

# Environmental Assessment Worksheet

## Alternative EAW Form for Animal Feedlots

December 2024 version

This form is authorized to prepare Environmental Assessment Worksheets (EAWs) for **animal feedlots**. This most recent Environmental Assessment Worksheet (EAW) Alternative Form for Animal Feedlots (and guidance) is available at the [Environmental Quality Board's \(EQB\) website](#). This form provides information about a project that may have the potential for significant environmental effects. Guidance documents provide additional detail and links to resources for completing the EAW form.

**Cumulative potential effects** can be addressed under each applicable EAW Item or collectively under EAW Item 21.

**Note to reviewers:** Comments must be submitted to the Responsible Governmental Unit (RGU) during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation, and the need for an EIS.

### 1. Feedlot Project Title: West River Dairy Expansion

2. Proposer:	2a. Consultant assisting in EAW completion (if applicable):	3. Responsible Governmental Unit (RGU):
Riverview, LLC	Environmental Scientific	Minnesota Pollution Control Agency
Damon Knobloch	Jason Kirwin	Charles Peterson
Authorized Partner	President	Project Manager
26406 470th Avenue	46170 120th Street	520 Lafayette Road North
Morris, Minnesota 56267	Donnelly, Minnesota 56235	Saint Paul, Minnesota 55155-4194
320-392-5609	320-589-9893	651-757-2856
<a href="mailto:damon.knobloch@riverviewllp.com">damon.knobloch@riverviewllp.com</a>	<a href="mailto:jason@environmental-scientific.com">jason@environmental-scientific.com</a>	<a href="mailto:charles.peterson@state.mn.us">charles.peterson@state.mn.us</a>

### 4. Reason for EAW Preparation: Mandatory EAW

#### MN Rule 4410.4300 subp. 29. Animal Feedlots. If EAW is mandatory, does subpart A or B apply?

Subpart A. For the construction of an animal feedlot facility with a capacity of 1,000 animal units or more or the expansion of an existing facility by 1,000 animal units or more if the facility is not in an area listed in item B.

### 5. Project Location:

5.A. **County:** Stevens County

5.B. **City or Township:** Synnes Township

5.C. **Legal Description (¼, ¼, Section, Township, Range):** N 1/2 & SE 1/4, Section 1, T123N, R43W

5.D. **Watershed in 81 major watershed scale, Hydrologic Unit Code (HUC) 8:** Pomme De Terre River (07020002)

5.E. **GPS Coordinates:** 45°29'43.16"N, 95°59'56.30"W

5.F. **Tax Parcel Number:** 09-0001-000,09-0001-001,09-0003-000, 09-004-000, 09-0005-000

5.G. **At a minimum, attach each of the following to the EAW:**

- County map showing the general location of the project

- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries
- Site plan showing all significant project and natural features for pre- and post-construction
- Map showing manure application sites, manure storage, permanent manure stockpiles, and setback buffers
- Map showing all wells, tile inlets, residences, and sensitive receptors within a one-mile radius of the feedlot or on manure land application sites
- Feedlot Permit Application (SDS, NPDES)
- Map of Tribal boundaries within 10 miles
- List of data sources, models, and other resources (from the Item-by-Item Guidance: *Climate Adaptation and Resilience* or other) used for information about current Minnesota climate trends and how climate change is anticipated to affect the general location of the project during the life of the project (as detailed below in Item 7. Climate Adaptation and Resilience).

### **Attachment List**

Attachment 1: County Map with Project Location  
 Attachment 2: U.S. Geological Survey 7.5 Minute Map  
 Attachment 3: Project Site Map  
 Attachment 4: Resident Map  
 Attachment 5: Manure Application Acres with Cultural Resource Sites Map  
 Attachment 6a: State Historic Preservation Office (SHPO) Results for Project Site & Waterline Route  
 Attachment 6b: SHPO Results for Manure Application Acres  
 Attachment 7a: Natural Heritage Information System (NHIS) Search Results for Project Site  
 Attachment 7b: NHIS Search Results for Waterline Route  
 Attachment 7c: Conservation Planning Report for Manure Application Acres  
 Attachment 7d: NHIS Search Results for Manure Application Acres  
 Attachment 8: Manure Application Acres Available  
 Attachment 9: Soils Map for Project Site  
 Attachment 10: Soils and Buffers Maps for Manure Application Acres  
 Attachment 11: Department of Natural Resources (DNR) Water Appropriation Permit  
 Attachment 12: Minnesota Department of Health (MDH) Well Index Map  
 Attachment 13: Air Quality Modeling Report  
 Attachment 14: Minnesota Pollution Control Agency (MPCA) Feedlot Map  
 Attachment 15: Minor Watershed Map with Manure Application Acres  
 Attachment 16: MPCA Impaired Waters Map  
 Attachment 17: Soil Boring Report with MDH Well Records  
 Attachment 18: Permanent Conservation Easement Map  
 Attachment 19: Minnesota Tribal Lands Map  
 Attachment 20: Environmentally Relevant Area Map  
 Attachment 21: Climate Change and Greenhouse Gas (GHG) Calculations  
 Attachment 22: Minnesota NPDES Individual Feedlot Permit Application  
 Attachment 23: Manure Management Plan (MMP)  
 Attachment 24: Stormwater Runoff Report

## **6. Project Description:**

### **6.A. Provide the brief project summary to be published in the *EQB Monitor* (approximately 50 words).**

Riverview, LLP proposes to expand the existing West River Dairy 7,855-cow (10,997 AU) facility by adding an 11,000-cow dairy (15,400 AU) facility in Section 1 of Synnes Township, Stevens County. Cows will be housed in a cross-ventilated, total-confinement, free-stall barn and will use clay-lined basins with impermeable covers to collect and store manure and wastewater. Liquid manure will be land applied as fertilizer on cropland.

**6.B. Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion, include a description of the existing facility; emphasize:**

**6.B.1. Purpose of the project:**

Riverview, LLP (Proposer) proposes to build an 11,000-cow dairy feedlot in Section 1 of Synnes Township in Stevens County (Project). The Project is an expansion to the existing West River Dairy (Existing Facility), which together will milk a combined total of 18,855 dairy cows (26,397 AU).<sup>1</sup>

See Attachment 1 for the location of the Project within southcentral Stevens County. See Attachment 2 for the location of the proposed expansion with the Project boundary. See Attachment 3 for a Project facility map, including both the proposed Project and the Existing Facility.

**6.B.2. Construction, operation methods, and features that will cause physical manipulation of the environment or will produce waste:**

**Total Confinement Barn (Facility 201)**

The Proposer will construct one total confinement barn with concrete flooring. The barn will be organized into pens, each made of raised bedding stalls, scrape alleys, and feed bunks. Manure, spilled water, and water (from the misters that are used to keep cows cool during the summer months) will be collected with a vacuum truck in the scrape alleys. The north wall of the barn will have a bank of 72"-84" diameter fans to draw air across the barn for ventilation. Overhead doors on the north and south sides of the covered drive alley provide access to the barn. The total site disturbance area for the barn will be 20.7 acres.

**Milking Parlor (Facility 203)**

The Proposer will construct a milking parlor, a utility room, a milk transfer room, and milk storage silos. The Proposer will also construct a holding pen (Facility 202) with concrete floors and a crowd gate to guide the dairy cows into the parlor. The Project will include a reinforced concrete tank (Facility 103) for the temporary storage of parlor water, which will be reused to flush the holding pen (Facility 202). The total site disturbance area for the parlor and holding pens will be 2.9 acres.

**Stormwater Management Construction and Management (Facilities 301, 302, and 303)**

The Proposer will install stormwater basins and modify the contour of the site to direct stormwater to stormwater basins. The Project will include physical landscape modifications, including removing topsoil and grading the site to meet the stormwater management plan. The Project will also implement stormwater erosion prevention and sediment control best management practices (BMPs) during Project construction. The total site disturbance area for the stormwater basin management system will be 7.3 acres.

**Liquid Manure Storage Areas (Facilities 101, 102, and 106)**

The Proposer will install three basin containment systems to store liquid manure, covering 35.2 acres. The LMSA storage capacity will exceed the nine-month minimum required by Minn. R. 7020 by installing basins that will provide 14 months of liquid manure storage capacity. The Proposer expects to store liquid manure for approximately 12 months each year until land application. The Proposer will use onsite earthen materials (clay) to construct manure storage facilities, stormwater basins, and

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<sup>1</sup> An "animal unit" or "AU" is a unit of measure developed to compare the differences in the amount of manure produced by livestock species. The "AU" is standardized to the amount of manure produced on a regular basis by a slaughter steer or heifer, which also correlates to 1,000 pounds of body weight. The "AU" is used for administrative purposes by various governmental entities for permitting and record-keeping.

water storage basins. The updated Feedlot Permit incorporates manure storage guidelines that exceed those in the NPDES General Feedlot Permit.

Installation of a perimeter drain-tile system will be at an elevation below the liner of each of the three LMSAs to control seasonal sub-surface saturation as outlined in the Minnesota NPDES Individual Feedlot Permit (Feedlot Permit) application (Attachment 22). The Proposer will install an inspection port near the LMSAs to enable monthly visual inspections. After construction, the Proposer will ensure the drain-tile system is functioning correctly for each LMSA and look for signs of discoloration or odor that may indicate an issue with the liner.

### **Manure Processing and Dry Manure Storage**

The Project will include a 36' x 36' x 12'-deep reinforced concrete, below-grade tank (Facility 104) to temporarily store and mix manure from the barn. Water from washing onsite equipment (Facility 205) will also be directed to Facility 104. Multiple times per day, the Proposer will pump manure from Facility 104 to Facility 204, where the manure will be routed through mechanical presses to separate the liquid and solid manure. The solid fraction will be used as bedding in the barn and the liquid manure will be pumped to the LMSAs. Excess solids will be stored on Facility 105 and applied on cropland. The total site disturbance area for the manure processing and solid manure storage will be 3.4 acres.

### **Feed Storage Pad (Facility 206)**

The Project will include a 1,070' x 630' (15.5 ac) asphalt feed storage pad designed to direct stormwater to an intake on the east side of the pad. Captured stormwater runoff will flow to Facility 106, which is sized to accommodate a 25-year, 24-hour storm event.<sup>2</sup> The outside perimeter of the feed pad will slope away to prevent additional water from flowing onto the feed pad.

### **Feedstuffs Storage (Facilities 207 and 210)**

The Proposer will construct several facilities for feedstuffs processing and storage. Facility 207 will include bays to store various dry feedstuffs as well as an insulated section for liquid feedstuffs. Grain corn will be unloaded in an enclosed building (Facility 208), where it will be milled and transferred to Facility 207 for storage. Dry straw bales will be stacked and stored in a shed with a gravel floor (Facility 210). The total site disturbance area for feedstuffs processing and storage will be 2.1 acres.

### **On-Site Residential Building (Facility 404)**

The Project will include another on-site apartment building. The residential building will use a designed subsurface septic treatment system adjacent to the residential building (Attachment 3) for the disposal and treatment of wastewater. The total size of the residence and septic will be approximately 1.4 acres.

### **Water Supply**

The primary source of water will be an existing off-site well. The Project will also include two water storage basins to serve as a contingency source of water (Facilities 501 and 502). Unlike stormwater basins, the water storage basins will be designed for long-term water storage. The water source for the water storage basins will come from the off-site well and stormwater runoff collected from other areas of the Project. The site is designed so that no stormwater runoff will naturally enter the water storage basins. Facility 503 will house the pumping equipment necessary to transfer water from the water storage basins to the appropriate facilities. The total size of the water storage basins and pump building will be approximately 21.6 acres with a combined design capacity of 157 million gallons of water. See [Item 12.B.3](#) (Water Appropriation) for more detailed information.

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<sup>2</sup> "Precipitation Frequency Data Server." National Oceanic and Atmospheric Administration (NOAA). [https://hdsc.nws.noaa.gov/pfds/pfds\\_map\\_cont.html?bkmrk=mn](https://hdsc.nws.noaa.gov/pfds/pfds_map_cont.html?bkmrk=mn)

## **Lawn and Landscaping**

The Project will have approximately 63.4 acres of lawn and landscaping. This represents the areas between animal housing and accessory buildings, along driveways, around stormwater basins, as well as areas separating each of the manure storage areas. These acres will be seeded to grass and maintained as perennial vegetative cover, as required by the Stormwater Pollution Prevention Plan (SWPPP) for the Project.

## **Impervious Surface**

Overall, the Project will create a total of 121.1 acres of new impervious surface, generating a significant amount of stormwater runoff from roofs, driveways, and other surfaces. The Feedlot Permit includes stormwater requirements for the treatment of construction stormwater when one or more acres of soil is disturbed and permanent treatment of stormwater when one acre or more of new impervious surface is created (Attachment 22). The construction stormwater requirements will ensure that additional stormwater created by the Project will not degrade the water quality of the surrounding area. In addition, when more than 50 acres are disturbed during construction, the MPCA requires approval of a permanent Stormwater Pollution Prevention Plan (SWPPP).

### **6.B.3. Modifications to existing equipment or industrial processes:**

While the Project is an expansion, there will be no modifications to existing equipment or industrial processes.

### **6.B.4. Significant demolition, removal, or remodeling of existing structures:**

There will be no significant demolition, removal, or remodeling to the adjacent Existing Facility. There are no existing structures within the Project site. The construction of the Project will take place on undeveloped land and will include a barn, holding pen, parlor, feed storage pad, manure storage, loading areas, and water supply.

### **6.B.5. Timing and duration of construction activities:**

The Proposer plans to begin construction in the Spring of 2026, contingent upon completion of the environmental review process, issuance of the Feedlot Permit, and approval of other relevant permit applications. The Proposer estimates the total construction duration for the Project to be 16-24 months.

### **6.B.6. Any future plans/stages for this project including an anticipated timeline and plans for environmental review:**

There are no future plans or stages of the Project.

### **6.B.7. Any past stages of this project, including timeframe and environmental review proceedings:**

There are no past stages for the Project. The Existing Facility was permitted in August 2003 after undergoing environmental review and receiving a negative declaration on the need for an Environmental Impact Statement (EIS). The Existing Facility operates under the NPDES General Feedlot Permit and has undergone the addition of an anaerobic digester (2008), dry manure solids storage (2010), and liquid manure storage (2014). Additionally, the Existing Facility has increased its animal unit capacity three times (2008, 2011, and 2018). There have been no changes to the Existing Facility for seven years.

The Environmentally Relevant Area (ERA) for the Project has been delineated to ensure that environmental effects from other projects do not overlap. The ERA is defined as the oversized Project Boundary, all identified manure application fields designated for the Project and Existing Facility, and a one-mile radius surrounding the off-site water-supply well (Attachment 20). The established ERA for the Project avoids cumulative potential effects (CPE) as detailed in Item 21.

6.C. Provide facility information.

Table 1. Facility components.

Facility components (show on site map)			
Animal holding areas	Existing/proposed	Total quantity	Total area (sq ft)/volume (gal)
Total confinement barns	Existing <b>Proposed</b>	5 <b>1</b>	Facilities: 4 and 15: 162,016 ft <sup>2</sup> Facility 1: 81,008 ft <sup>2</sup> Facility 2: 157,136 ft <sup>2</sup> Facility 3: 200,528 ft <sup>2</sup> Facility 6: 108,896 ft <sup>2</sup> <b>Facility 201: 902,368 ft<sup>2</sup></b> Total area: 1,611,952 ft <sup>2</sup> or 37 acres
Partial confinement barns	None		
Open lots	None		
Individual animal housing areas	None		
Manure storage areas	Existing/Proposed	Total quantity	Total area (sq ft)/volume (gal)
Liquid manure storage areas	Existing <b>Proposed</b>	7 <b>5</b>	Facility 7: 2,500 ft <sup>2</sup> / 224,310 gal Facility 9: 172,000 ft <sup>2</sup> /15,372,238 gal Facility 10: 60,000 ft <sup>2</sup> /3,442,440 gal Facility 11: 367,740 ft <sup>2</sup> /39,212,509 gal Facility 12: 243,000 ft <sup>2</sup> /22,361,367 gal Facility 19: 11,025ft <sup>2</sup> /660,000 gal <b>Facility 101: 504,000 ft<sup>2</sup>/58,672,434 gal</b> <b>Facility 102: 504,000 ft<sup>2</sup>/58,672,434 gal</b> <b>Facility 103: 900 ft<sup>2</sup>/107,700gal</b> <b>Facility 104: 1,018 ft<sup>2</sup>/91,300 gal</b> <b>Facility 106: 525,336 ft<sup>2</sup>/30,816,149 gal</b> Total Area: 2,652,143 ft <sup>2</sup> or 60.9 acres Total Volume: 250,460,291 gal
Solid manure storage areas	Existing <b>Proposed</b>	2 <b>2</b>	Facility 13: 35,763 ft <sup>2</sup> Facility 17: 12,800 ft <sup>2</sup> <b>Facility 105: 115,425 ft<sup>2</sup></b> <b>Facility 204: 30,300 ft<sup>2</sup></b> Total Area: 194,314 ft <sup>2</sup> or 4.5 acres
Other components	Existing/proposed	Total quantity	Total area (sq ft)/volume (gal)
Feed storage areas	Existing <b>Proposed</b>	1 <b>1</b>	Facility 14: 840,000 ft <sup>2</sup> /19.3 acres <b>Facility 206: 674,100 ft<sup>2</sup>/15.5 acres</b> Total Area: 1,514,100 ft <sup>2</sup> or 34.8 acres
Mortality management areas	Existing	1	Facility 16: 512 ft <sup>2</sup>
Anaerobic digester	Existing	1	Facility 8: 5,419,000 gal
Milking parlor (with holding pens)	Existing	1	Facility 5: 30,000 ft <sup>2</sup>

**Facility components (show on site map)**

Animal holding areas	Existing/proposed	Total quantity	Total area (sq ft)/volume (gal)
	<b>Proposed</b>	<b>1</b>	<b>Facility 202: 45,522 ft<sup>2</sup></b> <b>Facility 203: 79,200 ft<sup>2</sup></b> Total Area: 154,722 ft <sup>2</sup> or 3.5 acres
Commodity shed	Existing <b>Proposed</b>	1 <b>1</b>	Facility 212: 8,800 ft <sup>2</sup> <b>Facility 207: 53,600 ft<sup>2</sup></b> Total Area: 62,400 ft <sup>2</sup> or 1.4 acres
Straw shed	Existing <b>Proposed</b>	1 <b>1</b>	Facility 211: 20,000 ft <sup>2</sup> <b>Facility 210: 30,800 ft<sup>2</sup></b> Total Area: 50,800 ft <sup>2</sup> or 1.2 acres
Stormwater basin	Existing <b>Proposed</b>	2 <b>3</b>	Facility 305: 73,000 ft <sup>2</sup> Facility 306: 73,000 ft <sup>2</sup> <b>Facility 301: 67,500 ft<sup>2</sup></b> <b>Facility 302: 109,040 ft<sup>2</sup></b> <b>Facility 303: 140,000 ft<sup>2</sup></b> Total area: 462,540 ft <sup>2</sup> or 10.6 acres
Feed pad runoff settling basin	Existing	1	Facility 304: 113,925 ft <sup>2</sup> or 2.6 acres
Shop	Existing	1	Facility 213: 5,760 ft <sup>2</sup>
Housing	Existing <b>Proposed</b>	3 <b>1</b>	Facility 401: 2,880 ft <sup>2</sup> Facility 402: 5,600 ft <sup>2</sup> Facility 403: 5,600 ft <sup>2</sup> <b>Facility 404: 8,100 ft<sup>2</sup></b> Total Area: 22,180 ft <sup>2</sup> or 0.5 acres
Wash bay	<b>Proposed</b>	<b>1</b>	<b>Facility 205: 2,500 ft<sup>2</sup></b>
Grain building	<b>Proposed</b>	<b>1</b>	<b>Facility 208: 5,000 ft<sup>2</sup></b>
Water storage basin	<b>Proposed</b>	<b>2</b>	<b>Facility 501: 456,000 ft<sup>2</sup>/78,000,000 gal</b> <b>Facility 502: 480,000 ft<sup>2</sup>/79,000,000 gal</b> Total Area: 936,000 ft <sup>2</sup> or 21.5 acres Total Volume: 157,000,000 gal
Water pump building	<b>Proposed</b>	<b>1</b>	<b>Facility 503: 3,200 ft<sup>2</sup></b>

**6.D. Provide animal information.**

**Table 2. Animal information.**

Animal type	Number existing	Animal units existing	Number after project	Animal units after project
Swine				
Dairy cattle	7,855	10,997	18,855	26,397
Beef cattle				
Turkeys				
Chickens				
Other (Identify species)				
<b>TOTAL</b>	N/A	10,997	N/A	26,397

**6.E. Provide annual manure generation information.**

**Table 3. Manure generation information.**

Animal type	Existing annual generation		After project annual generation	
	liquid (gal)	solid (ton)	liquid (gal)	solid (ton)
Dairy cattle	70,775,000 (manure/process wastewater) 18,350,000 (captured stormwater runoff)	11,000	169,888,000 (manure/process wastewater) 32,856,000 (captured stormwater runoff)	26,400
<b>TOTAL</b>	89,125,000	11,000	202,744,000	26,400

**6.F. Check any of the items below that are part of the manure management system proposed for this feedlot.**

- Stockpiling
- Liquid storage under barns
- Liquid storage outside of barns
- Dry manure/litter pack
- Dry manure/litter under barn storage
- Manure composting system
- Anaerobic digestion
- Manure solids separation

**6.F.1. Manure storage capacity (number of months/days): 448 days**

**6.F.2. Land available for manure application (acres): 16,669**

**6.F.3. Land needed for manure application (acres): 7,700 (Project)/13,200 (Project and existing facility).**

**6.G. Are future stages of this development including development on any other property planned or likely to happen? If yes, briefly describe future stages, relationship to the present project, timeline, and plans for environmental review.**

There are no planned future stages of the Project beyond what is described in this worksheet.

**6.H. Is this project a subsequent stage of an earlier project? If yes, briefly describe the past development, timeline, and any past environmental review.**

The Project is an expansion of an existing operation. There are no past stages of the Project. See Item 6.B for more details on previous permit and environmental review processes for the Existing Facility.

**7. Climate Adaptation and Resilience:**

**7.A. Describe the climate trends in the general location of the project and how climate change is anticipated to affect that location during the life of the project. See guidance: EQB Climate Adaptation and Resilience, Item 2, and the Feedlot EAW Guidance document. Examples are shown in italics, below. List which climate trends and projections resource tool(s) was used in completing the EAW and describe how it was used.**

Minnesota’s climate is rapidly changing and will continue to do so for the foreseeable future. Some areas of the state have experienced temperature increases of 3 degrees Fahrenheit (°F) in the last century.

