MINNESOTA
PUBLIC UTILITIES COMMISSION

DRAFT APPLICATION GUIDANCE FOR LARGE ENERGY INFRASTRUCTURE FACILITIES IN MINNESOTA

MINNESOTA PUBLIC UTILITIES COMMISSION GUIDANCE FOR PREPARING SITE AND ROUTE PERMIT APPLICATIONS FOR LARGE ENERGY INFRASTRUCTURE FACILITIES

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List of Acronyms and Abbreviations

AIMP	Agricultural Impact Mitigation Plan
ALJ	Administrative Law Judge
DNR	Minnesota Department of Natural Resources
EA	Environmental Assessment
EIP	Energy Infrastructure Permitting
EIS	Environmental Impact Statement
EMF	Electric and Magnetic Fields
EQB	Environmental Quality Board
GHG	Greenhouse Gas
IPaC	Information for Planning and Consultation
kV	kilovolt
MCE	Minnesota Conservation Explorer
MDA	Minnesota Department of Agriculture
MISO	Midcontinent Independent System Operator
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MW	Megawatts
PPA	Power Purchase Agreement
PUC	Minnesota Public Utilities Commission
RIM	Reinvest in Minnesota
ROI	Region of Influence
ROW	right of way
SHPO	Minnesota State Historic Preservation Office
USFWS	US Fish and Wildlife Service
VMP	Vegetation Management Plan

1 INTRODUCTION AND OVERVIEW OF THE PERMITTING PROCESS

1.1 Introduction

Under the Minnesota Energy Infrastructure Permitting Act (Minn. Stat. § 216I (2024)), the Minnesota Legislature has declared the policy of the state is to locate large electric power facilities in an orderly manner compatible with environmental preservation and the efficient use of resources. The legislature has charged the Public Utilities Commission (PUC) with choosing locations that minimize adverse human and environmental impact while ensuring continuing electric power system reliability and integrity while meeting electric energy needs in an orderly and timely fashion.

Large energy infrastructure facilities include:

- High voltage transmission lines, which are conductors of electric energy and associated facilities that are designed for and capable of operation at a nominal voltage of 100 kilovolts or more and greater than 1,500 feet in length.
- Large electric power generating plants, which are electric power generating equipment and associated facilities designed for or capable of operating at a capacity of 50 megawatts (MW) or more.
- Energy storage systems: equipment and associated facilities with a nameplate capacity of 10 MW or more that are capable of storing generated electricity for a period of time and delivering the electricity for use after storage.
- Large wind energy conversion systems, which are a combination of devices including, but not limited to a wind charger, windmill or wind turbine and associated facilities with a combined nameplate capacity of 5 MW or more.[1]

A complete permit application is a critical element for large energy infrastructure facilities seeking a site or route permit from the PUC. Preparing a thorough, complete, and organized application benefits applicants, the PUC, other agencies, and members of the public. An incomplete or unorganized application can lead to permitting delays.

The Minnesota Energy Infrastructure Permitting Act requires applicants seeking a site or route permit from the PUC to provide a draft permit application to PUC staff for review prior to formally submitting the application to the PUC. The act directs PUC staff to focus its review on application completeness and clarifications that may assist the PUC's review of the application and to provide the applicant with a summary of the completeness review.[2]

This document is intended to assist project proposers during permit application development by providing a "plain meaning" understanding of Minn. Stat. § 216I, where applicable, with a summary of suggested assessment and evaluation practices based on previous PUC decisions and permitting activities. The document contents reflect practices based on the applicable PUC permitting decisions,

[1] Minn. Stat. 216I.02.subd. 10
[2] Minn. Stat. 216I.05, subd. 6

statutes, regulations, and administrative procedures as of the date of publication but are subject to change. For official legal interpretations, technical advice, or clarification, citizens and project proposers are encouraged to consult with their own legal counsel, consultant, or the PUC, to address project-specific details.

1.2 Role of the PUC and Other Agencies

The PUC regulates electricity, natural gas, and telephone service industries in Minnesota and is responsible for issuing site and route permits for large energy infrastructure facilities defined in Minn. Stat. §216I.02, subd. 10.

Site and route permits supersede local zoning, building, and land use rules.[3] However, the PUC's decision must be guided, in part, by consideration of impacts to local zoning and land use in accordance with the legislative goal to "minimize human settlement and other land use conflicts."[4] Therefore, the PUC can and does consider local impacts and preferences regarding these resources when considering permit applications.

Stakeholders, including other state agencies, federal agencies, tribal governments, local units of government, and any member of the public may review and comment on large energy infrastructure facilities during the permitting process.

As part of the permitting process, an administrative law judge (ALJ) from the Office of Administrative Hearings will conduct a public hearing. The hearing provides the public and other interested parties an opportunity to present information that may be relevant to the project, ask questions, and offer preference for a proposed alternative, which they think the PUC should consider in their permitting decision. After the hearing comment period closes, the ALJ writes a report summarizing the record and makes recommendations to the PUC on whether to grant a permit and what conditions to include.

A site or route permit issued by the PUC does not preclude the need to obtain required permits from other state and federal agencies.[5] Applicants are responsible for identifying and obtaining the necessary permits or approvals required for the project prior to beginning construction.

1.3 Overview of the Large Energy Infrastructure Permitting Process

Depending upon the type and size of the facility seeking a permit, the PUC will review the application under either the standard review process or major review process.

- **Standard Review**: Applicants may elect to seek review under the standard review process for many types of large energy infrastructure facilities. The following types of facilities are eligible for standard review:
    - large electric power generating plants with a capacity of less than 80 megawatts;
    - large electric power generating plants that are fueled by natural gas;

[3] Minn. Stat. 216I.18, subd. 1
[4] Minn. Stat. 216I.05, subd. 11(2)
[5] Minn. Stat. 216I.05, subd. 18

- high-voltage transmission lines with a capacity between 100 and 300 kilovolts;
- high-voltage transmission lines with a capacity in excess of 300 kilovolts and less than 30 miles in length in Minnesota;
- high-voltage transmission lines with a capacity in excess of 300 kilovolts, if at least 80 percent of the distance of the line in Minnesota, as proposed by the applicant, is located along existing high-voltage transmission line right-of-way;
- solar energy systems;
- energy storage systems; and
- large wind energy conversion systems.[6]

- **Major Review**: Large energy infrastructure facilities not specifically identified under Minn. Stat. § 216I.07, subd. 2 must be evaluated under the major review process. An applicant may elect to have a project reviewed under the major review process for any large energy infrastructure facility.

The differences between the review processes are

- **Environmental Review**: Under the standard review process the application must contain an environmental assessment (EA) with information on the proposed project's human and environmental impacts and potential mitigation measures associated with the identified impacts.[7] If, following the public meeting and comment period, the PUC determines that an addendum to the EA is needed it will prepare an addendum.[8] Under the major review process the PUC prepares an environmental impact statement (EIS).[9]
- **Timeframe**: Under the standard process, the PUC has six months from application completeness to make a permit decision. Under the major process, the PUC has twelve months for its permit decision. For both processes, the PUC may extend this deadline for cause or with agreement from the applicant by up to three months.

Table 1 provides an overview of key milestones and tasks in the standard review process. Both review processes require:

- Applicants to provide PUC staff with a draft of the application prior to submitting the application in the eDockets system.
- Applicants to submit the application to the PUC through the Docketing system.
- PUC to determine application completeness and provide notice of the application and public meeting.
- PUC to hold a public information meeting in the project area.
- PUC to issue a draft permit and identify the scope of the EA addendum (as applicable in the standard process) or an EIS in the major process.

[6] Minn. Stat. 216I.07, subd. 2
[7] Minn. Stat. 216I.07, subd. 3(a)
[8] Minn. Stat. 216I.07, subd. 3(b)
[9] Minn. Stat. 216I.06, subd. 1

- A public hearing in the project area.
- PUC to decide on issuance of a permit and any appropriate conditions.

Table 1. Overview of Permitting Processes

Milestone	Responsible Party & Activities	eDockets Filing	Process Dates		
			Standard Review		Major Review
Pre Application Activities					
Pre-Application	Applicant consults with tribes, federal agencies, state agencies, local governments.	None	Prior to draft application		
Applicability Determination	If desired, Applicant files request for determination	Request for Determination	Prior to draft application		
	PUC staff makes applicability determination	Applicability Determination	Within 30 days of applicability request		
Draft Application Review	Applicant provides draft application and supporting materials	None	~ 2-3 -months prior to filing application		
	PUC staff reviews draft application	None	Within 4 weeks of receiving draft application		
Application Filing and Review					
Application Filed	Applicant files application	Application	–10		
Completeness Determination and Public Notice of Info/Scoping Mtg	PUC staff provides notice to the official, state agency reps, Tribal Governments, Tribal THPOs, state agency reps and project contact lists & publishes in local newspapers	Notice	0		
Public Meeting & Comment Period	PUC staff conducts public meetings and seeks public comment	Presentations and Public Comments	20 - 30		
PUC Meeting	PUC determines draft permit conditions and need & scope for EA Addendum or EIS	Notice	60		
Draft Permit Issued	PUC issues draft permit	Draft Permit	70		
Scoping Decision	PUC issues scoping decision for EA Addendum/EIS	Scoping Decision	N/A	70	70
EA Addendum/ Draft EIS	PUC Staff files EA Addendum/ Draft EIS	EA Addendum/ Draft EIS	N/A	120	180
Notice of Public Hearings	PUC Staff issues Notice of Public Hearing	Notice	75	125	185
Public Hearing and Comment Period	ALJ conducts public hearings, followed by written comment period	Public Comments	90 - 100	140 - 150	200 - 225
	PUC Staff issues Final EIS	Final EIS	N/A		265
	Applicant responds to public comments & proposes findings	Applicant Response and Proposed Findings	107	157	272

	PUC Staff responds to public comments & Applicant's proposed findings	Hearing Comments	121	171	286
ALJ Report	ALJ issues report	ALJ Report	151	201	325
Exceptions	Applicant and parties file exceptions to ALJ Report	Exceptions (15 days) 7829.2700, Subp. 1	166	216	340
PUC Agenda Meeting	PUC meeting to decide on permit and any conditions	Meeting Notice	180	245	365

1.3.1 Applicability Determination

Applicants seeking an applicability determination should submit a form, along with a cover letter addressed to the PUC executive secretary requesting a determination of permit applicability.

1.3.2 Draft Application and Review

Applicants must provide a draft of the application, including the required EA information, to PUC staff prior to filing the application.[10] Required and recommended application content is discussed in Section 3 of this document. PUC staff will provide applicants with review comments in a timely manner and will communicate with and develop the schedule with the applicant. Staff recommends applicants provide a draft application two to three months prior to filing the application to allow time for PUC staff to thoroughly review the application and for applicants to address PUC staff comments.

Along with the draft application, applicants should provide PUC staff with GIS shapefiles used in preparing the draft application, addresses for property owners and local governments, and publication deadlines for local newspapers to assist in the development of maps and a draft notice for filing when the application is accepted as complete.

1.3.3 Application Filing and Completeness Determination

The PUC will determine an application's completeness within 10 working days of submission. The application may still be considered complete if missing information that may be obtained from the applicant prior to the public meeting and the missing information is not essential to provide adequate public notice.[11]

Once the PUC determines an application is complete it will file a notice of application describing:

- The proposed project;
- Information on how a person may receive more information and future notices of the proposed project;
- A location where a copy of the application may be reviewed; and
- Information on the date and location of the public meeting(s) in the project area and information on how to submit comments.

[10] Minn. Stat. 216I.07, subd. 3(a)
[11] Minn. Stat. 216I.05, subd. 7

The notice will be published in local newspapers and provided to Minnesota tribal governments, local and regional governments, property owners within or adjacent to the proposed site or route, and other interested persons.[12] Staff will ask the applicant for contact information for property owners and will request the applicant's assistance in publishing the notice in local newspapers.

1.3.4 Public Information Meeting and Comment Period:

The PUC will hold at least one public meeting in the project area to describe the proposed facility, explain the permitting process, present major issues associated with the proposed facility, seek public comments on whether the PUC should prepare an EA addendum, and respond to questions raised by the public. PUC practice is to hold at least one in-person meeting as well as a remote-access meeting. For some projects, particularly long transmission lines, staff may hold multiple in-person meetings to accommodate members of the public. A comment period of at least 10 days following the public meeting will be open to accept comments on potential impacts of alternative sites or routes to be considered in the addendum and potential permit conditions.[13] Staff recommends coordinating with applicants on potential meeting dates and locations during the review of the draft application to allow meeting notices to be issued at the time of completeness determination or shortly thereafter. Staff recommends that the applicant attend the public meeting and be prepared to discuss the proposed facility, and the information contained in the application.

1.3.5 Draft Permit and Environmental Review Scoping Decision

Following the close of the comment period, the PUC will prepare a draft site or route permit and identify the scope of the EIS or, if a need for one is identified, an EA addendum.[14] The PUC will make its determination at a regularly scheduled agenda meeting.[15]

PUC staff will review comments and make recommendations to the PUC on the contents of the draft permit and the scope of environmental review. The draft permit will identify the permittee for the facility, describe the proposed project, and include proposed permit conditions. If, after the public meeting and associated comment period, the PUC identifies other sites or routes or potential impacts for review, the PUC will issue a scope for identifying the site or route alternatives and impacts to be evaluated in an EA addendum.[16] .[17] For facilities reviewed under the major review process, the PUC will identify the scope of the EIS and the alternatives to be examined.

Depending upon the number and complexity of alternatives and the availability of information, staff anticipates that an EA addendum will take 30 – 60 days to prepare and 90- 120 days for a draft EIS to be developed. If additional sites or routes are reviewed, staff will request the applicant provide contact information for landowners within and adjacent to the site or route alternatives so that it can notify new landowners potentially affected by the alternative(s). Staff anticipates requesting assistance from applicants in providing information on the alternatives.

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[12] Minn. Stat. 216I.05, subd. 8
[13] Minn. Stat. 216I.05, subd. 9
[14] Minn. Stat. 216I.05, subd. 10
[15] For more information on PUC meetings see: https://mn.gov/puc/activities/meetings/
[16] Minn. Stat. 216I.05, subd. 10(2) and Minn. Stat. Minn. Stat. 216I.07, subd. 3(b)
[17] Minn. Stat. 216I.05, subd. 10(1)

1.3.6 Hearing and ALJ Report

The PUC will hold a hearing in the project area after the draft permit and draft EIS (or EA addendum if ordered) is issued. The PUC will post notice of the hearing to eDockets provide the notice to those on the project service list. The PUC, with the assistance of the applicant, will publish notice of the hearing in local newspapers and mail notice to regional and local governments and Tribal governments. [18] Although not required by statute, staff will also mail the notice to interested persons.

The PUC will request that the Office of Administrative Hearings assign an ALJ to conduct the hearing. Following the hearing, interested persons may submit written comments into the record.

Interested persons may comment on the application, the EA addendum or draft EIS during the hearing comment period. Staff will prepare and file a final EIS that addresses the comments on the draft EIS and will address comments on the EA addendum in hearing comments.

Following the close of the public comment period, typical practice is for the applicant to provide a response to comments received and then provide its proposed findings of fact to the ALJ. Following the applicant's filing, staff files its response to public comments and a response to the applicant's proposed findings. Following the close of the comment and reply period (usually approximately 30 days after the close of comments and reply comments if any) the ALJ will prepare a report with findings, conclusions, and recommendations. The applicant and other parties have 15 days following the ALJ report to file exceptions.

1.3.7 PUC Decision

The PUC has up to 60 days following ALJ report (or the close of the comment period if there is no ALJ report) to make a final decision on the application.[19] Following the end of the exception period, staff will prepare a briefing paper summarizing the record and highlighting the PUC's decision options.

