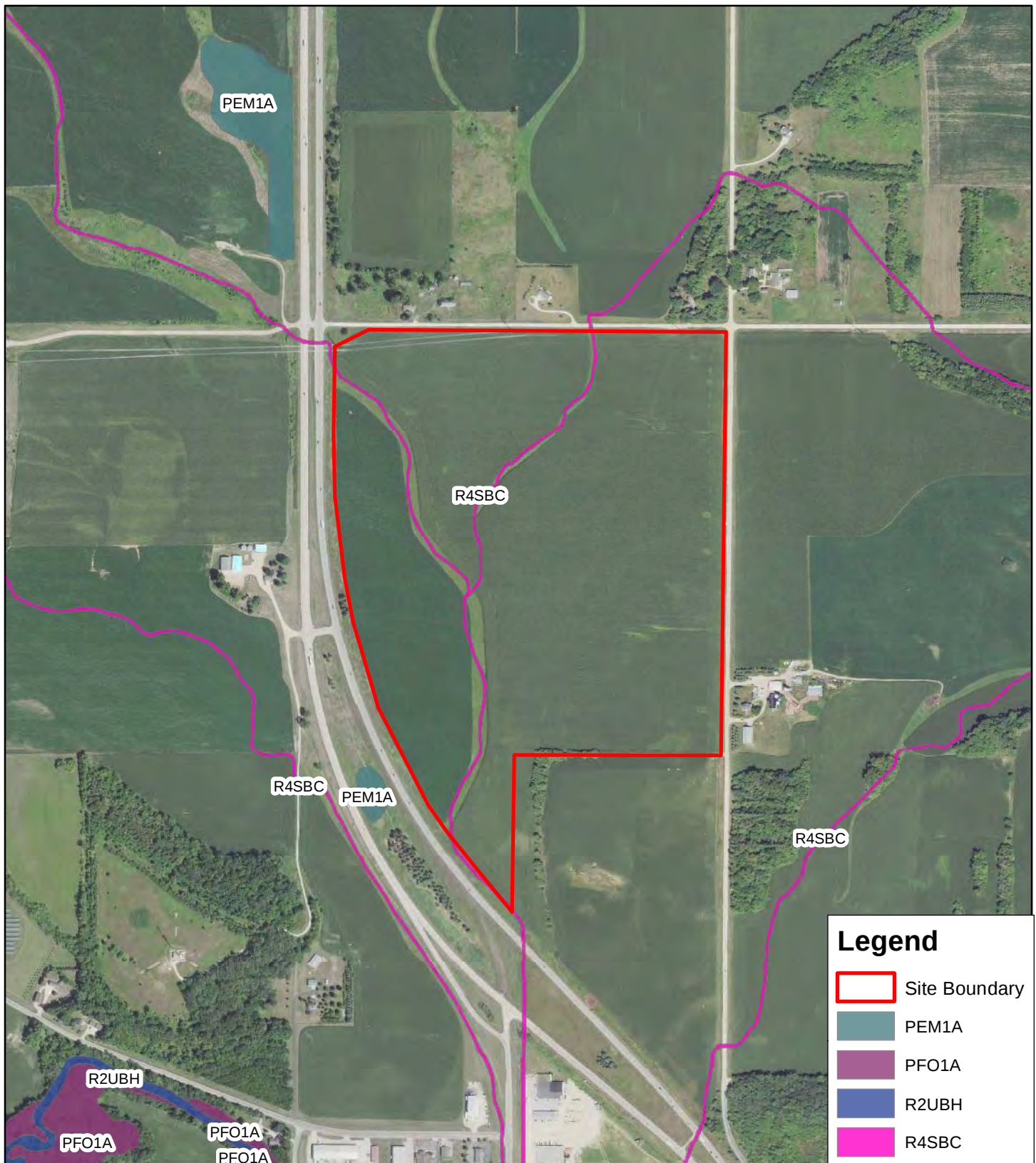
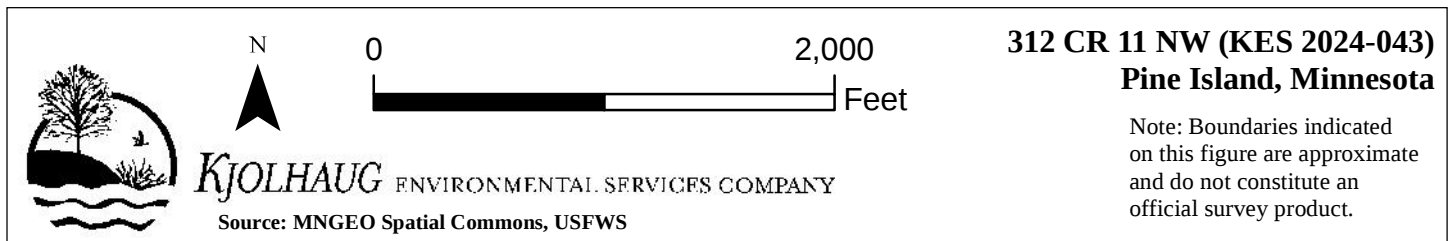


