November 19, 2004

TO: INTERESTED PARTIES

RE: Central Minnesota Ethanol Coop Biomass Gasification

Enclosed is the Environmental Assessment Worksheet (EAW) for the proposed Central Minnesota Ethanol Coop Biomass Gasification, Morrison County. The EAW was prepared by the Minnesota Pollution Control Agency (MPCA) and is being distributed for a 30-day review and comment period pursuant to the Environmental Quality Board (EQB) rules. The comment period will begin the day the EAW availability notice is published in the EQB Monitor, which will likely occur in the November 22, 2004, issue.

Comments received on the EAW will be used by the MPCA in evaluating the potential for significant environmental effects from this project and deciding on the need for an Environmental Impact Statement (EIS).

A final decision on the need for an EIS will be made by the MPCA Commissioner after the end of the comment period. If a request for an EIS is received during the comment period, or if the Commissioner recommends the preparation of an EIS, the MPCA Citizens' Board (Board) will make the final decision. The final EIS need decision will also be made by the Board if so requested by the project proposer, other interested parties or MPCA staff and if this request is agreed to by one or more members of the Board or the MPCA Commissioner. The Board meets once a month, usually the fourth Tuesday of each month, at the MPCA office in St. Paul. Meetings are open to the public and interested persons may offer testimony on Board agenda items. A listing of Board members is available on request by calling (651) 296-7306.

Please note that comment letters submitted to the MPCA do become public documents and will be part of the official public record for this project.

If you have any questions on the EAW, please contact Lynne Kolze of my staff at (651) 282-5992.

Sincerely,

Beth G. Lockwood
Supervisor, Environmental Review Unit
Environmental Review and Operations Section
Regional Division

BGL:gs

Enclosure

# ENVIRONMENTAL ASSESSMENT WORKSHEET

**Note to reviewers:** The Environmental Assessment Worksheet (EAW) provides information about a project that may have the potential for significant environmental effects. This EAW was prepared by the Minnesota Pollution Control Agency (MPCA), acting as the Responsible Governmental Unit (RGU), to determine whether an Environmental Impact Statement (EIS) should be prepared. The project proposer supplied reasonably accessible data for, but did not complete the final worksheet. Comments on the EAW must be submitted to the MPCA during the 30-day comment period which begins with notice of the availability of the EAW in the *Minnesota Environmental Quality Board (EQB) Monitor*. Comments on the EAW should address the accuracy and completeness of information, potential impacts that are reasonably expected to occur that warrant further investigation, and the need for an EIS. A copy of the EAW may be obtained from the MPCA by calling (651) 296-7398. An electronic version of the completed EAW is available at the MPCA Web site http://www.pca.state.mn.us/news/eaw/index.html#open-eaw.

**1. Project Title:** Central Minnesota Ethanol Coop Biomass Gasification

**2. Proposer:** Central Minnesota Ethanol Cooperative

**Contact Person** Kerry Nixon

**and Title** General Manager

**Address** 17936 Heron Road

Little Falls, Minnesota 56345

**Phone** (320) 632-1614

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**3. RGU:** Minnesota Pollution Control Agency

**Contact Person** Lynne Kolze

**and Title** Project Manager

**Address** 520 Lafayette Road North

St. Paul, Minnesota 55155

**Phone** (651) 282-5992

**Fax** (651) 296-7782

**4. Reason for EAW Preparation:**

| EIS Scoping | Mandatory EAW | Citizen Petition | RGU Discretion | Proposer Volunteered |
|---|---|---|---|---|
| | X | | | |

If EAW or EIS is mandatory give EQB rule category subpart number and name: 4410.4300 5A "Fuel Conversion Facilities"

**5. Project Location:** County Morrison County City/Twp Belle Prairie Township

E 1/2 NE 1/4 Section 23 Township 41N Range 32W

**Figures**

Figure 1 – County Location Map;
Figure 2 – Site Location Map;
Figure 3 – Site Aerial Photo;
Figure 4 – Process Diagram;
Figure 5 – Site Layout;
Figure 6 – National Wetland Inventory Map;
Figure 7 – Federal Emergency Management Agency (FEMA) Floodplain Map; and
Figure 8 – Soils Map.

**Attachments**

1. State Historic Preservation Officer (SHPO) Review Request;
2. Minnesota Department of Natural Resources (DNR) Natural Heritage Letter Request; and

**6. Description:**

a. Provide a project summary of 50 words or less to be published in the *EQB Monitor*.