1.4 How to Use this Document

This document provides information and recommendations on how to prepare a complete site or route permit application for large energy infrastructure facilities seeking a permit from the PUC. It also includes information on the permitting process, pre-application consultation, and filing requirements. The guidance identifies the statutorily required elements of a permit application and provides staff recommendations on developing and presenting the required information as well as additional information based on previous large energy infrastructure proceedings. Additionally, this document serves as the framework for organizing the application, including relevant appendices.

This document is organized into five parts:

1: Introduction and Overview of the Permitting Process

2: Pre-Application Activities and How to File

3: Permit Application Content and Guidelines

[18] Minn. Stat. 216I.07, subd. 4(a) and (b)
[19] 216I.07, subd. 5

4: Facility Specific Contents and Guidelines

5. Typical Application Appendices and Guidelines

This guidance is intended for information purposes only and does not constitute legal or technical advice, nor is it an official interpretation of law. This guidance is not a promulgated rule or regulation under the Minnesota Administrative Procedure Act and should not be construed as such, meaning it is not legally binding and does not have the force or effect of law.

Rather, this document is guidance - a permitting practice support document, offering a "plain meaning" understanding of Minn. Stat. § 216I, where applicable, with a summary of suggested assessment and evaluation practices based on previous PUC decisions and permitting activities, to assist project proposers during application development. This document's contents reflect practices based on applicable PUC permitting decisions, statutes, regulations, and administrative procedures as of the date of publication but are subject to change. For official legal interpretations, technical advice, or clarification, citizens and project proposers are encouraged to consult with their own legal counsel, consultant, or the PUC, to address project-specific details. Questions or feedback related to the practices outlined in this document should be directed to [Name, email, phone].

2 PRE-APPLICATION ACTIVITIES AND HOW TO FILE

While the specific public sector entities that an applicant will need to notify will vary by project, applicants should identify the local, state, and federal agencies, and tribal governments that will have a role in the permit application development, either as a source of information, or, as the source of a "downstream" permit. Notifying and engaging stakeholders early on ensures a smoother, more efficient permitting and environmental review process, while also reducing the risk of contention. Failure to notify governmental authorities at any level, including tribal government, may lengthen the permit review process, as the PUC carefully weighs agency, tribal, and local government recommendations and concerns.

In addition to engaging governmental agencies and tribes, staff recommends engaging landowners and nearby communities throughout project development. Engaging landowners near the proposed project as well as communities near the project can be helpful in ensuring a smoother, more efficient permitting and environmental review process, while also reducing the risk of contention. Engagement is a smart 'good neighbor' policy.

This section identifies the primary content-related topics common to all PUC permit applications under Minn. Stat. § 216I

2.1 Pre-Application Coordination with PUC

Staff recommends that applicants contact the Energy Infrastructure Permitting (EIP) manager to discuss the proposed facility several months before submitting a draft application for review. The EIP manager will assign staff based on availability and expertise and can direct applicants to appropriate resources.

- **Docket Number**: Applicants should contact the Department of Commerce (marcella.emeott@state.mn.us) to request a docket number. In the request, applicants should provide the company name, regulatory address and regulatory contact person for the project, the docket description, and the docket type(s) (energy storage system (ESS), generation siting – non wind (GS), Transmission Line (TL) and/or wind siting (WS)).
- **Applicability Determination**: Applicants seeking an applicability determination should submit a form, along with a cover letter addressed to the PUC executive secretary requesting a determination of permit applicability. A copy of the form can be found on the PUC's website.
- **Draft Application**: Applicants must provide a draft application to PUC staff for review. As the draft application is not formally filed with the PUC,[20] staff recommends the applicant coordinate with staff to discuss timing and the method for sharing the draft (e-mail, file transfer site, etc.). Staff recommends applicants provide the draft application two to three months prior to the anticipated filing date to allow adequate time for PUC staff to review the application and for applicants to respond to staff comments. Permit application content is discussed in Section 3. PUC staff will focus comments on completeness but may also make recommendations on clarity and presentation of the information to assist in application review and permitting of the facility.

[20] Minn. Stat. 216I, subd. 6(a)

2.2 Pre-Application Coordination with Local, State, and Federal Agencies

Staff recommends that applicants reach out to local, state, and federal agencies well before the draft application is provided to PUC staff for review. Staff recommends that applicants contact:

- **Local Governments**: The actual contact information will vary by location, but applicants should contact each city, township, and county in which the site or route is located. Local governments can provide historical knowledge of the project area and have an idea of what their constituents will care about and be concerned about. Additionally, local governments may wish to coordinate their own projects, such as road improvements, with the timing of the proposed project. Staff encourages applicants to keep local governments informed throughout project development, permitting, construction, and operation. Failing to notify local governments can lengthen the review process.
- **State Technical Resource Agencies**: Applicants should inform state agencies including the Minnesota State Historic Preservation Office (SHPO), Minnesota Department of Natural Resources (DNR), Minnesota Department of Transportation (MnDOT), Minnesota Board of Water and Soil Resources, Minnesota Department of Health, Minnesota Department of Agriculture (MDA), and the Minnesota Pollution Control Agency (MPCA). Applicants for site and route permits must notify the MDA about the proposed project's impact on cultivated agricultural land. The MDA is the lead agency on the development of any agricultural impact mitigation plan (AIMP) required for the project.[21]
- **Federal Agencies**: United States Army Corps of Engineers, United States Fish and Wildlife Services, and the Environmental Protection Agency.

The application should include an appendix summarizing outreach to local, state, and federal governments the applicant has conducted for the project to demonstrate coordination (discussed in Section 5.5)

Staff encourages applicants to follow-up with agencies that request coordination on the project or have other concerns with the project. As an example, during review of a draft application, staff will look for a response of concurrence from the DNR on rare and unique natural resources as it is an integral component of environmental review. Staff strongly encourages applicants to demonstrate pre-application coordination with local, state, and federal agencies and governments generally, and particularly where potential impacts that involve other state or local agencies, such as impacts to road rights of way, municipal wastewater facilities, wildlife, and rare and unique natural resources.

2.3 Tribal Coordination

Under Minn. Stat. §216I, entities interested in developing energy infrastructure projects like solar, wind, energy storage, and high volage transmission lines have a requirement to engage with Tribal Nations in Minnesota.

[21] Minn. Stat. 216I.18, subd. 3(b)

Permit applicants should reach out to the 11 federally recognized Tribal Nations in Minnesota as well as Tribal Nations who may currently not be located in Minnesota but still may have historical, cultural, archeological, or treaty interests in the area in which the project is being proposed.

As part of a permit application, applicants are required to submit a discussion of coordination that has occurred with Tribal governments in Minnesota. An application appendix with a narrative describing outreach that has occurred; the method, time, date, and persons involved with the coordination; and the outcomes of the coordination is helpful for ensuring that meaningful engagement has occurred. The PUC is developing guidance on engaging with Tribal Nations in Minnesota. A guidance document will be posted on the PUC's website when available.

2.4 Application Preparation Guidelines

In preparing an application, it is important to address several key elements to ensure clarity and effectiveness that will facilitate issuance of a permit. Permit application content is listed in Minn. Stat. § 216I.05 Subd. 3 (Application) and Minn. Stat. § 216I.05 Subd. 4 (Environmental) which is collectively referred to in this document as "required elements" of a permit application.

Section 2.3.1 summarizes the "required elements." The application's data analysis (Section 2.3.2) is essential to PUC review and public consideration as it offers evidence-based insights. Because data analysis is an integral part of the application, applicants will want to make sure that the work is thorough, with all relevant data presented in a clear, concise manner. Ideally, this would include a narrative that addresses analytical methods, a description of the outcome, and an interpretation or explanation of the findings. Permit applications and related supporting documentation submitted for public review are encouraged to apply plain language practices. The plain language narrative, described in greater detail in Section 2.3.3, more effectively conveys technical information to a wider audience.

Incorporating images, figures, and maps enhances PUC and public understanding by visually representing key data points and geographical context. Successful applications typically include well-designed, clear, graphics that are directly relevant to the application's content. Sections 2.3.4 and 2.3.5 provide practices that may be useful for permit application content. Finally, formatting is vital to ensure the document is well-organized, professional, and easy to navigate. Consistent use of headings, bullet points, and other formatting tools helps improve readability and highlights important sections. By focusing on these areas, the application will be both informative and easy to navigate. A review of suggested PUC formatting is provided in Section 2.3.6.

2.4.1 Required Elements

Under the Energy Infrastructure Planning Act, applicants must meet certain required elements to complete their permit applications.[22] **APPENDIX A** provides a completeness checklist outlining application content expectations for site or route applications for large energy infrastructure facilities. Key elements of these requirements are:

[22] Content requirements are listed in Minn. Stat. 216I.05 Subd. 3 (Application) and Minn. Stat. 216I.05 Subd. 4 (Environmental)

- **Project ownership and permit details:** Information on facility ownership, permittee name, and any potential permit transfer.
- **Certificate of Need:** a discussion of whether a certificate of need is required and, if required, a discussion of whether a certificate of need application has been submitted
- **Facility and project description:** A detailed description of the proposed facility, its type, size, and expected construction timeline.
- **Power Purchase Agreement (PPA):** The requirement for a PPA or other enforceable mechanisms for selling the generated power, and the consequences if not obtained.
- **Site acquisition and construction:** Information on land acquisition, construction, and restoration practices.
- **Environmental and societal impacts:** The potential effects of the facility on the environment, human health, land use, socioeconomic conditions, and public services. This includes impacts on air, water, soil, noise, and wildlife, and environmental justice impacts.
- **Evaluation of alternative sites/routes:** The permit application should consider alternative sites or routes that were rejected during the planning process.
- **Mitigation measures:** Plans for mitigating unavoidable environmental and human impacts.

The PUC's permit application review process considers environmental, economic, and social factors before approving or denying a permit. The following sections of this document provide descriptions of PUC processes, as well as suggested practices designed to assist applicants during the development of their permit application.

2.4.2 Data Analysis

Permit applications should include data that clarifies costs, impacts, and the proposed project's operational aspects. The type of data will differ depending upon the resource. As the applicant, finding quality data that is accurate, reasonably current, reliable, and reputably sourced strengthens the credibility of the analysis and related findings.

Data analysis is often used to support permit applications, but its value depends on how well it is explained. A clear narrative is essential to describe both methods and findings. Applicants should describe limitations of the data, such as potential biases, gaps, or related data analysis uncertainties particularly for data that is collected specifically to support the application (e.g., wildlife surveys, visual simulations). In some situations, staff may request the underlying data used in the analysis. To facilitate such a request, staff will request that applicants organize the data in an accessible, consistent format, such as a spreadsheet or database, to facilitate easier analysis. For larger datasets, categorizing or grouping the data into meaningful sections (e.g., by species, region, or time period) will often create a more manageable analysis and easier review.

Staff recommends that findings are presented using "plain language" writing practices to explain complex data in a way that is accessible to a wide audience. From previous practice, thorough documentation of all data sources, assumptions, and methodologies, strengthens credibility and enhances public review.

Along with a useful narrative, data is often easier to understand through visualization tools like charts, graphs, and tables. This type of imagery can help highlight key data points without overwhelming the reader. Maps can reveal spatial visualizations that are useful for reports with a geographical focus, as they can show important regional differences or patterns. When using visualizations, staff recommends that applicants prioritize content clarity and simplicity and avoid unnecessary clutter to emphasize key information (See Section 2.3.4).

Lastly, staff recommends applicants double-check their calculations and statistical conclusions to confirm their accuracy and validity, ensuring that the information provided in the application is accurate and reliable.

2.4.3 Using Plain Language

Plain language generally means language that is clear, concise, well-organized, and that uses common, everyday words. It should avoid unnecessary jargon or technical terms that the audience is unlikely to understand. Generally accepted plain language writing practices focus on making communication clear, concise, and easy for the reader to understand, regardless of their background or expertise. Plain language approaches are especially important in regulatory settings, where clarity can have significant implications. Applicants are encouraged to develop their application with plain language writing practices in mind. While proper technical terminology is important in applications, staff encourages applicants to minimize the use of acronyms and jargon where possible. Staff also encourages applicants to use an active voice to clarify the actor (e.g., "applicant will apply for an accommodation permit from MnDOT" rather than "the project will seek a permit from MnDOT).

2.4.4 Figures and Tables

Staff encourages applicants to include figures (e.g., photos, schematics, maps, graphs, etc.) and tables in the application to summarize important information and highlight key points. When using figures and tables in a permit application, it's crucial to ensure clarity with appropriate labeling, concise captions, proper source citation, and consistent formatting. The choice to include figures and tables in a permit application is a function of whether the work would complement the text and help readers better understand the data being presented.

Clearly label each figure with the word "Figure" followed by a number (e.g., Figure 1, Figure 2, etc.). If the application uses tables, the PUC suggests a similar practice (e.g., Table 1, Table 2, etc.). From previous PUC practice, labels have typically been placed above the figure or table. Staff recommends that applications number figures and tables consecutively, rather than by application section (e.g., Figure 1, Figure 2, Figure 3, rather than Figure 1.1.1, Figure 4.3.1, Figure 4.5.1).

The title should provide a succinct understanding of the figure or table content. If the figure or table is sourced from another work, cite the original source in a footer or footnote. When the figure or table is developed by the applicant, a simple caption without a source reference is acceptable.

Examples: (Figure and table labels)

- **Figure 1.** Photovoltaic Cell. Source: US Energy Information Solar Explained: Photovoltaics and Electricity, https://www.eia.gov/energyexplained/solar/photovoltaics-and-electricity.php, accessed February 18, 2025

- **Table 1.** Soil Type and Water Table Depth (Source, *Soil Survey for Stearns County* [Minnesota Board of Soil and Water Resources, 2023], 91).

When referencing figures or tables in a text, refer to each figure or table in the text itself, using the figure or table number (e.g., "As shown in **Figure 2**..." or "As shown in **Table 1**"). This practice directs readers to the figure or table and enhances the application narrative. Staff recommends that applicants consider hyperlinking the references to the tables and figure when the text refers to a table or figure that is not on the same page.

Applicants will also want to pay attention to clarity and readability to ensure that figures and tables are clear and legible. Use simple, readable fonts, and appropriate colors. Avoid clutter—figures and tables will ideally convey one key message at a time, minimizing unnecessary details. Busy tables are also difficult for accessibility or screen readers to process. Lastly, pay attention to consistent formatting across figures and tables in terms of layout, style, and labeling. This ensures the application is easy to follow.

2.4.5 Maps

Applications must contain maps that show the facility in its entirety.[23] Maps are foundational to a permit application, illustrating important information on the project location and its proximity to the built environment and natural resources. Effective maps convey spatial information in a clear and concise manner and are easy to interpret. Staff recommends that a map showing the proposed facility be included in the facility description section of the application (see Section 3.2 of this document) and that detailed maps be provided in an appendix. Staff recommendations for formatting and a list of recommended maps are detailed in APPENDIX B.

The state of Minnesota has a wide variety of geographic data available for use in map construction. The Minnesota Geospatial Information Office is a useful resource for applicant data needs and technical support.[24]

2.4.6 Formatting

The PUC permit application is a structured document that contains a considerable amount of information from a wide variety of sources. Based on previous and current permit applications staff recommends the following formatting conventions be used:

- **Cover Page:** The project name, applicant information, docket number(s), and application date should be featured on the cover page.
- **Headings, Subheadings, and Table of Contents**: Staff recommends that headings, subheadings, and table of contents follow a numbered, hierarchical scheme (e.g., Section 3, Section 3.2, Section 3.2.1). This scheme creates consistency across applications, is easier for staff to cite in its review and comment and is efficient for locating topics of interest within the document. In most situations, the table of contents will contain the list of headings and subheadings, as well as a

[23] Minn Stat. 216I Subd.3(b)(6)
[24] Minnesota Geospatial Information Office website, (n.d.), https://www.mngeo.state.mn.us/

list of figures, tables, maps, images, and appendices. Staff strongly recommends applicants use hyperlinked headings and table of contents to allow easy navigation within the application.