Higher temperatures may alter winter recreation, extend the growing season, change the composition of trees, and increase water pollution in lakes and rivers.<sup>3</sup>

Minnesota has had an overall increase in both temperature and precipitation.<sup>4</sup> Although Minnesota has gotten warmer and wetter based on records dating back to 1895, the most drastic changes have come in the past several decades. Compared to 20th century averages, all but two years since 1970 have been warmer, wetter, or both, and each of the top ten combined warmest and wettest years on record occurred between 1998 and 2024. While climate conditions will vary from year to year, these increases are expected to continue throughout the 21st century.<sup>5</sup>

Heavy rains are now more common in Minnesota and more intense than at any time on record. Long-term observation sites have seen dramatic increases in 1-inch rains, 3-inch rains, and the size of the heaviest rainfall of the year. Since 2000, Minnesota has also seen a significant uptick in devastating, large-area extreme rainstorms. Rains that historically would have been in the 98th percentile annually (the largest 2%) have become more common. Climate projections suggest these big rains will continue increasing into the future.<sup>6</sup>

Outlined below are the historic climate trends<sup>7</sup> and future climate projections during the Project’s lifetime<sup>8</sup> for Minnesota and Stevens County. Figures for each trend and projection are included in Attachment 21.

**Table 4. Historic climate trends.**

State of Minnesota historic climate trends (data-driven) and projected climate changes (model-driven)	County/local trends	Project impacts (climate effects on project location)
<p><b>Average annual temperature increasing</b></p> <p><b>Historic trend</b> Minnesota’s average annual temperature has increased by 1.79° F since 1980.</p> <p><b>Future projection</b> Minnesota’s average annual temperature is projected to increase by 3.8° F.</p>	<p><b>Historic trend</b> Stevens County’s average annual temperature has increased by 1.83° F since 1980.</p> <p><b>Future projection</b> Stevens County’s average annual temperature is projected to increase by 3.8° F.</p>	<ul style="list-style-type: none"> <li>• Longer growing seasons.</li> <li>• Corn used for feed could mature faster; however, heat may reduce corn yields.</li> <li>• Longer timeframe for manure application.</li> <li>• Increase in energy usage from cooling equipment.</li> <li>• Increased nitrification of manure.</li> </ul>
<p><b>Average annual precipitation increasing</b></p> <p><b>Historic trend</b> Minnesota’s average annual precipitation has increased by 1.21 inches since 1980.</p> <p><b>Future projection</b></p>	<p><b>Historic trend</b> Stevens County’s average annual precipitation has increased by 1.87 inches since 1980.</p> <p><b>Future projection</b></p>	<ul style="list-style-type: none"> <li>• Decrease in area irrigation well usage due to more moisture received from rain.</li> <li>• Increase in stormwater.</li> <li>• Increased potential of water pollution in lakes and rivers.</li> <li>• Increase in stormwater quantity.</li> </ul>

<sup>3</sup> “Climate Trends.” Minnesota DNR. [https://www.dnr.state.mn.us/climate/climate\\_change\\_info/climate-trends.html](https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html)

<sup>4</sup> “Minnesota Climate Trends.” Minnesota DNR. <https://arcgis.dnr.state.mn.us/ewr/climatetrends/#>

<sup>5</sup> “Climate Trends.” Minnesota DNR. [https://www.dnr.state.mn.us/climate/climate\\_change\\_info/climate-trends.html](https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html)

<sup>6</sup> “Climate Trends.” Minnesota DNR. [https://www.dnr.state.mn.us/climate/climate\\_change\\_info/climate-trends.html](https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html)

<sup>7</sup> “Minnesota Climate Trends.” Minnesota DNR. <https://arcgis.dnr.state.mn.us/ewr/climatetrends/#>

<sup>8</sup> Liess, S. Roop, H.A., Twine, T.E., Noe, R., Meyer, N., Fernandez, A., Dolma, D., Gorman, J., Clark, S., Mosel, J., Farris, A., Hoppe, B., Neff, P. 2023. Fine-scale Climate Projections over Minnesota for the 21st Century. Prepared for the University of Minnesota Climate Adaptation Partnership. V1 released October 2023.

State of Minnesota historic climate trends (data-driven) and projected climate changes (model-driven)	County/local trends	Project impacts (climate effects on project location)
Minnesota's average annual precipitation is projected to increase by 1.2 inches.	Stevens County's average annual precipitation is projected to increase by 0.6 inches.	
<p><b>Cold weather warming</b></p> <p><b>Historic trend</b> Minnesota's winter minimum temperature has increased by 1.84°F since 1980.</p> <p><b>Future projection</b> Minnesota's average winter temperature is projected to increase by 4.7°F.</p>	<p><b>Historic trend</b> Stevens County's winter minimum temperature has increased by 1.30°F since 1980.</p> <p><b>Future projection</b> Stevens County's average winter temperature is projected to increase by 4.6°F.</p>	<ul style="list-style-type: none"> <li>• Longer growing seasons.</li> <li>• Increased potential for double cropping.</li> <li>• Decreased energy usage for heating.</li> <li>• Decreased emissions from snow removal equipment.</li> <li>• Decreased potential for spring runoff.</li> <li>• Increased landscape perennial vegetation mortality leading to bare ground and erosion.</li> <li>• Decreased snow cover may lead to increased soil erosion if a cover crop is not present.</li> </ul>
<p><b>Nighttime temperature increasing</b></p> <p><b>Historic trend</b> Minnesota's nighttime (minimum) temperature has increased by 2.27°F since 1980.</p> <p><b>Future projection</b> Minnesota's average nighttime temperature is projected to increase by 4.0°F.</p>	<p><b>Historic trend</b> Stevens County's nighttime (minimum) temperature has increased by 2.08°F since 1980.</p> <p><b>Future projection</b> Stevens County's average nighttime temperature is projected to increase by 4.0°F.</p>	<ul style="list-style-type: none"> <li>• Faster corn maturation.</li> <li>• Potential for earlier manure application which could result in a decreased potential for runoff.</li> <li>• Increased cooling costs.</li> </ul>
<p><b>Heavier, more damaging rains</b></p> <p><b>Historic trend</b> The maximum amount of rain received in a single day in Minnesota has averaged 3.4 inches since 1995.</p> <p><b>Future projection</b> In general, heavy rains with more intensity are expected to become more common. The maximum amount of rain received in a single day in Minnesota is expected to increase by 0.5 inches.</p>	<p><b>Historic trend</b> The maximum amount of rain received in a single day in Stevens County has averaged 3.5 inches since 1995.</p> <p><b>Future projection</b> The maximum amount of rain received in a single day in Stevens County is expected to increase by 0.7 inches.</p>	<ul style="list-style-type: none"> <li>• Intense rains can increase soil erosion at the facility and on manure application fields.</li> <li>• Increased need for sufficient stormwater basins to account for sudden, heavy rains.</li> </ul>
<p><b>Increasing risk of heat waves</b></p> <p><b>Historic trend</b></p>	<p><b>Historic trend</b> Since 1995, the average number of</p>	<ul style="list-style-type: none"> <li>• Increased water usage.</li> <li>• Potential for lower crop yields.</li> </ul>

State of Minnesota historic climate trends (data-driven) and projected climate changes (model-driven)	County/local trends	Project impacts (climate effects on project location)
<p>Since 1995, the average number of days in Minnesota exceeding:</p> <p>90°F has been 11.7 days 95°F has been 4.1 days 100°F has been 1.2 days</p> <p><b>Future projection</b></p> <p>For Minnesota, the average number of days exceeding:</p> <p>90°F is projected to increase by 12.0 days 95°F is projected to increase by 7.2 days 100°F is projected to increase by 3.4 days</p>	<p>days in Stevens County exceeding:</p> <p>90°F has been 18.7 days 95°F has been 6.8 days 100°F has been 1.9 days</p> <p><b>Future projection</b></p> <p>For Stevens County, the average number of days exceeding:</p> <p>90°F is projected to increase by 17.3 days 95°F is projected to increase by 11.1 days 100°F is projected to increase by 5.5 days</p>	<ul style="list-style-type: none"> <li>Increased energy and water needed for cow cooling.</li> </ul>
<p><b>Increasing risk of drought</b></p> <p><b>Historic trend</b></p> <p>The maximum number of consecutive days without rain during the growing season in Minnesota has averaged 14.4 days since 1995.</p> <p><b>Future projection</b></p> <p>The maximum number of consecutive days without rain during the growing season in Minnesota is expected to increase by 1.1 days.</p>	<p><b>Historic trend</b></p> <p>The maximum number of consecutive days without rain during the growing season in Stevens County has averaged 15.6 days since 1995.</p> <p><b>Future projection</b></p> <p>The maximum number of consecutive days without rain during the growing season in Stevens County is expected to increase by 1.6 days.</p>	<ul style="list-style-type: none"> <li>Added dust control measures.</li> <li>Potential for lower crop yields.</li> <li>Increased water use and appropriation in the area.</li> </ul>

7.B. For each Resource Category in the table below, describe how the project’s proposed activities and how the project’s design will interact with those climate trends. Describe proposed adaptations to address the project effects identified. Refer to Feedlot Guidance and EQB EAW Guidance and complete the table below using the information from those guidance documents. Examples are shown in italics, below.

Table 5. Resource categories.

Resource category	Climate trends and climate projections	Project components	Potential environmental effects Identify climate change risks & vulnerabilities to the project component. Identify long-term impacts that climate conditions pose to proposed activities.	Adaptation strategies (with applicable timeframe: construction to end of expected lifespan)
<b>Project design</b>	<b>Average annual temperature increasing</b>	<p>Increased constructed surfaces by 26.5 acres.</p> <p>Increased quantity of concrete, building construction materials, and infrastructure.</p> <p>Increased impervious surfaces by 121 acres.</p>	<p>Potential for increased heat absorption during the day that is radiated at night, which increases heat island effect.</p> <p>Infrastructure may be more vulnerable to damage and deterioration from elevated temperatures and extreme weather events.</p>	<p>The Proposer primarily uses steel and light-colored building materials. This can increase solar reflectance to reduce heat absorption and the heat island effect within the surrounding environment. Regular maintenance of infrastructures will also be implemented.</p> <p>Use of construction materials that are resilient to the area’s climate. Regular maintenance of the Project’s infrastructure can help maintain its resilience to weather events.</p> <p>Light colored buildings and paving materials can be incorporated to ensure infrastructure will be more heat-resistant and have less heat absorption. The steel building exterior will also increase the solar reflectance and reduce heat absorption.</p>
		<p>Increase in stormwater basins by 7.3 acres.</p>	<p>Increase in evaporation from stormwater basins being directly exposed to the elements.</p> <p>Increase in overall temperature of stormwater basins.</p>	<p>During construction, inspections will be completed at least every 7 days to ensure all stormwater basins structures are in good operating condition.</p> <p>An increase in the stormwater basins temperature would increase the rate of biodegradation to better treat stormwater. A diversified approach to water resources can help minimize reliance on a single water</p>

Resource category	Climate trends and climate projections	Project components	Potential environmental effects Identify climate change risks & vulnerabilities to the project component. Identify long-term impacts that climate conditions pose to proposed activities.	Adaptation strategies (with applicable timeframe: construction to end of expected lifespan)
				source. The Project will use groundwater as its primary source, but it will also have two water storage basins to serve as backup water sources in the event groundwater availability is disrupted.
		Increase in animal units, manure storage and application, and transportation (animals, manure, feedstock, employees, etc.).	<p>Higher temperatures and humidity increase the potential for animal heat stress and decreased milk production. Greater need for water for processes including cow consumption, cleaning, and cooling.</p> <p>Increase in manure storage decomposition rates.</p> <p>Increase in emissions from animal hauling, manure application, and feed.</p> <p>Increase manure applied and exposed to higher temperatures.</p> <p>Increase in nitrification if manure applied on higher soil temperatures, increasing nitrate runoff and pollution potential.</p>	<p>The Project’s design and construction incorporate components that can help alleviate reliance on water resources for cow cooling. These include confined, well-ventilated barns. By providing a roofed facility, animals are not directly exposed to the heat of the sun. The facility will have rows of fans and misters that will maintain a stable temperature inside the barn. Misters will be equipped with temperature sensors to limit usage and conserve water and energy. Fans will be operated based on temperature and climate factors to reduce run time as much as possible to conserve energy.</p> <p>A diversified approach to water resources can help minimize reliance on a single water source. The Project will use groundwater as its primary source, but it will also have two water storage basins to serve as backup water sources in the event groundwater availability is disrupted.</p> <p>Emissions from increased transportation will be reduced by using local contractors and vendors, when available during both construction and operation. On-site housing will be available for personnel during both construction and operation.</p>

Resource category	Climate trends and climate projections	Project components	Potential environmental effects Identify climate change risks & vulnerabilities to the project component. Identify long-term impacts that climate conditions pose to proposed activities.	Adaptation strategies (with applicable timeframe: construction to end of expected lifespan)
				<p>Land application of manure replaces nutrients that farmers would otherwise provide to their fields by application of chemical or synthetic fertilizers, thereby avoiding emissions associated with synthetic fertilizer production, storage, and transportation.</p> <p>Liquid manure will be applied using a knife-injection drag hose system. This will decrease air emissions from nitrification and decrease nutrient runoff potential.</p>
	<b>Average annual precipitation increasing</b>	<p>Increased constructed surfaces by 26.5 acres.</p> <p>Increased quantity of concrete, building construction materials, and infrastructure.</p> <p>Increased impervious surfaces by 121 acres.</p>	<p>Increase in stormwater runoff, potential for contamination of surface water and groundwater.</p> <p>Increase in stormwater runoff.</p>	<p>The Project will utilize durable materials to help prevent weather and precipitation-related damage to structures. Additionally, preventive maintenance will be performed to ensure structural integrity.</p> <p>Stormwater basins for the Project are sized more than 20% larger than required to accommodate the predicted precipitation increases and allow for more sedimentation to occur prior to controlled release.</p>
		<p>Increase in stormwater basins by 7.3 acres.</p>	<p>Potentially greater volumes of water accumulating in stormwater basins.</p>	<p>During construction, inspections will be completed at least every 7 days to ensure all stormwater basin structures are in good operating condition.</p> <p>To account for future precipitation increases, the stormwater basins for the Project are sized more than 20% larger than the minimum required for a 25-year 24-hour precipitation event.</p>

Resource category	Climate trends and climate projections	Project components	Potential environmental effects Identify climate change risks & vulnerabilities to the project component. Identify long-term impacts that climate conditions pose to proposed activities.	Adaptation strategies (with applicable timeframe: construction to end of expected lifespan)
				Periodic inspections and maintenance will be performed to ensure the stormwater basins are in good condition during operations.
		Increase in animal units, manure storage and application, and transportation (animals, manure, feedstock, employees, etc.).	<p>Manure application window may be affected.</p> <p>Increased humidity may cause animal heat stress which can affect milk production, fertility, water needs, and feed intake.</p>	<p>Manure application begins in the fall and is applied 24 hours a day 6 days a week for approximately 30 days each year. The Proposer anticipates sufficient time is available during this season to apply all manure. In addition, the Project has several thousand extra manure application acres available to spread manure to help account for unsuitable field conditions. If weather conditions during the fall prevent complete emptying of the LMSAs, manure will be applied the following spring. Based on the Proposer's previous experience with applying manure in this area of the state, spring application of manure due to weather conditions the previous fall is rare.</p> <p>The Project will use livestock misters and ventilation fans to maintain an optimal temperature and control the humidity for the animals. Misters will be equipped with temperature sensors to limit usage and conserve water and energy. Fans will be operated based on temperature and climate factors to reduce run time as much as possible to conserve energy. Animal temperatures will be monitored to provide early warning of stress.</p>
	<b>Heavier, more damaging rains</b>	Increased constructed surfaces by 26.5 acres.	Increase in runoff – potential to flood stormwater basins or LMSAs if near capacity.	Grading at the Project site will direct clean stormwater away from manure storage areas and feedstock storage areas and toward stormwater basins, where the water will be

Resource category	Climate trends and climate projections	Project components	Potential environmental effects Identify climate change risks & vulnerabilities to the project component. Identify long-term impacts that climate conditions pose to proposed activities.	Adaptation strategies (with applicable timeframe: construction to end of expected lifespan)
		<p>Increased quantity of concrete, building construction materials, and infrastructure.</p> <p>Increased impervious surfaces by 121 acres.</p>	<p>Increased potential for surface water contamination.</p> <p>Increased velocity of heavy rains may damage structures.</p> <p>Increase in runoff potentially leading to flooding or contamination breaches from LMSAs overflowing.</p>	<p>collected and treated before released back to the existing watershed at a controlled rate (Attachment 24).</p> <p>LMSAs have covers to prevent stormwater from entering and causing overflow. To account for future precipitation increases, the stormwater basins for the Project are sized more than 20% larger than the minimum required for a 25-year 24-hour precipitation event. This is a net improvement as the Project site is currently pattern-tiled crop land with no ability to retain runoff from storm events. During construction, inspections will be completed at least every 7 days to ensure all stormwater basin structures are in good operating condition.</p> <p>Periodic inspections and maintenance will be performed to ensure the stormwater basins are in good condition during operation. Inspections will also occur prior to activating the pump to ensure the captured stormwater is free of waste before being released back to its natural drainage course.</p> <p>Most structures will have steel roofs and siding, which are durable and resistant to damage from heavy rains. The Proposer regularly conducts site inspections, which include visual checks to prevent LMSAs from being structurally compromised. Site personnel also monitor that stormwater is properly directed and treated.</p>

Resource category	Climate trends and climate projections	Project components	Potential environmental effects Identify climate change risks & vulnerabilities to the project component. Identify long-term impacts that climate conditions pose to proposed activities.	Adaptation strategies (with applicable timeframe: construction to end of expected lifespan)
		Increase in stormwater basins by 7.3 acres.	Potential for overflow from stormwater basins if they exceed capacity.	<p>To account for future precipitation increases, the stormwater basins for the Project are sized more than 20% larger than the minimum required for a 25-year 24-hour precipitation event.</p> <p>Grading at the Project site will direct clean stormwater away from manure storage areas and toward stormwater basins, where the water can be treated.</p>
		Increase in animal units, manure storage and application, and transportation (animals, manure, feedstock, employees, etc.).	<p>Heavy rains and strong winds may damage facilities housing animals.</p> <p>Heavy rains and strong winds may damage area crops needed to feed animals.</p> <p>Manure application ability may be affected by localized flooding and damage to ditches and transportation routes.</p>	<p>Most structures will have steel roofs and siding, which are durable and resistant to damage from heavy rains.</p> <p>Grading at the Project site will direct clean stormwater away from manure storage areas and toward stormwater basins, where the water can be treated. Manure storage areas will have established vegetation on the banks to decrease potential erosion.</p> <p>The project will have ample on-site feed storage to store a certain amount of extra feed, mitigating the potential for feed shortages due to extreme weather.</p> <p>The Project has several thousand extra manure application acres available to help account for unsuitable fields or route conditions. However, if weather conditions during the fall season prevent complete emptying of the LMSAs, manure will be applied the following spring. Based on the Proposer's previous experience with applying manure in this area of the state,</p>

Resource category	Climate trends and climate projections	Project components	Potential environmental effects Identify climate change risks & vulnerabilities to the project component. Identify long-term impacts that climate conditions pose to proposed activities.	Adaptation strategies (with applicable timeframe: construction to end of expected lifespan)
				spring application of manure due to weather conditions the previous fall is rare.
	<b>Increasing risk of heatwaves</b>	<p>Increased constructed surfaces by 26.5 acres.</p> <p>Increased quantity of concrete, building construction materials, and infrastructure.</p> <p>Increased impervious surfaces by 121 acres.</p>	<p>Potential for increased heat absorption during the day that is radiated at night, which increases heat island effect and amplifies warming temperatures of climate change.</p> <p>Infrastructure may be more vulnerable to damage and deterioration from elevated temperatures.</p>	<p>Use of construction materials that are resilient to the area's climate.</p> <p>The Proposer primarily uses light-colored steel building materials. This can increase the solar reflectance and reduce heat absorption and the heat island effect withing the surrounding environment.</p> <p>Regular maintenance of infrastructures will help maintain its resilience to weather events.</p>
		Increase in stormwater basins by 7.3 acres.	Increase in evaporation from stormwater basins being directly exposed to the elements.	The Proposer strives to be good stewards of natural resources, including water. A diversified approach to water resources can help minimize reliance on a single water source. For the Project, groundwater will be used as the primary source and two water storage basins will serve as a contingency plan to ensure adequate water is available.
		Increase in animal units, manure storage and application, and transportation (animals, manure, feedstock, employees, etc.).	<p>Greater need for feed and water for processes including cow consumption, cleaning, and cooling.</p> <p>Increased risk of heat stress.</p> <p>Potential for increased energy consumption from cooling.</p> <p>Increase in manure storage decomposition rates.</p> <p>Increase in emissions from animal hauling, manure application, and feed.</p>	The Project's design and construction incorporate components that can help alleviate reliance on water resources for cow cooling. These include confined, well-ventilated barns. By providing a roofed facility, animals are not directly exposed to the sun. Additionally, the facility will have rows of fans and misters that will help maintain a more stable temperature inside the barn. Misters will be equipped with temperature sensors to limit usage and conserve water and energy. Fans will be operated based on temperature and climate

Resource category	Climate trends and climate projections	Project components	Potential environmental effects Identify climate change risks & vulnerabilities to the project component. Identify long-term impacts that climate conditions pose to proposed activities.	Adaptation strategies (with applicable timeframe: construction to end of expected lifespan)
			<p>Increase manure applied and exposed to higher temperatures.</p> <p>Increase in nitrification if manure applied on higher soil temperatures, increasing nitrate runoff and pollution potential.</p>	<p>factors to reduce run time as much as possible to conserve energy.</p> <p>More heat tolerant genetics will be selected, and animal temperatures will be monitored for early signs of heat stress.</p> <p>The Proposer will use a variety of feed ingredients, which allow flexibility in years of poor crop yields to provide sufficient feed for the cattle.</p> <p>The Project’s design and construction incorporate components that can help alleviate reliance on water resources for cow cooling. These include confined, well-ventilated barns. By providing a roofed facility, animals are not directly exposed to the sun. Additionally, the facility will have rows of fans and misters that will help maintain a more stable temperature inside the barn. Misters will be equipped with temperature sensors to limit usage and conserve water and energy. Fans will be operated based on temperature and climate factors to reduce run time as much as possible to conserve energy.</p> <p>A diversified approach to water resources can help minimize reliance on a single water source. The Project will use groundwater as its primary source, but it will also have two water storage basins to serve as backup water sources in the event groundwater availability is disrupted.</p>