Central Minnesota Ethanol Cooperative (CMEC) proposes to construct a biomass gasification system that will fuel pollution control equipment for the ethanol plant. The biomass that will be used would be clean wood scraps from furniture manufacturing and forestry cuttings. The gasifier would create a renewable fuel for the thermal oxidizer (TO) which is required to destroy at least 95 percent of the Volatile Organic Compounds (VOC) generated during ethanol production. Waste heat generated from VOC destruction will be used to create steam for electric power generation, process steam, and hot air for the plant's dryer.

b. Give a complete description of the proposed project and related new construction. Attach additional sheets as necessary. Emphasize construction, operation methods and features that will cause physical manipulation of the environment or will produce wastes. Include modifications to existing equipment or industrial processes and significant demolition, removal or remodeling of existing structures. Indicate the timing and duration of construction activities.

CMEC in Little Falls, Minnesota, proposes to construct a full scale biomass gasification process to fuel pollution control equipment required under a consent decree issued by the U.S. Environmental Protection Agency (USEPA), the U.S. Department of Justice (USDOJ), and the MPCA in 2002 (Figures 1 – 3). Construction of the gasification process would begin during the spring of 2005 and would be completed in approximately one year.

The TO would only be able to operate on gasifier gas and would not be co-fired with natural gas. The entire system would include the gasifier, TO, boiler and generator as an integrated system and construction must be completed in parallel.

**Wood Waste Gasification System, Thermal Oxidation, and Steam Production**

**I. Equipment Sizing and Feed Rate Discussion**

Synthesis gas from the gasification of wood waste would provide the energy for thermal oxidation of air emissions from the distillers' dry grains (DDG) and soluables dryer exhaust (Figures 4 and 5). The gasification process would generate approximately fifty thousand (50,000) pounds per hour of 600 pounds per square inch gauge, superheated steam from the thermal oxidation of the dryer exhaust.

This project includes a single gasifier with a design throughput of approximately twelve tons of clean scrap wood per hour. The spent products of thermal oxidation would be directed to a waste heat recovery boiler generating over fifty thousand pounds per hour of high-pressure steam.

## II. Equipment Descriptions

### A. Gasifier Fuel Sizing, Transfer, and Storage Equipment

Clean sawdust and chipped wood (two inches or less in size), would be received on walking floor trailers. The wood would be unloaded into a live bottom hopper. The wood would then be conveyed from the hopper to a screening device to remove oversized pieces, then conveyed to a bucket elevator that delivers the fuel into a storage silo. The storage silo is "slip-form poured" concrete with approximately 96 hours of storage at the design feed rate. Internal to the silo is a mechanical, motor driven, anti-bridging unloader. The unloader would consist of a tapered auger with a shield assembly for the bearing mount, sweep arm advance system with cast iron track and hydraulic drive with motion sensor, center hopper assembly, exit auger assembly and local stop switch. The silo is provided with level switches for level monitoring and control.

The unloader would convey the wood scraps to the wood grinders. The project includes two six-ton per hour grinders that will reduce the chipped wood from approximately two inches in size to a size appropriate for the gasifier (less than one-fourth inch). From the grinder, the ground wood would be transferred to the gasification metering bin. The wood waste fuel will contain no more than 30 percent moisture.

### B. Gasification System Description

The Biomass Gasification System will include the following equipment: a solid fuel metering bin, metered feeding system, a KC Reactor/Gasifier, the gasifier cooling water pumps and piping, ash discharge conveyor with ash discharge valve, gasification air supply, access structures, and instrumentation required to provide automatic or manual control over the process.

For this application, a single gasification system would be used. The KC Reactor/Gasifier has a design capacity of approximately 12-tons per hour of wood and consists of a high temperature, refractory lined, cylindrical steel shell that is mounted in a vertical position on heavy structural steel supports. The refractory lining consists of the required thickness of insulating castable and high-temperature castable. The lining is secured to the shell with welded stainless steel anchors. The gasifier includes a valved emergency vent stack to safely exhaust gas to the atmosphere in the event of an unplanned shutdown of the gasification or downstream equipment.

Stored, solid fuel (wood waste) would be delivered from the fuel storage silo to the gasifier system metering bin. The source of the wood product would be forest cuttings, saw dust, and untreated furniture cuttings. CMEC will only be authorized to use wood sources that meet the MPCA's definition of a clean fuel. Specifically, wood or sawdust must be untreated and may not include oriented strand board, painted, stained or pressure treated wood.