Figure 3 - National Wetlands Inventory



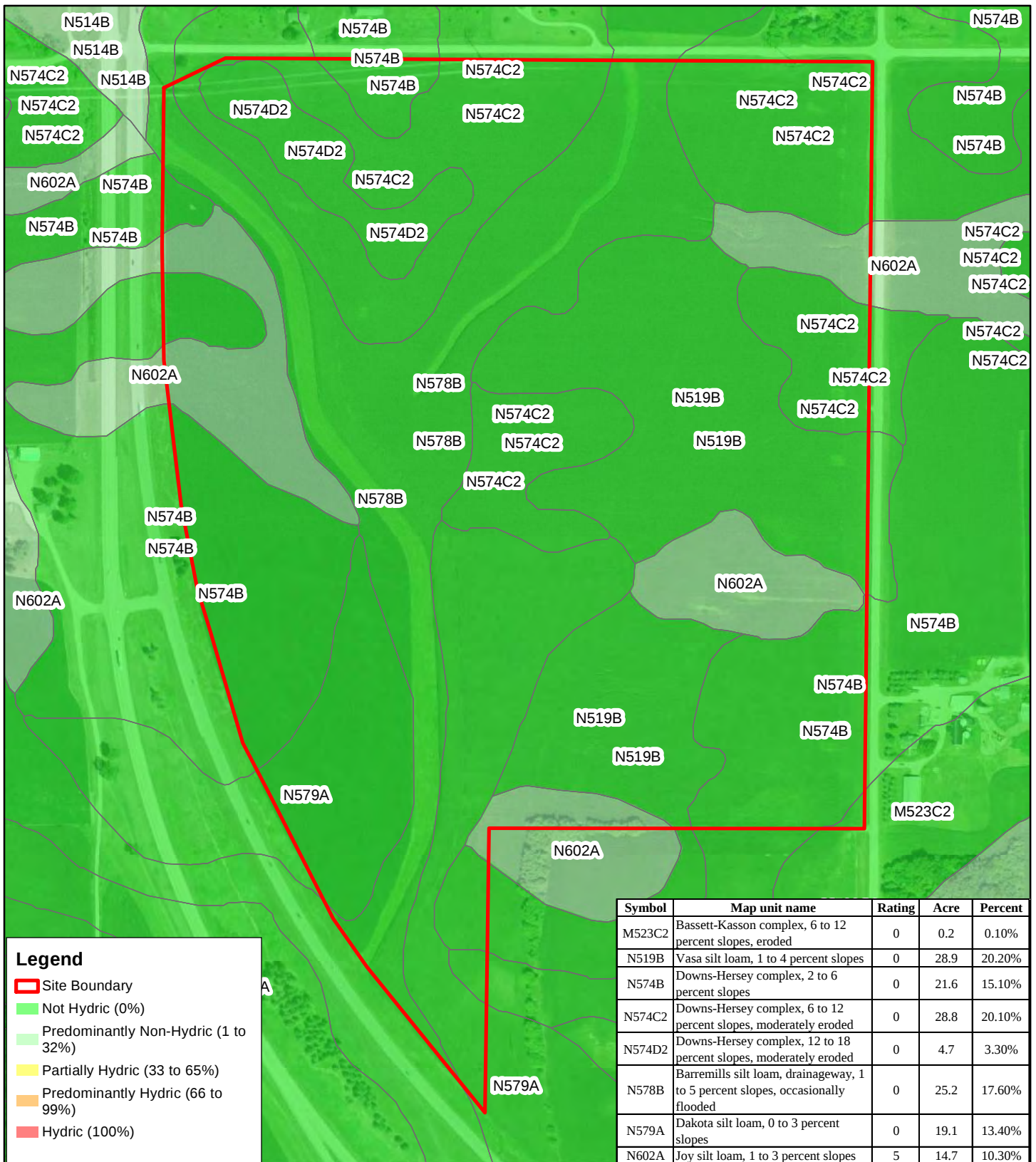


Figure 4 - Soil Survey



KJOLHAUG ENVIRONMENTAL SERVICES COMPANY
Source: MNGEO Spatial Commons, USDA, NRCS

N