Resource category	Climate trends and climate projections	Project components	Potential environmental effects Identify climate change risks & vulnerabilities to the project component. Identify long-term impacts that climate conditions pose to proposed activities.	Adaptation strategies (with applicable timeframe: construction to end of expected lifespan)
				<p>Emissions from increased transportation will be reduced by using local contractors and vendors, when available during both construction and operation. On-site housing will be available for personnel during both construction and operation.</p> <p>Land application of manure replaces nutrients that farmers would otherwise provide to their fields by application of chemical or synthetic fertilizers, thereby avoiding emissions associated with synthetic fertilizer production, storage, and transportation.</p> <p>Liquid manure will be applied using a knife-injection drag hose system. This will decrease air emissions from nitrification and decrease nutrient runoff potential.</p> <p>A diversified approach to water resources can help minimize reliance on a single water source. The Project will use groundwater as its primary source, but it will also have two water storage basins to serve as backup water sources in the event groundwater availability is disrupted.</p>
	<b>Increasing risk of drought</b>	Increased constructed surfaces by 26.5 acres. Increased quantity of concrete, building construction materials, and infrastructure.	Increased risk of fire.	The Project will be constructed to meet Minnesota State Building and Fire Codes. Most building exteriors will be clad in metal. Vegetation at the Project site will be manicured and maintained to decrease fire fuel. Additionally, forage moistures are monitored multiple times a week on-site. As a

<b>Resource category</b>	<b>Climate trends and climate projections</b>	<b>Project components</b>	<b>Potential environmental effects Identify climate change risks &amp; vulnerabilities to the project component. Identify long-term impacts that climate conditions pose to proposed activities.</b>	<b>Adaptation strategies (with applicable timeframe: construction to end of expected lifespan)</b>
		Increased impervious surfaces by 121 acres.		precautionary measure, local emergency responders, including firefighters, routinely visit the facility to ensure adequate preparation for potential emergencies
		Increase in stormwater basins by 7.3 acres.	Decrease in inflow will result in shallower water levels and potential increase in vegetation growth.	On-site personnel will monitor stormwater basins to ensure they are functioning properly, and the vegetation is controlled.
		Increase in animal units, manure storage and application, and transportation (animals, manure, feedstock, employees, etc.)	Increased need for water.	A diversified approach to water resources can help minimize reliance on a single water source. The Project will use groundwater as its primary source, but it will also have two water storage basins to serve as backup water sources in the event groundwater availability is disrupted.
<b>Land use</b>	Addressed in item 10	Addressed in item 10	Addressed in item 10	Addressed in item 10
<b>Water resources</b>	Addressed in item 12	Addressed in item 12	Addressed in item 12	Addressed in item 12
<b>Contamination/ hazardous materials/wastes</b>	Addressed in item 13	Addressed in item 13	Addressed in item 13	Addressed in item 13
<b>Fish, wildlife, plant communities, and sensitive ecological resources (rare features)</b>	Addressed in item 14	Addressed in item 14	Addressed in item 14	Addressed in item 14

## 8. Cover Types:

Estimate the acreage of the site with each of the following cover types before and after development:

**Table 6. Cover types.**

Cover types	Before (acres)	After (acres)
Wetlands and shallow lakes (<2 meters deep)	0	0
Deep lakes (>2 meters deep)	0	0
Wooded/forest	0	0
Rivers/streams	0	0
Brush/grassland	0	0
Cropland	191.8	0
Livestock rangeland/pastureland	0	0
Lawn/landscaping	0	0
Green infrastructure TOTAL (from table below*)	0	0
Impervious surface	0	121.1
Stormwater pond (wet sedimentation basin)	0	7.3
Other (describe)	0	0
<b>TOTAL</b>	191.8	191.8

**Table 7. Green infrastructure.**

Green infrastructure*	Before (acres)	After (acres)
Constructed infiltration systems (infiltration basins/infiltration trenches/ rainwater)	0	0
Gardens/bioretenion areas without underdrains/swales with impermeable check dams)	0	0
Constructed tree trenches and tree boxes	0	0
Constructed wetlands	0	0
Constructed green roofs	0	0
Constructed permeable pavements	0	0
Other (describe)	0	0
<b>TOTAL*</b>	0	0

**Table 8. Tree canopy.**

Trees	Percent	Number
Percent tree canopy removed, or number of mature trees removed during development	0	0
Number of new trees planted	0	0

The Project is not proposing to incorporate typical green infrastructure or planting trees at or around the Project site due to the negative effects they bring to the dairy cows. Common green infrastructure includes landscaping features such as trees, shrubs, and standing water that attract insects. In turn, this attracts birds and/or other animals. The United States Department of Agriculture (USDA) recommends incorporating enhanced biosecurity features into new dairy operations to avoid unwanted diseases.<sup>9</sup> Enhanced biosecurity

<sup>9</sup> USDA, [cdc.gov/bird-flue/prevention/index.html](https://www.cdc.gov/bird-flue/prevention/index.html)

measures included designing the facility to minimize livestock exposure to birds and further prevent disease transmission, such as Highly Pathogenic Avian Influenza.

**9. Permits and Approvals Required: List all known local, state, and federal permits, approvals, certifications, and financial assistance for the project. Include modifications of any existing permits, governmental review of plans, and all direct and indirect forms of public financial assistance, including bond guarantees, Tax Increment Financing, and infrastructure. All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.**

**Table 9. Permits and approvals.**

Unit of government	Type of application	Permit #	Status
MPCA	Individual NPDES Feedlot Permit		Submitted
	Construction Stormwater Permit		Submitted
DNR	Water Appropriation Permit Amendment (off-site well)	2008-0230	In progress
	Water Appropriation Permit Amendment (ag irrigation/livestock)	2009-0492	Planned
	Dam Safety Permit (water storage basins)		In progress
	Utility Crossing License (crossing a public watercourse)	ULA250902 (application #)	Submitted
Stevens County	Conditional Use Permit		Planned
	SSTS Permits		Planned
Tribes	None		Not required
Other	None		Not required

The Proposer will procure a DNR-issued Dam Safety permit for the on-site water storage basins (Facilities 501 and 502). While the permit application has not been submitted due to engineering due diligence required, the Proposer has been in constant communication with DNR regarding this permit. It is anticipated that the permit application will be submitted by Wednesday December 31st, 2025.

The Proposer also anticipated requiring a Utility Crossing License from the DNR and submitted the respective permit application to the DNR.

**Cumulative potential effects may be considered and addressed in response to individual EAW Item 10 through 20, or the RGU can address all cumulative potential effects in response to EAW Item 22. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item 21.**

**10. Land Uses:**

**10.A. Describe:**

**10.A.1. Existing uses of the site as well as adjacent lands to and near the site, and give the distances and directions to nearby residences, schools, daycare facilities, senior citizen housing, places of worship, open space, cemeteries, trails, prime or unique farmlands, tribal lands, and other places accessible**

**to the public (including roads) within one mile of the feedlot and within or adjacent to the boundaries of the manure application sites.**

### **Project Site**

The Project is in an agricultural portion of Stevens County with low population density. The nearest incorporated cities to the Project are Alberta (5.2 miles north), Morris (6.2 miles northeast), Chokio (8.9 miles east northwest), and Hancock (9.1 miles east). Based on the 2020 census, these towns have 94; 5,105; 404; and 863 residents, respectively. Two public gravel roads (520th Avenue to the east and 530th Avenue to the west) and one public paved road (280th Street/ Stevens County Road 8 to the north) border the Project site.

A total of thirteen rural-residential properties are within approximately one mile of the Project site as summarized below:

- Location A: approximately 920 feet to the north
- Location B: approximately 2,130 feet to the northeast
- Location C: approximately 2,000 feet to the east
- Location D: approximately 4,400 feet to the east
- Location E: approximately 1,900 feet to the east
- Location F: approximately 4,580 feet to the east
- Location G: approximately 3,580 feet to the southwest
- Location H: approximately 5,900 feet to the south
- Location I: approximately 5,500 feet to the west
- Location J: approximately 5,720 feet to the west
- Location K: approximately 4,840 feet to the northwest
- Location L: approximately 5,170 feet to the northwest
- Location M: approximately 4,710 feet to the northwest

The location of each of these residential properties in relation to the Project is depicted in Attachment 4. There are no schools, daycare facilities, senior citizen housing, places of worship, or cemeteries within one mile of the Project. The closest registered feedlots to the Project are approximately one mile south and 1.2 miles northeast. Attachment 14 is an MPCA Feedlot map depicting all feedlots in the general area. Three areas with permanent easements/public access were identified within approximately one mile of the Project: 1) Landers Waterfowl Production Area (WPA) southwest and upstream from the Project, 2) a Reinvest in Minnesota (RIM) easement with a portion in the Wetland Reserve Program (WRP) east and downstream from the Project, and 3) Alberta Wildlife Management Area (WMA) west and upstream from the Project.

### **Manure Application Sites**

Local producers have identified and offered over 16,500 acres of currently tilled cropland for manure application. With the expansion Project, West River Dairy expects to utilize approximately 13,200 acres per year. The Proposer owns some of the manure application sites and has agreements in place to transfer manure ownership of the remaining application sites. The manure application sites are within: Steves County (Baker, Darnen, Horton, Synnes, and Scott Townships) and Swift County (Hegbert and Fairfield Townships) as shown in Attachment 5 and Attachment 8. The manure application sites are currently cultivated for crop production, and landowners may have used the fields for manure application in the past. The Proposer is unaware of any schools, daycare facilities, senior citizen housing or public places of worship within or adjacent to the manure application field boundaries. There are several residences and one cemetery adjacent to some of the available manure application

areas. The Proposer has an abundant, and excess, number of manure application acres allowing for flexibility to avoid potential conflicts with adjacent land uses.

Multiple WPA, WMA, WRP, and RIM conservation easements are adjacent to some of the identified manure application areas. The Proposer has reviewed all adjacent conservation easement areas and determined them to be outside of the manure application areas. Since the Proposer will not spread any manure within the conservation easement areas, land use is not changing due to the Project. Manure application fields near the conservation easement areas are currently using some type of fertilizer. Manure from the Project will replace some commercial fertilizer use where it currently exists.

### **Climate Adaptation and Resilience**

It is reasonable to expect that with changing weather conditions (temperature, precipitation, etc.), the surrounding land will remain as tilled cropland. With rising average temperatures and precipitation, and potentially longer growing seasons, the crop rotation may change, with some crops better suited to these conditions. Crops will continue to require nutrients to optimize productivity, and manure will remain a nutrient source.

Increased precipitation may cause the loss of some acres of cropland due to saturation of low spots within fields or localized flooding after rain events. New drainage or water impoundment systems may need to be developed by landowners to handle increased volumes of stormwater in fields. If these structures are built on any of the manure application fields, they would take land out of crop production to convert to water management structures. With a contingency of over 3,000 additional manure application acres beyond what is needed each year, there is abundant operational flexibility if some portions of the fields are no longer available due to weather condition impacts.

The Proposer executes manure application by a dragline hose system. The Proposer pumps manure from the Project through a series of hoses overland to reach application fields. This system provides flexibility in the number of available routes to reach manure application fields. It also greatly reduces the impact of manure application equipment on local road infrastructure. The Proposer has designed the Project to have 14 months of manure storage, which provides a buffer in case some application fields are temporarily unavailable.

County Road 8 connects to US Highway 59, a major corridor for commerce in western Minnesota and engineered to withstand weather events. The Project is accessible by asphalt county and state roads from the west, should the Proposer need alternate routes. The Project is outside of the 1% Base Flood Elevation, and the critical infrastructure at the Project site (animal holding, manure storage, feed pad) is at a relatively higher elevation, which provides additional protection in case of extreme precipitation events.

### **10.A.2. Planned land use as identified in a comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.**

The Project will be in the General Agricultural District in Stevens County on agricultural land that currently abuts an existing feedlot. The Stevens County Comprehensive Plan 2017 states that “(CAFOs) should only be located in areas especially identified as appropriate for such uses or where conflicts with nearby property owners, negative impacts on road infrastructure, and degradation of sensitive water resources can be minimized.”

As summarized in relevant items throughout this worksheet, the Project successfully mitigates or minimizes potential impacts to nearby property owners, roads, and sensitive water resources, thereby satisfying the requirements outlined in the Stevens County Comprehensive Plan 2017. See Item 10.A. for a description of nearby property owners, Item 20.A. through b for details on traffic impacts, and Item 11 and 12 for discussion of sensitive features and water resources.

**10.A.3. Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic river, critical area, agricultural preserve, etc.**

Stevens County has a Shoreland Zoning Ordinance and a Floodplain Ordinance; however, the Project site is not in the shoreland or floodplain zone.

**10.A.4. If any critical facilities (i.e. facilities necessary for public health and safety, those storing hazardous materials, or those with housing occupants who may be insufficiently mobile) are proposed in floodplain areas and other areas identified as at risk for localized flooding, describe the risk potential considering changing precipitation and event intensity.**

No critical facilities are planned as part of this Project. Furthermore, based on Federal Emergency Management Agency's (FEMA) floodplain map for Stevens County, the Project site is outside of any floodway areas.<sup>10</sup>

**10.B. Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 10.A. above, concentrating on implications for environmental effects.**

The Project site and manure application acres are in existing agricultural production areas. There are no other zones, land uses, or plans that designate the Project site as anything other than agricultural use. The Project will be compatible with the intended use of the Project location. The Stevens County Comprehensive Plan 2017 discourages the construction of feedlots with 1,000 animal units or more within 1 mile of cities. As described in Item 10.A., the nearest city to the Project is over 5 miles away.

Land in the Agricultural District of Stevens County has traditionally been used for row-crop production and feedlots. The Project will convert 191.8 acres of tillable cropland into a feedlot. The land use conversion falls within the "Agricultural" use and serves a complementary purpose to surrounding tillable cropland by providing the local end user commodity products, such as corn silage and alfalfa produced on the surrounding cropland, while also supplying manure as a local, organic fertilizer for use on nearby fields.

In addition to livestock housing and accessory facilities, 63 acres of cropland will be converted to lawn and landscaping. These acres represent the areas of the facility between animal housing and accessory buildings, along driveways, around stormwater basins, as well as areas separating each of the manure storage areas. These spaces must be removed from crop production, as they are narrow strips not suitable for cropland. These acres will be seeded to grass and maintained as perennial vegetative cover, as required by the Stormwater Pollution Prevention Plan (SWPPP) for the Project.

**10.C. Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 10.B. above and any risk potential.**

No potential incompatibility was identified.

**11. Geology, Soils and Topography / Landforms:**

**11.A. Geology: Describe the geology of the underlying project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.**

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<sup>10</sup> "Floodplain." Stevens County, MN. <https://stevens-county.maps.arcgis.com/apps/webappviewer/index.html?id=174cae410c1a4361a6d50b6cc396b998>

As outlined in the Traverse-Grant Regional Hydrogeologic Assessment,<sup>11</sup> the Project site is located within an area dominated by fine-textured glacial till that is generally more than 33 feet thick and underlain by one or more buried unconsolidated gravel and sand aquifers (CW and/or LG Aquifers). The remote wellfield is located within a coarse-textured outwash plain dominated by sand and gravel that is up to 80 feet thick and features a surficial water table aquifer. The sensitivity to pollution ratings for these aquifers is Very Low for the Project site area and Very High for the remote wellfield area. There are no karst conditions in this region of the state.

As outlined on the MDG records for the Existing Facility wells, there are no unconfined/shallow aquifers beneath the Project site (Attachments 17). American Engineering Testing, Inc. (AET) performed soil borings at the Project site and collected soil samples to investigate the soil beneath the proposed LMSA locations. Attachment 17 includes copies of the soil boring logs and maps depicting the locations of the borings. Even though subsurface water was not identified in most of the boring locations at the time field work was performed, it is AET’s opinion that there is the potential for high water near the ground surface during periods of significant precipitation, especially in the spring.

To control potential seasonal subsurface saturation near the LMSAs, a drain-tile system will be installed around the perimeter of the LMSAs at an elevation below the LMSA liners. The clean seasonal subsurface water from the perimeter tile system will drain into a nearby stormwater basin, where it combines with Project stormwater. To account for the projected increase of precipitation over the life of the Project, the stormwater basins are sized to hold more than 20% of the required minimum volume for a 25-year 24-hour rain event. Although not expected, if dewatering is needed, the Proposer will obtain a DNR Water Appropriation Permit for any temporary construction dewatering.

**Table 10. Geologic features.**

<b>Geologic features</b>	<b>Project site</b>	<b>Manure application site</b>
Unconfined or shallow aquifer?	No	No
Less than 50 ft of soil cover over karst susceptible bedrock?	No	No
Less than 40 inches of soil cover over karst susceptible bedrock?	No	No
Karst features <sup>a</sup> within 300 ft?	No	No

<sup>a</sup> Karst features include sinkholes, caves, resurgent springs, disappearing springs, karst windows, blind/dry valleys.

**10.B. Soils and topography: Describe the soils on the site, giving Natural Resources Conservation Service (NRCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes or highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 12.B.2. Soils information for the manure land application sites will be addressed in Item 12.B.5.**

As defined by the Natural Resources Conservation Science Web Soil Survey,<sup>12</sup> no steep slopes, soil limitations, or highly erodible soils were found on the Project site. Most of the Project site is prime farmland, meaning that soils are best suited for food, feed, fiber, forage, and oilseed crops.

<sup>11</sup> “Regional Hydrogeologic Assessment,” MnDNR – Traverse-Grant RHA-6 [https://www.dnr.state.mn.us/waters/groundwater\\_section/mapping/regional-hydro-assess.html](https://www.dnr.state.mn.us/waters/groundwater_section/mapping/regional-hydro-assess.html)

<sup>12</sup> “Web Soil Survey.” USDA NRCS. <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>

During construction, the topography will be modified to build LMSAs, provide a base on which to build structures, and shape the Project area to provide adequate drainage of stormwater. Construction activities and final stabilization will be performed following a Stormwater Pollution Prevention Plan (SWPPP). The area of the project is 191.8 acres, as identified in Item 8. Permanent vegetative cover will be established on non-paved surfaces to prevent soil erosion. Upon completion of the Project, there will be no further topographic modifications as part of routine operations.

**Table 11. NRCS soil.**

NRCS soil	Feedlot	Manure storage area
See Attachment 10	See Attachment 9	See Attachment 10

**12. Water Resources:**

**12.A. Describe surface water and groundwater features on or near the site and manure application areas below and on attached maps.**

**12.A.1. Surface water: lakes, streams, wetlands, intermittent streams, and county/judicial ditches. Include any special designations such as public waters, shoreland classification and floodway/floodplain, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include the presence of aquatic invasive species and the water quality impairments or special designations listed on the current MPCA 303(d) Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s) if any.**

**Project Site/Off-Site Well**

The Project Site and the Off-Site Well are within the Pomme de Terre River Watershed. There are no lakes, streams, wetlands, or intermittent streams at the Project site. Pre-settlement wetlands once present within the Project site were historically drained via private pattern tiles connected to a public ditch (Stevens County Ditch 30), which runs through the site. Additionally, there are no aquatic invasive species or impaired waters within one mile of the Project site (Attachment 16). There is an unnamed lake (Public Water Basin# 75017100) and several wetlands immediately south of the Project site within the Landers WPA. Aside from the public water designation, these surface waters have no other special designations. Surface water from the Project will flow south/east to County Tile 30, which runs across the south side of the Project site. County Tile 30 outlets into two unnamed creeks (WID 070200002-551 and 07020002-552),<sup>13</sup> which then flows to the Pomme de Terre River (WID 07020002-501), and then eventually to the Minnesota River (WID 070200001-552). The Off-Site Well is located approximately 500 feet west of the Pomme de Terre River. This is summarized in Item 6.B. (Project Description) and 7.B. (Climate Adaptation and Resilience) and detailed in Attachment 24 (Project Run-off Hydrology Report). The Project site is designed to capture and reuse most or all of stormwater runoff, largely eliminating the untreated runoff that currently leaves the property.

**Manure Acres**

All of the manure application sites are also within the Pomme de Terre River Watershed. There are several lakes, wetlands, and streams adjacent to the manure application sites. Details about each waterbody are summarized in the table below. Manure application procedures summarized above and detailed in Item 12.B.5 outline controls to prevent runoff and impacts to waterbodies.

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<sup>13</sup> Water Unit ID (WID), was formerly known as an Assessment Unit ID (AUID)

**Table 12. Waterbodies adjacent to manure application acres.**

<b>Waterbody type</b>	<b>Waterbody name</b>	<b>DNR PWI number</b>	<b>Special designation</b>	<b>Listed impairments (year added)</b>
Public water basin	Unnamed	75017100	None	None
Public water basin	Unnamed	75016700	Shoreland Class: natural environment	None
Public water basin	Lake Hattie	75020000 WID: 75-0200-00	Shoreland Class: natural environment	Mercury in fish tissue TMDL plan approved in 2014 Nutrients TMDL plan approved in 2015
Public water basin	Unnamed	75019600	Shoreland Class: natural environment  High biological significance for birds	None
Public water basin	Unnamed	75016800	None	None
Public water basin	Unnamed	75032500	None	None
Public water basin	Unnamed	75017700	None	None
Public water wetland	Unnamed	75017900	None	None
Public water basin	Unnamed	75017300	None	None
Public water wetland	Unnamed	75017400	None	None
Public water basin	Unnamed	75037500 WID: 75-0375-00	None	Aquatic plan bioassessments (2010) Benthic macroinvertebrates bioassessments (2010)
Public water wetland	Unnamed	75018200	None	None
Public water wetland	Unnamed	75018400	None	None
Public water wetland	Unnamed	75038000	None	None
Public water wetland	Unnamed	75037800	None	None
Public watercourse	Pomme de Terre River	M-055-179 WID: 07020002-501	None	Fish bioassessments (2012) Benthic macroinvertebrates bioassessments (2012) Mercury in fish tissue (2006) Turbidity (2002) Fecal coliform (1994)
Public watercourse	Muddy Creek	M-055-179-014 WID: 07020002-501	None	E. Coli (2020)
Public watercourse	Dry Wood Creek	M-055-179-005 WID: 07020002-556	None	Fish bioassessments (2012)

Waterbody type	Waterbody name	DNR PWI number	Special designation	Listed impairments (year added)
				Dissolved oxygen (2012) Benthic macroinvertebrates bioassessments (2012) Turbidity (2010) E. Coli (2010) TMDL plan approved for all impairments in 2015
Public watercourse	Unnamed stream	M-055-179-005-009	None	None
Public watercourse	Unnamed stream	M-055-179-005-009-001	None	None
Public watercourse	Unnamed stream	M-055-179-008 WID: 07020002-551	None	Fish bioassessments (2012)
Public watercourse	Unnamed stream	M-055-179-008-005	None	None
Public watercourse	Unnamed stream	M-055-179-010	None	None
Public watercourse	Unnamed stream	M-055-179-014-003 WID: 07020002-576	None	Fish bioassessments (2020)
Public watercourse	County Ditch 3	M-055-179-014-013	None	None
Public watercourse	County Ditch 18	M-055-179-014-015	None	None

**12.A.2. Groundwater: aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) federal equivalent to wellhead protection areas or drinking water supply management areas found near/within tribal boundaries; 4) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells on site or nearby, explain the methodology used to determine this.**

**Depth to Groundwater**

Depths to groundwater in the table below are based on 29 geotechnical soil borings conducted at the Project site. Groundwater was only identified in two of the borings, which in some cases provide evidence of intermittent perched high water table conditions. Depth to the shallowest potential aquifer at the Project site is approximately 100 feet below grade or deeper, as evidenced within the MDH Well Records for the wells currently present at the site (Attachment 17).