The solid fuel would be metered into the gasifier from the fabricated steel metering bin. The bin is equipped with variable speed discharge conveyors that deliver the fuel at a controlled rate to the gasifiers. The speed of the discharge conveyor is automatically adjusted by the gasifier control system to maintain a pre-set energy demand or may be manually adjusted. The rate of feed is monitored by a flow meter that provides indication of mass flow for the gasifier.

The synthesis gas (syngas) exits the gasifiers at temperatures in excess of one thousand degrees Fahrenheit (F) and is cleansed of ash fines in a high temperature cyclone prior to further oxidation.

### C. Gasification Ash Removal System

Located beneath the gasifier and high temperature cyclone are pick up points for ash removal. For ash removal, there will be an ash discharge conveyor, with discharge nozzles and an ash discharge valve. The ash discharge valve delivers the ash to the ash transfer and storage system. The ash transfer system consists of conveyors that transfer the ash into a storage silo with over 2,500 cubic feet of ash storage capacity. The ash storage silo is a drive-under style that allows unloading of the ash directly into a truck. Water will be added to the ash as it is loaded. Ash from the gasification process would be either disposed of in an approved landfill or would be land-applied as a fertilizer. Should the ash be land-applied, the MPCA would have to review lab analyses and determine whether the ash can be safely disposed of in this manner. The MPCA approval would have to be granted for any land application process.

**D. Thermal Oxidation**

The core technology for the thermal destruction of the volatile organic compounds in the DDG dryer vent is the TO. The TO is a refractory- lined, horizontal vessel that would be approximately 75 feet high. To provide additional energy necessary for the overall thermal destruction of the organic compounds in the DDG Ronning vent, a synthesis gas burner will located at the inlet of the vessel. Within the high temperature operating conditions of the TO, the volatile organic compounds contained in the DDG Ronning vent will be thermally destroyed.

**E. Steam Generation, Induced Draft Fan, Particulate Removal, and Vent Stack**

**Steam Generation**
The flue gas exits the TO into a waste heat recovery steam generator (HRSG). The boiler removes heat from the flue gas to generate high pressure, superheated steam. The HRSG in this project consists of a waste heat-style boiler and an economizer. The existing deaerator will be used as part of the proposed project.

Specific HRSG features include the following:

- Conservative steam drum sizing
- Steam drum internals
- Safety valves and boiler trim
- Expansion joints as required
- Piping from the feed water inlet valve station to the economizer inlet, trim piping, and drains
- All galvanized steel ladders and platforms
- American Society of Mechanical Engineers (ASME) certification of the HRSG
- Superheater section
- New feedwater pumps

Brief descriptions of the major sections of the HRSG are:

a. Convection Tubes
The convection tubes are attached to the steam and mud drums. Tubes with a small amount of extended surface are used in the cooler portion of the convection bank to increase the heat recovery efficiency. The several rows of tubes of the first convection section are bare and serve as screen tubes to protect against the high temperature inlet gas.
b. Steam Drum
The steam drum is conservatively sized for the capacity of the boiler. Each head of the drum will have a hinged manway, to provide access for inspection. The drum is provided with mechanical

separators to provide steam purity within the limits specified by the ASME Consensus Guidelines, provided that the boiler water is maintained within required specifications.

c. Mud Drum
The HRSG includes a mud drum complete with bottom blowdown connections to allow for the proper intermittent blowdown of solids that accumulate in the bottom of the drum. Each drum head has a manway to provide access to the mud drum. The HRSG will be supported from grade on steel saddles. The saddles will be fixed on one end, while the other end is free so that it can slide to accommodate thermal expansion.

d. Economizer
The HRSG package includes a vertical gas flow, horizontal tube economizer. The tubes are fully drainable. The tubes are arranged at a pitch for maximum heat transfer efficiency. The economizer casing is gas tight and externally insulated and lagged.

e. HRSG Outlet and Economizer Outlet Transitions
The HRSG outlet and economizer outlet transitions have been included and will be designed and fabricated to the same specifications as the heater casing, previously described.

f. Piping
Piping from the feed water control valve stations to the economizer inlets; from the economizer and HRSG outlets; and associated with the continuous and intermittent blowdowns and vents are provided. All piping will be completely analyzed for stresses and will come with the necessary support to properly carry the loads.

g. Insulation, Lagging, and Painting
The HRSG will be insulated and lagged prior to shipment. All exposed surfaces not insulated and lagged will be cleaned and primed with one coat of inorganic zinc primer.

h. Ladders and Platforms
Galvanized steel ladders, platforms, walkways, and stairs, complete with handrails, and in accordance with Occupational Safety and Health Administration regulations have been included. Access will be provided to the full length of the steam drums, heater header ends, and all access ports.