- **Body of the Application**: Staff recommends pages be numbered consecutively rather than starting again in each section to allow for easier reference, and that page-numbers be located at the bottom of the page. Staff recommends that applicants use footnotes, rather than endnotes, as footnotes allow the reader to review the referenced material on the same page a work is cited. Staff has found that navigating between the text and endnotes is difficult with an electronic application.
- **Figures, Tables, and Maps**: Staff recommendations for figures, tables, and maps, are provided in other sections (2.3.4 and 2.3.5 as well as **APPENDIX B**) of this document and will not be repeated here.
- **Appendices**: Permit application appendices are separate from the main body of the application and contain a title that describes its content clearly (e.g., "Appendix A: Cultural Resources"). Staff recommends that appendices are labeled with letters (Appendix A, Appendix B).
- **Citation and References**: Staff recommends that applicants use the most current edition of the *Chicago Manual of Style*.[25] As noted above, staff recommends use of footnotes for citations, as they are more convenient and understandable for the reader. This is particularly relevant for citation practices that rely on digital and online sources. Any legal citations should follow the acceptable Minnesota or Federal practices for statutes, rules, guidance, and cases.

2.5 Application Filing and Follow Up

Site and route permit applications are formally submitted electronically through the eFiling application to eDockets, the PUC's electronic docket system. In addition to the e-filed applications, applicants should plan to provide paper copies for review in the project area and, depending upon staff preference, to PUC staff. Applicants should also provide electronic files and GIS files directly to PUC staff.

E-Filing: The permitting process begins when an application has been filed to the docket number assigned to the case through the eFiling application. Applicants are responsible for registering as a user to submit documents to eDockets; information on the eFiling process can be found at https://www.edockets.state.mn.us/help.

Electronic and Paper copies: In addition to filing in eDockets, applicants should provide electronic files of the application to PUC staff to post to the website and use for analysis. Staff recommends the electronic files break out the application into individual PDF files by text, appendices, and maps. Staff strongly recommends the PDF version of the application include hyperlinked headings to allow for easy navigation from the table of contents. Files should be labeled as they appear in the table of contents.

Applicants should also inform PUC staff where copies of the application may be reviewed so that the information can be provided in the required notice.[26] Past practice has been for the applicant to provide paper copies of the applications to local libraries or government centers for review. Applicants should

[25] University of Chicago, (2017), *Chicago Manual of Style,* *https://www.chicagomanualofstyle.org/book/ed18/frontmatter/toc.html (accessed February 26, 2025)*
[26] Minn. Stat. 216I.05, subd. 8

confer with PUC staff regarding additional paper copies for review at public meetings and hearings or other uses.

Map Data: Provide the data used (shapefiles) for all maps submitted with the application to PUC staff. See **APPENDIX B** for more detail.

Non-Public Data: Applicants may file certain information as not public (most typically information considered by applicants as trade secret and/or privileged data). The PUC's policy on non- public data is available on its website.[27] If any information in the application is filed as not public, both *Public* and *Trade Secret* versions of that document must be filed. Applicants are responsible for removing all trade secret data from the public version and properly identifying the *Trade Secret* document when filing. Under the Minnesota Government Data Practices Act (and other applicable law), the PUC has the authority to determine if the trade secret request satisfies the requirements for the protected classification and will notify the applicant of the determination before releasing such data or information.

Applicants should bear in mind that, because the permit application serves as the basis for public review and comment as well as the environmental review document for facilities seeking permitting under the standard process, permit applications are generally regarded as public information. In some cases, non-public information such as the location of sensitive resources is filed as both a "Public" and "Trade Secret" appendix).

[27] PUC, *Data Practices Policy – Not Public Data in Commission Proceedings, (2021),* https://mn.gov/puc/assets/Not%20Public%20Data%20in%20Commission%20Proceedings%20FINAL.4-29-21_tcm14-482049.pdf

3 PERMIT APPLICATION CONTENT AND GUIDELINES

A thorough, accurate, and well-organized application will assist the PUC in its completeness review and will facilitate public review and comment that informs the PUC's decision on whether to issue a site or route permit.

Applicants should be aware that they will likely be asked to provide additional information and data throughout the permitting process and should plan to respond to PUC inquiries and requests in a timely and thorough manner.

When discussing potential facility impacts to identified resources staff encourages applicants to identify the region of influence (ROI) for each resource. These ROIs will vary by resource from very localized (e.g., the right of way (ROW) of a transmission line when considering impacts to vegetation) to something much larger (e.g., a county when looking at socioeconomic impacts). Additionally, staff recommends that applicants characterize the impact of their projects and describe the methodology for this characterization (e.g., what is a minimal impact? What is a moderate impact?)

3.1 Applicant Information and Project Ownership

The application must include a statement of proposed ownership of the facility as of the day of filing and after commercial operation.[28]

Staff recommends that the ownership statement describe the relationship of the identified facility owner (often an LLC) to any parent company, as in many cases landowners and local residents are more familiar with the parent company than the LLC identified in the permit. For example:

> *"Sunbeam Solar, LLC, an indirect subsidiary of Acme Energy Corporation, proposes to construct and operate a 100 MW solar energy generating system and 50 MW (200 MWh) energy storage system on a 1,000 acre site in Ramsey County, Minnesota."*

The application should include the name of any person or organization that will initially be named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated.[29] Staff recommends the application identify one individual/organization along with contact information (name, address, email, and telephone number) for each entity listed as an owner.

Applicants should be aware that PUC site permits for generating and storage facilities contain a standard condition requiring permittees to identify their ownership structure, including the ultimate parent entity, prior to construction. The permit condition also requires permittees to notify the PUC of any changes in the financial or governance interests of the permittee or the permittee's owners or sale which changes the ultimate parent of the permittee throughout the term of the permit.

[28] Minn. Stat. 216I.05, subd. 3(b)(1)
[29] Minn. Stat. 216I.05, subd 3(b)(2)

3.2 Facility Description

The application must describe the proposed large energy infrastructure facility and all associated facilities, including the size, type, and timing of the facility.[30] Staff recommends that this section contain a brief (1 – 2 paragraph) introduction summarizing the major components of the proposed facility and the anticipated construction duration and commercial operation date, with more detail in following subsections. Staff also recommends that a map showing an overview of the proposed facility be included in this section to help readers understand the relative location of the facility.

The narrative may vary somewhat by the type of project, but should include general information on:

- **Location** (county, township, nearby landmarks such as cities, major highways, parks, or notable natural features).
- **Physical Size**: acres to be developed for generation and storage facilities, length in miles and width in feet for route and right-of-way (ROW) for transmission facilities.
- **Design Capacity:** MW of generation for energy generating facilities, MW and MWh of energy storage capacity, kilovolts (kV) for transmission lines. Indicate whether the capacity is in direct or alternating current.
- **Major Components:** Number of turbines, number of storage containers, number of PV panels, stormwater basins, laydown areas, new or expanded substations, etc.

3.2.1 Facility Location and Land Control

Applications must describe the location of the proposed facility and the procedures and practices the applicant proposes to use to acquire the facility site or ROW.[31] Applications should include a table identifying the townships, ranges, and section where the facility will be located. If there are route alternatives or alternate site configurations under consideration, applications should identify all sections that may be affected.

If alternate locations are proposed, the application should also describe alternate locations, describe impacts and mitigation measures for the alternatives under consideration, and discuss the anticipated timeline for resolution of location uncertainties. Alternate locations (e.g., route segment alternatives, alternative access roads or collector lines, multiple potential interconnection points) may still be under consideration at the time of application due to uncertainties about land control, interconnection details, or final design.

Complete applications will identify the land interests necessary to construct and operate the proposed facility (e.g., turbine locations, wind easements, developed area for generation or storage sites, necessary setbacks, substation and other associated facilities, electric collector systems, transmission ROW, etc.). Applications should also discuss how the applicant proposes to acquire land interest necessary for the proposed facility (e.g., site control through purchase or easement, ongoing lease

[30] Minn. Stat. 216I.05, subd. 3(b)(3)
[31] Minn. Sta. 216I.05, subd. 3(b) (6) and (11)

payments, one-time easement payments, etc.) and whether they may use eminent domain to establish the necessary land control.

3.2.2 Facility Components

Applications must contain a description of the facility and all associated facilities, including the engineering and operation design for the proposed facility as well as the transportation, pipeline, and electrical transmission systems required to construct, maintain, and operate the facility.[32] Facility components will vary by project type, but should include a description of major components (e.g., turbines, PV panel type and racking, batteries and storage containers) and associated facilities (e.g., roads, substation, fencing, inverters, electrical collection system, stormwater basins). More detailed information on facility components and associated facilities is found by facility type in Section 4 of this document. If multiple options are in play (e.g., different turbine models, different PV panels, different batteries), describe the options being considered.

3.2.3 Interconnection

Applications for generation and storage facilities should describe how the facility will be connected to the electric grid and the facilities necessary to interconnect.[33] The application should identify the point of interconnection (e.g., new or existing substation or switchyard, line taps, etc.) and necessary transmission components, including the size and length of any new transmission lines and modifications to existing transmission infrastructure (e.g., substations, transmission lines, switching stations). The application should also discuss if the applicant has applied for interconnection from the Midcontinent Independent System Operator (MISO) and, if there is an application, where the proposal is in the process and the anticipated execution date for any generator interconnection agreement.

If the facility includes a transmission line capable of operating at 100 kV or more, for a distance greater than 1,500 feet, a route permit will also be required.

3.2.4 Power Purchase Agreement

A site permit issued by the PUC does not authorize construction of the facility until the permittee has obtained a power purchase agreement (PPA) or other enforceable mechanism.[34] If the permittee doesn't have a PPA at the time the permit is issued, the PUC requires the permittee to notify them when a commitment is obtained. Under these same statutes, the PUC may also set a deadline for the permittee to obtain a PPA or other mechanism. If the permittee fails to secure either by the specified date, the site permit becomes null and void.

Staff recommends that applicants include information on the intended use of power in the application. For generation or storage facilities owned by an investor-owned utility or electric cooperative, clarify whether the generation will be used by the proposing utility. For any portion of the output or storage capacity sold through a PPA, the description should include the expiration date of any PPA(s). If the

[32] Minn. Stat. 216I.05, subd. 3(b)(3) and (8)
[33] Minn. Stat. 216I.03(b)(8)
[34] Minn. Stat. 216I.05, subd. 1(c)

applicant intends to sell the generation or storage directly into the MISO market, describe how such sales are enforceable.

If the applicant is considering various options for the use of the power, describe the options under consideration.

3.2.5 Construction

Applications are required to describe how the applicant proposes to construct the facility.[35] Applicants should describe pre-construction procedures for site or route preparation and how the project will be constructed, including any best management practices to be used. All primary project components and associated facilities should be addressed.

Describe in detail the following activities: pre-construction communication with landowners and mobilization, necessary equipment and crew, construction management, geotechnical studies, utility locates, erosion control measures, site clearing and vegetation removal, earthwork, access road construction, establishment of laydown yards, concrete/aggregate base construction, crane usage and required facilities such as crane paths or pads (if applicable), electrical collection construction, on-site operation and maintenance facilities construction (if applicable), on-site concrete batch plant construction (if applicable), project substation or switchyard construction (if applicable), operations and maintenance facility (if applicable), and project commissioning. Briefly describe the sequencing and duration of construction phases and indicate the approximate number of on-site workers at various stages.

Staff also recommends that applicants provide a description of construction activities that may be needed at the interconnection substation. Although these activities may be outside of, and separate from the proposed project, these improvements are connected to the project and necessary to make the project operational.

3.2.6 Restoration

Applications are required to describe how the site or route will be restored following construction.[36] Staff recommends the application describe and detail removal of temporary aggregate materials, earthwork, decompaction measures, revegetation measures, restoration of agricultural lands to production quality, and erosion control measures that will be maintained long-term after restoration is considered complete. Provide details on how unanticipated erosion events will be handled should they occur after restoration is considered complete.

In practice, site and route permits issued by the PUC require permittees to develop a Vegetation Management Plan (VMP) to detail how a site or route will be vegetated, maintained, and monitored over time. Staff recommends that a draft version of a VMP be included as an appendix in the application. The restoration procedures detailed in this section should be consistent with those proposed in the draft VMP and with any AIMP the applicant develops with the MDA.

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[35] Minn. Stat. 216I.05, subd. 3(b)(11))
[36] Minn. Stat. 216I.05, subd. 3(b)(11)

3.2.7 Operations and Maintenance

Applicants are required to describe how the site or route will be operated and maintained following construction.[37] Provide information about the number of full-time operation staff, where maintenance equipment will be stored (whether in an on-site facility or in a nearby building), regularly scheduled maintenance, parking requirements, supervisory control and data acquisition equipment, equipment inspections, ROW clearing standards that must be maintained, and the general maintenance schedule. Include a table highlighting operation and maintenance tasks along with frequency. The discussion of operations should include safety features.

3.2.8 Decommissioning

The PUC may require any reasonable conditions in a site or route permit that are necessary to protect the public interest and maintains jurisdiction over site and route permits and any conditions in those permits.[38] In practice site permits issued by the PUC require permittees to provide a decommissioning plan to assure that the permittee is responsible for decommissioning a facility at the end of its useful life. Because residents and local governments often identify concerns about what will happen to the facility and site at the end of its operating life, staff recommends that the application contain a draft decommissioning plan. Guidance for preparing decommissioning plans is included in **APPENDIX C.**

3.2.9 Future Expansion

Applicants should include a description of how the project could accommodate future expansion.[39] Example include: space within the land control area for more panels or storage units, electrical capacity within the project substation or interconnection facilities, capability of adding an additional circuit along transmission structures.

3.3 Cost and Schedule

Applicants should include estimated costs for construction, operation, and maintenance of the proposed facility.[40] Cost estimates may be presented in a reasonable range and should indicate a margin of error. Staff recommends that applicants provide an estimate of the total capital costs as well as a breakout by major component. These categories will vary by project, but often include:

- Engineering, procurement, and construction contractor
- Development expense (land acquisition, permitting)
- Interconnection cost
- Financing
- Total Project Cost

[37] Minn. Stat. 216I.05, subd. 3(b)(11)
[38] Minn. Stat. 216I.05, subd. 12(a)
[39] Minn. Stat. 216I.05, subd. 3(b)(10)
[40] Minn. Stat. 216I.05, subd. 3(9)

The application should discuss estimated annual operation and maintenance costs. Operating estimates should include taxes, ongoing landowner payments, inspections, scheduled maintenance, and monitoring necessary for permits.

Applicants must describe the timing of the facility.[41] Applications should include an anticipated schedule of project milestones with associated dates leading to the commercial operation of the facility. The description would likely include the following key milestones:

- Site or route permit
- Land acquisition complete
- Downstream permits
- Power purchase agreement or other enforceable mechanism (generating facilities)
- Construction
- Testing and commissioning
- Expected dates of commercial operation
- Restoration completion

3.4 Permits

Applications must include a list and brief description of federal, state and local permits that may be required.[42] Staff recommends that the applicant focus this list to permits that may reasonably be required. For instance, a solar facility that does not include tall structures such as communication towers would not require tall structure review by the Federal Aviation Agency.

3.5 Alternative Sites or Routes Considered but Rejected

Describe the applicant's planning process and reasons why the proposed site or route was selected. Although the applicant is not required to propose alternative sites and routes, applicants must discuss alternative sites or routes that were considered but rejected.[43] This discussion should include the reasons why these alternative locations were rejected.

3.6 Environmental Setting

Applicants must include a description of each site or route's environmental setting.[44] Staff understands "environmental setting" as a collective reference to the physical, biological, and cultural characteristics of a project area that could potentially be affected by a proposed project or action. This means that the environmental setting includes the existing conditions of the environment, such as land use, air and water quality, wildlife, ecosystems, noise levels, cultural and historic resources, and nearby

[41] Minn. Stat. 216I.05, subd. 3(b)(3)
[42] Minn. Stat. 216I.05, subd. 3(b)(12)
[43] Minn. Stat. 216I.05, subd. 3(b)(14)
[44] Minn. Stat. 216I.05, subd. 4.(1)

communities. A description of the project's environmental setting helps the reader understand the project area environmental baseline conditions before the project, so that any potential impacts—both positive and negative—can be accurately assessed. Functionally, it provides a context within which a project's potential environmental effects can be evaluated, by serving as a "snapshot" of the current environment that helps determine how the proposed project might alter those conditions.