**Table 13. Depths to groundwater.**

Approximate depth (in feet) to:	Feedlot	Manure storage area	Manure application sites
Groundwater – minimum	>21'	9.5'	*
Groundwater – average	>21'	>21.4'	*
Bedrock – minimum	281'	281'	281
Bedrock – average	289'	289'	289'

\*The Proposer has agreements with landowners for manure application covering over 16,500 acres. Depth to groundwater will vary throughout these acres. There are no rules prohibiting manure application onto high water table soils. The Proposer uses and exceeds BMPs for manure application and follows all state rules and local ordinances.

\*\*Bedrock Elevation Source: Steffl Well Drilling Well Records: 731318 and 869955.

**MDH Wellhead Protection Area**

There are no MDH Wellhead Protection Areas in proximity to the Project, nor any within or adjacent to any manure application sites. As identified on the MDH Source Water Protection Web Map,<sup>14</sup> the closest MDH Wellhead Protection Areas to the Project site are in Hancock and Morris approximately 9.7 miles east and 7.8 miles northeast, respectively.

**Federal and Tribal Wellhead Protection Areas**

There are no federal Wellhead Protection Areas by tribal land adjacent to the Project and manure application sites. The nearest tribal land (Upper Sioux) is approximately 50 miles southeast of the Project.

**Wells: Project Site**

There is one well (UN#: 768109) within the Project footprint that is 138-feet deep and screened in a buried quaternary (confined) artesian aquifer. This well has an existing DNR water appropriation (DNR Permit #2009-0492) for both irrigation and livestock watering. Nine domestic wells and four commercial wells are within one mile of the Project site. Four commercial wells and one domestic well (UN#: 682246, 6822488, 731318, 757860, & 836244) are at the Existing Facility. The remaining domestic wells are at rural farmsteads. There are no public water supply wells within or adjacent to the Project or any manure application areas. Detailed information about the well locations, unique numbers, and logs can be found in Attachments 12 and 17.

**Wells: Off-Site Well**

As outlined in the Aquifer Test Report for the APEC well, a well survey was completed for all wells within 1.5 miles of the Off-Site Well. A total of nine domestic wells, four irrigation wells, and one observation well were identified. See Attachment 25 for more information on each of these wells.

**12.A.3. Risks to Groundwater: Indicate Yes or No whether any of the following geologic site risks to ground water are present at the feedlot, manure storage area, or manure application sites. If yes, describe the features, show them on a map, and discuss proposed design and mitigation measures to avoid or minimize potential impacts.**

The Proposer, in conjunction with an environmental consultant, has completed a comprehensive review of the Project’s vicinity and examined its relation to water resources in the area. Please refer to the Manure Management section of Item 12 for details on the water resources surrounding the Project. Additional water and wildlife information can be found in Item 14 on Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources.

**Table 14. Site risks to groundwater.**

<b>Geologic site risks to groundwater</b>	<b>Feedlot</b>	<b>Manure storage area</b>	<b>Manure application sites</b>
Karst features (sinkhole, cave, resurgent spring, disappearing spring, karst window, blind valley, or dry valley)	No	No	No
Exposed bedrock and /or limited unconsolidated cover soils	No	No	No

<sup>14</sup> “Source Water Protection Web Map Viewer.” MDH. <https://mdh.maps.arcgis.com/apps/View/index.html?appid=8b0db73d3c95452fb45231900e977be4>

Geologic site risks to groundwater	Feedlot	Manure storage area	Manure application sites
Soils developed in bedrock (as shown on soils maps)	No	No	No
Sandy soils and/or sand plain	No	No	No

**12.B. Describe effects from project activities on water resources and measures to minimize or mitigate the effects in items below.**

**12.B.1. Wastewater: All sewage produced in Minnesota must be disposed of in accordance with Minn. R 7080.2450, subp. 6. This rule requires that “Septage or any waste mixed with septage must be disposed of in accordance with state, federal, and local requirements for septage and other wastes.” As such, anyone wishing to co-mix sewage with animal manure is allowed to do so provided all state, federal, and local regulations are met. Currently, state regulations require adherence with the federal regulations found within 40 C.F.R. § 503. Additionally, local units of government within Minnesota may have supplementary ordinance requirements that must be followed. All material that comes into contact with sewage must be treated to the same requirements as sewage alone. Furthermore, any other regulations which apply to the material the sewage is mixed with must also be followed.**

**For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic, and industrial wastewater produced or treated at the site.**

**12.B.1.a. If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.**

Not Applicable.

**12.B.1.b. If the wastewater discharge is to a subsurface sewage treatment system (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system. If septic systems are part of the project, describe the availability of septage disposal options within the region to handle the ongoing amounts generated as a result of the project. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity, and amount with this discussion.**

Residential wastewater will be generated at the following Project facilities: one four-unit apartment building (6 beds/2 baths per unit), an employee bathroom in the milking parlor, and an employee bathroom for the barn. The Design Flows for each facility are as follows: Apartment (2,250 gpd), Parlor Bathroom (450 gpd), and Barn Bathroom (450 gpd). These design flows meet or exceed Design Flows outlined in MN Rules 7080.1860 and are also confirmed by measured flows at similar existing facilities. Preliminary soils evaluation by Environmental Scientific (MPCA Design License #2196) identifies that individual mound systems will be utilized to treat this wastewater. All septic tanks for these facilities will be pumped annually by Engebretson Pumping (MPCA Maintainer License #3265), based in the region. After the SSTSs are constructed per MN Rules 7080, the areas around them will be landscaped to divert any excess stormwater away which will prolong the life of each system.

**12.B.1.c. If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects.**

Not Applicable.

**12.B.2. Stormwater: Describe the following:**

**12.B.2.a. Changes in surface hydrology resulting from change of land cover.** As shown in Item 8, the primary changes in land cover include:

- Brush/Cropland – 191.8 acres before the Project, 0 acres after the Project.
- Lawn/Landscaping – 0 acres before the Project, 63.4 acres after the Project.
- Impervious surface – 0 acres before the Project, 121.1 acres after the Project.
- Stormwater basin (wet sedimentation basin) – 0 acres before the Project, 7.3 acres after the Project.
- Water storage basins (acreage included in impervious surfaces).

The Project is on cultivated agricultural cropland with improved drainage featuring a matrix of private pattern tile and County Tile 30. There is currently no retention or treatment of any surface water runoff within the Project area. The proposed Project will include the retention, filtering, treatment and/or reuse of surface water runoff that would otherwise be directed downstream by existing drainage. Therefore, surface hydrology changes expected from this Project would be reduced runoff post-construction. See Attachment 24 and Item 12.B.5 (Surface Water) below for additional details on changes to surface water hydrology.

**12.B.2.b. Routes and receiving water bodies for runoff from the project site (immediate receiving waters and major downstream water bodies).**

Surface water runoff from the Project currently flows directly into County Tile 30, which outlets directly to two unnamed creeks (WID 07020002-551 & 07020002-552), which then flow to the Pomme de Terre River (WID 07020002-501), and eventually to the Minnesota River (WID 07020001-552).

**12.B.2.c. Environmental effects from stormwater discharges on receiving waters post-construction, including affected runoff volume, discharge rate, and change in pollutants.**

After construction is complete, the Proposer will control surface water runoff prior to any discharge from the Project. Specifically, the Proposer will construct three permanent stormwater basins for volume control and have two water storage basins that will store stormwater and contingency groundwater at the Project site. Placement of the stormwater basins is part of the Project plans approved by the MPCA as an effective means of preventing and minimizing stormwater impacts to the surrounding area. As part of the SWPPP, each stormwater basin will have a maintenance plan. Since all stormwater is contained on the Project, impacts to nearby lands are not expected. To account for future precipitation increases, these stormwater basins are sized more than 20% larger than the minimum required.

Additional Best Management Practices (BMPs) implemented by the Proposer to prevent negative stormwater-related effects include:

- The Proposer will house all cows inside the free-stall barn. Stormwater will generally not come into contact with feed, animals, manure, or bedding. Any contaminated runoff will not leave the Project site.
- The Proposer will cover the feed piles with impermeable plastic on an asphalt feed pad to minimize rainwater contact with the feed. Stormwater from the feed pad and solid manure storage areas will flow to Facility 106 and be contained in an LMSA.

Based on the above information, environmental effects associated with stormwater runoff post-construction are not expected.

**12.B.2.d. Effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity.**

Based on expected future climate trends, rainfall frequency and intensity are expected to increase in the future, with the projected annual rainfall increasing by 0.6 inches during the projected 30-year lifetime of the Project (Attachment 21, Figure 15). To account for future precipitation increases, the Project's stormwater basins are sized at least 20% larger than the required minimum volume for a 25-year, 24-hour rain event.

**12.B.2.e. Total number of acres that will be disturbed and describe the stormwater pollution prevention plan (SWPPP) (for projects requiring NPDES/SDS Construction Stormwater permit coverage), include best management practices to address soil erosion and sedimentation during and after project construction.**

Approximately 191.8 acres of current tilled land will be disturbed as part of the construction of the Project. A SWPPP has been prepared as part of the Project's Feedlot Permit application. The SWPPP describes BMPs that the Proposer will use to prevent erosion and control sediment runoff during construction. It also includes permanent stormwater management practices after construction is completed.

BMPs will incorporate the most effective and practical methods for erosion prevention and sediment control. Water quality management practices that control, prevent, and minimize degradation of surface water include:

- Avoidance of impacts.
- Construction-phasing.
- Minimizing the length of time soil areas are exposed.
- Pollution prevention through good housekeeping.

**12.B.2.f. Permanent stormwater management plans, including methods of achieving volume reduction to restore or maintain the natural hydrology of the site using green infrastructure practices or other stormwater management practices.**

Design of the Project is to capture, filter, treat, and/or reuse most or all stormwater runoff that would otherwise be directed downstream. This plan will not only reduce current stormwater discharges from the Project site but also provide a diversified water supply for use at the Facility. Specifically, the Project's permanent stormwater management plan will result in a minimum 10% reduction in post-construction stormwater runoff (Attachment 24).

The Project is designed to direct clean run-off water from the Project site to the water storage basins for reuse. The Proposer conservatively calculates that they will be able to collect and reuse an average of 90 million gallons per year (MGY) of stormwater runoff from the Project site.

**12.B.2.g. Any receiving waters that have construction-related water impairments or are classified as special as defined in the Construction Stormwater permit.**

Not applicable.

**12.B.2.h. Additional requirements for special and/or impaired waters.**

Not applicable.

**12.B.3. Water appropriation: Describe the following:**

**12.B.3.a. If the project proposes to appropriate surface or groundwater (including dewatering).**

The project proposes groundwater to be the primary source of water.

**12.B.3.b. The source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required.**

See Table 15, below.

**Table 15. Water sources.**

Water Source	Well number	Permit #	Amount	Use
Off-site well "APEC"	UN # 740629	2008-0230	226 MGY*	Livestock watering
Stormwater collection/reuse			90 MGY**	Project runoff directed to Water Storage Basins to be used for livestock watering.
Water storage basins (Facilities 501 and 502)		DNR permit #?	157 MGY^	Contingency water storage if pumping restrictions on APEC well are required.
<b>Total water available for the Project</b>			<b>316 MGY (226 + 90)</b>	

\*Pumping restrictions possible based on river flow (see groundwater items below).

\*\*Average annual estimated Project runoff water available for livestock watering.

^Water storage basins will hold water from both the APEC well and stormwater runoff for Project livestock watering.

### Groundwater

The groundwater source will be an off-site well (UN# 740629), approximately 3 miles southeast of the Project (Off-Site Well). This Off-Site Well (also called the APEC Well) is appropriated for the withdrawal of 226 MGY a proposed ethanol plant (APEC) and 226 MGY for livestock watering (Riverview) as outlined in existing MN DNR Permit #2008-0230 (Attachment 11). Riverview has an agreement in place with APEC to acquire the ethanol production portion of the permit. This water allocation (226 MGY) will be terminated during the permit amendment process with DNR.

Once the permit is amended, its listed use will be livestock watering, and the total appropriated volume will be 226 MGY.

Prior to obtaining the appropriation permit, an aquifer test was completed, including continuous pumping of the Off-Site Well at 1093 gallons per minute (gpm) for seven days while monitoring water levels in new observation wells, existing observation and potable wells, and nearby surface water levels. Based on the results of this aquifer test, the engineers found that the water-table aquifer used by the APEC/Off-Site Well provides ample water, is hydraulically connected to the Pomme de Terre River, and that river flows need to be considered (Attachment 25). Accordingly, the Aquifer Test Report included an assessment of potential impacts to surface-water features, including the historical examination of the Pomme de Terre River flows (Section 6.2). As part of that assessment, the project engineer recommends the DNR consider river base flows when determining the appropriation for the APEC/Offsite Well. Therefore, the DNR Water Appropriation Permit (2008-0230), includes a condition to reduce or restrict well pumping based on Pomme de Terre River flow in cubic feet per second (cfs) measured at the Appleton gauge as outlined below:

**Table 16. Pomme de Terre River flow and off-site well pumping restrictions.**

Pomme de Terre River flow	APEC/Off-site well pumping
>31 cfs	1000 gpm
31-22 cfs	450 gpm
22-15 cfs	300 gpm

Pomme de Terre River flow	APEC/Off-site well pumping
<15 cfs	0 gpm

### Water Storage Basins

DNR Water Appropriation Permit #2008-0230 was issued for an overall appropriation of 452 MGY between Riverview and APEC. Riverview has an agreement in place with APEC to acquire and terminate APEC’s portion of the original permit. In a pending permit amendment with the DNR, the Proposer will reduce the overall appropriated volume by half and develop an alternative contingency plan that differs from the original appropriation. The backup water supply will consist of two Water Storage Basins (See Attachment 3 - Facilities 501 and 502), designed to hold a 9-month contingency water supply in the event the well pumping is restricted for extended periods . See below for more details on the potential for pumping restrictions due to low river flows.

### Stormwater Collection

The water storage basins will also be used to store rainwater collected from the Project, conservatively averaging an additional 90 MGY.

**12.B.3.c. Any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure.**

The Project will not include any well abandonment or connection to a municipal water supply system.

**12.B.3.d. Environmental effects from water appropriation, including an assessment of the water resources available for appropriation.**

#### Available water resources

The off-site well is near the Pomme de Terre River valley and is screened in a Quaternary Water Table Aquifer (QWTA), while the wells for the existing facility are screened in the Quaternary Buried Artesian Aquifer (QBAA) beneath the Project site. The Proposer plans for this diversified groundwater approach to avoid environmental effects associated with groundwater appropriation from the same aquifer and/or location.

**12.B.3.e. How the proposed water use is resilient in the event of changes in total precipitation, large precipitation events, drought, increased temperatures, variable surface water flows and elevations, and longer growing seasons.**

The Proposer proposes to use 226 MGY from the offsite well (APEC). That appropriation was established based on the results of a 7-day aquifer pump test that identified sufficient water in the water-table aquifer and confirmed that the aquifer is hydraulically connected to the Pomme De Terre River. As recommended in the Aquifer Test Report (Attachment 25), pumping conditions were imposed by the DNR to protect the river in the event of drought or low surface-water flows.

The Proposer will follow the DNR-identified restrictions on pumping levels and/or cessation of pumping based on the measured flow conditions of the Pomme de Terre River (Attachment 11).

As a contingency measure for seasonal fluctuations and potential pumping restrictions, water storage basins will be constructed as part of the Project, to enable better management of water flows from the Off-Site Well should pumping restrictions occur (Attachment 3). The basins will be filled with well water outside restricted periods. The water storage basins will also store an average of 90 million gallons of collected stormwater per year, enabling a diversified approach to water resources and reducing reliance on a single water source (Attachment 3). “Clean” stormwater will be

collected using existing infrastructure, such as stormwater basins, to direct runoff into the water storage basins. Clean stormwater does not encounter manure or feed storage areas. The process is similar to the required capture of precipitation in stormwater basins; however, instead of releasing the captured water, clean stormwater is used to offset the water pumped for cow consumption.

To understand the frequency of potential pumping restrictions, the Proposer contracted Moore Engineering (Moore) to complete a historic flow study of the Pomme de Terre River with respect to the pumping restriction levels outlined in the appropriation permit (Attachment 26). Moore identified that there has been an historic increase in river flows since 1991. Moore identified an average minimum flow of 8.5 cubic feet per second (cfs) between 1931-1991 and 50 cfs post-1991, while average maximum flows were 933 cfs and 1,706 cfs during the same timeframe, respectively. Pumping restrictions during low cfs between time periods are outlined in Table 17.

**Table 17. Pumping restrictions during low river flow between time periods.**

Parameter	Average Percent (1931 – 1991)	Average Percent (1991 – current)
< 31 cfs	38.9%	3.4%
< 22 cfs	28.9%	1.9%
< 15 cfs	20.3%	0.6%

The increasing trend in river flows is likely correlated to drainage improvements within the Pomme de Terre River watershed. Increasing river flow trends decrease the likelihood of required pumping restrictions.

**12.B.3.f. Any measures to avoid, minimize, or mitigate environmental effects from the water appropriation.**

The Proposer will comply with DNR pumping restrictions for the Off-Site Well. Though water use for the Facility will remain constant throughout the year, the Proposer has observed seasonal increases and decreases during the summer and winter months. As a contingency measure for both seasonal fluctuations and/or possible pumping restrictions, water storage basins will be constructed at the Project site, which will allow for better management of water flows from the Off-Site Well in the event that pumping restrictions are ever needed (Attachment 3). These water storage basins will also collect stormwater, enabling a diversified approach to water resources and reducing reliance on a single source. The Project was designed to deliver an average annual flow of 90 MGY of non-contaminated runoff (after evaporation losses) to the water storage basins for reuse. This backup source of clean water has proven effective as a mitigation tool at similar facilities operated by the Proposer.

**12.B.3.g. Contingency plans should the appropriation volume increase beyond infrastructure capacity or water supply for the project diminish in quantity or quality, such as reuse of water, connections with another water source, or emergency connections.**

**12.B.3.g.1. Current water use (gal/yr):**

Not applicable.

**12.B.3.g.2. Proposed water use (gal/yr):**

316,000,000 gallons per year

**12.B.3.g.3. Water supply source:**

- Existing well
- New well
- Public supply
- Other:

**12.B.3.g.4. Aquifer test required by DNR?**

- Yes  No

As outlined in DNR correspondence dated April 2, 2025, a new aquifer test for the Off-Site Well will be waived if the Proposer abides by the following parameters:

- Pumping will occur from only the Off-Site Well.
- No more than 226 MGY is to be used at a rate not to exceed 1,000 gpm.
- Pumping is subject to restrictions up to and including cessation of pumping depending on the flow conditions of the Pomme de Terre River.
- The Proposer will construct water storage basins to store a contingency supply of water. This contingency will allow flexibility if pumping restrictions of the Off-Site Well are ever required during low-flow periods.
- The Proposer had a river flow study completed, which identified that there is an increasing trend in river flows and a decreased likelihood of required pumping restrictions (Attachment 26).
- The Proposer has designed the facility to direct an average of 90 MGY of clean run-off from the project as another water source contingency. This same contingency has proven effective at other facilities operated by the Proposer.

Details of the pumping restrictions are in the final Water Appropriations Permit Application submitted to DNR by the Proposer on May 2, 2025. This application updates the existing DNR permit #2008-0230 for the same Off-Site Well (Attachment 11).

**12.B.4. Surface Waters**

**12.B.4.a. Wetlands: Describe the following:**

**12.B.4.a.1. Any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal.**

There are no physical impacts or alterations to any wetlands expected from this Project.

**12.B.4.a.2. Direct and indirect environmental effects from physical modification of wetlands, (include anticipated effects to the host watershed, taking into consideration how current Minnesota climate trends may be affected).**

There are no physical modifications to any wetlands from the Project.

**12.B.4.a.3. Measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands.**

All wetlands have been avoided.

**12.B.4.a.4. Required compensatory wetland mitigation for unavoidable wetland impacts that will occur in the same minor or major watershed and identify those probable locations.**

Not applicable.

**12.B.4.b. Other surface waters: Describe the following:**

**12.B.4.b.1. Anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent streams, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal, riparian alteration, drain tiling, and tile inlets or outlets. Show these features on maps.**

Clean stormwater from the Project will comply with an approved SWPPP and be discharged via BMPs. There will be a minimum of 10% reduction in stormwater runoff from the Project site post-construction. Moreover, after rain events, the Proposer will inspect the stormwater basins to ensure captured stormwater is free of waste before releasing it to its natural drainage course.<sup>15</sup>

The Proposer will develop the Project to collect post-construction stormwater to filter, treat, or reuse, unlike the current drainage status of the land at the Project site today (Attachments 3 and 24). Additional information is detailed below.

**12.B.4.b.2. Direct and indirect environmental effects from physical modification of water features, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects.**

There will be no physical modification of water features as part of the Project. As outlined in Item 7, climate change projections indicate that Minnesota will be among the fastest-warming states, with overall increases in precipitation. To avoid potential indirect effects on surface waters related to climate change, the Proposer has incorporated climate change adaptation strategies into the Project, including designing stormwater basins to account for projected precipitation, as detailed in Item 7.B. In addition, there are pumping restrictions on the Off-Site Well to avoid indirect impacts on the Pomme de Terre River, as outlined in Item 12.A.3. above.