**Induced Draft Fan**
The biomass gasification and thermal oxidation processes are operated at a slightly negative pressure. This negative pressure is provided by a variable speed controlled-induced draft fan. The induced draft fan is sized for the mass flow with sufficient static pressure to overcome the pressure loss through the gasification system and energy generation equipment. Negative pressure operation, in addition to superior process control, provides the added safety benefit of preventing leakage of flue gas.

Any leakage of flue gas stays within the system where it will be combusted. Flow through the induced draft fan will be controlled by a signal from the gasifier pressure controller to maintain a preset negative pressure in each gasifier.

**Particulate Removal**
Exiting the economizer, the combustion products are pulled through a filter-type dust collector to remove remaining particulates from the flue gas and achieve the required particulate emission levels. Removed fly ash falls into the dust collector hopper, through the ash discharge valves at the bottom of the hoppers and is delivered to storage drums for occasional disposal.

**Vent Stack**
The spent syngas composition is normal combustion products of nitrogen, carbon dioxide, water vapor, and excess oxygen. These combustion products are discharged to the atmosphere via a common freestanding vent stack downstream of the induced draft fan. The vent stack will be mechanically designed to resist wind and earthquake loading and will be complete with two (2) three-inch USEPA sampling ports, access platform, ladders, and intermediate step-off platforms.

**Other Construction**

**Dried Distiller's Grains with Solubles (DDGS) Silos**
Construction of three new DDGS silos will also take place during the proposed project. The three silos will be located to the west of the Energy Building. The three new silos are new to replace the previous DDGS storage. The existing DDGS storage building will become the Energy Building. The location of the silos can be seen in Figure 5 - "Site Layout" map.

**Wet Cake Storage**
CMEC will not produce wet cake except under conditions of shutdown or breakdown of the dryer or associated pollution control equipment. For each event leading to the production of wet cake, CMEC must conduct a root cause failure analysis of the event and submit a report of the analysis to the MPCA Commissioner within 15 days.

**Ethanol Loadout Relocation**
The existing ethanol truck loadout equipment skid and associated piping will be relocated to the west side of the ethanol storage area.

**Power Generation**
High pressure (600 PSI) steam from the HRSG will be used to drive a steam turbine. The turbine will drive an electric generator. Steam will be removed from the turbine at 150 PSI pressure for use in the ethanol plant, replacing steam created from natural gas combustion.

**Dryer Heat**
A small amount of hot air from the HRSG will be used to provide heat for the wet grain dryer, replacing heat derived from the burning of natural gas.

**Summary of Construction Activities:**

The following new equipment will be used at the facility:

| Equipment | Location | Equipment | Location |
|---|---|---|---|
| KC-20 Gasifier System | Outside | Fuel Truck Unloading | Inside |
| Cyclone | Outside | Fuel screening | Inside |
| Overfire Combustion Tube | Outside | Transfer Conveyor to Storage | Outside |
| TO | Inside | Bucket Elevator | Outside |
| Ash Storage Silo | Outside | Wood Storage Silo | Outside |
| Metering Bin | Outside | Turbine/Generator Set | Inside |
| Bucket Elevator | Outside | Heat source for dryer | Inside |
| Waste Heat Boiler | Inside | Transfer Conveyor to Metering Bin | Outside |
| Economizer | Inside | Multiclone and Fan | Inside |
| 3 DDGS Silos | Outside | Wet-Cake Concrete Slab | Outside |

c. Explain the project purpose; if the project will be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

The purpose of the biomass gasification installation is to satisfy the requirements of the Consent Decree (CD) that CMEC entered into on October 2, 2002, with the USDOJ, USEPA, and the MPCA. The CD required all Minnesota ethanol plants to install pollution control equipment on the DDGS rotary drum dryers. The CD required CMEC to achieve at least 95 percent control of VOC emissions from the facility. The CMEC intends to install a TO to meet this requirement.