Based on previous permit and environmental analysis documents, staff recommends that the application include the following information when describing the environmental setting:

- **Project Area Definition**: Clearly outline the geographic scope of the project area, including direct and indirect areas that may be subject to project impacts. This could include land, water, air, and surrounding communities.
- **Natural Resources:** Provide a general description of the land use, geology, soil types, topography, water resources (surface water and groundwater), vegetation, wildlife, and ecosystems in the area.
- **Human Settlements and Socioeconomics:** Provide a general description of human settlement patterns in the area, noting nearby cities and towns, parks and recreational areas, significant landmarks, and major transportation and energy infrastructure.

The practices outlined above represent common practices; however, it's important to note that this approach is both broad and flexible, allowing applicants to adapt the steps to suit the specific needs of their projects. This analysis is essential for both the public and the PUC to fully understand the environmental context of a proposed project, establishing a baseline for evaluating potential impacts and determining whether mitigation measures are required.

3.7 Human Settlement

Applicants must include an analysis of potential project impacts on human settlement in their permit application for each proposed site or route.[45] As noted in the statute, a human settlement analysis is not limited to the topics provided ('including but not limited to").[46] Applicants are encouraged to consult with staff to determine if other factors should be included in the human settlement analysis for specific projects.

Staff recommends that each resource section of the application provide a general description of the resource, identify a ROI for impacts appropriate to the resource, then discuss potential impacts and mitigation measures for the impacts. Applicants should describe the measures to avoid, minimize, or mitigate effects, identifying mitigation measures required by PUC or other permits and additional mitigation measures proposed by the applicant.

3.7.1 Aesthetics

Applications must contain a description of the facility's impact on aesthetics.[47] Neither the PUC nor the Minnesota Environmental Quality Board (EQB) have defined "aesthetics" for impact assessment and

[45] Minn Stat. 216I.05, Subd. 4(2)
[46] Minn Stat. 216I.05, Subd. 4(2)
[47] Minn. Stat. 216I.05, Subd. 4(a)(2)

mitigation purposes; however, a general understanding of this term refers to the relationship between sensory experiences—such as sight, sound, smell, taste, touch—and the enjoyment of distinctive physical and cultural characteristics of an environment. With this broad and flexible understanding of the term, an applicant will want to consider how best to evaluate potential project aesthetic impacts, typically focused on visual impacts.

Project-specific aesthetic impacts from large energy infrastructure facilities can be substantial and permanent, as they often alter the visual landscape and may influence the experience of natural environments and associated communities. These impacts are dependent on the type of power generation (e.g., fossil fuel, renewable, etc.) and the scale and design of transmission infrastructure (e.g., power lines, substations, etc.), the context in which the viewer is experiencing the viewshed (e.g., from a home or driving through the area), and the social context of the potentially affected aesthetic resource. Typically, applicants have included pre-project landscape descriptions and images, and in some cases, project simulations to demonstrate potential visual impacts within the project area. This form of visual impact evaluation can be helpful to explain changes in landscape features, as well as acreage conversion based on project footprint. Thoughtful site and route planning and mitigation measures can help reduce these impacts and balance energy infrastructure development with environmental and community aesthetics.

Staff recommends that an aesthetics analysis describe and illustrate:

- The dimensions of relevant project components (e.g., height and diameter of transmission poles, height and rotor diameter of wind turbines, height and acres of solar panels, height of emissions stacks, etc.)
- The proximity of residences and non-residential buildings to the site or route and potential impacts.

Staff also recommends the discussion of mitigation include the potential for placing new infrastructure where there is already existing infrastructure, e.g., using or paralleling existing road or transmission line rights-of-way.

The United States Bureau of Land Management has developed an approach to visual resource management, which may be useful for applicants.[48],. The Clean Energy States Alliance has also developed a “best practices” approach for visual impact assessment, specific to wind-energy projects; however, many of these practices are adaptable to other project visualization impact needs.[49] If an applicant is considering a visual impact assessment, typical practices have included simulations that reflect site-survey data, multiple viewpoints or 360-degree views, before-and-after comparisons, as well as, weather, and daytime/evening comparisons, and seasonal variability. A “worst-case” viewshed impact analysis, along with potential mitigation measures, is also useful for both PUC and public review.

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[48] US Bureau of Land Management, *Visual Resource Management*, website, (n.d.) www.blm.gov/programs/recreation/recreation-programs/visual-resource-management (accessed February 24, 2025)

[49] Vissering, Jean, Clean Energy States Alliance, A Visual Impact Assessment Process for Wind Energy Projects, published by Clean Energy States Alliance (2011), www.cesa.org/wp-content/uploads/CESA-Visual-Impacts-Methodology-May2011.pdf

Other aesthetic impacts, or complex aesthetic impacts involving interconnected and combined effects, may require consultation with PUC staff to develop a practical analytical approach and mitigation plan.

3.7.2 Cultural Values

Applications must discuss impacts from construction and operation of a proposed facility on cultural values.[50] Although the term cultural values is not further defined in the statute, staff understands the term to mean shared community beliefs or attitudes that define what is collectively important to the group. Large energy infrastructure facilities believed inconsistent with these values can deteriorate community character, while those found consistent with these values can strengthen it.

Staff recommends the application describe the project area's history and ethnic heritage, land use, and the work and recreational pursuits of residents. Comprehensive plans can provide useful information and context for understanding cultural values. The application should discuss cultural values in the general project area and identify potential consistencies and conflicts between the identified cultural values and the proposed facility. The application should also discuss mitigation measures the applicant has employed or that could be employed to minimize or eliminate conflicts.

3.7.3 Displacement

The application must discuss whether the project will require displacement.[51] Although not defined in statute, staff understands displacement to mean the need to remove structures to facilitate the construction and operation of the proposed facility.

Based on previous siting and routing projects, few large energy infrastructure facilities actually result in displacement, but it is a concern to residents and businesses in the vicinity of proposed facilities. Staff recommends the application generally discuss distances from the area of disturbance to existing homes and businesses and identify the potential for displacement because of the project. If displacement is necessary or possible, the application should identify structures with a potential for displacement in the text and on a map and discuss why those structures may need to be displaced. The application should discuss measures the applicant has taken to avoid displacing homes or businesses. If there is a potential for displacement, the application should discuss additional mitigation measures to minimize impacts to property owners.

3.7.4 Environmental Justice

The PUC must consider impacts to environmental justice.[52] The PUC defines an environmental justice area as meeting one or more of the following criteria:[53]

(1) 40 percent or more of the area's total population is nonwhite;

(2) 35 percent or more of households in the area have an income that is at or below 200 percent of the federal poverty level;

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[50] Minn. Stat. 216I.05, subd. 4(2)
[51] Minn. Stat. 216I.05, subd. 4(2)
[52] Minn. Stat. 216I.11, subd. 11 (a)(3), referencing environmental justice areas as defined in Minn. Stat. 216B.1691, Subd. 1(e)
[53] Minn. Stat. 216B.1691, subd. 1(e)

(3) 40 percent or more of the area's residents over the age of five have limited English proficiency; or

(4) the area is located within Indian country, as defined in United State Code, title 18, section 1151.

Staff understands environmental justice to mean as the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income in the development, implementation, and enforcement of environmental laws, regulations, and policies. "[54] The purpose of considering impact to environmental justice communities is to ensure that all people benefit from equitable levels of environmental protection and have the same opportunities to participate in decisions that might affect their environment or health.

Applications should discuss whether the proposal will be within an environmental justice area using US Census data based on census tracts covered by the project. Staff recommends that applicants use MPCA's environmental justice mapping tool to identify environmental justice populations.[55] Applications should also present nonwhite populations, low income, and English proficiency for the census tracts as well as the counties covered by the project. Often, this is most easily conveyed in a table so that the data from the counties can be compared with census tracts within that county and the other environmental justice characteristics. Lastly, this same data should be listed for the State of Minnesota for comparison. Separately, the applicants should identify if any part of the project will be located within Indian country.

If the proposed facility is located within an environmental justice area, applicants should discuss whether there are potentially disproportionate impacts on the population in those areas. The MPCA has developed tools to identify existing impacts on human health and the environment that may be disproportionate to the public in the environmental justice area. [56]The application should discuss project components or activities that would increase those impacts (e.g., would the project increase air pollutants in the area where the same air pollutant is present at levels that could cause health effects) and measures to avoid or minimize potential adverse effects, including any adverse effects that cannot be avoided. If impacts to environmental justice populations are expected, discuss whether they are expected to be disproportionately high or adverse to human health or the environment in a way that would affect these populations.

There may also be existing impacts in environmental justice areas that do not interact with the project. For instance, there may be an existing remediation cleanup site in the area that can be avoided by prudent siting and routing design. Include a discussion for which of these existing impacts are not applicable and why.

While the statute offers a tool for analysis, it is also common to compare the data of the counties with the State of Minnesota to determine if any county was greater than 50 percent or 10 percentage points

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[54] MPCA, Environmental Justice Website, www.pca.state.mn.us/about-mpca/environmental-justice#:~:text=The%20MPCA%20is%20committed%20to,laws%2C%20regulations%2C%20and%20policies

[55] MPCA, Understanding Environmental Justice in Minnesota, https://experience.arcgis.com/experience/bff19459422443d0816b632be0c25228/page/Page/?views=EJ-areas ,

[56] MPCA, *MNRISKS: Minnesota Statewide Screening of Health Risks from Air Pollution*. March 2023, www.pca.state.mn.us/sites/default/files/aq9-29.pdf; What's in my Neighborhood, 2025, www.pca.state.mn.us/about-mpca/whats-in-my-neighborhood

or more for any category. If either of those percentages are exceeded, the potential environmental justice impacts from the project are likely to be significant and staff would expect to see a more robust discussion on impacts and mitigation in the application.

If the proposed project is located within a statutorily defined environmental justice area, the PUC must consider cumulative impacts to environmental justice areas.[57] To support this requirement, staff expects that applicants complete a cumulative impacts analysis for facilities located within an environmental justice area.[58] Analyzing cumulative impacts to environmental justice communities requires a detailed and systematic approach to evaluate how multiple sources of pollution accumulate and affect both the environment and the health of residents in a specific geographic area. Staff encourages applicants to review the MPCA website on cumulative impacts analysis for additional guidance and to consult with staff if the facility is located in an environmental justice community.[59]

3.7.5 Public Health and Safety

Applications should discuss impacts that construction and operation of a proposed facility may have on public health and safety.[60] Any large electric infrastructure facility will have safety risks to workers and the public during construction and operation. Describe these potential issues and mitigation measures the applicant or operator will employ to avoid or minimize the potential impacts to public health and safety and identify adverse effects that cannot be avoided.

Describe construction activities that are most likely to pose risks to workers (e.g., potential injury from falls, equipment and vehicle use, exposure to hazardous materials, and electrical accidents) and discuss risks are there to operations staff or the public during operation (e.g., electrocution, falls, exposure to hazardous materials, fire risk, injury from equipment operations, or unauthorized entry to the project). Describe any hazardous materials used or stored at the project location and how they will be disposed.

Discuss how emergency services are provided in the project area and how the proposed facility may impact emergency services (e.g., traffic detours, potential fire hazards, construction accidents) and potential mitigation measures. Discuss the estimated number of construction and operation personnel and the ability of local medical facilities to handle emergencies. Discuss potential for interference with emergency service communications, including radio facilities used by first responders and public works providers.

The discussion of mitigation measures should include references to electric, fire, and safety codes that will be applicable to the project as well as additional safety measures built into the project above and beyond codes. A list of emergency responders in the project area along with any emergency plans the project will create or be subject to should be listed in the application. This is particularly important for energy storage system (Section 4.4).

Transmission line, solar energy, wind energy projects, battery energy storage systems and their associated facilities produce electric and magnetic fields (EMF). Potential impacts due to EMF and

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[57] Minn. Stat. 216I.05, subd. 11(a)(3)
[58] Minn. Stat. 216E.05, subd. 11(a)(3) refers to cumulative impacts analysis required by MPCA under Minn. Stat. 116.065 for permit decision in environmental justice areas
[59] MPCA, *Cumulative Impacts Analysis* website, (n.d.), www.pca.state.mn.us/trending-topics/cumulative-impacts-analysis (accessed February 24, 2025)
[60] Minn. Stat. 216I.05, subd. 4(2); 216I.05, subd. 11(b)(1); 216I.19

possible mitigation measures should be discussed. Electrical fields should be discussed in the context of kilovolts per meter (kV/m) at one meter above ground level and reference the PUC's standard maximum electrical field of 8 kV/m at one meter above ground level. Magnetic fields should be discussed in the context of milliGauss (mG) produced. The application should indicate the distance between the nearest residences to the facility and provide estimates of EMF at various distances from the facility. The discussion of EMF should characterize potential electric field and magnetic fields impacts and include discussion of public health research that supports this characterization.

Staff also recommends that applications define stray voltage and discuss the potential sources of stray voltage generally and from the project. Applicants should also discuss potential impacts of stray voltage and mitigation measures that the applicant will employ to minimize potential impacts as well as additional mitigation measures that could be deployed.

3.7.6 Noise

Applications should discuss noise impacts from construction and operation of a proposed facility.[61] Noise can be defined as any undesired sound. Noise standards in Minnesota are promulgated by the MPCA and based on noise area classifications, which correspond to the location of the listener, referred to as a receptor. [62] Noise standards are public health standards. They protect people from noise generated by all sources at a specific time and place. The total sum of noise at a specific time and location cannot exceed the standards. The MPCA evaluates whether a specific noise source is in violation by determining if the source causes or significantly contributes to a violation of the standards.

Describe daytime and nighttime ambient sound levels in the project vicinity and the primary sources of human-generated sound in the landscape (e.g., traffic, farm equipment, industrial facilities). The description should include a discussion of any seasonal differences in noise levels (e.g., fall harvest). Certain projects may require day and/or night-time noise surveys to be conducted to establish ambient levels, this should be discussed further with PUC staff.

Describe the noise associated with construction and operation of the project and any of its associated facilities. Discuss whether the project will generate a temporary or permanent increase in ambient noise levels in the vicinity of the project and conditions (often weather-related) under which facility-related noise may be more noticeable. Project related noise impacts can occur before the state noise standards are exceeded, so identify and acknowledge these impacts in both realistic and worst case scenario situations and identify any anticipated exceedances of the state noise standards. For example, when evaluating construction noise, document what types of equipment will be used and base the analysis on the loudest piece of equipment and estimate how long that equipment is likely to run. A dump truck may be a constant source of noise during grading, but a pile driver may be a louder, less frequent source of noise during structure installation.

Using the appropriate noise modeling analysis, identify anticipated noise levels at receptors in the project area. Discuss the potential impacts of these noise levels and compare them to state noise standards. Indicate whether those receptors are expected to experience exceedances of Minnesota noise standards or local ordinances, if they apply. For generation and storage facilities show receptors and anticipated noise levels on a map.

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[61] Minn. Stat. 216I.05, subd. 4(2); 216I.05, subd. 11(b)(1); 216I.19

[62] Minn. Rule Chapter 7030.

Discuss potential mitigation regardless of whether state noise standard exceedances are expected. List any adverse effects that cannot be avoided.

Additional pre-application sound/noise modeling and operational phase monitoring may be necessary for any project type seeking a state permit (see Section 4). Staff recommends that applicants contact them early in project development to clarify expectations.