**12.B.4.b.3. Measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water best management practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features.**

The Project will not physically alter any water features.

**12.B.4.b.4. How the project will change the number or type of watercraft on any water body, including current and projected watercraft usage.**

The Project will have no effect on watercraft usage.

**12.B.4.b.5. Quantity and quality of site runoff before and after the project:**

**Pre-Construction**

The proposed Project site is currently cropland, where stormwater is either absorbed by the soil and used by a growing crop or runs off into the field's pattern tile system, which is connected to County Tile 30. Using the SCS Curve Runoff Method, 117 MGY is calculated to run off from the Project site as it sits today in crop production. Moreover, this type of runoff is susceptible to sediment and nutrient loss due to the lack of pretreatment and will yield 0.41 tons/acre of sediment annually (Attachment 24).

**Post Construction**

The Project will replace cropland with impervious surface, grass/landscaping, and stormwater basins. The addition of stormwater basins will balance stormwater flow by collecting and filtering the water before release. Additionally, the impervious surface will include feed storage and solid

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<sup>15</sup> Stevens County. "County Ditches" Public Viewer.

<https://experience.arcgis.com/experience/6d6f5d75644b45edb3f113ed2c906753>

manure storage areas. The Project will direct runoff from the feed storage and solid manure storage areas to an LMSA for land application. Ultimately, the calculated runoff for the Project site will decrease to 106 MGY and the post-treatment runoff sediment and nutrient amounts will decrease to 0.05 tons/acre of sediment annually (Attachment 24). Water that is not recaptured would be discharged to the county tile system after passing through a stormwater basin with natural filtration. The water discharge rate would follow agronomic rates and would not be higher than it would be without the dairy.

**12.B.4.b.6. Permanent controls to manage or treat runoff. Identify water resource affected and give the DNR Protected Waters Inventory (PWI) number(s) if the water resources affected are on the PWI.**

The Project will manage runoff in accordance with the SWPPP plan submitted with the Feedlot Permit application.

**12.B.4.b.7. Proposed mitigation measures to avoid or minimize impacts.**

No mitigation measures are required for the Project location. There are pumping restrictions in place for the Off-Site Well to avoid indirect impacts to the Pomme de Terre River as outlined in Item 12.A.3 above.

**12.B.5. Manure management. Describe how manure will be collected and stored at this facility. Include a description of any manure processing activities such as liquid solid separation and anaerobic digestion. Attach a copy of the Manure Management Plan (MMP). If an anaerobic digester will process manure, list any other feedstocks used in the digester.**

Manure from cattle in the free-stall barn will be collected twice daily using a self-propelled vacuum wagon. This manure will be transported to a temporary manure storage tank (Facility 104). From there, the manure will be processed through screw-press separators to separate the solid fraction from the liquid. The liquid portion will be transferred to the LMSAs for long-term storage. These facilities (Facilities 101, 102, 106) will be topped with synthetic covers to control odors. All LMSAs will be lined with no less than 60" of compacted clay. The Proposer will utilize the recycled manure solids as cattle bedding in the free stalls. This bedding material will be held in Facility 204. Excess recycled manure solids may be sold to other dairy producers for cattle bedding material. Recycled manure solids may also be transferred to local farmers for use as fertilizer on cropland after harvest. Solid manure will be stored on a concrete pad (Facility 105) until transfer.

Solid and liquid manure transferred to area farmers for use as fertilizer will be applied in accordance with Feedlot Permit requirements. The Proposer may choose not to separate solids from manure and instead send all manure in its unprocessed liquid form to the LMSAs for storage and eventual liquid application. This would be enacted to control the production of cattle bedding and solid manure depending on the needs for these products.

An anaerobic digester is currently operating at the Existing Facility. That digester was constructed many years after the Existing Facility became operational by a third-party vendor, who also operates it. During regular operations, manure is routed to the digesters prior to passing through the screw-press separators. The digestion process is simply an added step in the manure handling system, and it can be bypassed if needed. Additionally, it is worth mentioning that digesters have limited capacity. The digester at the Existing facility will only be able to handle manure from the existing dairy. No third-party vendors have expressed interest or provided plans for building a digester for the Project. Therefore, the Proposer cannot assume a future anaerobic digester for this environmental review.

**12.B.5.a. Manure removal activities.**

**12.B.5.a.1. Manure removal frequency:**

- Once per year.
- Twice per year.
- Other.

**12.B.5.a.2. Time required for manure removal (days/year):**

There are 75 calendar days designated as available for manure application, following corn silage harvest around September 1st, and going as late as mid-November, depending on field conditions. Manure will be applied 24 hours a day, 6 days a week, with no application happening on Sundays. The Proposer estimates that with setup times and potential delays for weather events or field conditions that 30 calendar days will be needed for active application.

**12.B.5.b. Manure transfer.** Will any amount of manure be transferred to a third party for land application?

- Yes (complete a - c below).  No (skip a - c below).

**12.B.5.b.1. Estimated amount of manure transferred throughout the year:**

**Table 18. Estimated amount of transferred manure per year.**

Transfer timeframe (months)	Liquid (gal)	Solid (ton)
September 1 – November 15	85,214,000	11,550
Total	85,214,000	11,550

**12.B.5.b.2. Describe the protocols used to ensure information about nutrient content, nitrogen and phosphorus rate requirements, and setback requirements are made available to the recipient.**

The MPCA requires that Feedlot Permit holders sample manure yearly. This sample must be representative and follow the University of Minnesota Extension Service recommendations and be analyzed at a Minnesota Department of Agriculture certified lab. The Proposer will take representative samples each year and send them to a local laboratory and make these results available to all manure recipients.

Manure is applied at agronomic rates in accordance with Minn. R.7020 and the Feedlot Permit. For acreage converting from commercial fertilizer to manure from the Project, there will be more oversight and regulation of nutrient application than currently exists. Following laboratory analysis of manure samples, the Proposer will determine the agronomic rate using the University of Minnesota’s recommendations for manure application based on the previous crop harvested, the available nutrients, yield goals, and the crop grown.

The Commercial Animal Waste Technician (CAWT) may land apply manure in the fall, spring, or summer if there is an existing crop on the applicable site. The CAWT will inject the manure directly into the soil when cover crop is not present. The CAWT must follow County ordinances and setbacks for manure application at each manure application site. The CAWT must also adhere to applicable manure application setbacks as outlined in Item 12.B.5 of the EAW.

The CAWT must evaluate field specific setbacks prior to manure application on a year-to-year basis since the existence of sensitive feathers could change. In some circumstances, runoff characteristics from the acres may improve due to regulation of land application under the Feedlot

Permit as described above. Improvements may occur through developing better soil tilth from organic fertilizer and the uniform practice of incorporating manure as identified in the MMP.<sup>16</sup>

MPCA will require that when ownership of manure is transferred, the recipient be equipped with the “Manure Transfer Tracking” form generated by the Nutrient Management Tool. This form outlines the key requirements that recipients must follow, including protective measures from the Producer’s approved manure management plan. All those measures are designed to reduce the risk of polluting waterways as a result of manure application.

The Proposer will also develop and maintain a Manure Management Plan using the MPCA’s Nutrient Management Tool. Both the Producer and manure recipients must abide by the requirements found in the manure management plan and transfer documents.

**12.B.5.b.3. Describe efforts to limit the potential for application of transferred manure to fields without actively growing crops during the summer and during frozen or snow-covered conditions.**

The MPCA prohibits the transfer of manure when the recipient intends to apply liquid manure during winter conditions anytime between December 1 and March 31. The MPCA also requires that fields with manure applied between June 1 to September 30 have a cover crop planted or be applied to an actively growing crop. The Proposer will comply with the MPCA requirements. The Proposer will only make liquid manure from West River Dairy available to recipients in accordance with the Feedlot Permit. The Proposer will also communicate Best Management Practices with manure recipients.

**12.B.5.c. Manure land application (non-transfer).** Will any amount of manure be applied to fields owned, leased, rented, or otherwise controlled by any member of the ownership entity of the feedlot?

Yes (complete a-e below).  No (skip a-e below).

**12.B.5.c.1. Estimated amount of manure applied throughout the year:**

**Table 19. Estimated amount of manure applied per year.**

Application timeframe	Liquid (gal)	Solid (ton)
September 1 – November 15	28,405,000	3,850
Total	28,405,000	3,850

**12.B.5.c.2. Describe anticipated manure application technologies and methods of application and incorporation. Include measures to limit the potential for runoff, especially for manure applied in winter conditions.**

Manure can be used to replace or supplement commercial fertilizer. The Proposer will remove liquid manure from LMSAs using a drag hose system and transfer some to neighboring farms where a CAWT will knife-inject the liquid manure into fields. A CAWT will surface-apply solid manure and incorporate it within 24 hours.

The Proposer will begin manure application following corn silage harvest starting around September 1 every year. The CAWT will land apply manure 24 hours a day, 6 days a week for approximately 30 days each year. Due to factors such as rain events or waiting on fields to become available for application, the CAWT may need to spread out the manure application over several weeks. No manure will be applied on Sundays.

<sup>16</sup> “Runoff reductions with incorporated manure.” MPCA. May 2018. <https://www.pca.state.mn.us/sites/default/files/wq-f1-08.pdf>

Local producers have identified and offered over 16,500 acres of currently tilled cropland for manure application (Attachments 5 and 8). Some of the available acres that could receive manure may or may not be available in any given year based on many factors, including, but not limited to, the desire by both parties involved to apply manure, crop rotation, and weather. The manure agreements the Proposer has with the landowners continue from year to year unless cancelled by either party in any given year.

Before manure application season, the Proposer will coordinate with the neighboring farms to transfer the ownership of manure per the MPCA-approved process. The Proposer will also inform recipients about the time and weather-dependent BMPs and permit conditions that must be adhered to. These include, among other things, cover crops, nitrogen inhibitors, and adequate soil temperatures. The Proposer allows recipients the operational flexibility to implement the measures that are most practical for their operation. The Proposer provides the recipient with the most current nutrient analysis from a fixed-based lab, and a receipt with a description of the minimum state requirements for manure application as required by the Feedlot Permit and Minn. R. 7020.2225, subp. 1(D) the Proposer will calculate the number of acres needed based on volume of manure in the LMSAs that is determined by using the depth and the design volume chart found in the Feedlot Permit.

To apply manure at the correct agronomic rates, the CAWT will use pressure gauges and flow meters on each applicator. A monitor in the tractor cab displays the rate of manure application (flow), the pressure of the hose (pressure), and the revolutions per minute (RPM) of each engine pumping manure. If any malfunction were to occur such as a hose break, the monitor in the tractor cab immediately detects change in flow, pressure, and RPM. The CAWT can shut down the entire system, closing shutdown valves at the main pump and subsequent booster pumps. Additionally, each pump has an automatic shutoff mechanism should hose pressure exceed or fall below predetermined operating levels.

The Proposer anticipates sufficient time is available from September 1 until freeze to apply all the manure while also factoring in unexpected downtime due to weather conditions. Typically, the Proposer will only apply manure in the spring if the weather conditions during the previous fall prevented complete emptying of the LMSAs. Based on the Proposer's previous experience with applying manure in west central Minnesota, the need for manure application in spring is rare. Occasionally, the Proposer may land apply manure during the spring and summer months. Summer application could occur on a growing crop such as alfalfa. In that case, the Proposer will land apply manure to an alfalfa field within days after a harvest (known as a cutting). Manure application has the potential to damage the alfalfa stand when the soil moisture is high; therefore, the Proposer will avoid manure application during times of high soil moisture. The Proposer will not apply liquid manure in winter conditions, as it is prohibited by the MPCA.

**12.B.5.c.3. Describe measures used to manage field soil phosphorous levels to prevent excessive phosphorus build-up.**

As required by the MPCA, the Proposer will sample soil from manure application fields every 4 years to monitor phosphorus (P) levels, using the Olsen or Bray P1 analysis. The Proposer will also use the Manure Management Plan (MMP) resources to prevent long-term soil P build-up. The steps in the MMP are to: determine crop P uptake, determine manure P level, determine the amount of P applied from commercial fertilizer, and compare the amount of P applied and removed. The Proposer can adjust the amount of manure applied or commercial fertilizer applied or adjust the crop rotation to prevent long term phosphorus build-up.

**12.B.5.c.4. Describe any measures (Best Management Practices) used to limit the potential for nitrate impacts to water resources.**

Manure will be applied at agronomic rates, supplying only the nitrogen (N) needed by the crop to be grown. The Proposer will use the MPCA's Nutrient Management tool to calculate the amount of nitrogen that can be safely applied to each of their application fields. This tool considers manure N levels, the type of crop to be grown, and previous manure application (residual N levels) to indicate how many gallons per acre may be applied.

The Proposer will also follow the state or county setbacks from ditches, lakes, tile intakes, and wells, to prevent nutrient runoff into those features.

**12.B.5.c.5. If land application acres drain to a waterbody with an impairment, describe the measures used to limit land application effects on the impairment.**

The Federal Clean Water Act (CWA) (33 U.S.C. and 303 (d)) (1972) requires that each state develop a plan to identify and restore a waterbody that is deemed impaired by state regulations. The Environmental Protection Agency (EPA) requires a Total Maximum Daily Load (TMDL) in accordance with the CWA. A TMDL identifies pollutants causing impairment and how much of those pollutants can enter the waterbody while still meeting water quality standards.

Several practices are required by the Feedlot Permit to prevent nutrient runoff that include application at agronomic rates to not exceed expected crop nitrogen needs, testing for soil phosphorus, application timing, planting cover crops, and setbacks from waterways. The Proposer will comply with manure application requirements set forth by the Feedlot Permit that are intended to protect waters of the state.

As detailed in Item 12.A.1, all the manure application areas are within the Pomme de Terre River Watershed, and several are adjacent to impaired waters including:

Lake Hattie (WID: 75-0200-00)

- Unnamed Basin (WID: 75-0375-00)
- Pomme de Terre River (WID: 07020002-501)
- Muddy Creek (WID: 07020002-511)
- Dry Wood Creek (WID: 07020002-556)
- Unnamed Stream (WID: 07020002-551)
- Unnamed Stream (WID: 07020002-576)

See Attachment 16 for additional details.

**12.B.5.d. Manure application fields.**

**12.B.5.d.1. General description. Describe each land application field with the following:**

**Field name/ID, location (Township-Range-Section), tillable acres, predominant soil type, field tiling system, irrigation system, description of bordering lands/roads, waters (within 2 miles) receiving runoff or tile line flow, etc. Include DNR Public Waters Inventory numbers (if available) and any special designations such as public waters, shoreland classification and floodway/floodplain, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water.**

See Attachment 8 for manure application field IDs, locations and tillable acres.

See Attachment 10 for soil maps of manure application fields. These maps contain locations of known tile inlets. Many of the fields in the MMP belong to third-party farmers who will receive transferred manure and are responsible for manure application on their land. For those parcels, the location of all tile inlets is not easily identifiable by the Proposer. All manure recipients will be

responsible for following proper setbacks to tile inlets to ensure no nutrients enter the tile line, per permit requirements.

See Attachment 15 for DNR Watershed overlay map of manure application sites.

**12.B.5.d.2. Map the manure application fields. Show on a map the following within or near (300 ft.) land application fields:**

**Lakes, rivers, streams, intermittent streams, wetlands, county/judicial ditches, open tile intakes, wells, springs, Karst features (Sinkholes, caves, resurgent springs, disappearing springs, karst windows, blind/dry valleys).**

See Attachment 8 for manure application field IDs, locations and tillable acres.

See Attachment 10 for soil maps of manure application fields.

See Attachment 15 for DNR Watershed overlay map of manure application acres.

**12.B.5.d.3. Additional field sensitivity information. Below each of the following items list any fields that meet the criteria described.**

**Fields within Drinking Water Supply Management Areas (DWSMAs) or Source Water Protection Areas (SWPAs) with medium to high vulnerability, including tribal drinking water supply areas.**

There are no DWSMAs or SWPAs near the Project or the manure application fields. The nearest drinking water supply areas are in the City of Morris and the City of Chokio, which are 2.45 and 3.0 miles away from the nearest manure application field, respectively.

Feedlot operations and land application activities can affect groundwater resources at or near the surface or that are accessible through conduits and fractures within topography. Karst topography is not known to exist within the vicinity of the Project or the manure application acres. The Groundwater Contamination Susceptibility in Minnesota report<sup>17</sup> estimates the potential for groundwater pollution. In June 2016, the DNR updated this evaluation. The report uses a matrix for determining a sensitivity rating of the water table ranging from very high to very low based on aquifer material, recharge potential, soil materials, and vadose zone materials. After review of the published information related to pollution sensitivity potential the Project and its manure application fields are primarily in an area designated as having a low sensitivity to groundwater pollution. Specifically, of the 16,669 manure acres designated for the proposed Project, only 425 acres are within sensitive areas that have fall fertilizer application restrictions.

**Table 20. Geologic sensitivity rating descriptions of the near surface as defined by vertical travel time.**

<b>Near-surface pollution sensitivity</b>	<b>Time of travel</b>	<b>Description</b>
Very low	>1600-8000 hours	Months to a year

The Proposer will take the following measures to protect groundwater that are enforceable parts of the Feedlot Permit.

The MPCA reviewed and approved design plans and construction specifications for the LMSAs in the Feedlot Permit. The Proposer will follow requirements of Minn. R. 7020 for the construction of the LMSAs.

The Proposer must maintain records of all inspections as part of the operation and maintenance for the LMSAs. The Proposer will follow the Operation and Maintenance Plan submitted as part of

<sup>17</sup> Adams, R. "Pollution Sensitivity of Near-Surface Materials." Minnesota DNR. June 2016. [http://files.dnr.state.mn.us/waters/groundwater\\_section/mapping/mha/hg02\\_report.pdf](http://files.dnr.state.mn.us/waters/groundwater_section/mapping/mha/hg02_report.pdf)

its Feedlot Permit application. The plan is integral to the Feedlot Permit and must meet the requirements of Minn. R. 7020.2100.

The risk of contamination to groundwater quality due to the LMSAs is low given the engineered concrete structures and clay-lined design for the Project. LMSAs at the Project site will exceed the required soil seepage standard, and LMSA clay-liner thickness will be increased from two feet to five. The Proposer may encounter shallow groundwater during construction of the LMSAs. The Proposer will install a perimeter drain-tile system at an elevation that is lower than the liner within the LMSA to reduce external groundwater pressure on the walls and to control seasonal sub-surface saturation near the LMSAs.

The Project will reduce contamination risk from manure application to groundwater quality by following proper land application practices. The Proposer will follow requirements of Minn. R. 7020 and the MMP in the Feedlot Permit for manure application.

**Fields planned for winter manure applications.**

The Proposer does not plan to apply any manure during the winter season, in accordance with Feedlot Permit requirements. The Project has sufficient manure storage to prevent liquid or solid manure application during the winter. Manure application begins around September 1st, following corn silage harvest and applied 24 hours a day, 6 days per week for approximately 30 days each year. The Proposer anticipates sufficient time is available between September 1st until freeze to apply all manure. In addition, the Proposer has several thousand extra acres of tillable land available to spread manure to help account for unsuitable field conditions. However, if weather conditions during the fall prevent complete emptying of the LMSAs and land application of solid manure, the Proposer will apply manure the following spring. Based on the Proposer's previous experience with applying manure in west central Minnesota, the need for manure application in spring is rare.

**Fields with soil phosphorous tests levels above 21 ppm Bray 1 or 16 ppm Olson and have surface water within 300 feet.**

Of the manure application fields owned or operated by the Proposer, fields 2012 and 2068 in section 32 and section 11 of Synnes Township were identified. Both fields had an 18ppm Olson phosphorus test result and surface water within 300 feet of the tillable portion of the field. In the case of field 2012, there is a wetland in the center of the field, and field 2068 has a drainage ditch along its northern border. However, both surface water areas have vegetative buffers surrounding them that allows them to be available for manure application under the Feedlot Permit requirements.

Once the Project is operational and manure is being generated and transferred to farmers, the manure recipients will be required to follow the Feedlot Permit rules for land application of manure that requires: "field receiving manure shall be sampled and tested in the upper six inches for soil phosphorus at least once every four years". Where field phosphorous tests levels are above 21 ppm Bray 1 or 16 ppm Olson and have surface water within 300 feet, the Feedlot Permit requires that manure recipients apply manure at a rate and frequency that phosphorous applied does not exceed phosphorous removal during a six-year period or that there be a vegetated buffer along lakes, streams, or other waterways.

**Fields with soil phosphorous tests levels above 75 ppm Bray 1 or 60 ppm Olson.**

Of the manure application fields owned or operated by the Proposer, none had a Fall 2024 phosphorus test above 60ppm Olson.

Farmers who receive transferred manure from the Project will be required to follow the Feedlot Permit requirements for land application of manure. The Feedlot Permit requires that when field average phosphorus soil tests exceed 75ppm Bray or 60ppm Olsen within 300 feet of a waterway or conduit, and manure is injected or incorporated, that re-application of manure cannot occur until phosphorus from the previous manure application is calculated to have been removed by subsequent crops and that runoff and soil erosion practices are implemented to achieve a “very low” or “low” rating with the Minnesota Phosphorus Index. The Proposer will follow protocol to communicate these requirements with manure recipients described in this application in Item 12.B.5.

**Fields that could receive broadcast manure (not immediately incorporated) that have slopes at 6% or greater.**

The Proposer predominantly knife-injects manure, a practice that immediately incorporates manure into the soil, and rarely broadcasts manure. In some cases, dry solids not utilized for bedding will be broadcast, but that broadcasting would be immediately incorporated into the soil.

As outlined in the Feedlot Permit, broadcasting manure on any slopes greater than 6% slope must be immediately incorporated, with winter application prohibited because incorporation is not possible. To avoid the potential for an emergency winter application situation for this Project, manure storage capacity has been designed with a 14-month capacity. This is greater than the minimum required storage capacity of 9 months. This additional contingency storage allows operational flexibility to apply in the spring and summer months and avoid winter application if fall weather conditions are not conducive to applying all manure before winter. However, if an emergency winter application was necessary, the Proposer would not apply manure to any fields with slopes greater than 6%. Fields with this condition make up a small portion of the total acres dedicated to the Project.

Listed below are the identified Township sections that contain Project manure application fields with portions that have greater than 6% slopes. See Attachment 10 for further details on soil slopes for the Project manure application sites.