CMEC will fuel the TO with its wood gasification process. CMEC would also power the rest of the facility with waste heat from the process. Waste heat generated from VOC destruction would be used to create steam for electric power generation, process steam, and hot air for the dryer. This eliminates all natural gas uses at the plant.

d. Are future stages of this development including development on any outlots planned or likely to happen? ☐Yes ☒No
If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

No future stages of development are anticipated at this time.

e. Is this project a subsequent stage of an earlier project? ☒ Yes ☐ No
If yes, briefly describe the past development, timeline and any past environmental review.

An EAW for the construction of the original plant was submitted in June 1995. An air quality permit application to construct a 15-million gallons per year facility was submitted in September 1995. Construction of the plant was completed and production began in March 1999. Through subsequent major and minor permit amendments in April 1998 and January 2000, the facility is currently permitted to operate a fuel ethanol production plant at a maximum rate of 22-million gallons per year.

As stated above, on October 2, 2002, CMEC entered into a CD with the USDOJ, USEPA, and the MPCA that required the installation of pollution control equipment (a TO) on the DDGS rotary drum dryer. CMEC has chosen to implement an alternative technology for fueling that TO. Development of the wood gasification process requires a new environmental review process. This requirement can be found in Minn. R. ch. 4410, subp. 5 (Fuel Conversion Facilities).

The facility will still be considered a minor source of air emissions after the gasification process is installed. The installation of the gasification process is authorized under the CD and, therefore, does not require a new air quality permit from the MPCA at this time. However, the CD requires that CMEC submit a new air quality permit application within 180 days after the last piece of pollution control equipment is installed. The new application would include all facility emission sources.

**7. Project Magnitude Data**

Total Project Area (acres) 0.25 – for new construction or Length (miles) N/A
Number of Residential Units: Unattached na Attached na maximum units per building na
Commercial/Industrial/Institutional Building Area (gross floor space): total square feet 7,200 (existing)
Indicate area of specific uses (in square feet):

Office _____ Manufacturing _____
Retail _____ Other Industrial _____
Warehouse _____ Institutional _____
Light Industrial _____ Agricultural _____
Other Commercial (specify) _____ Storage Tanks: See below
Building height See below If over 2 stories, compare to heights of nearby buildings _____

The DDGS Silos would be 95 feet above grade. The TO stack height would be 75 feet above grade. The wood storage silo will be 92 feet above grade.

**8. Permits and approvals required.** List all known local, state and federal permits, approvals 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.

| Unit of Government | Type of Application | Status |
|---|---|---|
| MPCA/USEPA/USDOJ | Alternative Technology Approval | Entered on October 2, 2002 |
| County/City of Little Falls | Building Permits | To be determined |
| City of Little Falls | Storage Silo Permits | To be submitted |
| Morrison County | Incinerator Permit | To be submitted |
| Morrison County | Permit to Dispose at County Landfill | To be submitted |
| Little Falls County/ City of Lake Crystal | Utility Permit | To be determined |
| Minnesota Department of Transportation | Utility Permit | To be determined |
| Minnesota Dept. of Agriculture | Agricultural Liming License | To be submitted, if required |
| MPCA | Beneficial Use Determination for Ash Disposal | To be submitted, if required |

**9. Land use.** Describe current and recent past land use and development on the site and on adjacent lands. Discuss project compatibility with adjacent and nearby land uses. Indicate whether any potential conflicts involve environmental matters. Identify any potential environmental hazards due to past site uses, such as soil contamination or abandoned storage tanks, or proximity to nearby hazardous liquid or gas pipelines.

The proposed project would be constructed on the existing CMEC facility's site, approximately 1.7 miles north of the city of Little Falls. Prior to the existence of the CMEC, the site was used for agricultural purposes. No potential environmental hazards related to this use are known to exist on the property. The land that will be used for the project will be located within the existing site's property boundaries.

The land use on the east side of the property is agricultural. To the west is a railroad and highway, to the south is a nursery, and approximately one-fourth mile to the north is a supper club. The nearest residence is one-fourth mile from CMEC and the Mississippi River is about one-half mile to the west.