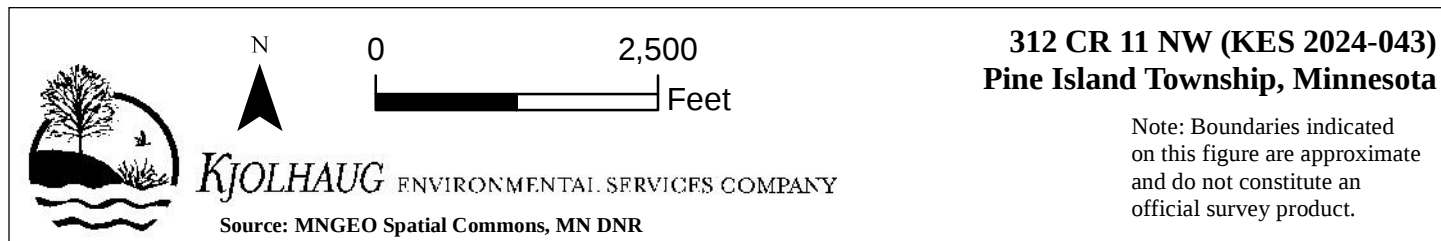
0 500 Feet

312 CR 11 NW (KES 2024-043)
Pine Island, Minnesota

Note: Boundaries indicated on this figure are approximate and do not constitute an official survey product.