**Table 21. Project manure acre sections with >6% slopes (acres and % of field).**

Field	Soil type	Acres >6% slope	% of field >6% slope
Fairfield 6	Hatte-Audubon complex 4 to 10% slope	19.6	22.8%
Horton 19	Forman-Bule complex 6 to 12% slope	1.2	0.8%
Horton 29	Various	1.8	4.1%
Horton 30	Various	2.4	0.9%
Horton 31	Various	21	15%
Synnes 5	Various	1.3	0.6%
Synnes 6	Various	0.2	0.5%
Synnes 8	Various	6.3	2.5%
Synnes 9	Hattie clay 6 to 12% slope	14.8	10.4%
Synnes 11	Hattie clay 6 to 12% slope	23.6	7.2%
Synnes 12	Hattie clay 6 to 12% slope	2	0.6%
Synnes 16	Hattie clay 6 to 12% slope	7.7	3.1%
Synnes 22	Hattie clay 6 to 12% slope	50.7	19.1%

Field	Soil type	Acres >6% slope	% of field >6% slope
Synnes 23	Hattie clay 6 to 12% slope	2	0.7%
Synnes 25	Hattie clay 6 to 12% slope	62.6	11.9%
Synnes 35	Barnes-Buse complex 6 to 12%	18.2	9.2%
Synnes 36	Various	47.3	18.8%
Darnen 19	Hattie clay 6 to 12% slope	13.4	4.5%
Darnen 20	Hattie clay 6 to 12% slope	13.1	4.2%
Total acres		289.6	1.7%

**12.B.5.d.4. Using Web Soil Survey data, list any fields with at least 33% of the acreage that meets the following:**

**Sensitive aquifer assessment rating.**

None of the manure fields have this rating.

**Soil texture of sand, loamy sand, loamy coarse sand, fine sand, loamy fine sand, coarse sand, or very fine sand.**

None of the manure fields have any of the listed soil types present.

**Depth to bedrock of 40 inches or less.**

None of the manure fields have this rating.

**Soil erosion (“T factor”) rating of 5 or more tons/acre/year.**

The fields were reviewed using the RUSLE2 calculator for erosion loss. No fields were identified as having erosion factor of greater than 5 tons/acre/year.

**Frequently flooded.**

No fields were identified as having greater than 33% of the acres as a “frequently flooded” soil type.

**12.B.5.e. Manure application setbacks. Describe any required township/county/state setbacks for land application systems. Show as a buffer on maps.**

The table below outlines the required setbacks for the land application of manure when the manure is either injected or incorporated within 24 hours, which is consistent with how manure from the Project will be managed. The Proposer will remove liquid manure from LMSAs using a drag hose system, and some will then be transferred to local producers’ identified fields. A CAWT will knife-inject the liquid manure into fields. The Proposer will broadcast apply solid manure and incorporate within 24 hours. Applicable buffers for each manure application field are outlined in Attachment 10.

**Table 22. Manure application setbacks.**

Feature	MPCA	Stevens County	Swift County
Floodplain	0 feet	Same as MPCA	Injected: 0 feet Surface: prohibited
Open tile intake	0 feet	Same as MPCA	Injected: 10 feet Surface 100 feet
Drainage ditch	25 feet	Same as MPCA	Injected: 100 feet Surface: 300 feet

Feature	MPCA	Stevens County	Swift County
Lake/river/stream	25 feet	Same as MPCA	Injected: 100 feet Surface: 300 feet
Intermittent stream/public waters wetlands well	100 feet	Same as MPCA	Injected: 200 feet Surface: 200 feet
Residence/cemetery	None*	Same as MPCA	Injected: 100 feet Surface: 300 feet

\*manure application setback if manure is either injected or incorporated within 24 hours.

**12.B.5.f. Other methods of manure utilization. If the project will utilize manure other than by land application, please describe the methods. If the project includes an anaerobic digester or one exists on-site include that information here.**

The Proper uses recycled manure solids as bedding for the cattle in the free stall area. For greater detail on the manure solids recycling process, see Item 12.B.5 on Page 38 of the EAW.

A third-party vendor currently operates an anaerobic digester at the Existing Facility. No third-party vendors have expressed interest or provided plans for building a digester for the Project.

**13. Contamination/Hazardous Materials/Wastes:**

**13.A. Pre-project site conditions: Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.**

The Project site is on tillable land in a rural area with low population density. The Minnesota Pollution Control Agency’s (MPCA) “What’s in My Neighborhood?” (WIMN) map identified one hazardous waste site near the Project, at RDF Stevens LLC WR. The site was a one-time generator, of a quantity of less than 2,200 lbs of material. Upon consulting with AMP Americas, the owner of the material, this was a one-time cleanout of a material that is no longer in use at that location. Therefore, this occurrence has no impact on the Project. In addition, the MPCA WIMN map identified no soil or ground water contamination sites, no active or abandoned soil waste sites, no tank sites, and no feedlots other than the Project on or within a 1/2 mile of the site. Lastly, the National Pipeline Mapping System was reviewed, and there are no pipelines identified on or within 1/2 mile of the Project.

With no known hazards on or near the Project, the potential for any existing negative environmental effects that would be exacerbated by Project construction and operation is very low. If the Proposer or one of their contractors identify an unknown environmental contamination or hazard, the Proposer has a contract with an environmental consulting company, Environmental Scientific, LLC, as a contingency plan. Environmental Scientific will promptly call the Minnesota State Duty Officer and work with the appropriate agencies to mitigate any contamination, hazardous materials, and/or wastes identified.

**13.B. Project related generation/storage of solid wastes: Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.**

The construction phase will predominantly generate shipping and packaging material as waste. Materials will come as part of a building package, with most components arriving at the Project site cut to the size needed for construction. Construction contractors will be required to collect, contain, and properly dispose of solid waste as required by local ordinances. Construction contractors will also minimize and mitigate adverse effects from solid waste generation and storage by recycling construction waste to the degree practicable. The local landfill, Engebretson & Sons Disposal, can accept all construction waste expected for the Project, including plastic, concrete, metal, and untreated wood. The local landfill can also accept materials for recycling, including plastic cardboard, and steel.

Once the Project is operational, all the disposable rags utilized in the parlor will be kept separate from solid waste and collected for recycling. Specifically, the disposable rags will be stored in a separate container, which Engebretson Disposal will pick up and then add to the organic waste generated in Stevens County. This practice of recycling disposable rags at the Project and other existing Proposer operated parlors in the area will enable Stevens County to achieve its 35% recycling goal ahead of the schedule mandated by the state.

**13.C. Project related use/storage of hazardous materials: Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location, and size of any new above or below ground tanks to store petroleum or other materials. Indicate the number, location, size, and age of existing tanks on the property that the project will use. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.**

The use and/or storage of bulk chemicals/hazardous materials is limited to diesel fuel needed during both the construction and operational phases of the Project. During construction, a temporary aboveground tank will be utilized, while an existing aboveground fuel containment area (Facility 218) will be used during operation. In both cases, this storage will follow local and state regulations.

Non-bulk chemical/hazardous materials used during construction include typical paints and stains, while those used during operation will include lawn fertilizer and pesticides, veterinary medications, household cleaning agents, disinfectants, and sanitizers. If any unanticipated spills occur on the Project, the Minnesota Duty Officer will be notified as outlined in Project's Stormwater Pollution Prevention Plan, and cleanup will be in accordance with local and state regulations.

**13.D. Project related generation/storage of hazardous wastes: Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.**

The Project will not generate hazardous wastes during construction or operation. All chemicals/hazardous materials mentioned above will be utilized entirely. Therefore, the Proposer will avoid the generation of hazardous wastes. Should a spill of hazardous material occur the Proposer has a contract with Environmental Scientific as a contingency plan. Environmental Scientific will promptly notify the Minnesota State Duty Officer and work with the appropriate agencies to mitigate any contamination, hazardous materials, or waste.

Veterinary pharmaceuticals are subject to the same hazardous waste requirements and are eligible for the same allowances as human pharmaceuticals. Licensed veterinarians manage all pharmaceuticals and keep inventory at a minimum to avoid the risk of expiration. All pharmaceuticals are either individually packaged (whether in pill form or in individual syringes) or in containers with specific dosages to limit the

risk of any excess, unused medicine. Because of those practices, all medicine is used for its intended purpose.

Pharmaceutical stock and dispensing containers with a capacity of 10,000 tablets or 1 liter liquid or less may be considered empty (“empty containers”) for hazardous waste purposes (also known as RCRA-empty) after the contents have been fully removed by normal means. No further rinsing or cleansing or measurement of residual is required (see link to MPCA - Regulatory consensus on health care waste issues).

Used needles/syringes are placed in sharps containers. Once the containers are full, they are packaged according to service provider instructions and are shipped out using the “mail back system.” Stericycle and SharpsAssure are the outside professional services the Proposer utilizes.

**13.E. Dead animal disposal: Describe the quantities of dead animals anticipated, the method for storing and disposing of carcasses, and frequency of disposal. What is the response to a major disease or death event? Identify local ordinance restrictions for animal disposal, composting, etc.**

Mortalities at the Project will be removed from the barn upon discovery and placed in Facility 16. A rendering service will pick up carcasses every 72 hours. Facility 16 is a roofed building with concrete sides and floor. The Facility 16 is designed to be converted to a composting building if a rendering service becomes unavailable. The estimated annual mortality rates are 500 cows and 225 calves. In the event of a catastrophic loss, the Proposer will follow the Emergency Response Plan included in the Feedlot Permit Application.

A changing climate could increase cow mortality. As outlined in Item 7, climate change forecasts indicate that Minnesota will be among the fastest-warming states, with overall increases in precipitation. These climate changes will have both positive and negative effects on agriculture, including longer growing seasons, hotter summers, and more extreme precipitation events. Additional hazardous waste is not anticipated as a result of climate change, beyond potentially increased cow mortality. The Proposer has implemented several climate adaptations to mitigate this, including selecting for more heat-tolerant genetics, monitoring animal temperatures for early signs of heat stress, using ventilation fans, and using temperature-sensing livestock misters.

**14. Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features):**

**14.A. Describe fish and wildlife resources as well as habitats and vegetation on or near the site.**

The Project is on land that has been used for decades as an agricultural production area. Fish and wildlife resources on or within the Project site, the Project waterline route, and the Project manure application sites are, by default, limited due to current agricultural land use. The Project site resides entirely within agricultural land currently in annual row-crop production. The Project waterline route (about 4.11 miles) is also entirely within agricultural land, of which all is in row crop production except for approximately the final 3,000 feet, which is pasture. The Project manure application sites are all agricultural land currently used for row-crop production. The pasture on the last portion of the Project waterline route crosses a waterway. However, the area will be restored to its current condition after the waterline is installed, with minimal impact on the habitat.

Although fish and wildlife resources are limited, natural resources are available near the Project. These notably include: Gorder Lake, 0.86 miles north of the Project; Landers Waterfowl Production Area, 0.5 miles south of the Project; the Bill Freeman Wildlife Management Area, 0.26 miles west of the Off-Site Well; and the Pomme de Terre River, 3.84 miles east of the Project and 0.11 miles east of the Off-Site Well. Additional efforts to avoid fish and wildlife resources during the Project’s review and selection of available manure application sites are discussed separately below.

**14.B. Describe rare features such as state-listed (endangered, threatened, or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-\_\_\_\_) and/or correspondence number (ERDB \_\_\_\_ ) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.**

### **Rare Features**

Environmental Scientific contacted the DNR to identify rare features in the vicinity of the Project site, the Project waterline route, and the Project manure application sites. The results of each search are outlined separately below:

### **Project Site**

The DNR conducted a search of the Natural Heritage Information System (NHIS) for the Project site and identified no ecologically significant areas or state-listed Endangered or Threatened species documented within the vicinity of the Project site. However, the DNR identified a State-listed special concern species in the vicinity of the Project site. The DNR recommended evaluating whether suitable habitat for this species is present within the project area, as any impacts on those habitats could negatively affect the species (Attachment 7a).

The Prairie Mimosa (*Desmanthus illinoensis*) historically grows in prairie meadows, lakeshores, and riverbanks, but now resides in suitable areas that have been protected from agricultural tillage and crop production.<sup>18</sup> Those areas most commonly consist of a narrow band of shoreline habitat that surrounds prairie lakes.<sup>19</sup> The Project site is entirely in crop production which is not considered a suitable area for Prairie Mimosa. To confirm the presence or absence of the Prairie Mimosa within the Project site, Environmental Scientific contacted Becky Marty, the DNR Regional Ecologist. Ms. Marty commented that the noted Prairie Mimosa was identified north of the Existing Facility.

### **Project Waterline Route**

The DNR searched the Natural Heritage Information System (NHIS) for the Project waterline route on February 28, 2023, and again on April 15, 2025, to include the amended portion of the route. The DNR noted that they do not believe the Project will affect any known occurrences of rare features, including any State-listed species, rare plant communities, or other sensitive ecological resources (Attachment 7b).

### **Project Manure Application Sites**

Prior to submitting the DNR NHIS Request for the manure acres, Environmental Scientific submitted a merged shapefile including all available manure acres offered by area producers to the DNR Conservation Explorer for a Conservation Planning Review. During this initial automated review, the DNR Conservation Report identified no DNR Old Growth Stands within 330 feet of the proposed manure areas and no Calcareous Fens within 5 miles of the proposed manure areas. However, the DNR Conservation Report did identify:

- Three areas with Moderate Biodiversity Significance ranking near the manure areas
- Seven areas with Below Biodiversity Significance ranking near the manure areas
- Three areas with native plant communities near the manure areas
- Two MN Prairie Conservation Plan areas (Agassiz Beach Ridges and Scharf WMA)

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<sup>18</sup> *Desmanthus illinoensis* (Prairie Mimosa)." Minnesota Wildflowers.

<https://www.minnesotawildflowers.info/flower/prairie-mimosa>

<sup>19</sup> "Desmanthus illinoensis (Prairie Mimosa)." Rare Species Guide. Minnesota DNR.

<https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=PDFAB1C040>

- One Important Bird Area (Lac Qui Parle – Big Stone IBA)
- Two lakes with High Biological Significance rankings (Clear Lake, Unnamed Lake)

To avoid any potential impacts to these mapped areas, the Proposer reviewed the above listed areas and if there was overlap, they either amended field boundaries to avoid the above identified features or removed the entire field from consideration. Following these changes, an updated shapefile was submitted to the DNR Conservation Explorer, which generated an updated Conservation Planning Report. The new automated report removed one of the identified areas with Moderate Biodiversity Significance, two of the native plant communities, and both lakes with High Biological significance (Attachment 7c).

Following the preliminary manure application sites approval process established to avoid, minimize or mitigate effects, the Proposer submitted the same updated manure acres for a formal DNR NHIS review on October 17, 2023, and again on June 19, 2025. An automated formal NHIS review indicated that a further review of the manure application areas was required by the Natural Heritage Review Team for listed species (Attachment 7d). The Natural Heritage Review Team then conducted a formal NHIS search and generated a formal report as summarized below:

### **Ecologically Significant Areas**

The manual review by the Natural Heritage Review Team identified three lakes with High Biological Significance (Gorder Lake, Clear Lake, and Unnamed Lake) and noted these lakes were ranked largely due to their bird populations. To understand why they were identified in the manual search but not in the automated search, Environmental Scientific reached out to James Drake, Natural Heritage Review Specialist at the DNR. Mr. Drake mentioned that manual searches can take into account the type of project, in this case manure application, which if not done properly could impact lakes from expanded setbacks. Mr. Drake recommended the Proposer closely consider application rates to prevent any migration towards or into the identified lakes.

Additionally, the DNR noted that the Minnesota Biological Survey (MBS) identified one or more sites of Biodiversity Significance adjacent to some of the proposed manure application areas (Attachment 7d). As detailed in the Conservation Report, six sites were identified as having a Below Biodiversity Significance ranking based on the relative significance of biodiversity at the statewide level (Attachment 7c). In all cases, these ecologically significant areas are outside the tillable fields designated for manure application. In addition, there are no current Project plans to either add additional acres beyond those identified (Attachments 5 and 8) or convert any undisturbed land for crop production.

The DNR has stated that overapplication or improper application of liquid manure can pose a potential threat to these communities and the identified lakes. For this Project, an MPCA-approved MMP requires that all manure applications comply with agronomic rates and setbacks from surface waters. Following these regulations will help avoid adverse impacts, such as nitrogen loading and crop nutrient uptake exceeding limits. See Item 12.B.5, starting on Page 38 of the EAW, for more information regarding manure management for this project.

### **Minnesota Biological Survey (MBS)**

The DNR identified one site of Moderate Biological Significance adjacent to one manure application site in Section 3 of Horton Township. The MBS site is identified as an example of the Dry Hill Prairie (Southern) native plant community that is moderately disturbed. Environmental Scientific reviewed the adjacent manure application site and confirmed the field does not extend into the mapped native plant community. Moreover, the adjacent manure application site is currently in crop production and lacks native plant communities. To avoid potential indirect impacts, the Proposer will follow MPCA

recommendations to follow proper manure application rates and timing to ensure the nutrient input does not exceed the crop nutrient uptake on this and all Project manure application sites.

### State-listed Species

The DNR identified no state-listed endangered species in the vicinity of the final manure acres. However, one threatened species was documented in the vicinity as listed below:

- The **Elktoe mussel** (*Alasmidonta marginata*) was documented in a portion of the Pomme de Terre River in 2007. Although its status near the manure application areas is unknown, mussels are particularly vulnerable to deterioration in water quality. The DNR recommends taking measures to avoid impacting its habitat. In this case, the Project only includes manure application to land that is in crop production. Additionally, the Project will operate with an MPCA-approved MMP, which regulates manure application and requires following BMPs such as agronomic rates and setbacks from surface waters in order to avoid adverse impacts and minimize runoff from the field.
- The **Small White Lady's Slipper** (*Cypripedium candidum*) has been documented near a proposed manure application area. This species can be found in mesic native prairies and wet prairies; it cannot grow in habitats on land used for livestock grazing or crop production.<sup>20</sup>
- The **Prairie Mimosa** (*Desmanthus illinoensis*) has been documented near a proposed manure application area. This species can be found in mesic native prairie and on sandy lake shores.<sup>21</sup>

The DNR recommends avoiding areas with suitable habitat for these two species in the proposed manure application areas. In this case, the Project only includes manure application to land that is in crop production, and that is not considered suitable habitat for either species. The DNR had no records of any federally listed species within one mile of the manure application areas.

The USFWS Information for Planning and Consultation (IPaC) tool was utilized to conduct a federal regulatory review of the Project site, the waterline route, and the entire manure application area. The results are summarized below by category:

### Endangered Species

The IPaC identified no federally protected endangered species or critical habitats within the Project site. However, the Northern Long-Eared Bat (*Myotis septentrionalis*) is a federally endangered species that was identified in the vicinity of the Project waterline route and Project manure application area. There are no critical habitats designated for this species, and the Project is unlikely to affect its habitat, as the waterline route installation will cause short-term disturbances with no tree removal. Additionally, the Project manure application sites are already in crop production.

### Bald and Golden Eagles

The IPaC identified the presence of Bald Eagles (*Haliaeetus leucocephalus*) in the vicinity of the Project, and the manure application area; the federal setback from an eagle's nest is 660 feet.<sup>22</sup> On December 26, 2023, on-site observations were made in and around the Project site, and no eagles or eagle nests were observed anywhere in the vicinity. Moreover, the closest trees capable of being utilized for nest sites are 2,300 feet away in the Waterfowl Production Area south of Project site (Attachment 2). Since

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<sup>20</sup> "Cypripedium candidum (Small White Lady's-Slipper)." Rare Species Guide. Minnesota DNR.

<https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=PMORCOQ050>

<sup>21</sup> "Desmanthus illinoensis (Prairie Mimosa)." Rare Species Guide. Minnesota DNR.

<https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=PDFAB1C040>

<sup>22</sup> "National Bald Eagle Management Guidelines." USFWS. May 2007.

[https://www.fws.gov/sites/default/files/documents/national-bald-eagle-management-guidelines\\_0.pdf](https://www.fws.gov/sites/default/files/documents/national-bald-eagle-management-guidelines_0.pdf)

the Project manure application sites are already in crop production, no further disturbances can be expected.

**14.C. Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project including how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.**

As outlined above, the Project site, the Project waterline route, and the proposed Project manure application sites are all located on agricultural production land. Since row-crop production land is not identified as suitable habitat for any known fish, wildlife, plant communities, rare features, and ecosystems, no projected negative effects from those areas were identified. The only portion of the Project not in row-crop production is the portion of the Project waterline where the Off-Site Well is located, which is currently in agricultural production pastureland. After the underground water line is installed, the disturbed area will be restored to its current condition.

As outlined in Item 7, climate change forecasts predict Minnesota will be one of the fastest warming states with overall increases in precipitation. These changes will have both positive and negative effects on agriculture with extended growing seasons, hotter summers, and extreme precipitation events. The Project site, the Project waterline, and the Project manure application sites are on land currently in agricultural production. As such, fish, wildlife, plant communities, rare features, and ecosystems are not expected to be directly affected by the Project, even with changing climate conditions. To avoid potential indirect effects, the Project includes climate adaptation strategies, such as designing stormwater basins more than 20% larger than required to account for forecasted precipitation changes.

The Project will predominantly utilize local contractors and vendors during construction. As a result, the potential introduction of new invasive species to the Project site is considered low. While the possibility of spreading invasive vegetative species exists, the likelihood is low. The Project's location has been utilized for crop production for decades, and the presence of invasive species would have been limited during that time.

**14.D. Identify measures that will be taken to avoid, minimize, or mitigate the adverse effects to fish, wildlife, plant communities, ecosystems, and sensitive ecological resources.**

By locating the Project site entirely on tillable land, potential impacts to fish, wildlife and other rare features are avoided. The Proposer collaborated with an environmental consultant to evaluate all proposed Project manure application sites, identifying any potential impacts flagged by the DNR and avoiding areas where such impacts were found by amending the proposed Project manure application sites.

**15. Historic and Cultural Resources: Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include 1) historic designations, 2) known artifact areas, 3) architectural features, 4) Tribal connections to the site. Attach any comment letters received from the state, Tribal, or other governmental organizations. Discuss anticipated effects to historic properties and cultural resources during project construction and operation. Identify measures that will be taken to avoid, minimize, or mitigate adverse effects to historic properties and cultural resources.**

SHPO was contacted to identify any archaeological, historical, or architectural resources in the vicinity of the Project site, waterline route, and manure application sites. Since the Project site and waterline route involve actual construction activity, a formal request was submitted to the State Historic Preservation Office for Project Review. The Proposer provided SHPO with a list of all sections where manure application is proposed. The results of each search are outlined separately below.