**10. Cover Types.** Estimate the acreage of the site with each of the following cover types before and after development:

| | Before | After | | Before | After |
|---|---|---|---|---|---|
| Types 1-8 wetlands | 0 | 0 | Lawn/landscaping | 4 | 3.75 |
| Wooded/forest | 0 | 0 | Impervious Surfaces | 6 | 6.25 |
| Brush/grassland | 8.2 | 8.2 | Other | | |
| Cropland | 0 | 0 | Stormwater pond | 1.3 | 1.3 |
| | | | **TOTAL** | 19.5 | 19.5 |

The proposed gasifier and silos would be constructed on a gravel area within the CMEC property boundaries.

**11. Fish, Wildlife, and Ecologically Sensitive Resources.**

a. Identify fish and wildlife resources and habitats on or near the site and describe how they would be affected by the project. Describe any measures to be taken to minimize or avoid impacts.

The existing site was reviewed in a 1995 EAW. The proposed project is within the existing site's property boundaries and would not affect any new sensitive areas or natural resources in an adverse way. There are no wetlands of any kind on this site (Figure 6).

b. Are any state (endangered or threatened) species, rare plant communities or other sensitive ecological resources such as native prairie habitat, colonial waterbird nesting colonies or regionally rare plant communities on or near the site? ☐ Yes ☒ No
If yes, describe the resource and how it would be affected by the project. Indicate if a site survey of the resources has been conducted and describe the results. If the DNR Natural Heritage and Nongame Research program has been contacted give the correspondence reference number. ERDB 20040935
Describe measures to minimize or avoid adverse impacts.

This site was reviewed by the staff of the DNR Natural Heritage Database Program in June 2004. Based on this review, DNR staff determined that there are ten known occurrences of rare species or natural communities within a one-mile radius of the site (Attachment 2). All of these occurrences

existed within Belle Prairie Park, outside the property boundaries of the CMEC site. The size of the facility's footprint will not change as a result of adding the wood gasification process. As a result, no new impacts to natural habitats or sensitive species are expected.

**12. Physical Impacts on Water Resources.** Will the project involve the physical or hydrologic alteration (dredging, filling, stream diversion, outfall structure, diking, and impoundment) of any surface waters such as a lake, pond, wetland, stream or drainage ditch? ☐ Yes ☒ No
If yes, identify water resource affected. Describe alternatives considered and proposed mitigation measures to minimize impacts. Give the DNR Protected Waters Inventory (PWI) number(s) if the water resources affected are on the PWI.

There are no wetlands on this site. Please see Figure 6.

**13. Water Use.** Will the project involve installation or abandonment of any water wells, connection to or changes in any public water supply or appropriation of any ground or surface water (including dewatering)? ☐ Yes ☒ No
If yes, as applicable, give location and purpose of any new wells; public supply affected, changes to be made, and water quantities to be used; the source, duration, quantity and purpose of any appropriations; and unique well numbers and DNR appropriation permit numbers, if known. Identify any existing and new wells on the site map. If there are no wells known on site, explain methodology used to determine.

The proposed project will not require any increases in water usage at the facility. Water used within the new gasification system would be similar to what is currently used for the natural gas fired boilers. The size of the new boiler is similar to the existing boilers. The facility currently uses approximately 390,000 gallons per day of water, which is obtained from the city of Little Falls. Some of the current water distribution pipes will be rerouted to serve the new equipment and to cool and dampen the ash from the gasifier before entering the ash silo. A small amount of water, previously discharged to the Little Falls Wastewater Treatment Facility (WWTF), will be used for this purpose.

**14. Water-related land use management districts.** Does any part of the project involve a shoreland zoning district, a delineated 100-year flood plain, or a state or federally designated wild or scenic river land use district? ☐ Yes ☒ No
If yes, identify the district and discuss project compatibility with district land use restrictions.

See Figure 7 - "FEMA Floodplain Map".

**15. Water Surface Use.** Will the project change the number or type of watercraft on any water body? ☐ Yes ☒ No
If yes, indicate the current and projected watercraft usage and discuss any potential overcrowding or conflicts with other uses.

Not applicable.

**16. Erosion and Sedimentation.** Give the acreage to be graded or excavated and the cubic yards of soil to be moved: **0.25** acres; _____ cubic yards. Describe any steep slopes or highly erodible soils and identify them on the site map. Describe any erosion and sedimentation control measures to be used during and after project construction.

There are no steep slopes present on the site; however, the sandy soils are susceptible to wind erosion. The entire site is nearly flat with no more than one percent slope in any area except for the road ditches. The sandy soils present are permeable and are not considered prone to soil erosion. The new equipment to be constructed will be located on gravel that already exists on-site. Due to the small area that will be disturbed during construction of the gasification unit, the proposer would *not* be required to obtain a MPCA National Pollutant Discharge Elimination System Construction Permit.