3.7.7 Public Services

Applications must describe the impact that construction and operation of the proposed facility will have on public services.[63] Large energy infrastructure facilities can interfere with these services including:

- Transportation (e.g., roads, railroads, airports)
- Emergency services and communications (e.g., ambulance, police, fire, Allied Radio Matrix for Emergency Response (ARMER) System)
- Local & regional utilities (e.g., electric, natural gas, sewer, water)
- Public communications (e.g., television, radio, telephone and internet)

The application should describe public services in the project area generally and discuss potential mitigation regardless of whether negative impacts are expected and identify measures to avoid or minimize impacts to these services. Staff recommends that emergency services be discussed in the public health and safety section of the application and has included recommendations in Section 3.7.5.

Transportation

The application should discuss the transportation resources (roads, railroads, airports) in the project area. Discuss the road networks (highways and local roads in the project area) including average daily traffic. Discuss the potential impacts that construction and operation of the facility may have on the existing roads such as increased traffic or temporary detours during construction. Discuss how the site or ROW will be accessed during construction and operation of the facility and whether new driveways or other road improvements such as culverts will be required to ensure access or accommodate construction equipment and deliveries. Specific requirements for transmission lines related to using or parallelling railroad and highway ROW are discussed further in Section 4.1.

Identify railroads adjacent to or within the proposed site or route and discuss potential impacts to the railroad from the facility or limitations the railroad may have on the facility.

Discuss potential impacts to aviation and required or potential mitigation measures, including marking and lighting for tall structures such as wind turbines and met or communications towers. The application should identify all public and private licensed airports within 10 miles of the site boundary or route. Discuss the proposed facility's compliance with Minnesota Department of Transportation Department of Aviation[64] and Federal Aviation Administration requirements. Discuss whether a no hazard determination from the Federal Aviation Administration is necessary.

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[63] Minn. Stat. 216I.05, subd. 3(b)(2)

[64] MnDOT, Aeronautics and Aviation: Tall Towers, www.dot.state.mn.us/aero/talltowers.html ,

Wind facilities permitted by the PUC must be equipped with light mitigation technology that meets the Federal Aviation Administration's requirements.[65] Depending upon the location of the wind turbines, additional coordination with the U.S. Department of Defense, North American Aerospace Defense Command, or Air National Guard may be necessary. Potential impacts to aerial applications for agricultural purposes and pest control should be discussed in the agriculture section.

Utilities

Discuss how utilities (electric, gas, sewer, and water) are provided in the project area and the presence of transmission lines and pipelines (petroleum, natural gas, carbon dioxide, etc.) within or adjacent to the proposed site or route. Local governments can identify area service providers. The PUC maintains a map of electric service territory[66] and major pipelines can be located through the National Pipeline Mapping System.[67]

Discuss how utilities will be provided to the proposed facility, for example how will water and wastewater needs from an operations and maintenance facility be provided (e.g., a new or existing well, septic system, municipal water or sewer service). Discuss potential impacts (e.g., temporary outages during final interconnection) to existing utilities and mitigation measures to minimize impacts (e.g. scheduling with utilities to minimize outage impacts). Discuss any outages expected during construction and efforts to minimize those impacts.

Public Communications

Discuss the telephone and internet providers in the general project area and the potential impacts (e.g., damage to underground lines) to these resources. Information on local providers can be found from local governments. Discuss measures during construction that can be used to avoid impacts to communication services, such as marking underground utilities and complying with Gopher State One Call requirements.

Discuss potential for interference with radio including AM, FM, land mobile and radio facilities used by first responders and public works providers Proposals for wind facilities should provide a microwave beam path study to ensure that the turbines do not interfere with microwave beam paths (Section 4.2).

3.7.8 Land Use and Zoning

Although site and route permits issued by the PUC supersede local land use regulations, [68] the PUC must minimize environmental and human impacts, including land use conflicts, in its siting and routing determinations.[69]

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[65] Minn. Stat. 215I.19
[66] PUC, Electric Utility Service Areas, Interactive Map, https://minnesota.maps.arcgis.com/apps/webappviewer/index.html?id=95ae13000e0b4d53a793423df1176514/ (accessed February 26, 2025)
[67] US Department of Transportation, National Pipeline Mapping System, ttps://pvnpms.phmsa.dot.gov/PublicViewer/ (accessed February 25, 2025)
[68] Minn. Stat. 216I.19, subd. 1
[69] Minn. Stat. 216I.05, subd. 11((a)I2)

Applications should describe the types of land use in the vicinity of the project (e.g., cultivated agriculture, industrial, rural residential, etc.). In addition to the general discussion of land use, applications should identify zoning ordinances adopted by county, city, township, or special purpose governments and provide a zoning map overlaying (including any urban growth boundaries) the proposed facility. If applicable, future urban growth boundaries should be shown on a map. Applications should discuss how the type of facility is addressed in local zoning ordinances (e.g., permitted use or conditional use in the zoning district). If applicable, discuss the types of conditions or setbacks required for similar facilities permitted locally.

Applications should also identify and discuss comprehensive plans adopted by counties or local governments where the project is located. Staff recommends the applications include a table of adopted comprehensive plans within and adjacent to the proposed project area and the year they were adopted. If applicable, include other associated development plans such as land and water management plan and farmland preservation plan.

In its discussion of project impacts and mitigation measures, the application should discuss how the proposed facility is or is not consistent with local land use plans and regulations, and how the applicant has taken local plans and regulations into account in development of the project.

3.7.9 Recreation

Applications should discuss impacts from construction and operation of a proposed facility on recreation resources in the project vicinity.[70] Recreational resources include parks, forests, refuges, fairgrounds, recreational areas, wildlife areas managed by various levels of government, campgrounds, playgrounds, motorized and non-motorized trails, and fairgrounds. Staff recommends that the application focus its analysis on resources within one mile of the proposed facility.

Describe direct and indirect impacts would impact recreational opportunities during construction and operation. If there are potential impacts, show the locations on a map. Negative impacts to recreational opportunities might occur if the project interferes with the resources that provide these activities. For example, project construction or operation that may deter wildlife use of established areas where wildlife observation and/or hunting are intended primary or secondary uses, or construction noise along recreational trails. Identify ways to minimize or avoid potential impacts and indicate which mitigation measure are typically required by required permits from the PUC as well as additional mitigation strategies the applicant is committed to using. Identify impacts that cannot be avoided.

Information on recreational resources can be found by contacting city and counties, and at the statewide level from the DNR and United States Fish and Wildlife Service (USFWS):

- Minnesota Public Recreation Information Map: www.dnr.state.mn.us/maps/prim.html
- DNR Division of Parks and Trails: www.dnr.state.mn.us/trails_waterways/index.html
- DNR Wildlife Management Areas: www.dnr.state.mn.us/nature_viewing/index.html; www.dnr.state.mn.us/wmas/index.html
- DNR Scientific and Natural Areas: www.dnr.state.mn.us/snas/index.html

[70] Minn. Stat. 216I.05, subd. 4(2); 216I.05, subd. 11(b)(1); 216I.19

- DNR Interactive Snowmobile Map: www.dnr.state.mn.us/snowmobiling/interactive_map/index.html
- National Wildlife Refuges: www.fws.gov/our-facilities?state_name=%5B%22Minnesota%22%5D

3.7.10 Socioeconomics

Applications must discuss the facility's impacts on socioeconomics and must consider the proposed facility's employment and economic impacts in the facility site's vicinity and throughout Minnesota. The PUC must consider a facility's local employment and economic impacts and clarifies that the PUC may reject or place conditions on a permit based on the local employment and economic impacts.[71] Applications should describe the existing socioeconomic profile of the ROI, including population characteristics, the local economy and labor force and discuss how the proposed project will impact the social and economic aspects of the environment over both the short term (construction) and long term (throughout the operating life of the facility).

Population and Economic Profile

Provide a narrative of the population and economic profile in the relevant ROI (typically counties where the project will be located) and how that compares to Minnesota generally. Relevant information can be found in the US Census Bureau[72] and the Minnesota State Demographic Center.[73] Staff recommends the application include a table (Table 2 is provided as an example) that summarizes relevant information.

Table 2: Sample Population and Economic Profile[74]

Location	Total Population	Percent Minority Population*	Median Household Income	Percent Low Income
Minnesota	5,706,494	22	$82,338	9.6
Douglas County	39,006	5	$72,472	8.5
Todd County	24,109	10	$63,216	12
Sherburne County	97,183	12	$96,889	6.2
Stearns County	158,292	17	$71,880	11.3
Wright County	141,337	10	$93,602	5.1
***Minority population was rounded to the nearest percent and includes all persons who do not self-identify as white alone.** **Source: U.S. Census Bureau, 2022 American Community Survey 1-Year Estimates.**				

[71] Minn. Stat. 216I.05, subd. 4(2), subd. 11(14) and (15)
[72] US Census Bureau, https://www.census.gov/
[73] Minnesota State Demographic Center, https://mn.gov/admin/demography/
[74] Minnesota Department of Commerce, ,*Environmental Assessment: Alexandria to Big Oaks 345 kV Transmission Project*, May 20, 2024, eDocket ID: 20245-207199-02 , p.81

Local Economy and Labor Force

Describe the local economy and labor force using information from local comprehensive plans and regional economic profiles prepared the Minnesota Department Employment and Economic Development's regional economic profiles.[75] Applicants may find additional components that better explain the socioeconomic impacts of a proposed project and are encouraged to include them in their analysis.

Assess how the project might affect local economies. Impacts may be either positive (e.g., job creation, increased business opportunities) or negative (e.g., loss of jobs, potential decline in property values). The application should include estimates of the number, type, and compensation levels of construction and operations jobs.[76] Staff also recommends that applications provide information on potential tax revenues from property or energy production taxes, payments to landowner, and local economic impacts (e.g., demand on housing and schools, availability of lodging options in the area during construction, equipment and supplies that can be purchased locally) to better asses the economic impacts. Describe potential impacts from the project on property values.

3.8 Land-based Economies

Applications must discuss impacts from construction and operation of a proposed facility on land-based economics including agriculture, forestry, mining, and tourism.[77]

Staff recommends that each resource section of the application provide a general description of the resource, identify a ROI for impacts appropriate to the resource, then discuss potential impacts and mitigation measures for the impacts. Applicants should describe the measures to avoid, minimize, or mitigate effects, identifying mitigation measures required by PUC or other permits and additional mitigation measures proposed by the applicant.

3.8.1 Agriculture

Describe the agricultural setting of the ROI (typically the county) and the project vicinity and describe current agricultural practices on site. Describe the role of agriculture in the regional and local economies. If there are drain tiles present on site, discuss efforts that will be taken to ensure preservation and protection of drain tile. Provide context of project related impacts to agriculture over the life of the facility. Identify the acreage of land removed from agricultural production both temporarily and permanently. Discuss how project infrastructure placement may impact farming practices adjacent to structures, and/or may limit equipment access or require special farming practices. Include any relevant information from the AIMP.

For site permit applications for generating facilities, applicants should be aware of the prime farmland exclusion under Minnesota Rule, which precludes permitting of generation sites that include more than 0.5 acres of prime farmland per MW of net generating capacity unless there are no feasible and prudent

[75] Minnesota Department of Employment and Economic Development, *Regional Labor Markets*, https://mn.gov/deed/data/regional-lmi/
[76] Minn. Stat. 16B.05, subd. 11(b)(15)
[77] Minn. Stat. 216I.05, subd. 4(3)

alternatives.[78] If the site is located on prime farmland, the application should discuss whether feasible and prudent alternatives to the site are available.

Identify measures to avoid, minimize, and mitigate effects to agriculture. List any adverse effects that cannot be avoided.

The AIMP developed with the MDA should focus on managing impacts to soils as a natural resource essential to agricultural production, and to managing impacts to agricultural drainage systems, both surface and sub-surface. Depending on the proposed project type additional agricultural issues to consider and address include interference with aerial crop spraying and interference with irrigation systems.

3.8.2 Forestry

Describe the forest resources in the project vicinity, and the role of forestry in the regional and local economy. Describe the impact the proposed project will have on forestry resources. The loss of planted windbreaks and shelterbelts, with a primary intent and purpose other than forestry and timber harvest should not be included in this section. Planted windbreak or shelterbelt should be discussed in the vegetation and wildlife resource sections of the application.

Discuss mitigation measures that would minimize, avoid, or mitigate impacts to forestry resources and identify any unavoidable impacts resulting from the proposed project.

3.8.3 Mining

Describe the mining resources and operations in the local area and the role mining has in the regional and local economy. This should include a general discussion of potential revenues lost due to the project, such as acres that may be removed from production. Mining resources include underground mineral resources – mineral resources are resources that have a concentration or occurrence of natural, solid, inorganic, or fossilized organic material in such form, quantity, grade, and quality that it has reasonable prospects for commercial extraction.

Describe the impact the proposed project will have on mining resources. Impacts may include interference with access or extraction of mining resources, or future mining exploration and development in areas deemed to have metallic, mineral, or aggregate potential. This information can be obtained in coordination with the DNR or through the collection of geophysical data before project development. If the project is not on property designated as state or federal land, the DNR would still maintain underground mineral rights but no surface mineral rights.

Discuss how the impacts to mining resources will be mitigated and any adverse effects that cannot be avoided. This may include preserving access to minerals or aggregates in case of future exploration and/or development. Electric utility facilities tend to interfere with geophysical surveys because the technology cannot accurately assess what is underground when facilities are directly overhead the survey location. The most common mitigation is prudent siting of project structures to allow for survey and extraction of mining resources.

[78] Minn. R. 7850.4400, subp. 4

3.8.4 Tourism

Describe any tourism and associated community benefits derived from natural resources, recreational, and/or historical or cultural opportunities in the area. Provide an estimate of annual tourism revenues, using information from Explore Minnesota,[79] or other relevant resources.

Provide an analysis and discussion of potential impacts of the project, proposed mitigative measures, and any adverse environmental effects that cannot be avoided. As with recreational resources, tourism resources can be indirectly impacted by project related activities that may occur away from specific tourism areas by impacting other resources that the tourism attractions are dependent on.

3.9 Archaeological and Historic Resources

This section should discuss the effects of the facility's construction and operation on archaeological and historic resources. Effects from construction usually occur in areas where there will be new ground disturbance. Archaeological resources are locations where objects or other evidence of archaeological interest exist, and can include aboriginal mounds and earthworks, ancient burial grounds, prehistoric ruins, or historical remains. Historic resources are sites, buildings, structures, or other antiquities of state or national significance.

Generally, projects cannot be located in state registered historic sites, state historic districts, or national historic sites, landmarks, and districts unless there is no feasible and prudent alternative. Economic considerations alone do not justify approval of these areas.

The main state agencies in Minnesota that work in this area include the State Historic Preservation Office (SHPO), the State Archaeologist, and the Minnesota Indian Affairs Council. Tribal Historic Preservation Offices (THPOs) are officially designated by Tribes and serve the same function as a SHPO and work out of the Minnesota Indian Affair Council. These state agencies have datasets that applicants must consult as they develop their project. While these datasets may include federal information such as National Register of Historic Places eligible properties, SHPO coordination does not substitute federal obligations. Federally, the United States Army Corps of Engineers enforces Section 106 of the National Historic Preservation Act and may act as the lead agency on that aspect for the project. Any project that will be built on public land or waters will also be reviewed under the Minnesota Field Archaeology Act. In addition to these resources, applicants may wish to contact local governments for information on locally designated historic properties or districts.

Beyond analysis of potential impacts in an application, PUC application acceptance orders typically authorize the applicant to consult with SHPO and THPOs to complete this work, SHPO is statutorily obligated to participate in the PUC's siting and routing proceedings.[80] Staff recommends that applicants work with SHPO and THPOs during preparation of the application and include documentation of this coordination in the draft application.

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[79] *Explore Minnesota* website, (n.d.)https://mn.gov/tourism-industry/research/tourism-and-the-economy.jsp (accessed February 26, 2025)
[80] Minn. Stat. 216I.18, subd. 3(c)

SHPO's comments are recommendations, as state law regulates the state agency funding, permitting, or licensing of the project. PUC permits generally include recommendations (e.g., hiring a qualified consultant to conduct a Phase Ia literature review, Phase I archaeological survey, or an archaeological assessment), are included in permit condition to be completed prior to construction.