**Project Site/Waterline Route**

Following separate SHPO review requests for the Project site and waterline route, SHPO recommended on February 7, 2023, that a “Phase I literature review and archaeological assessment be completed for the Project site and the waterline together.” To complete this work, the Proposer contracted with Agassiz Archaeology. Agassiz Archeology concluded their field work and literature review and submitted it to SHPO. On September 26, 2023. Following review of the Phase I report for the Project site and waterline route, SHPO concluded there were “no properties listed in the National or State Registers of Historic Places, and no known or suspected archaeological properties located in the area that will be affected by this project.” On June 24, 2025, SHPO provided an updated copy of the original review with no changes (Attachment 6a).

The Proposer later amended the portion of the waterline route parallel to 290th Street (1.5 miles) by moving it from the south side to the north side of the road. The amended portion of the route was reviewed on both the Minnesota Statewide Historic Inventory Portal (MnSHIP)<sup>23</sup> and the Office of the State Archaeologist (OSA) public viewer.<sup>24</sup> In each case, no historical, archaeological, or Minnesota Indian Affairs Council (MIAC) sites were identified within one mile of the amended portion of the route (Attachment 5).

The Proposer reached out to MIAC to confirm there were no features of concern or significant tribal concerns to the site and waterline route. MIAC did not respond to this request.

### **Project Manure Application Sites**

All manure application sites identified by and offered by local producers for the Project are on land that is already in crop production and typically fertilized annually. For the original 17,360 manure acres offered for the Project, the SHPO provided Excel files listing all known historical and archaeological resources within the sections identified for proposed manure application (Attachment 6b).

Following a detailed comparison of the SHPO files and available manure acres, it was determined that no significant historic resource sites were located within the proposed areas for manure application.

Historic resources identified within the manure application sites, but not affected by manure application:

- Trunk Highway 28 (Multiple Townships)
- Bridge 55582 (Darnen Township)
- Christ Luthi Jr. Farmstead (Darnen Township)
- Farmhouse-moved (Horton Township)
- Bridge 75502 (Horton Township)

The Proposer reviewed legal descriptions for archeological resources and requested more detailed information by supplying USGS 7.5-minute topographic maps outlining the Project manure application sites to the Minnesota Office of the State Archeologist (OSA). On December 14, 2023, OSA stated the only location of the four submitted legal descriptions, one contains an archaeological site in Darnen 28 (Attachment 6b). Based on this information, the Proposer removed the two fields in Darnen 28 from the list of available Project manure application sites, leaving an adjusted total of 16,669 acres. On June 24, 2025, OSA provided an updated copy of the original review, with the same conclusion (Attachment 6b).

The archeological resources identified by OSA include:

- 21SE0011 (Darnen 26)
- 21SE0019 (Darnen 28)

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<sup>23</sup> “Minnesota Statewide Historic Inventory Portal.” Minnesota State Historic Preservation Office.  
<https://mnship.gisdata.mn.gov/public-map>

<sup>24</sup> “Minnesota Office of the State Archaeologist Portal.” Minnesota State Archaeologist.  
<https://osaportal.gisdata.mn.gov/OSAViewer>

- 21SE0022 (Horton 10)
- 21SE0044 (Darnen 20)

No MIAC sites were identified within two miles of the updated Project manure application sites (Attachment 5). The Proposer contacted MIAC to confirm that there were no features of concern or significant tribal concerns on the available manure acres. MIAC did not respond to this request.

As outlined above, based on SHPO, OSA, and MIAC reviews, literature reviews, and online public viewer searches, no historical properties, archaeological resources, or cultural resources were identified that the Project site, waterline, or manure application sites would be significantly impacted.

**16. Visual: Describe any scenic views or vistas on or near the project site. Describe any project-related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.**

There are no identified scenic views or vistas on or near the Project site. For the benefit of wildlife, neighboring landowners, and the reduction of insect attraction, the Proposer will consider a previous DNR-recommended best management practice of choosing downward-facing and shielded fixtures to prevent light pollution.

**17. Air/Odor Emissions: Describe the following:**

**17.A. Stationary source emissions:**

**17.A.1. Type, sources, quantities, and compositions of any hazardous air pollutants and criteria pollutants emissions from stationary sources;**

The free-stall barn and the LMSAs are sources of air and odor emissions. Air emissions from the Project will include hydrogen sulfide, ammonia, methane, nitrous oxide, and particulate matter in the form of vehicle and equipment dust. Methane and nitrous oxide are greenhouse gases (GHG). Hydrogen sulfide and ammonia are odorous gases. These types of emissions are common on dairy farms.

The Proposer will cover the LMSAs (facilities 101, 102, & 106) with impermeable synthetic covers, thereby significantly reducing odor emissions. Emissions of some odorous gases (e.g. ammonia) occur during the land application of manure. Injecting the manure into the soil below the surface minimizes the release of these odorous gases. Other sources of odor include spilled feed, animals, animal carcasses, animal bedding recovery and storage, feed storage, and runoff from the feed pad.

**17.A.2. Effects on air quality including any sensitive receptors, human health, or applicable regulatory criteria. Include a discussion of any methods used to assess the project's effect on air quality and the results of that assessment.**

The Proposer contracted with Barr Engineering to conduct air dispersion modeling to predict how the Project's air emissions of hydrogen sulfide, ammonia, and odors would impact air quality at the Project's property lines and at the nearest residences. The modeling was done using the American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD) to assess the Project's effect on air quality. AERMOD predicted that the Project will not create exceedances of the Minnesota Ambient Air Quality Standard or Sub-chronic Inhalation Health Risk Value (iHRV) for Hydrogen Sulfide (H<sub>2</sub>S). AERMOD similarly predicted that the Project would not create exceedances of the Acute or Chronic iHRV for Ammonia (NH<sub>3</sub>). Finally, AERMOD predicted that the property-line and nearest residence odor intensity would be consistently below the threshold for faint odors. In summary, AERMOD predicts no negative impacts on air quality. The modeling results are summarized below a full report included (Attachment 13).

**Hydrogen Sulfide (H<sub>2</sub>S)**

**Minnesota Ambient Air Quality Standard (MAAQS)**

The AERMOD air quality model predicted that the proposed expansion of West River Dairy will comply with the MAAQS for H<sub>2</sub>S. The standard regards the third exceedance of 30 parts per billion by volume (ppb) within any 5-day period as a violation. Compliance is demonstrated when the high-third-high (H<sub>3</sub>H) concentration (with background) for any 5-day period at each property-line receptor is less than 30 ppb. AERMOD calculated a maximum H<sub>3</sub>H H<sub>2</sub>S concentration of 12.44 ppb at the Project site's property lines. When a background concentration of 17 ppb is added to the AERMOD-calculated concentration, the H<sub>3</sub>H H<sub>2</sub>S concentration is 29.44 ppb, which is below the ambient standard of 30 ppb.

#### **Sub-chronic Inhalation Health Risk Value (iHRV)**

The AERMOD model predicted that the Project will not exceed the subchronic (13-week) inhalation Health Risk Value (iHRV) for H<sub>2</sub>S at the nearest residences to the Project. An iHRV is the concentration of a chemical (or a defined mixture of chemicals) that is likely to pose little or no risk to human health. The calculated maximum monthly H<sub>2</sub>S concentration for the neighboring residences is 0.21 micrograms per cubic meter (µg/m<sup>3</sup>). When a background concentration of 1.00 µg/m<sup>3</sup> is added to the AERMOD-calculated concentration, the maximum monthly neighbor H<sub>2</sub>S concentration is 1.21 µg/m<sup>3</sup>, which is below the subchronic H<sub>2</sub>S iHRV of 10 µg/m<sup>3</sup>. Note that although the iHRV is for a 13-week period, AERMOD cannot average concentrations over this period. Instead, AERMOD uses a monthly averaging period, which yields a more conservative prediction.

#### **Ammonia (NH<sub>3</sub>)**

##### **Acute iHRV**

AERMOD predicted that the Project will not cause exceedances of the acute NH<sub>3</sub> iHRV at the nearest residences. AERMOD calculated a maximum hourly property-line NH<sub>3</sub> concentration of 1,861 µg/m<sup>3</sup>. When a background concentration of 148 µg/m<sup>3</sup> is added to the AERMOD-calculated concentration, the maximum property-line NH<sub>3</sub> concentration is 2,009 µg/m<sup>3</sup>, which is below the acute NH<sub>3</sub> iHRV of 3,200 µg/m<sup>3</sup>.

##### **Chronic iHRV**

AERMOD predicted that the Project will not cause exceedances of the chronic NH<sub>3</sub> iHRV at the nearest residences. The calculated maximum one-year, time-averaged NH<sub>3</sub> concentration for the neighbors is 9.39 µg/m<sup>3</sup>. When a background NH<sub>3</sub> concentration of 5.72 µg/m<sup>3</sup> is added to the AERMOD concentration, the maximum annual NH<sub>3</sub> concentration for a neighboring residence is 15.11 µg/m<sup>3</sup>, which is below the chronic NH<sub>3</sub> iHRV of 80 µg/m<sup>3</sup>.

#### **Odor**

##### **At Project Property Line**

The AERMOD predicted that the Project will result in a maximum hourly odor intensity of 260 odor units per cubic meter (OU) at the Project's near south property line. This predicted odor intensity is just above the moderate odor threshold of 244 OU. The calculated property-line odor intensities for the Project were less than the 83 OU threshold for faint odors at least 99.7 percent of the time.

##### **At Nearest Residences**

AERMOD predicted that the Project will result in a maximum hourly odor intensity of 74 OU at a non-feedlot, nearby residence, which is below the 83 OU threshold for faint odors.

The tables below summarize the AERMOD results and supplement the above summary.

**Table 23. Hydrogen Sulfide (H<sub>2</sub>S).**

Highest modeled value at property line	Background concentration	Highest modeled value with background concentration	MN ambient air quality standard (MAAQS)
12.44 ppb	17 ppb	29.44 ppb	30 ppb
Highest modeled value at nearest residences	Background concentrations	Highest modeled value with background concentration	Sub-chronic iHRV (13-week)
0.21 µg/m <sup>3</sup>	1.00 µg/m <sup>3</sup>	1.21 µg/m <sup>3</sup>	10 µg/m <sup>3</sup>

**Table 24. Ammonia (NH<sub>3</sub>).**

Highest modeled value at property line	Background concentration	Highest modeled value with background concentration	Acute iHRV (hourly)
1,861 µg/m <sup>3</sup>	148 µg/m <sup>3</sup>	2,009 µg/m <sup>3</sup>	3,200 µg/m <sup>3</sup>
Highest modeled value at nearest residences	Background concentrations	Highest modeled value with background concentration	Chronic iHRV (yearly)
9.39 µg/m <sup>3</sup>	5.72 µg/m <sup>3</sup>	15.11 µg/m <sup>3</sup>	80 µg/m <sup>3</sup>

**Table 25. Odor.**

Highest modeled value at property line	Odor thresholds	Percent of time faint threshold exceeded
260 odor units (OU)	Faint threshold: 83 OU Moderate threshold: 244 OU	0.33%
Highest modeled value at nearest residences	Odor threshold	Percent of faint threshold exceeded
74 OU	Faint threshold: 83 OU	0%

\*It was modeled that the odor units at the property line were equal to or below the faint odor threshold 99.67% of the time.

**17.A.3. Identify pollution control equipment and other measures that will be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions, proposed feedlot design features or air or odor emission mitigation measures to be implemented to avoid or minimize potential adverse impacts and discuss their anticipated effectiveness.**

**If no feedlot design features or mitigations were proposed, provide a summary of the results of an air emissions modeling study designed to compare predicted emissions at the property boundaries with state standards, health risk values, or odor threshold concentrations. The modeling must incorporate an appropriate background concentration for hydrogen sulfide to account for potential cumulative air quality impacts.**

As discussed above, no adverse effects are predicted by the AERMOD. However, the Project will have operational and design features to minimize gas and odor emissions. These features include the following:

## **Basin Covers**

The Proposer will install synthetic covers over the basins (Facilities 101, 102, and 106) to reduce or mitigate the release of gases and odors from stored manure. Impermeable covers can reduce odor and gas emissions by 95% or more.<sup>25</sup>

As discussed above, AERMOD predicts no adverse effects. However, the Project will have operational and design features to minimize gas and odor emissions. These features include the following.

## **Manure Separation Process**

Twice a day, the Proposer will collect manure generated in the barn using self-propelled vacuum wagons. The manure will be transported to the temporary manure storage tank (Facility 104). The Proposer will route the manure through screw-press separators to retain manure solids for use as cow bedding for the dairy barn free stalls. The Proposer will then transfer the liquid fraction of the manure to the LMSAs; first to an existing straw-covered transfer basin (Facility 10), where any remaining solid particles can settle out, then to the larger LMSAs with impermeable synthetic covers.

The Proposer's removal of the manure solids from the liquid before storage in the LMSAs eliminates the need for manure agitation in the Project's LMSAs. Manure agitation is a source of odor. The Proposer will only use agitation in the straw-covered LMSA. In the alternative scenario in which the screw press is bypassed, the Proposer will allow solids to partially separate by settling in Facility 10. Odor issues are not expected in the alternative scenario, as it is expected to occur only rarely.

The manure solids stored at Facility 105 are kept dry and compacted by tractors as needed, thereby reducing odor. Tractors will be used to compact the manure solids, depending on separator management, which markets develop for the solids, how long the solids have been piled, and other methods that mitigate odors. The Proposer will construct Facility 105 in the center of the feedlot on the north side of the property, away from all roads, and is able to store solid manure for up to a year.

## **Manure Removal System**

The Project's manure removal system is designed to reduce the time manure remains in the barn before collection and transfer to storage, and to minimize handling, stirring, and agitation during transfer. The Proposer will collect manure generated in the barn by using self-propelled vacuum wagons. The wagon will clean each pen during milking. The Proposer milks each pen multiple times per day, and pen cleaning occurs during milking periods. This manure removal system prevents manure buildup in barns and mitigates associated gases and odors. After cleaning, the manure is transported to Facility 104 and then proceeds through the remainder of the process as described above.

## **Good Housekeeping Practices**

Good housekeeping practices help mitigate the release of gases and odors. The following good housekeeping practices will be implemented for the Project:

- Mortalities will be placed in a scavenger-proof, enclosed area and will be removed by rendering service every 72 hours.
- Spilled feed will be promptly cleaned up; this will prevent the fermentation of spilled feed and reduce the emission of odor.
- CAWTs will apply liquid manure using knife injection to both owned and transferred manure application sites. Subsurface incorporation of manure helps retain the nutrient value of the manure (e.g., reduces ammonia volatilization) and reduces the emission of odorous gases (e.g., ammonia).

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<sup>25</sup> Covers for manure storage" <https://extension.umn.edu/manure-management/covers-manure-storage>

- General cleanliness will be maintained to help minimize odor emissions.
- Grains will be stored in on-site bins or the covered commodity shed, and will use distressed animal sounds, if necessary, to deter unwanted animals. Additionally, cross-ventilation, along with good housekeeping practices, will minimize insect presence.

**17.B. Vehicle emissions: Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g. traffic operational improvements, diesel idling minimization plan) that will be taken to minimize or mitigate vehicle-related emissions.**

Vehicle emissions during the Project's construction phase will result in a net increase and will primarily be from equipment operation and contractor commutes. During the Project's operation, vehicle emissions will also increase, primarily from milk hauling, feed delivery, manure land application, and employee commuting.

During construction, local contractors will be used when available to decrease commuting emissions. Once operational, the Project will use modern equipment and technologies designed to reduce air emissions and meet the latest EPA standards, including particulate filters, exhaust fluid to reduce nitrogen oxide emissions, and improved fuel-injection systems to increase efficiency. On-site housing will be available to reduce commuting emissions. Furthermore, creating a local organic fertilizer source (Project manure) will replace the need for manufactured synthetic fertilizer on area fields, hence decreasing the emissions associated with the production, transportation, and storage of synthetic fertilizer.

See Item 20 for more details regarding the Project's traffic generation.

See Item 18 for more details regarding Greenhouse Gas emissions related to the Project.

**17.C. Dust and odors: Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation, and any proposed measures to mitigate adverse impacts. (Fugitive dust may be discussed under item 17.A. Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that will be taken to minimize or mitigate the effects of dust and odors. Describe any plans to notify neighbors of operational events (such as manure storage agitation and pump out) that may result in higher-than-usual levels of air or odor emissions.**

**Dust**

The potential dust sources will be road dust and feed dust. The Project is on a paved road, which will reduce road dust from entering and exiting the Project. Project construction will create a temporary increase in noise and dust, mostly due to earthwork activities, delivery truck traffic, and construction equipment operating on unpaved surfaces. Construction will involve extensive dirt moving, especially removing topsoil and hauling in gravel to build the service roads for the Project. Dust emissions will be monitored to ensure they do not exceed 20% opacity and are not visible beyond the property lines. If dust becomes an issue and either threshold is exceeded during construction or operations, the Proposer will mitigate the issue using a dust suppressant (e.g., water).

The Proposer will pave traffic areas on the Project site with asphalt or concrete, and most feed-mixing will occur inside a building. These practices will minimize dust created on-site. Non-traffic areas will be planted with grass to control dust and erosion. Dry feedstuffs for the cattle will be stored inside a commodity shed, reducing dust from fine particles. Feedstuffs that are stored outside are forages, which are high in moisture content and are unlikely to create dust. Additionally, covers placed over the forage piles help prevent dust.

## Odor

The Project will have operational and design features to minimize adverse air and odor emissions. These include manure separation equipment, manure removal equipment, impermeable synthetic LMSA covers, and good housekeeping practices. These features are detailed in [Item 17.A.](#) above.

In some places, such as in Swift County, it is required to notify neighbors prior to manure application. When required, the Proposer will notify neighbors when manure application begins. Manure application is a predictable seasonal activity, typically occurring in the fall of the year. If there are any complaints, the Proposer will first work directly with the neighbors to reach a resolution, and then if needed, with county and state officials. The Proposer will implement the air emission plan for manure storage areas included in the Feedlot Permit application if an odor event occurs. The air emission plan is an enforceable provision of the Feedlot Permit.

### 18. Greenhouse Gas (GHG) Emissions/Carbon Footprint:

**18.A. GHG Quantification: For all proposed projects, provide quantification and discussion of project GHG emissions. Include additional rows in the tables as necessary to provide project-specific emission sources. Describe the methods used to quantify emissions. If calculation methods are not readily available to quantify GHG emissions for a source, describe the process used to come to that conclusion and any GHG emission sources not included in the total calculation. Refer to EAW Guidance, Item 18 and GHG calculator tools.**

The following tables list some examples, but the user must complete tables based on their project components; other layouts are acceptable for providing GHG quantification results.

**Table 26. Construction emissions.**

Scope	Type of emission	Emission sub-type	Project related CO <sub>2</sub> e emissions (tons/year)	Calculation method(s)
Scope 1	Land use and combustion	Area; stationary; mobile	1,915	MPCA Guidance
Total			1,915	

**Table 27. Operational emissions.**

Scope	Type of emission	Emission sub-type	Project-related CO <sub>2</sub> e emissions (tons/year)	Calculation method(s)
Scope 1	Land use	Conversion	97	MPCA Calculator <sup>26</sup>
Scope 1	Land use	Area enteric fermentation CH <sub>4</sub>	47,531	MPCA Calculator
Scope 1	Land use	Area-barn/manure storage CH <sub>4</sub>	15,682	MPCA Calculator
Scope 1	Land use	Area-barn/manure storage N <sub>2</sub> O	3,191	MPCA Calculator
Scope 1	Land use	Are-barn/manure land application N <sub>2</sub> O	4,673	MPCA Calculator
Scope 1	Land use	Carbon sink-alfalfa conversion	-2,662	MPCA Calculator
Scope 1	Combustion	Stationary-heaters	126	MPCA Guidance
Scope 1	Combustion	Mobile equipment	1,626	MPCA Guidance

<sup>26</sup> Based on assumptions using the standard weight of a dairy cow in this region.

Scope	Type of emission	Emission sub-type	Project-related CO <sub>2</sub> e emissions (tons/year)	Calculation method(s)
Scope 1	Land use	Area-ammonia replacement	-9,038	Barr Engineering
Scope 2	Electricity	Grid-based	5,098	MPCA Guidance
Total			66,324	

## 18.B. GHG assessment:

### 18.B.1. Describe any mitigation considered to reduce the project's GHG emissions.

As outlined in the table above, greenhouse gas (GHG) emissions from the Project will include methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O), which are common on dairy farms. In general, the direct GHG emissions are released from manure storage and from the feedlot. GHG emissions are indirectly released through the land application of manure, although other Project-related activities may reduce emissions.

The Project will annually generate 202,744,000 gallons of manure/process wastewater/captured stormwater runoff. Of this amount, approximately 1,250,000 pounds of plant-available nitrogen is available as fertilizer. Annually, the Project would provide a local source of organic fertilizer for approximately 7,700 acres.

Through landowner agreements, the Project has more than 16,000 acres to rotate manure application availability. Adequate cropland is available to utilize the nutrients generated by the Project.

Land application of manure provides farmers with a nearby source of organic fertilizer that would otherwise require chemical or synthetic fertilizers. Having this nearby source of fertilizer in the form of manure from the Project reduces GHG emissions associated with synthetic fertilizer production,<sup>27</sup> transportation, and storage. The Project will utilize crossbred dairy cows selected for improved production efficiency relative to conventional dairy breeds. In Minnesota, the dairy industry is dominated by Holstein cows, which are characterized by high milk yields but also relatively high greenhouse gas (GHG) emissions on a per-animal basis. In contrast, the Proposer will use a Holstein-Jersey crossbreed. Jersey cattle are generally associated with lower GHG emissions compared to Holsteins, as described below. The crossbreeding strategy is intended to combine the high milk production capacity of Holsteins with the greater efficiency and lower emission intensity of Jerseys, thereby improving overall production efficiency and reducing GHG emissions per unit of milk produced.