**17. Water Quality – Surface-water Runoff.**

a. Compare the quantity and quality of site runoff before and after the project. Describe permanent controls to manage or treat runoff. Describe any stormwater pollution prevention plans.

All surface-water runoff will be directed to a 1.3-acre stormwater detention pond, which already exists on the site. The pond will continue to function in the same manner as it has since the facility began operations in 1999.

The quantity and quality of the runoff from the site should not change since the majority of the site will remain undisturbed during installation of the gasification process. No impacts to surface waters are expected.

b. Identify routes and receiving water bodies for runoff from the site; include major downstream water bodies as well as the immediate receiving waters. Estimate impact runoff on the quality of receiving waters.

The 1.3 acre retention pond located on the south side of the property holds run-off from the existing impervious areas on the site. The pond does not discharge to surface water. Instead, runoff entering the pond is treated by bacteria and sunlight, then slowly infiltrates through the soil, eventually reaching ground water. No impacts to ground water are expected.

**18. Water Quality – Wastewater.**

a. Describe sources, composition and quantities of all sanitary, municipal and industrial wastewater produced or treated at the site.

Most of the process water at the ethanol facility is reused; therefore, the generation of wastewater is primarily related to boiler feed water softening, boiler blowdown, and cooling tower blowdown. The wastewater that results from water treatment processes and boiler blowdown is discharged to the city of Little Falls' sewer system. Wastewater is either pretreated prior to its discharge to the sewer or sometimes can be discharged without pre-treatment, if water quality is at acceptable levels.

The proposed project will not require any changes to the existing wastewater treatment processes already in place at the facility.

b. Describe waste treatment methods or pollution prevention efforts and give estimates of composition after treatment. Identify receiving waters, including major downstream water bodies, and estimate the discharge impact on the quality of receiving waters. If the project involves on-site sewage systems, discuss the suitability of site conditions for such systems.

A waste pretreatment system is currently in use at the facility. Only wastewater meeting Biochemical Oxygen Demand, Total Suspended Solids (TSS), and nitrate-nitrogen effluent limits is discharged to the Little Falls WWTF. After pretreatment, the concentration of pollutants in CMEC's wastewater is at or below these levels when it is discharged to the city sewer:

Table 19-1: Pollutant concentrations in CMEC effluent (after pretreatment):

| | |
|---|---|
| Biochemical Oxygen Demand (CBOD) | 30 mg/L |
| TSS | 30 mg/L |
| Nitrate-Nitrogen | 3 mg/L |

*milligrams per liter (mg/L)*

c. If wastes will be discharged into a publicly owned treatment facility, identify the facility, describe any pretreatment provisions and discuss the facility's ability to handle the volume and composition of wastes, identifying any improvements necessary.

CMEC is permitted through the city of Little Falls to discharge a maximum of 157,260 gallons per day to city sewers. The monthly maximum average is 112,620 gallons per day. The most recent wastewater discharge permit was issued in March 2001 and is valid through March 2006. Other values for which CMEC is permitted for are as follows:

Table 19-2: The city of Little Falls WWTF has been given the following effluent limitations:

| | |
|---|---|
| CBOD | 3915 lbs/day |
| Total Solids | 200 lbs/day |
| pH | no less than 4 or no more than 10 |
| Temperature | not to exceed 110° F |

*pounds per day (lbs/day)*

The Little Falls WWTF process includes primary settling, secondary treatment by a trickling filter process using a fixed growth contact chamber (ABF Tower), aeration, secondary clarification, chlorination, and dechlorination. All effluent is discharged into the Mississippi River. Sludge is anaerobically digested and land applied. No changes in wastewater pretreatment or treatment processes would be needed as a result of the proposed project.

d. If the project requires disposal of liquid animal manure, describe disposal technique and location and discuss capacity to handle the volume and composition of manure. Identify any improvements necessary. Describe any required setbacks for land disposal systems.

Not applicable.

**19. Geologic hazards and soil conditions.**

a. Approximate depth (in feet) to Ground water: 8’ minimum; 10’ average.
Bedrock: 55’ minimum; 60’ average.
Describe any of the following geologic site hazards to ground water and also identify them on the site map: sinkholes, shallow limestone formations or karst conditions. Describe measures to avoid or minimize environmental problems due to any of these hazards.