Figure 5 - DNR Public Waters Inventory



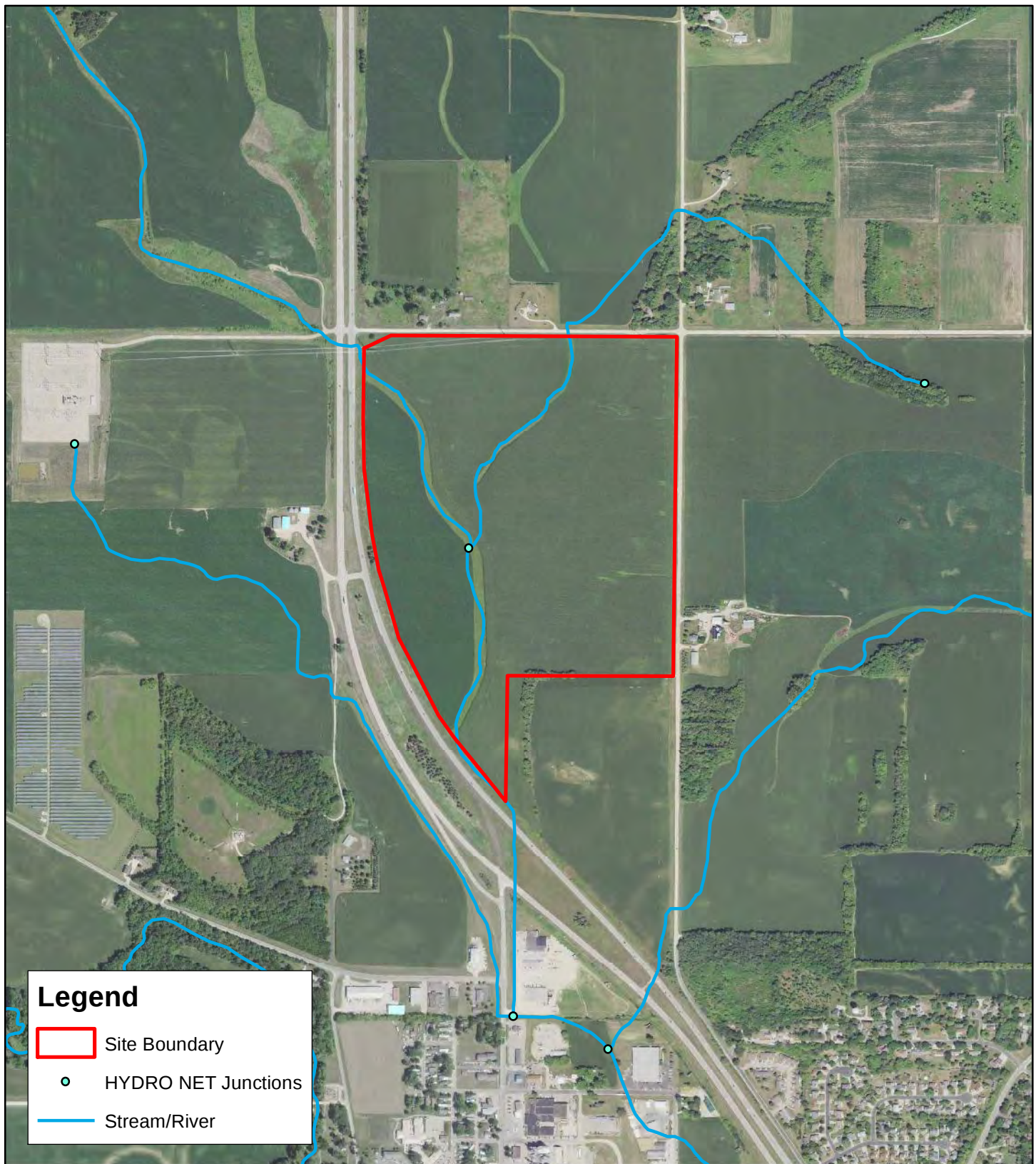


Figure 6 - National Hydrography Dataset



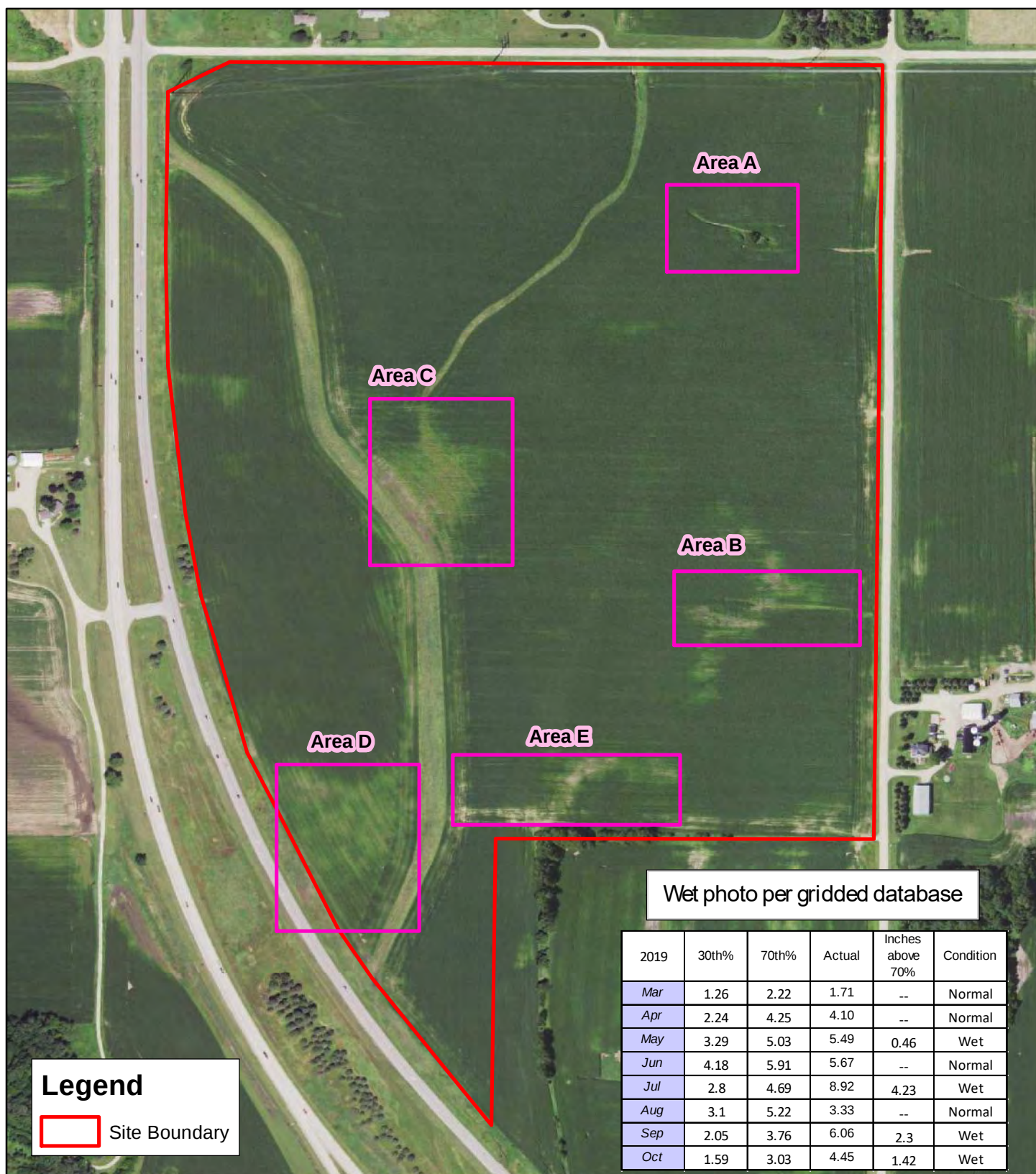


Figure 7 - Offsite Hydrology Assessment Areas (7-27-2019 FSA Photo - Wet)





Minnesota Wetland Conservation Act Notice of Decision

Local Government Unit: Goodhue SWCD	County: Goodhue
Applicant Name: Ryan Companies (Johnathon Blaha)	
Applicant Representative: Melissa Barrett, Kjolhaug	
Project Name: Manthei & Walters Parcels	LGU Project No. (if any): 2025-GC-WCA-05
Date Complete Application Received by LGU: 05/02/2025	
Date of LGU Decision: 05/28/2025	
Date this Notice was sent: 05/29/2025	

WCA Decision Type - check all that apply

☒ Wetland Boundary/Type	☐ Sequencing	☐ Replacement Plan	☐ Bank Plan (not credit purchase)
☐ Exemption	☐ No-Loss (8420.0415)		
MN Rules 8420.0420	Part: ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G ☐ H		
Subpart: ☐ 4 ☐ 5 ☐ 7 ☐ 9			
MN Statutes 103G.2241			
Subdivision: : ☐ 1 ☐ 2 ☐ 6 ☐ 9			