Records from SHPO and the State Archaeologist likely do not include locations of cultural importance only known by tribes. For this reason, staff strongly encourages applicants to work with THPOs. Coordination with THPOs prevents impacts from the project to known traditional cultural properties. THPOs assist with the preservation of Tribal historic properties and cultural traditions. They are also available to advise federal, state and local agencies on the management of Tribal historic properties and instruct municipalities on Section 106 reviews to represent tribal interests.

The preferred mitigation for impacts to archaeological and historic resources is prudent siting, routing, and design of the project to avoid these properties. and the application should describe how impacts will be avoided by the project. Where feasible, avoidance of the resource is required in PUC permits, and where not feasible, mitigation must minimize impacts consistent with SHPO and State Archaeologist requirements.

3.10 Natural Resources

Applications must discuss impacts from construction and operation of a proposed facility on the natural environment.[81] Large energy infrastructure facilities impact the natural environment. Impacts are dependent upon many factors, such as how the facility is designed, constructed, maintained, and decommissioned. Other factors, most notably the environmental setting, influence potential impacts. Impacts can and do very significantly across projects.

Staff recommends that each resource section of the application provide a general description of the resource, identify a ROI for impacts appropriate to the resource, then discuss potential impacts and mitigation measures for the impacts. Applicants should describe the measures to avoid, minimize, or mitigate effects, identifying mitigation measures required by PUC or other permits and additional mitigation measures proposed by the applicant.

3.10.1 Air Quality

Applications must discuss impacts from construction and operation of a proposed facility on air quality.[82] The nature and extent of these impacts will depend on several factors, including the size, purpose, and specific processes associated with the facility. In Minnesota the MPCA regulates and manages air quality in the state.

Air emissions from project operations will vary, with many project types that can operate without a need to mitigate air pollutant emissions. Regulated emissions could include particulate matter (PM), nitrogen oxides (NOx), Sulphur Dioxide (SO_2), carbon monoxide (CO), and volatile organic compounds (VOCs). For projects that include combustion processes (e.g., diesel, natural gas, etc.), including backup

[81] Minn. Stat. 216I.05, subd. 4(5)
[82] Minn. Stat. 216I.05, subd. 4(5)

generators, staff recommends applicants conduct a proposed annual emission inventory that can be compared to the MPCA air quality permitting thresholds by applicable pollutant.[83]

List the stationary sources of air emissions at the facility, such as combustion turbines, electricity generating equipment, large aboveground storage tanks, or fugitive emissions from leaks. Describe the fuel source for any equipment that uses combustion and the types of emissions. If emissions do not have the potential to be significant, summarize why that is the case and provide general emission values with proper justification. In any case, indicate the nearest sensitive receptors to the project, including residences, public places, hospitals, childcare facilities, nursing homes, and the like.

If emissions have the potential to be significant, summarize project emissions conservatively in pounds per hour as well as annually in tons per year under all applicable operating scenarios. Describe any limits on the equipment or operation that would limit air emissions such as curtailment, pollution control equipment, etc. If emissions still have the potential to be significant after equipment limitations are considered, staff may request further evaluation such as an Air Emissions Risk Analysis and Risk Assessment Screening Spreadsheet to assess impacts to human health.

Fugitive Dust

Project air quality impacts arise from various sources, e.g., construction equipment, during construction-related activities, and the operational process, which can include equipment usage and combustion sources. Construction activities can generate fugitive dust, especially in dry conditions. Dust can contribute to PM pollution, which can affect local air quality. These emissions are generally short-term and not persistent (i.e., part of the operational profile of the project), and are regulated by the MPCA under Minn. R. 7009.3000. Under this rule, project developers must take steps to minimize and control dust during construction and demolition phases. Applications for any project requiring should discuss the extent and type of fugitive dust impacts that could occur.

Similarly, all projects should discuss the mitigation measures that will be used to reduce fugitive dust impacts in the application. Common mitigation actions may include using water or other control methods to suppress dust during activities such as excavation, grading, and demolition. The DNR commonly recommends in comments to the PUC on these projects that non-chloride solutions for dust control be used. Other practices may include limiting vehicle speeds on unpaved roads to reduce dust generation or employing barriers or shields, as appropriate, to prevent dust from becoming airborne. Applicants are encouraged to consider development of a dust management plan to demonstrate how fugitive dust emissions during project construction will be mitigated.

Projects Requiring an Air Permit

The application should indicate whether an air quality permit is needed to construct and operate a facility. Applicants should contact the MPCA to discuss the potential air quality impacts of their project to determine if an air quality permit is required to manage their emissions. While an air quality permit is not required for most large energy infrastructure projects that require a site or route permit, facilities that will use several emergency engines or combust large amounts of fossil fuel, for instance, are

[83] MPCA, *Air Permits* website (n.d.), www.pca.state.mn.us/business-with-us/air-permits (accessed February 24, 2025)

expected to coordinate with the MPCA and provide all communication that's occurred with the MPCA for the project in their application.

3.10.2 Geology and Groundwater

The PUC considers underlying geology and groundwater resources to evaluate potential project impacts, as well as construction suitability. Designated sites must have access to proven water supply sufficient for plant operation and groundwater use for high consumption purposes should be avoided if a feasible and prudent alternative exists and any groundwater use at the site should not adversely impact groundwater dependent natural resources or higher priority users.[84] Construction activities often require dewatering and may breach acquirers. Additionally, some portions of the state present unique geologic conditions that may require additional engineering or alternative project siting to abate environmental risks.

Based on past practices, staff recommends that applications include a summary of the underlying geology and groundwater resources, which may include the subsurface, glacial-age deposits, bedrock, and any anticipated project features that may affect groundwater conditions.

Geologic and subsurface maps often convey important spatial information that the PUC and other reviewers will rely upon to determine if mitigation is needed during project construction and operation. Information and related geological data can be obtained through the Minnesota Geological Survey.[85] The discussion of resources and impacts should reflect the project location (e.g., areas with known karst features or sinkholes) and the specific elements of the project (e.g., underground storage tanks or related infrastructure). Staff recommends applicants consult DNR's groundwater atlas program to obtain the necessary technical and regulatory support.[86] Applications should state whether karst features or sinkholes are present in the project vicinity and any mitigation measures to avoid these features.

3.10.3 Soils

The PUC must consider the facility's impacts on land, and impacts to productive agricultural land.[87] Provide a description of the topography and soils within and adjacent to the project area including:

- Soil types, drainage class, depth to water table (restrictive layer)[88]
- Topography (contours at 2 feet)
- Hydrology: General hydrologic conditions of the area, location and characteristics of areas with saturated soils or standing water

Describe potential soil impacts during construction, operations, decommissioning, and restoration of the project, including any cut and fill work required for construction. This could include damage cause by

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[84] Minn. R. 7850.4400, subp. 5
[85] University of Minnesota, College of Science and Engineering, Minnesota Geological Survey, (n.d.), https://cse.umn.edu/mgs (accessed, February 25, 2025)
[86] DNR, Groundwater Atlas Program website, (n.d.), www.dnr.state.mn.us/waters/groundwater_section/mapping/index.html (accessed February 25, 2025)
[87] Minn. Stat. 216I.05, subd. 11(b)(1) and subd. 11(b)(5)
[88] USDA, Natural Resources Conservation Service, Soil Data Viewer, www.nrcs.usda.gov/resources/data-and-reports/soil-data-viewer; Web Soil Survey, https://websoilsurvey.nrcs.usda.gov/app/

rutting and compaction, especially to farmlands. With large amounts of soil excavation, identify quantities, where the soils will be stored and relocated, and how they will ultimately be used (e.g. backfilling).

Identify measures to avoid or minimize effects to soils. Discuss efforts to minimize soil erosion during construction and through the life of the project, minimization of soil compaction, restoration phase decompaction efforts, and the separation, storage, and redistribution of topsoil. Although many of these measures will be provided in greater detail in stormwater pollution protection plans, the application should provide a summary of these measures. Mitigation measures discussed in the application should be consistent with those outlined in the VMP and AIMP. Identify any adverse effects that cannot be avoided.

3.10.4 Surface Water (including stormwater, floodplains, and wetlands)

Applications must discuss impacts from construction and operation of a proposed facility on water quality.[89] Describe surface waters, floodplains, and wetlands within and adjacent to the project area. Identify any impaired water bodies in the area and identify their impairment(s). Provide maps showing surface waters, floodplains, and wetlands showing each water feature in relation to the project. Describe if water courses, waterbodies and wetlands were identified via desktop review or field surveys.

The DNR maintains an inventory of public waters[90] and provides a framework for assessing water health.[91] The USFWS maintains the National Wetlands Inventory.[92] The United States Federal Emergency Management Agency's Flood Map Service Center provides flood hazard mapping; not all floodplains are digitally mapped.[93]

Unavoidable surface water and wetland impacts (permanent and temporary) from the proposed project are subject to Minnesota Board of Water and Soil Resources, DNR, USFWS, the United States Army Corps of Engineers and local government permitting requirements as applicable. Any crossings, including aerial, of public watercourses, basins, and wetlands are subject to water crossing permits administered by DNR. Identify measures to avoid or minimize impacts to surface waters, and list adverse effects that cannot be avoided.

Construction disturbing more than one acre of soil requires a construction stormwater permit from the MPCA.[94] Describe how the project will manage stormwater during construction and operation of the project. Describe the impacts of stormwater management within and adjacent to the project boundary, including but not limited to infiltration and permanent retention/drainage ponds. Describe mitigation measures to minimize impacts to surface waters and wetlands.

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[89] Minn. Stat. 216I.05, subd. 4(5)
[90] DNR, Public Waters Inventory (PWI) Maps, www.dnr.state.mn.us/waters/watermgmtsection/pwi/maps.html
[91] DNR, Watershed Health Assessment Framework, www.dnr.state.mn.us/whaf/index.html
[92] USFWS, National Wetlands Inventory, www.fws.gov/program/national-wetlands-inventory
[93] United States Federal Emergency Management Agency, Flood Maps, www.fema.gov/flood-maps
[94] MPCA, Construction Stormwater, https://www.pca.state.mn.us/business-with-us/construction-stormwater

3.10.5 Vegetation

Applications must discuss impacts from construction and operation of a proposed facility on vegetation.[95] Describe the dominant vegetation and cover types within and adjacent to the project area, including, but not limited to, the following: agricultural lands (row crops, hay/pasture, other), non-agricultural upland (prairie, other grasslands, brushlands, and upland woods) and wetlands (forested, wet meadows, marshes, bogs, fens). Clarify whether the vegetation types were identified via desktop review only or were field verified. Staff recommends that applicants use the National Land Cover to allow comparison between facilities because the underlying data is updated more frequently than some alternatives.[96]

Describe potential vegetation impacts that could occur during construction, operation, maintenance, decommissioning, and restoration of the project. Staff strongly recommends that the application include a table with the estimated number of acres of each land cover type and the number of acres to be impacted by the project, including a breakdown of temporary and permanent impacts. The application should also include maps of the vegetation cover types within and adjacent to the project area. In addition to discussing the acreage of potential impact, describe the measures to avoid, minimize, or mitigate effects, identifying mitigation measures required by PUC or other permits and additional mitigation measures proposed by the applicant. The impacts and mitigation measures described in the application should be consistent with those described in the VMP and AIMP prepared for the project. Identify any adverse effects that cannot be avoided.

3.10.6 Wildlife and their Habitats

Applications must discuss impacts from construction and operation of a proposed facility on wildlife.[97] Describe existing wildlife resources, including wildlife species and habitats present within and adjacent to the project area. Wildlife habitats to discuss and consider for impact analysis include, but are not limited to:

- State Wildlife Management Areas) and Scientific and Natural Areas,[98]
- Federal Waterfowl Production Areas (WPAs),
- State and federal wildlife refuges, state parks, state forests, federal forests
- conservation easement lands (CRP, WPA, RIM,[99] federal easement lands)
- State waterfowl feeding and resting areas[100]

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[95] Minn. Stat. 216I.05, subd. 4(5)
[96] US Geological Survey, National Land Cover Database, www.usgs.gov/centers/eros/science/national-land-cover-database
[97] Minn. Stat. 216I.05, subd. 4(5)
[98] DNR, Wildlife management Areas, www.dnr.state.mn.us/wmas/index.html; Minnesota Scientific and Natural Areas, www.dnr.state.mn.us/snas/index.html
[99] Board of Water and Soil Resources, *Reinvest in Minnesota Overview*, https://bwsr.state.mn.us/reinvest-minnesota-overview
[100] www.dnr.state.mn.us/wildlife/shallowlakes/mwfra.html

- Important Bird Areas.[101]

Wildlife resources on private lands in the project vicinity should also be discussed as agricultural lands, wetlands, forested areas, farmsteads, and agricultural drainage ditches all provide wildlife benefits. DNR's Minnesota Wildlife Action Plan provides a useful context for the state's wildlife resources.[102]

In addition to information from wildlife management agencies, applicants should also provide a summary of any wildlife studies completed for the project and include them as an appendix to the application.

Conservation easements are sold or donated by a landowner to state, federal, or non-governmental organizations in perpetuity to meet conservation objectives. Conservation easements may or may not allow or require public access as part of the easement agreement. Describe the conservation easements on lands within and adjacent to the project boundary, particularly Reinvest in Minnesota (RIM) lands and conservation programs administered by the United States Department of Agriculture.[103] Conservation easements owned by non-governmental organizations, such as land trusts, are registered with the county.

Applications should provide an analysis and discussion of potential wildlife impacts of the project, proposed mitigative measures, and identify any adverse impacts that cannot be avoided. Risks to individual wildlife species will vary depending on what phase the project is in, what activities are occurring, why the species is within the project area, and the species ability to move away from a potential threat. When identifying potential impacts to wildlife species, applicants should consider the entire life of the project Discussion of impacts should include any proposed fencing and screening for the project and how these features may impact wildlife (e.g., habitat fragmentation, additional habitat from new plantings for screening).

Discuss measures that will or may be implemented to avoid, minimize, or mitigate adverse impacts to wildlife and identify mitigation measures required in the PUC or other permits as well as additional mitigation measures the applicant will commit to employing during construction and through the life of the project.

3.10.7 Rare and Unique Natural Resources

Applications must discuss impacts from construction and operation of a proposed facility on rare and unique natural resources.[104] Summarize any rare and unique natural resources including habitat and vegetation community types, threatened, endangered, species of special concern within or adjacent to the facility. Identify and describe any project related impacts to any rare and unique natural resources. Identify any measures proposed to avoid or minimize potential impacts to these resources, and list unavoidable impacts to these resources.

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[101] www.dnr.state.mn.us/iba/index.html
[102] DNR, Minnesota's Wildlife Action Plan 2015 – 2025, www.dnr.state.mn.us/mnwap/index.html
[103] USDA Farm Services Agency, Conservation Programs, www.fsa.usda.gov/sites/default/files/documents/conservation_at_a_glance_22_final.pdf
[104] Minn. Stat. 216I.05, subd. 4(8)

Applicants should consult two primary sources for identifying rare and unique natural resources in the project's area:

- The DNR Minnesota Conservation Explorer (MCE) to access Minnesota's Natural Heritage and request an automated assessment of potential impacts to Minnesota's rare features.[105]
- The USFWS Information for Planning and Consultation database (IPaC) for records of rare and unique resources.

Applications should include the reports from the MCE and IPac and additional correspondence with resource agencies in an appendix. Detailed locations of listed species should not be included in the application. Applications should describe Minnesota Biological Survey areas of biodiversity significance and native plant communities within and adjacent to the project boundary.[106]

MCE and IPaC database results can identify rare and unique natural resources that may be within the same county as the proposed project, and those resources may be far enough away from the proposed project or the resource may not be mobile, i.e. listed plant species, native plant communities, and Minnesota Biological Survey areas. All rare and unique resources identified by MCE and IPaC should be identified and summarized. If an identified resource is not known to be within the project area or if habitat for an identified rare or listed species is not found within the project area during field surveys, provide a detailed explanation as to why additional impact analysis will not be completed for the rare and unique resource.