Research on Jersey cows, similar to those housed at this Project, have shown less environmental impact when compared to Holstien cows for cheese production due to its higher nutrient density (fat/protein) thereby requiring less milk and thus fewer resources (land, water, feed) and producing less greenhouse gas emissions (like CO<sub>2</sub>, N, P) per unit of cheese solids compared to Holstein milk, even with their lower individual milk yield.<sup>28</sup>

The Project's cattle will require approximately 2,200 acres of alfalfa feed to be produced. The MPCA estimates that 1.21 tons of CO<sub>2</sub>e are avoided annually for each acre of row crops converted to alfalfa that the Project will use.<sup>29</sup> Additional reduction in CO<sub>2</sub>e could occur with (a) increased use of cover

<sup>27</sup> "Fertilizer and Climate Change." MIT Climate Portal. <https://climate.mit.edu/explainers/fertilizer-and-climate-change>

<sup>28</sup> Capper, JL and Cady, RA. "A Comparison of the Environmental Impact of Jersey compared with Holstein Milk for Cheese Production." Journal of Dairy Science. December 19, 2011. <https://www.sciencedirect.com/science/article/pii/S0022030211006874>

<sup>29</sup> Ciborowski, P. "Greenhouse gas reduction potential of agricultural best management practices (Revised edition)" pages 117, 118. MPCA. September 2022. <https://www.pca.state.mn.us/sites/default/files/p-gen4-21.pdf>

crops, which may occur since the Project would demand additional corn silage or corn earlage for animal feed, which is harvested earlier in the growing season and allows greater opportunity for cover crops to be planted versus corn harvested for grain only, (b) the Proposer's cross-breeding program, which prioritizes smaller body structure and higher volume and nutrient composition in milk production and (c) efficient feed practices, including sourcing the majority of ingredients locally, adjusting rations to maximize production and minimize spoilage, and reducing emission through implementation of feed additives like Rumensin. The Proposer's nutritionists also constantly evaluate other feed additives to determine if they are economically, nutritionally, and environmentally viable for the herd.

Application of the organic fertilizer generated by the Project will increase the yields of area fields, thereby decreasing the number of acres needed to produce an equivalent number of crops. In a recent study comparing the benefits of manure and synthetic fertilizer, a 5-13% increase in crop yield was observed with manure.<sup>30</sup>

The Project will use variable frequency drives (also known as variable speed drives) on approximately half of all motors, thereby reducing energy consumption. Examples include well pumps, milk-handling pumps, manure pumps, and parlor motors.

The Project will operate ventilation fans based on temperature and climate factors to reduce run time as much as possible, thereby reducing energy consumption.

The Project will utilize a plate cooler that will act as a heat exchanger to capture heat from milk cooling equipment and use it to heat portions of the parlor building as well as water used on-site.

High-efficiency LED lighting will be installed throughout the Project site to reduce energy consumption.

The Project will utilize livestock watering tanks in the free-stall barn that will not require electricity as the area will stay warm from the cows' body heat.

The Project will utilize livestock misters with temperature sensors to efficiently use water and reduce energy consumption.

The Proposer will consider purchasing renewable electricity from the utility provider for the Project.

The Proposer is researching ways to optimize feed efficiency to require less feed.

Manure from the Project will be incorporated into the soil during land application by CAWTs, thereby reducing emissions.

Through improved genetics and proper nutrition, the Proposer will improve potential milk yield of the animals.

The nearby cropland that will be used for feed production for the Project is already in crop production. Since the Project will not trigger new crop production and will create a market for crops already being grown, a reduction in GHG emissions is anticipated due to the shorter transportation distance of those crops to the Project.

While total GHG emissions in dairy production have increased worldwide from 2005 to 2015, North American dairies became more efficient, increasing yields and reducing emissions. Absolute GHG emissions in the global dairy sector have increased by 18 percent because milk production has increased 30 percent. Even though dairy farmers have become more efficient worldwide, their

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<sup>30</sup> Koelsch, R. "Does Manure Benefit Crop Productivity? Environment?" University of Nebraska Institute of Agriculture and Natural Resources. April 10, 2018. <https://water.unl.edu/article/animal-manure-management/does-manure-benefit-crop-yield-nitrogen-loss-or-soil-carbon#:~:text=Peak%20increases%20in%20yield%20of,manure%20often%20produced%20reduced%20yields>

emissions have also increased. In North America, however, absolute emissions have decreased by 5 percent as milk production has increased by 2.1 percent. As a growing global population demands more food and dairy, North American dairy farms provide an efficient and effective model that can reduce GHG emissions per unit of production while meeting that demand. Meeting growing global dairy demand from less-efficient dairy production outside of North America would have a more detrimental impact on global climate change.<sup>31</sup> Similar to the North American trends, the Proposer has used modern innovations in the dairy industry to increase their annual milk production in efficient ways. Exploring different nutrient ratios, feed additives, climate controls, and milking rates while using variable speed drives on motors, thermostats to regulate ventilation fan operation time, and cows' body heat instead of electric heaters in the barn are all examples of ways the Proposer is increasing milk production while decreasing GHG emissions. These practices will be implemented at the Project.

**18.B.2. Describe and quantify reductions from selected mitigation, if proposed to reduce the project's GHG emissions. Explain why the selected mitigation was preferred.**

Although many mitigation methods will be implemented to reduce GHG emissions for this Project, only two have clearly quantified reductions: (1) Alfalfa Conversion Carbon Sink, and (2) Area Ammonia Replacement. The other mitigation methods listed above will be implemented to reduce GHG emissions at the Project. However, given the variability of the energy usage by different products, it is difficult to accurately quantify the GHG reductions.

**Alfalfa Conversion Carbon Sink**

The MPCA estimates that 1.21 tons CO<sub>2</sub>e are avoided annually for each acre of row crop converted to alfalfa. The Project's cattle will require approximately 2,200 acres of alfalfa produced for feed each year. Therefore, it is estimated that this component of the Project would contribute to a reduction in GHG emissions by 2,662 tons CO<sub>2</sub>e per year.

**Area Ammonia Replacement**

Land application of manure provides farmers with a nearby source of organic fertilizer that would otherwise require chemical or synthetic fertilizers, such as ammonia. Having this nearby source of fertilizer in the form of manure from the Project reduces GHG emissions associated with synthetic fertilizer production. The manure generated by the Project will replace approximately 1,545 tons per year of anhydrous ammonia. The regional overall GHG emission factor for ammonia production by the Haber-Bosch process is about 5.85-ton CO<sub>2</sub>/ton NH<sub>3</sub>. Thus, the use of manure generated by the Project as fertilizer will reduce GHG emissions by an estimated 9,038 tons of CO<sub>2</sub>/year, because the corresponding mass of anhydrous ammonia is no longer produced.

**18.B.3. Quantify the proposed project's predicted net lifetime GHG emissions (total tons/# of years) and how those predicted emissions may affect the achievement of the Minnesota Next Generation Energy Act goals and/or other more stringent state or local GHG reduction goals.**

Based on the 2025 biennial Minnesota GHG emissions report, which tracks changes from 2005 to 2022, GHG emissions decreased by 14%.<sup>32</sup> However, the agriculture sector's emissions have remained essentially unchanged since 2005. The Project has a net increase of 66,324 CO<sub>2</sub>e per year in GHG emissions, primarily from livestock digestion (enteric fermentation), and manure storage. The total net GHG emissions during the life of the Project (~30 years), including the construction and operation

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<sup>31</sup> "Climate Change and the Global Dairy Cattle Sector: the role of the dairy sector in a low-carbon future." Food and Agriculture Organization of the United Nations. 2019. <https://www.fao.org/3/CA2929EN/ca2929en.pdf>

<sup>32</sup> "Greenhouse gas emissions in Minnesota 2005-2022." MPCA. <https://www.pca.state.mn.us/sites/default/files/lraq-3sy25.pdf>

phases, is estimated to be 1.99 million tons CO<sub>2</sub>e. Although this results in increased agricultural-sector GHG emissions in Minnesota, the Project provides several opportunities to reduce emissions.

### **Reduced Tillage**

The Project's cattle will require alfalfa feed produced on approximately 2,200 acres of cropland. Alfalfa is generally a 3-to-6-year rotation, meaning the normal spring and fall tillage does not occur for an extended period of time while the field is established with alfalfa. The MPCA estimates that 1.21 tons of CO<sub>2</sub>e is avoided annually for each acre of row crops converted to alfalfa.

### **Cover Crops**

The Project will promote increased use of cover crops, as it would require additional corn silage and corn earlage for animal feed. Corn silage and corn earlage are harvested sooner than corn harvested for grain only, which provides greater opportunity for cover crop planting.

### **Improved Genetics**

The Proposer's crossbreeding program incorporates genetics to maximize milk production efficiencies. Research has discovered that Jersey cows, similar to those that will be housed at this Project, have proven to have less environmental impact when compared to Holstien cows. Specifically, the carbon footprint was reduced by 1,662 x 10<sup>3</sup> t of CO<sub>2</sub>e per 500,000 t of cheese in Jersey cows compared to Holsteins.<sup>33</sup>

### **Efficient Feed Practices**

The Proposer implements efficient feed practices that increase feed digestibility, including research and use of feed additives such as Rumensin, to reduce GHG emissions by up to 4,365 tons CO<sub>2</sub>e per year.

### **Renewable Electricity Offset**

If market conditions allow, and renewable electricity is purchased from the utility provider for the Project, there would be a potential GHG offset of 5,520 tons CO<sub>2</sub>e per year.

All the above practices are identified in the 2025 biennial Minnesota GHG emissions report as methods to reduce emissions in crop and animal agriculture. The Project provides opportunities to indirectly reduce emissions from crop agriculture and directly reduce emissions from animal agriculture. Furthermore, research conducted by the Minnesota Department of Agriculture shows a significant decline in dairy cow numbers. Specifically, the number of dairy cows in Minnesota has dropped from 1.47 million (1950) to 460,000 (2015) cows.<sup>34</sup> Based on USDA census data, the number of dairy cows continues to decline with the most recent 2025 data indicating there are now 440,000 cows in Minnesota. Although the Project will increase the number of dairy cows in Minnesota by 11,000, overall totals continue to remain far below the historical totals.

## **19. Noise:**

**Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures taken to minimize or mitigate the effects of noise.**

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<sup>33</sup> Capper, JL and Cady, RA. "A Comparison of the Environmental Impact of Jersey compared with Holstein Milk for Cheese Production." *Journal of Dairy Science*. December 19, 2011.

<https://www.sciencedirect.com/science/article/pii/S0022030211006874>

<sup>34</sup> Zimmerman, Curt, 2015 Livestock Industry Study. Page 9. Minnesota Department of Agriculture. February 2016.

[https://www.mda.state.mn.us/sites/default/files/inline-files/legrpt-lvstk2015\\_0.pdf](https://www.mda.state.mn.us/sites/default/files/inline-files/legrpt-lvstk2015_0.pdf)

## Noise Standards

The land surrounding the Existing Facility and Project is agricultural land, with one rural residence within 1,000 feet. According to Minnesota Rule 7030.0040 on Noise Standards, the adjacent agricultural land must meet standards for Noise Area Classification (NAC) 3 (highlighted in green below), and the nearest rural residence must meet standards for NAC 1 (highlighted in blue below).

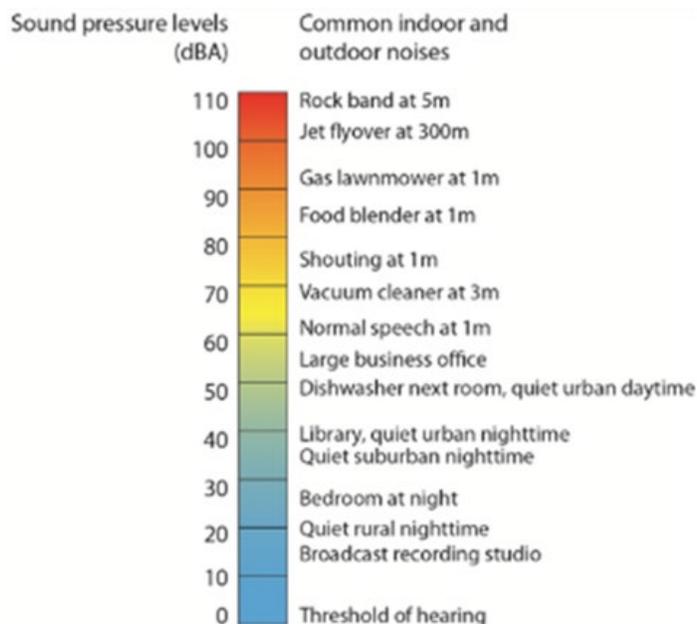
**Table 1: MN Noise Standards<sup>1</sup>**

Noise Area Classification	Daytime		Nighttime	
	L <sub>10</sub>	L <sub>50</sub>	L <sub>10</sub>	L <sub>50</sub>
1	65	60	55	50
2	70	65	70	65
3	80	75	80	75

<sup>1</sup> Noise Area Classifications are based on the land use where the noise can be heard. L<sub>10</sub> and L<sub>50</sub> are the noise levels that cannot be exceeded for more than 10% and 50% of the time respectively.

## Existing Noise Levels

Noise from the Existing Facility is primarily generated from traffic entering/exiting the facility and equipment operation. Primary equipment used includes feed mixing wagons, front-end loaders, skid loaders, UTVs, and manure vacuums. These vehicles are equipped with back-up signal alarms, which are an important feature for employee safety. Feeding activities, which would be peak noise times, typically take place during the morning and early afternoon. The noise level was measured with a sound level meter along the property lines during peak operation time at the Existing Facility. The highest noise level recorded was 48.5 decibels, which is equivalent to the noise in a library and below the most stringent noise standards (NAC 1).



## Projected Noise Levels

During construction, noise sources from the Project will primarily be from earthmoving equipment (e.g., excavators and dozers) and construction equipment (e.g., forklifts and loaders). Noise will be limited to daylight hours to minimize nuisances to neighboring properties. It is anticipated that Project construction will take 16-24 months. All noise standards outlined above will be met at each location.

Noise from the Project will be generated from similar sources at similar times during operation. Given that traffic and equipment operations increase proportionally to cow numbers, it is reasonable to assume that noise levels will also increase proportionally to cow numbers. The MPCA's "A Guide to Noise Control in Minnesota" states that doubling the number of sources emitting noise increases the sound level by three (3) decibels (Number of Sources).<sup>35</sup> This Project will have 1.4 times as many cows as the Existing Facility. Therefore, the noise level is projected to increase by 4.2 decibels. When the background noise from the Existing Facility is added to the projected increase from the Project, the highest noise level at the property line is projected to be 52.7 decibels, which is equivalent to a dishwasher in the next room and below the most stringent daytime noise standards (NAC 1). Noise levels will be significantly lower at night because it is not during peak operation time and most noise sources will not be in operation.

### **Sensitive Receptors**

The nearest sensitive receptor is a rural residence 920 feet north of the Project. MPCA guidance on noise states that when a distance is doubled, the sound level decreases by six (6) decibels (Distance Attenuation).<sup>36</sup> Therefore, the noise from the Project at the nearest sensitive receptor would be near 0 decibels and well below the most stringent MN noise standards.

### **Noise Minimization**

The Project is designed to operate with features that reduce noise. The manure vacuum and skid loaders are operated within the freestall barn (Facility 201). Front-end loaders and feed mixing wagons are primarily operated inside the commodity shed (Facility 207) and the freestall barn, with a small portion of feed preparation happening on the outdoor feed storage area (Facility 206). Equipment for milking and manure handling is within enclosed structures (Facilities 203 and 204, respectively).

## **20. Transportation:**

### **20.A. Describe traffic-related aspects of project construction and operation. Include:**

#### **20.A.1. Existing and proposed additional parking spaces:**

The Existing Facility currently has 40 parking spaces to accommodate personnel and residents of the on-site housing. The Project will include the following additional parking spaces at the indicated locations: 20 spaces at on-site housing (Facility 404) and 16 spaces at the milking parlor (Facility 203). These new spaces, in addition to existing ones, will provide adequate parking for employees, vendors, and visitors to the Project.

#### **20.A.2. Estimated total average daily traffic generated.**

##### **20.A.2.a. Estimate the number of heavy truck trips generated per week and describe their routing over local roads. Describe any road improvements to be made:**

The Project will generate approximately 58 semi loads of milk per week to a cheese processing plant. Suppliers will deliver an average of 21 feed loads to the Project each week. The Project will operate seven days a week. Most heavy trucks will exit the Project site via 520th Avenue and turn north onto

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<sup>35</sup> "A Guide to Noise Control in Minnesota." Minnesota Pollution Control Agency (MPCA). November 2015. <https://www.pca.state.mn.us/sites/default/files/p-gen6-01.pdf>

<sup>36</sup> "A Guide to Noise Control in Minnesota." Minnesota Pollution Control Agency (MPCA). November 2015. <https://www.pca.state.mn.us/sites/default/files/p-gen6-01.pdf>

Stevens County Road 8. The Proposer will complete road improvements on 520th Avenue between County Road 8 and the Project location to accommodate increased heavy-traffic use.

**20.A.2.b. Identify manure application routes and crossings, types of hauling equipment, impacts to road surface, and impacts to traffic. Identify use and road crossings of drag hoses:**

Manure application will be performed using drag hoses, which minimize road traffic from manure application equipment. Commercial animal waste technicians (CAWTs) will use existing culverts below the road surface to cross roads without impeding traffic. Further, the Proposer will develop and utilize an underground manure transfer line. The underground manure line system transports manure from the dairy to a field, typically in the middle of the field. This is an efficient way to transport manure while reducing the need for heavy equipment. This results in less impact on local infrastructure and a minimized risk of manure spills from overland transport. The underground manure line connects to a drag hose system via an aboveground valve system. The drag hose system is then utilized to apply manure throughout a field.

**20.A.3 Estimated maximum peak hour traffic generated and time of occurrence:**

Milking operations will take place 22 hours per day; therefore, milk hauling will occur at regular intervals throughout the day. Feed delivery will also occur throughout the day. Employees who live off-site will be traveling at the beginning and end of the workday. However, because on-site housing is available, many employees may choose to live at the Project site, reducing traffic generated by the Project. Passenger vehicle traffic is estimated to be 34 vehicles per day.

**20.A.4. Source of trip generation rates used in the estimates:**

Data sources include Proposer-provided data from similar active facilities and ITE Trip Generation Manual, 11th Edition, data for Land Use Code 130 (Industrial Park), with employees as the independent variable. The information provided by the Proposer is consistent with the ITE Trip Generation Manual estimates.

**20.A.5. Availability of transit and/or other alternative transportation modes:**

The Project is in a rural area. Therefore, public transportation is not available to service this location. It is anticipated that employees and visitors will arrive by passenger vehicle.

**20.B. Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. Discuss the project's impact on the regional transportation system. *If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW. Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (available at: <http://www.dot.state.mn.us/accessmanagement/resources.html>) or a similar local guidance.***

Most vehicle traffic will exit the Project to the east on 520th Avenue and head north to Stevens County Road 8 (~0.3 miles). Minnesota Department of Transportation data indicates that average daily traffic near the Project on Stevens County Road 8 is 520 vehicles. The Proposer estimates that the Project would increase current traffic counts by approximately 45 vehicles per day. Therefore, the traffic on Stevens County Road 8 would increase by up to 8.7%; no traffic study data is available for 520th Avenue.

**20.C. Identify measures that will be taken to minimize or mitigate project-related transportation effects.**

Minnesota Department of Transportation data indicates that Annual Average Daily Traffic (AADT) near the Project on Stevens County Road 8 is 520 vehicles. The Project would increase current traffic counts by an estimated total of 45 vehicles per day. Therefore, the traffic on Stevens County Road 8 would increase by up to 8.7%, and the potential for traffic congestion is considered low. No improvements to County Road 8 are considered necessary to accommodate this increase in traffic.

**20.D. Will new or expanded utilities, roads, other infrastructure, or public services be required to serve the project? If yes, please describe.**

Yes  No.

**21. Cumulative Potential Effects: (Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items).**

**21.A. Describe the geographic scales and timeframes of the project-related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.**

The last project completed in this township was the existing West River Dairy (Existing Facility), built in 2004. To prevent overlapping effects with any other projects, Environmental Scientific has established the Environmentally Relevant Area (ERA) for the Project to include: the Project site, all dedicated manure application sites for the proposed Project and the Existing Facility (16,669 acres), and a one-mile radius of the off-site Project well (Attachment 20). This generously sized ERA will keep other project-related environmental effects from overlapping with those from the Project, thereby avoiding the potential for cumulative potential effects.

**21.B. Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with the environmental effects of the proposed project within the geographic scales and timeframes identified above.**

The Proposer has stated that there are no reasonably foreseeable future projects for which a basis of expectation has been laid that may interact with the environmental effects of this proposed Project.

**21.C. Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.**

Cumulative potential effects for feedlot projects would generally be related to overlapping manure application and excess water usage within the same Environmentally Relevant Area (ERA) by other similar projects (Attachment 20) Each are discussed separately below:

For manure application, if fields were overlapping with other similar projects, and manure was applied to the same field twice, a Cumulative Potential Effect could result from manure over application. The Proposer established an ERA which includes sufficient manure acres for the Project and the Existing Facility and has over 3,000 additional acres extra to account for possible unknowns. These designated manure acres are not only established in this EAW, but they will also be reported in the Manure Management Plan that is submitted to the MPCA. This forward planning by the Proposer, in conjunction with in-place regulations from the MPCA, will avoid the potential for significant environmental and cumulative effects.

For groundwater extraction, the Proposer has chosen to use an off-site well screened in a different aquifer than the wells utilized by the Existing Facility. This diversification of groundwater usage helps to avoid cumulative effects from too much water use from a single location. Moreover, groundwater use is highly regulated by the MN DNR through its Water Appropriation Permit process. The DNR has imposed use-limitations for the Off-Site Well, which the Proposer will follow and report annually. Lastly, as part of the established ERA, the Proposer included a 1-mile radius around their off-site well to avoid potential for similar overlapping effects from other similar projects. This groundwater diversification plan, with robust existing regulatory protections by DNR, the established ERA around the offsite well, will avoid the potential for significant environmental effects due to these cumulative effects.

**22. Other Potential Environmental Effects: If the project may cause any additional environmental effects not addressed by Items 1 to 20, describe the effects here, discuss how the environment will be affected, and identify measures that will be taken to minimize and mitigate these effects.**

No additional environmental effects not already addressed above were identified.

**RGU CERTIFICATION.**

**I hereby certify that:**

The information contained in this document is accurate and complete to the best of my knowledge. The EAW describes the complete project; there are no other projects, stages, or components other than those described in this document, which are related to the project as “phased actions,” pursuant to Minn. R. 4410.0200, subp. 60, 4410.1000, subp. 4, and 4410.4300, subp. 1. Copies of this EAW are being sent to the entire EQB distribution list.

02/02/2026

*Date signed*

*Brian Timerson*

*This document has been electronically signed.*

Brian Timerson

Manager

Environmental and Business Assistance Section