Replacement Plan Impacts (replacement plan decisions only)

Total WCA Wetland Impact Area:
Wetland Replacement Type: ☐ Project Specific Credits - Number of Credits:
☐ Bank Credits – Number of Credits:
Bank Account Number(s):

Technical Evaluation Panel Findings and Recommendations (attach if any)

☒ Approve ☐ Approve w/Conditions ☐ Deny ☐ No TEP Recommendation
--

LGU Decision

☐ Approved with Conditions (specify below) ¹ List Conditions:	☒ Approved ¹	☐ Denied
Decision-Maker for this Application: ☒ Staff ☐ Governing Board/Council ☐ Other:		
Decision is valid for: ☒ 5 years (default) ☐ Other (specify):		

¹ *Wetland Replacement Plan approval is not valid until BWSR confirms the withdrawal of any required wetland bank credits. For project-specific replacement a financial assurance per MN Rule 8420.0522, Subp. 9 and evidence that all required forms have been recorded on the title of the property on which the replacement wetland is located must be provided to the LGU for the approval to be valid.*

LGU Findings – Attach document(s) and/or insert narrative providing the basis for the LGU decision¹.

☐ Attachment(s) (specify):	☒ Summary: TEP met and drove by the site. TEP concurs with the determination of no wetlands on site. One incidental wetland has occurred in the ditch however, TEP concurred that wetland 1 incidentally formed due to the prevention of drainage by the roadway shoulder and a slight rise in topography in the ditch.
---	---

¹ Findings must consider any TEP recommendations.

Attached Project Documents

☒ Site Location Map ☐ Project Plan(s)/Descriptions/Reports (specify):

Appeals of LGU Decisions

If you wish to appeal this decision, you must provide a written request within 30 calendar days of the date you received the notice. All appeals must be submitted to the Board of Water and Soil Resources Executive Director along with a check payable to BWSR for \$500 *unless* the LGU has adopted a local appeal process as identified below. The check must be sent by mail and the written request to appeal can be submitted by mail or e-mail. The appeal should include a copy of this notice, name and contact information of appellant(s) and their representatives (if applicable), a statement clarifying the intent to appeal and supporting information as to why the decision is in error. Send to:

Appeals & Regulatory Compliance Coordinator
Minnesota Board of Water & Soils Resources
520 Lafayette Road North
St. Paul, MN 55155
travis.germundson@state.mn.us

Does the LGU have a local appeal process applicable to this decision?

☐ Yes¹ ☒ No

¹If yes, all appeals must first be considered via the local appeals process.

Local Appeals Submittal Requirements (LGU must describe how to appeal, submittal requirements, fees, etc. as applicable)

Notice Distribution (include name)

Required on all notices:

☒ SWCD TEP Member: Ben Dvorak	☒ BWSR TEP Member: Jed Chestnut
☒ LGU TEP Member (if different than LGU contact): Willie root (Goodhue County)	
☒ DNR Representative: Ryan Tebo	
☐ Watershed District or Watershed Mgmt. Org.:	
☒ Applicant: Johnathon Blaha	☒ Agent/Consultant: Melissa Barrett, Kjolhaug

Optional or As Applicable:

☒ Corps of Engineers: Raelene Hegge	
☐ BWSR Wetland Mitigation Coordinator (required for bank plan applications only):	
☐ Members of the Public (notice only):	☐ Other:

Signature: <i>Ben Dvorak</i>	Date: 05/29/2025
--	----------------------------

This notice and accompanying application materials may be sent electronically or by mail. The LGU may opt to send a summary of the application to members of the public upon request per 8420.0255, Subp. 3.