Staff recommends that applications discuss whether native prairie[107] has been identified within or adjacent to the proposed facility and the presence of any Native Prairie Bank easements (voluntary easements between landowners and the DNR).[108] If the applicant has identified native prairie, applicants should discuss potential mitigation measures to avoid impacts to native prairie. PUC permits have required permittees to prepare a prairie protection and management plans in coordination with DNR if facilities are placed in native prairie. This has been a standard permit condition for wind and solar permits and a special condition for some transmission line permits. Staff recommends that applicants consider including a draft prairie protection and management plan in the application to streamline review and avoid construction delays. Recommendations for project setbacks from native prairie may be appropriate for site-specific conditions that warrant additional protection, such as prairie chicken habitat, associated wetland complexes, public waters, or other important wildlife uses.

Identify and document any known bald eagle activity, foraging areas, nests, and winter roost areas within the project area or within two miles of the project area. Potential impacts to bald eagles and their nests are regulated by the USFWS under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Potential impacts to the bald eagles and/or their nests should be discussed in the application, but the applicant is also responsible for coordinating with the USFWS directly to address potential bald eagle impacts, permitting, minimization, and mitigation needs.

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[105] DNR, *Minnesota Conservation Explorer*, https://mce.dnr.state.mn.us/
[106] DNR, *Minnesota Biological Survey*, www.dnr.state.mn.us/eco/mbs/index.html
[107] For purposes of its site and route permits, the PUC has deferred to the statutory definition of native prairie in Minn Stat. 84.02, subd. 5 Minn. Stat. 82
[108] DNR, Minnesota Native Prairie Bank, www.dnr.state.mn.us/snap/prairiebank.html

Describe the results of any surveys or known studies conducted for rare and unique resources. The application, in both draft and final forms, should describe any communication, coordination, or consultation with DNR or USFWS regarding potential project impacts to identified rare or unique resources in the application text and include the correspondence in an appendix.

3.11 Greenhouse Gases

Applications must include a description of greenhouse gas (GHG) emissions associated with constructing and operating the facility.[109] Staff recommends that applicants use the EQB's current guidance for providing proper GHG assessments in the State of Minnesota's environmental review process.[110] Using this guidance ensures consistent practices with sources used for emission factors, global warming potentials, and the like when developing the application's GHG calculation. Regardless of the method of calculation the applicant chooses to use, sufficient background technical information to allow the reader to replicate the emission calculations is required.

The EQB's guidance is not all-inclusive, so the project may require more specific emission factors. In this case, the applicant must provide a justification for using different emission factors. Using EPA developed emission factors as much as practical is encouraged to ensure credibility and consistency. The most common EPA emission factors related to energy projects can be obtained from EPA's simplified GHG calculator.[111]

The EQB is developing a GHG calculator tool to estimate a project's GHG emissions, but that tool was not available at the time this guidance was prepared. The tool is expected to be finalized by the end of April 2025. Guidance for this calculator will also be available by the end of June 2025. This application guidance will be updated accordingly when the calculator and guidance are both finalized.

If the project requires more specific emission factors or considerations, an applicant is not required to use the defaults provided in the EQB guidance or EPA calculator. Applicants may customize emission factors. However, applicants should justify why the deviation from the default emission factor is required and demonstrate that these emission factors are valid to use for the proposed project. Sufficient background technical information to allow the reader to replicate the emissions calculations should be robust if this alternative method is chosen.

The main GHGs to consider include are CO_2, N_2O, CH_4, and SF6. Final quantifications should be reported in short tons of carbon dioxide equivalent (CO_2e) and annualized for operation (tons per year). CO_2e is calculated based on the most recent global warming potentials (GWP) of each GHG as detailed in the EQB's guidance. If the Intergovernmental Panel on Climate Change's GWPs have been updated more recently than the EQB's guidance, those should be used.[112]

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[109] Minn. Stat. 216I.05, subd. 4(6)
[110] EQB, *Environmental Assessment Worksheet (EAW) Guidance: Developing a Carbon Footprint and Incorporating Climate Adaptation and Resilience*. (2024)
www.eqb.state.mn.us/sites/eqb/files/2024_eaw_climate_guidance_2.pdf (accessed February 27, 2025)
[111] EPA Center for Corporate Climate Leadership, Simplified GHG Emissions Calculator (2025)
www.epa.gov/climateleadership/simplified-ghg-emissions-calculator (accessed February 27, 2025)
[112] https://archive.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

For construction, report on the type of equipment to be used, the duration of use, the fuel type, and how much fuel would be consumed. Identify all other significant sources of GHG emissions that may be associated with the project

Include GHG emissions for both the construction and operation phases of the facility. Applicants should provide an estimate of annual GHG emissions for facilities powered by natural gas, diesel, fuel oil, or coal (including all types of facilities that include backup generators fueled by carbon based fuels) For transmission facilities, most renewable generation facilities, and many energy storage facilities, GHG emissions during the operations phase will likely be minimal. For these facilities, applicants should provide a discussion on how the project is using, transmitting, or generating renewable energy. This should include a description of how the project assists or interacts with Minnesota's Next Generation Energy Act goals.

3.12 Climate Change and Resilience

Applications must include a description of the facility's climate change resilience.[113] Many energy projects are considered critical facilities; that is, they are necessary to a community's public health and safety. These facilities require extra attention as risk potential is discussed for the project. As applicable, explore warmer, wetter, cold weather warming, more frequent freeze/thaw cycles, more damaging rains, extreme participation events, increased risk of heat waves, and drought.

Staff recommends this discussion outline current Minnesota climate trends and how anticipated climate change might interact with a project and its development and recommends applicants consult EQB's guidance in its discussion of potential climate effects.[114]

Staff recommends the application describe climate change trends specific to the most representative geographic unit for the project, typically a county. Report on historical climate trends in the project location, specifically including precipitation and temperature. The DNR's Minnesota Climate Trends tool is the best source of information to establish a narrative for climate trends.[115] Use year 1980 as the date start year as recommended in the EQB's guidance and use the most recent year with complete data as the date end year.[116] Applicants should report annual averages for temperature and precipitation for all projects, but some projects might require more specific timeframes. For instance, it may be helpful to evaluate the project in terms of winter climate trends if the project will only be operating in the winter (such as with a peaking plant).

Describe how the project will interact with climate trends throughout the life of the project. Examples include discussing how infrastructure will be resilient with the more extreme weather expected from climate change. Some examples include:

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[113] Minn. Stat. 216I.05, subd. 4(6)
[114] EQB, Environmental Assessment Worksheet (EAW) Guidance: Developing Carbon Footprint and Incorporating Climate Adaptation and Resilience, June 2024
www.eqb.state.mn.us/sites/eqb/files/2024_eaw_climate_guidance_2.pdf
[115] DNR, Minnesota Climate Trends,(n.d.) https://arcgis.dnr.state.mn.us/ewr/climatetrends/
[116] Page 19. www.eqb.state.mn.us/sites/eqb/files/2024_eaw_climate_guidance_2.pdf

- If a project would place infrastructure in a floodplain, the higher risks expected with the flooding frequency and intensity expected from climate change should be discussed.
- If the project changes land cover from being water retentive to a significant amount of new impervious surface, such as with a substation or battery energy storage facility, consider effects from increased rainfall and severity.
- Similarly, changing drainage patterns might amplify or interact with how climate change is anticipated to affect nearby resources such as fish, wildlife, plant communities and sensitive ecological resources like calcareous fens and trout streams. Interactions with other parts of the permit application, such as the VMP, may be required because of climate effects.
- When developing a VMP, keep in mind that warming winters can stress some species that need snow cover and has allowed better survival of invasive species and destructive insects.

Discuss mitigation measures to address the effects identified and how the project will adapt or cope with the expected effects of climate change. Include complete descriptions, quantification, and a detailed assessment of the planned mitigation activity. Propose mitigation measures that would minimize or eliminate potential significant effects to the project from climate change. The EQB's guidance has several examples of how to identify and assess reasonably available mitigation options.

3.13 Unavoidable Impacts

When determining whether to issue a site or route permit the PUC must evaluate unavoidable impacts of proposed sites or routes.[117] In order to assist this evaluation, staff recommends that applicants summarize the environmental impacts during both the construction and operations phases that cannot be avoided with mitigation. Unavoidable impacts during construction may include fugitive dust, noise, soil compaction and erosion, temporary displacement of wildlife, and traffic delays. Unavoidable impacts once the facility is operational may include visual impacts resulting from new infrastructure, loss of land previously used for agricultural or other purposes, and wildlife injury or death due to the presence of new structures or fences.

3.14 Irretrievable and Irreversible Impacts

When determining whether to issue a site or route permit the PUC must evaluate unavoidable impacts of proposed sites or routes.[118]

An irretrievable impact occurs when a commitment of resources is not recoverable for later use by future generations, and an irreversible impact occurs when a commitment of resources is impossible or very difficult to redirect to a different future use.

Applicants should provide a discussion of irretrievable and irreversible impacts. This can include the use of aggregate, hydrocarbons, labor, and fiscal resources during construction (irretrievable), and the loss (i.e., wetland type conversion) of forested wetlands (irreversible).

[117] Minn. Stat. 216I.05, subd. 11(b)(5)
[118] Minn. Stat. 216I.05, subd. 11(b)(11)

3.15 Cumulative Potential Effects

PUC is charged with minimizing environmental and human impacts, including land use conflicts, in its siting and routing determinations and with evaluating the future needs for large energy infrastructure facilities in the same general area as a proposed facility.[119] Because large energy infrastructure facilities exist in the physical environment, they may conflict with existing and planned infrastructure such as road improvements or recreational trails, as well as enhance opportunities for future development by enhancing grid stability. To assist the PUC in its determination, staff recommends that applicants identify foreseeable projects in the vicinity of the proposed facility and discuss potential interactions between the proposed facility and other planned projects in the project vicinity. Staff recommends using information from local governments, MnDOT, the MISO Transmission Planning and Generator Interconnection Queue, the EQB interactive project database, and other methods and sources as applicable to identify foreseeable project in the vicinity of the proposed facility.

[119] Minn. Stat. 216I.05, subd. 11(a)(1) and (b)10)

4 FACILITY SPECIFIC CONTENTS AND GUIDELINES

Chapter 3 provides a general overview of application content for all facilities seeking a site or route permit from the PUC. However, there are differences in how facilities are constructed and the type and level of impact that vary by type of facility. This chapter discusses aspects of projects that vary by facility type.

4.1 Transmission Lines

4.1.1 Facility Description and Land Control (Section 3.2)

Describe the status of the applicant's land control along the proposed route. Discuss whether the applicant anticipates using eminent domain or whether the applicant anticipates being able to secure all required land rights through voluntary agreements. Provide an estimate of the anticipated timeframe for securing all land control.

Describe the purpose of the transmission line (e.g., grid reliability, meeting increased energy demand, a gen-tie line connecting a generation or storage facility with the grid).

Describe the major components of the proposed transmission line including:

- **Transmission Line Design**: Discuss the following design considerations in the text and illustrate them on the accompanying maps:
    - *Requested route width*: The application should describe the route width the application is requesting, highlighting areas where the applicant seeks an expanded route width (e.g., around substations, near road intersections, near natural resource areas). Maps should illustrate the requested route width.
    - *Required ROW width*: The application should discuss the ROW required for the transmission line, indicating where the proposed route shares or parallels existing road or transmission ROW. The applicant must demonstrate that it has the ability to control the transmission line ROW in such a manner as to ensure its safe operation, particularly with respect to the National Electric Safety Code and applicable National American Electric Reliability Corporation standards. Maps should illustrate the required ROW.
    - *ROW Sharing and Paralleling***:** The PUC must consider, when appropriate, routes that would use or parallel existing railroad and highway ROW.[120] When applicable, the PUC must make a specific finding that the PUC considered locating a transmission route on an existing route and using parallel existing highway right-of-way. If an existing transmission route or parallel existing ROW is not used, the PUC must state the reasons.[121] Discuss whether the applicant considered locating the

[120] Minn. Stat. 216I.05, subd. 11(b)(8)
[121] Minn. Stat. 216I.05, subd. 11(e)

facility along an existing transmission line or parallel to or within existing highway ROW.

- *Anticipated Alignment*: The application should discuss generally the anticipated alignment and illustrate the alignment on application maps.

- **Transmission Structures**: Describe the type of structures (e.g., monopole, H-frame, lattice) and provide the height and diameter of the anticipated transmission poles. Discuss whether they will be secured by concrete footings or directly embedded. Discuss the average and maximum spans between transmission structures. Describe the anticipated depth of holes.
- **Conductors**: Discuss voltage and the type of conductors as well as any design features such as bird flight diverters or anti-galloping devices.
- **Substations and Switching Yards**: Describe both newly constructed substations and switching yards as well as improvements to existing facilities. Discuss fencing, lighting, and building and structure height.
- **Reliability and Safety:** Discuss transmission line safety features and operational reliability.

4.1.2 Public Services (Section 3.7.6)

If the proposed facility will use existing road ROW, discuss plans for maintenance of both the transmission line and the road ROW and any constraints the addition of the transmission line may impose on the existing roads. Information on MnDOT's utility accommodation policy can be found on its website (www.dot.state.mn.us/utility/). Applicants should consult with local road authorities for information on occupation of or work within local road ROWs.

4.1.3 Public Health and Safety (Section 3.7.5)

Applicants should calculate EMF levels for above-ground power lines and below ground power lines, if proposed. These calculations should be based on the maximum operating voltage of transmission. Provide a separate table for electric and magnetic fields. EMF might interfere with implantable electromechanical medical devices, such as pacemakers, defibrillators, neurostimulators, and insulin pumps. Propose mitigation measures that would minimize or avoid potential significant effects from the project due to EMF.

Staff also recommends that applications discuss stray voltage and and mitigation measures that the applicant will employ to minimize potential impacts as well as additional mitigation measures that could be deployed.

4.2 Wind Energy Generating Facilities

4.2.1 Facility Description and Land Control (Section 3.2)

At the time of application submittal, staff recommends the applicants should have 50-70% of the land control required to construct the project. If that cannot be accomplished, the applicant should provide insight to why land control has not been secured and a timeline for securing the necessary land rights.

Describe the major components of the wind facility including:

- **Turbines**: Applications should describe the number and models of turbines under consideration for the facility. If turbine model has not been selected, provide information on turbines being considered (up to three), representing the maximum and minimum megawatt size under consideration. Describe the turbine dimensions (tower height, total height when blade is fully extended, rotor diameter). Discuss mitigation measures (e.g., noise reduction operations operating mode, blade design). Discuss any alternate turbine locations under consideration.
- **Meteorological Towers**: Identify the number of meteorological towers for the project and whether they will be temporary or permanent. These shall be placed no closer than 250 ft. from the edge of the road rights-of-way and from the boundaries of the developer's site control (wind and land rights).
- **Roads**: Provide an estimate of the total length of newly constructed access roads and discuss road design. Discuss improvements to the existing public road system, such as new driveways or culverts.
- **Electrical Collector System**: Describe collector or feeder lines will be installed and provide an approximate length. Identify above-ground collector lines. For underground collectors, describe the method of installation and the depth of burial. Describe the size, number, housing and foundation of inverters.
- **Generation Intertie:** Describe how the facility will be connected to the electrical grid. Describe any generating tie line, including length and endpoints. Indicate whether the generation tie line will require a route permit from the PUC. Describe the location and size of the project substation(s). Describe the components of the substation, including equipment, access roads, and fencing.

4.2.2 Noise (Section 3.7.6)

Applications for energy storage facilities should describe noise generated by the facility and describe noise mitigation measure to minimize impacts to nearby receptors. Staff recommends that a noise impact assessment be included as an appendix.

4.2.3 Public Health and Safety (Section 3.7.5)

Applications should provide an analysis and discussion of shadow flicker based on the preliminary turbine layout. Include isopleths for 100, 50, and 25 hours / year of potential shadow flicker. List the assumptions and methodology used in the analysis. Provide a figure illustrating likely hours of shadow flicker/year at 1,000 feet and a table showing potential shadow durations/ day at 1,000 feet. Applications should identify how impacts will be minimized and mitigated based on landowners that are participants in the project, versus landowners that are not participating in the project.

4.2.4 Public Services (Section 3.7.7)

Applications for wind facilities should discuss potential impacts to communication and identify potential project interference with communication systems, television broadcast systems, cell towers, broadband services, and microwave beam paths. Staff recommends that applications include a communications study and a microwave beam path study as appendices to support the application discussion..

Discuss potential impacts to aviation and required or potential mitigation measures, including marking and lighting for tall structures such as wind turbines and met or communications towers. The application should identify all public and private licensed airports within 10 miles of the site boundary or route.

Discuss the proposed facility's compliance with Minnesota Department of Transportation Department of Aviation (www.dot.state.mn.us/aero/talltowers.html) and Federal Aviation Administration requirements. Discuss whether a no hazard determination from the Federal Aviation Administration is necessary. Depending upon the location of the wind turbines, additional coordination with the U.S. Department of Defense, North American Aerospace Defense Command, or Air National Guard may be necessary. Potential impacts to aerial applications for agricultural purposes and pest control should be discussed in the agriculture section.

Wind facilities permitted by the PUC must be equipped with light mitigation technology that meets the Federal Aviation Administration's requirements.[122]

4.2.5 Wildlife and their Habitat (Section 3.10.6) and/or Rare and Unique Natural Resources (Section 3.10.7)

Applications for wind facilities should discuss post-construction, operational phase avian and bat fatality monitoring that will be completed at the project, as well as any post-construction wildlife surveys and monitoring, other than fatality monitoring (e.g., eagle flight path surveys, eagle nest use surveys, acoustic monitoring, etc)..

4.3 Solar Generating Facilities

4.3.1 Facility Description and Land Control (Section 3.2)

Discuss site control and whether the site will be owned by the applicant or an affiliate or leased. Based on previous applications, staff recommends that applicants have 50-70 percent of the land control required to construct the project at the time of application. If that cannot be accomplished, the applicant should provide insight to why land control has not been secured and the timeline for securing the necessary control. Discuss the preliminary development area (area where development would occur) relative to the site.

Describe major facility components and design features of the facility. If multiple options are in play, describe the options being considered. Major components for solar facilities include:

- **Solar Arrays**: Describe the type, number, and dimensions, of panels. the type of racking (e.g. fixed or tracking) and describe the height and orientation of the arrays. Describe the tracking system and the racking.
- **Electrical Collector System**: Describe collector or feeder lines will be installed and provide an approximate length. Identify above-ground collector lines. For underground collectors, describe

[122] Minn.Stat. 215I.19

the method of installation and the depth of burial. Describe the size, number, housing and foundation of inverters.

- **Generation Intertie**: Describe how the facility will be connected to the electrical grid. Describe any generating tie line, including length and endpoints. Indicate whether the generation tie line will require a route permit from the PUC. Describe the location and size of the project substation(s). Describe the components of the substation, including equipment, access roads, and fencing.
- **Operations and Maintenance**: Discuss whether operations and maintenance will be housed at the site or offsite. If an operations and maintenance facility will be constructed, identify the location, the acreage of the facility, the approximate height of the building, parking areas, and fencing. Discuss whether the facility will require a well or septic system.
- **Communications**: Describe the facility's systems for monitoring and controlling generation and power delivery and how the power will be dispatched
- **Access Roads**: Describe how the facility will be accessed and identify locations of proposed driveways and gates. Describe the internal access roads (whether temporary or permanent), including anticipated width, surface material, and total length. Discuss the need for temporary improvements during construction (e.g., wider internal access roads, temporary culverts, temporary turning areas).
- **Project Lighting**: Describe lighting at the project, including the location of the lighting (e.g., gates, substation, fence-line, etc.), whether lights will be motion activated, and whether lights will be downward facing.
- **Fencing**: Describe the height, total length, and type (e.g. agricultural, chain link). of fencing anticipated. Discuss how the fencing is or is not consistent with DNR guidance regarding solar farms.[123]
- **Stormwater Basins**: Identify the location and approximate dimensions of anticipated stormwater basins.
- **Landscaping**: Describe any anticipated landscaping, including vegetative screening, berms, or special fencing.

4.3.2 Aesthetics (3.7.1)

Discuss potential for glare and identify any screening (e.g. vegetation screening, berms, special fencing, etc.).

4.3.3 Public Health and Safety (3.7.5)

Discuss EMF produced from the facility. For solar facilities, typical EMF sources are at transformers, inverters, underground collection lines, substation equipment, and any the gen-tie line. Discuss the

[123] DNR, Commercial Solar Siting Guidance, 2023, https://files.dnr.state.mn.us/publications/ewr/commercial_solar_siting_guidance.pdf (accessed February 24, 2025)

distance from these sources at which EMF can be expected to reach typical background levels and distance to the nearest residence.

4.4 Energy Storage Facilities

4.4.1 Facility Description and Land Control (Section 3.2)

Discuss site control and whether the site will be leased or owned by the applicant or an. If the applicant has not obtained site control at the time of the draft application, the applicant should provide insight to why land control has not been secured and the timeline for securing the necessary control. Discuss the preliminary development area (area where development would occur) relative to the site.

Describe major facility components and design features of the facility. If multiple options are in play, describe the options being considered. The application should describe the overall layout of the site, including fenced areas and areas outside the fence-line for which the applicant will maintain site control. Major components of energy storage facilities include:

- **Battery Cells and Enclosures**: Describe the type of battery, battery management system, number of enclosures, and spacing and separation of batteries and other components. Describe how the enclosures will be cooled to ensure thermal management. The application should also describe anticipated battery upgrades to accommodate degradation as the facility ages. Include graphics and photos to show major components.
- **Power Conversion Systems**: Describe the inverters and transformers used in the facility
- **Generation Intertie**: Describe the electrical collection system, project substation, and how the facility will be connected to the electrical grid.
- **Communications Systems**: Describe the facility's systems for monitoring and controlling power delivery and how the power will be dispatched.
- **Operations and Maintenance Facility**: Describe where operations and maintenance equipment will be stored, whether on site or at a remote location.
- **Safety Systems**: Describe the heat, smoke, and fire detection systems, fire suppression systems, and other safety mitigation measures.
- **Security Fencing**; Describe the anticipated fencing type including height and security measures and the number and location of gates.
- **Access Roads**; Describe how the site will be accessed and access roads within the site.
- **Stormwater Basins**: Identify the location and approximate size of anticipated stormwater basins.

4.4.2 Noise (3.7.6)

Applications for energy storage facilities should describe noise generated by the facility and describe noise mitigation measure to minimize impacts to nearby receptors. Staff recommends that a noise impact assessment be included as an appendix.

4.4.3 Public Health and Safety (3.75)

Discuss EMF produced from the facility. For storage facilities, typical EMF sources are the batteries, transformers, inverters, underground collection lines, substation equipment, and any the gen-tie line. Discuss the distance from these sources at which EMF can be expected to reach typical background levels and distance to the nearest residence.

Applications should also discuss the potential for thermal runaway events and fires and mitigation measures (including training resources for local first responders) in the application section on public safety (or reference the location of that discussion if located elsewhere in the application). Staff recommends that a hazard mitigation analysis be included with the application if available.

4.5 Combustion Facilities

4.5.1 Facility Description and Land Control (Section 3.2)

Discuss site control for the facility and where the facility components will be located on the site. Describe major facility components and design features of the facility. If multiple options are in play, describe the options being considered. Major components for combustion facilities are likely to include:

- **Structure and Turbines**: Characterize the type of generation (e.g., peaking plant), identify the turbine type(s) and burner type, discuss whether the facility is black-start capable, inlet air filters, , the dimensions of the control building, exhaust stack, storage tanks.
- **Cooling:** Describe how will incoming air be cooled before running through the turbine (evaporative cooling) and how the turbine itself will be cooled.
- **Backup Generation**: Discuss whether backup generation is required and, if so, the type and fuel source for backup generation.
- **Fuel Delivery and Storage**: Describe how fuel (including any fuel for backup generators) will be delivered to the facility (e.g., pipeline, fuel trucks). Describe the pipeline dimensions and the source of the fuel, the length of the pipeline. If applicable, describe how fuel will be stored and whether storage tanks will be above or below ground. If applicable, describe pump-house or gas conditioning stations. Describe any permitting requirements for pipelines or fuel storage facilities.
- **Electrical System**: Describe the substation and electrical collection within the site and the interconnection to the electrical grid.
- **Water Supply**: Discuss how both process and potable water will be supplied to the facility.

4.5.2 Aesthetics (3.7.1)

Describe the dimensions of the facility, including stack height and cooling plume.

4.5.3 Air quality (3.10.1)

Applications for combustion facilities will need to provide much more detail on emissions and air quality impacts than most other types of large energy infrastructure facilities. The application should indicate

whether an air quality permit is needed to construct and operate a facility and include all communication that's occurred with the MPCA regarding air quality impacts and permitting in their application.

Staff recommends applicants summarize project emissions conservatively in pounds per hour as well as annually in tons per year under all applicable operating scenarios and compare estimated emissions to the MPCA air quality permitting thresholds by applicable pollutant. Describe any limits on the equipment or operation that would limit air emissions such as curtailment, pollution control equipment, etc.

Staff also recommends that applications identify the nearest sensitive receptors (e.g., residences, hospitals, schools, childcare facilities, public gathering places, etc.) to the project and provide an Air Emissions Risk Analysis and Risk Assessment Screening Spreadsheet to assess impacts to human health.

4.5.4 Water Quality (3.10.2, 3.10.4)

Combustion facilities typically require water for evaporative cooling and facility cooling. The application should discuss the facility's water use (both potable and process water) during construction and operation. Estimate the volume of water necessary and describe how water will be supplied to the facility and, if applicable, stored. Describe how water will be discharged from the facility, any treatment prior to discharging, and the destination of the discharge (e.g., sanitary sewer, direct discharge). Identify any permits required for water use or discharge and describe mitigation measures.

4.5.5 Noise (3.7.6)

Applications for combustion facilities should describe noise generated by the facility and describe noise mitigation measure to minimize impacts to nearby receptors. Staff recommends that a noise impact assessment be included as an appendix.

5 TYPICAL APPENDICES

Typical Appendices provided in site and route permit applications include:

5.1 Completeness Checklist

A completeness checklist ensures that all the components required to be submitted with an application from Minnesota Statutes and Minnesota Rule are provided. This checklist should be in a table format including three columns: the regulatory citation of the requirement, the language of the citation, and where the required information is located in the application.

Checklists should reference the relevant statute or rule. See **APPENDIX A** of this guidance for a template for a completeness checklist.

It is helpful for applicants to also address all of the considerations the PUC must consider for the project when determining if a permit should be issued.

5.2 Maps

Staff recommends that applicants provide detailed maps in an appendix to the application. **APPENDIX B** provides a list of the maps staff recommends be included in the map appendix of the application and staff recommendations for formatting.

5.3 PUC Staff Comments on Draft Application

As part of the preapplication review process discussed in Section 1.3.1, PUC staff will provide the applicant with its completeness review and comments. Staff recommends the applicant include PUC staff comments as an appendix.

5.4 Tribal Coordination

This appendix should include documentation that the applicants attempted to engage all Tribes in the State of Minnesota about the project and offered an opportunity to collaborate with the applicants on the project. Include all letters, emails, notes of calls made, and messages left and to whom, meeting notes, and anything else that is applicable to demonstrate this coordination. An affidavit of mailing is commonly included if letters were sent in the postal mail, or copies of emails sent. If any responses were received by Tribes or changes were made to the project due to collaboration with Tribes, it is integral to include those in this appendix. Follow up with Tribes with different engagement methods if you do not initially receive a response is a best practice. The PUC is developing guidance on engaging with Tribal Nations in Minnesota. A guidance document will be posted on the PUC's website when available.

5.5 Agency Coordination and Comments

The application should include an appendix summarizing outreach to local, state, and federal governments to demonstrate coordination. Staff recommends that the appendix include:

- A table summarizing outreach efforts (including letters, presentations to boards or agencies, meetings with state or local governments or agencies), with a reference to any written correspondence in the body of the appendix.
- A template of the cover letter requesting comments, a list of the recipients, and
- Responses received from local, state, and federal governments.

5.6 List of Landowners

The application must include the names of each landowner whose property is within or adjacent to the proposed site or route.[124] Staff recommends this information be provided in an appendix.

5.7 Draft Decommissioning Plan

In addition to a general discussion of decommissioning (Section 3.2.8), the applicants should include a draft decommissioning plan as an application appendix. Guidance on preparing a decommissioning plan and the review process for these plans is included as **APPENDIX C** of this document.

5.8 Draft Vegetation Management Plan

As discussed in Section3.2.6, in practice site and route permits issued by the PUC require permittees to develop a Vegetation Management Plan (VMP) to detail how a site or route will be vegetated, maintained, and monitored over time. Staff recommends the applicant coordinate development of the VMP with the interagency Vegetation Management Plan Working Group. The Department of Commerce provides guidance on developing VMPs for solar facilities, and staff encourages applicants to consult the recommendations contained in the guidance and contact staff early in the process. [125] .Staff recommends that a draft version of a VMP be included as an appendix in the application to allow for comment and coordination on the plan.

5.9 Greenhouse Gas Calculations

As detailed in Section 3.11, GHG calculations for the project will be provided in the application. Because these calculations are often lengthy due to the amount of information required to provide enough detail for calculation replication, staff recommends that GHG calculations be included in an appendix and referred to in the text. Even with projects that only need to account for construction emissions, listing data sources, emission factors, fuel types and amounts, vehicle types, number of employees, GWPs, unit conversions, and the like is usually best represented in a table. This is most easily accomplished through a spreadsheet that is converted to a PDF. There may be instances where PUC staff request the original spreadsheet in addition to the appendix to verify calculations, so it is important to retain that data as well.

[124] Minn. Stat. 216I.05, subds. 3(b)(5) and 8(a)(3)
[125] Department of Commerce, Guidance for Developing a Vegetation Establishment and Management Plan for Solar Facilities. 2021. https://eera.web.commerce.state.mn.us/eera/web/project-file/11702

5.10 Archaeological and Historic Resources Report

Consultations with the SHPO and all Tribal Historic Preservation Offices (THPOs) should be included in the agency coordination and Tribal Coordination appendices. These documents should provide general determinations of archaeological and cultural resources in and near the project area (within 0.5 miles of the project boundary). The discussion within the application, as detailed in Section 3.9, will be supported by this appendix.

If SHPO or THPOs recommended any type of archeological and historic resource field surveys by qualified personnel, applicants should file reports as an appendix. If results have not been obtained yet, the discussion in the application should describe why the survey or assessment has not been conducted yet. If surveys are planned, list the type and phase as described in the SHPO Manual for Archaeological Projects in Minnesota (2005).

The location of archaeological and historic resources is generally non-public information. Staff encourages applicants to carefully review this appendix before filing the application to ensure the document does not reveal locations of these resources or non-public data.

5.11 Pre-Construction Noise Modeling

Staff recommends that applications for wind, storage, and combustion facilities include a noise impact assessment as an appendix.

5.12 Shadow Flicker

Staff recommends that applications for wind facilities include a shadow flicker assessment as an appendix.

5.13 Avian and Bat Protection Plan

A draft Avian and Bat Protection Plan/Bird and Bat Conservation Plan should be included as an appendix in wind facility applications.