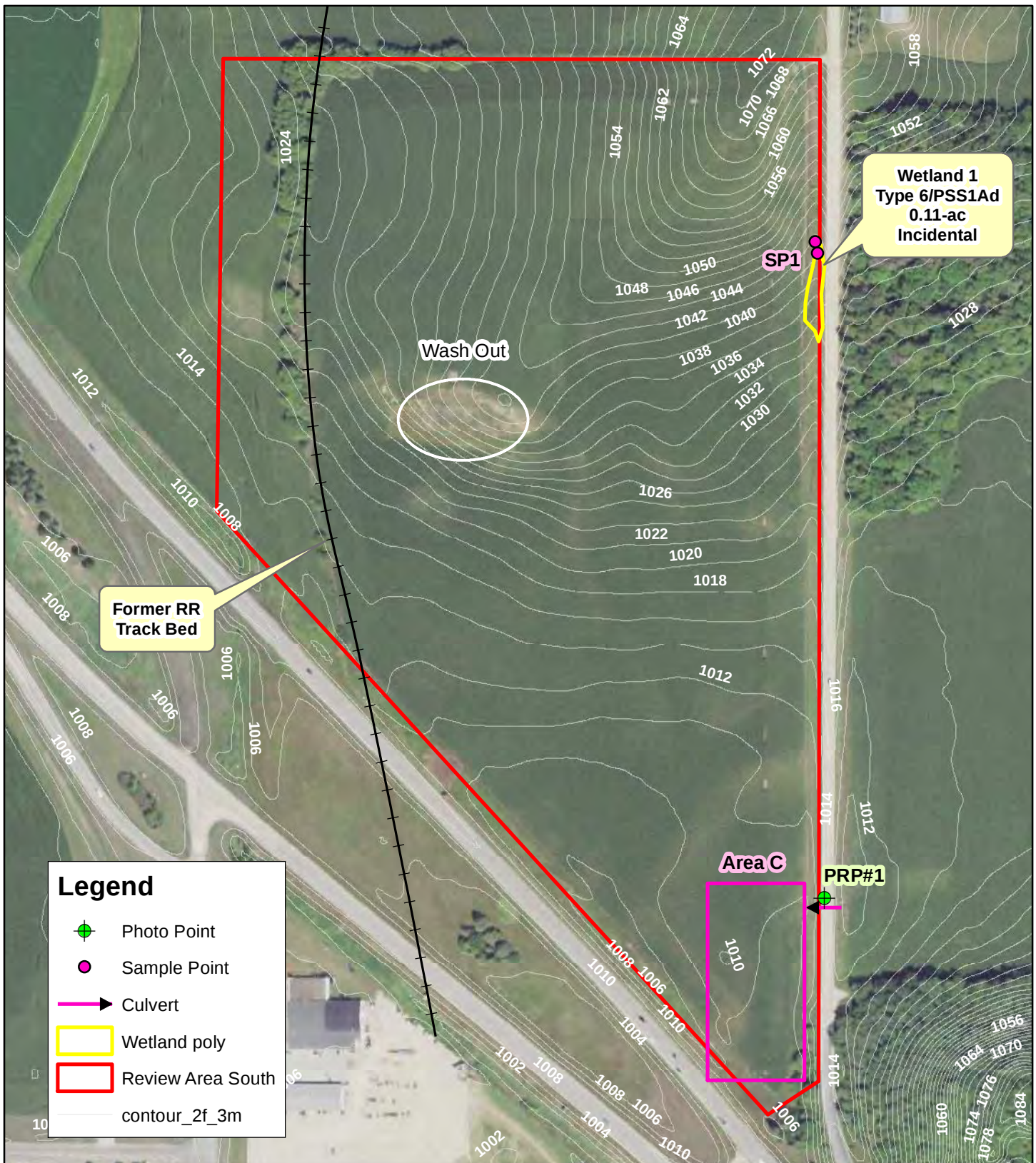


Figure 2 - Existing Conditions (8-13-2021 FSA Photo)



This page is intentionally left blank.