Based on the U.S. Geological Survey, “Hydrologic Investigations Atlas” HA-534 Sheet 2 of 3, geologic site hazards are not present on the proposed site.

b. Describe the soils on the site, giving SCS classifications, if known. Discuss soil granularity and potential for groundwater contamination from wastes or chemicals spread or spilled onto the soils. Discuss any mitigation measures to prevent such contamination.

Based on the Morrison County Soil Survey, the soils at the site are primarily sandy loam or loamy sand in nature. These soils have high water tables and are subject to wind erosion if unprotected. Figure 8 presents a soils map and a list of each soil type present at the site.

**20. Solid Wastes, Hazardous Wastes, Storage Tanks.**

a. Describe types, amounts and compositions of solid or hazardous wastes, including solid animal manure, sludge and ash, produced during construction and operation. Identify method and location of disposal. For projects generating municipal solid waste, indicate if there is a source separation plan; describe how the project will be modified for recycling. If hazardous waste is generated, indicate if there is a hazardous waste minimization plan and routine hazardous waste reduction assessments.

The CMEC facility will need to be redesigned to accommodate the new gasification process. Some equipment will be removed, other pieces added or moved. As a result of the design modifications, three new DDGS silos, each 22 feet in diameter and 95 feet high, will be constructed to the west of the Energy Building. In addition, a wood storage silo (44 feet in diameter and 92 feet high) and an ash silo, which can hold 15 tons of ash, will be constructed on the site. The location of the silos can be seen in Figure 5 - “Site Layout”. A 75-foot TO stack will also be constructed on site to meet air emission regulations.

There will be a maximum of six tons per day of wood ash generated from the gasification process. The ash would be removed from the facility every four days and taken to an approved landfill. CMEC is also investigating the possibility of land applying the ash as a fertilizer. A thorough lab analysis of the ash must be completed and the proposal must be reviewed and approved by the MPCA before ash can be disposed of in this manner. A Beneficial Use Determination must be obtained from the MPCA if the ash is land applied. In addition, a Agricultural Liming License must also be obtained from the Minnesota Department of Agriculture.

Waste resulting from construction activities would be properly disposed of at an approved demolition landfill.

b. Identify any toxic or hazardous materials to be used or present at the site and identify measures to be used to prevent them from contaminating groundwater. If the use of toxic or hazardous materials will lead to a regulated waste, discharge or emission, discuss any alternatives considered to minimize or eliminate the waste, discharge or emission.

CMEC produces a small amount of hazardous waste in the form of spent solvents and waste oil for parts cleaning. They are stored and disposed of properly. Hazardous waste generation will not increase as a result of the proposed project.

c. Indicate the number, location, size and use of any above or below ground tanks to store petroleum products or other materials, except water. Describe any emergency response containment plans.

See Item 20a above.

**21. Traffic.** Parking spaces added: 0 Existing spaces (if project involves expansion): 40
Estimated total average daily traffic generated: 15 vehicles Estimated maximum peak hour traffic generated (if known) and its timing: 90 percent - between 8:00 am and 5:00 pm
Provide an estimate of the impact on traffic congestion affected roads and describe any traffic improvements necessary. If the project is within the Twin Cities metropolitan area, discuss its impact on the regional transportation system.

Due to the addition of the wood gasification process, approximately 12 new trucks will be going in and out of the facility per day. The trucks will deliver chipped wood to the facility or remove ash from the site to either an approved landfill or other approved disposal site.

**22. Vehicle-related Air Emissions.** Estimate the effect of the project's traffic generation on air quality, including carbon monoxide levels. Discuss the effect of traffic improvements or other mitigation measures on air quality impacts. Note: If the project involves 500 or more parking spaces, consult *EAW Guidelines* about whether a detailed air quality analysis is needed.

Due to low traffic volumes, air emissions from vehicles would not be significant.

**23. Stationary Source Air Emissions.** Describe the type, sources, quantities and compositions of any emissions from stationary sources of air emissions such as boilers, exhaust stacks or fugitive dust sources. Include any hazardous air pollutants (consult *EAW Guidelines* for a listing), any greenhouse gases (such as carbon dioxide, methane, and nitrous oxides), and ozone-depleting chemicals (chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons or sulfur hexafluoride). Also describe any proposed pollution prevention techniques and proposed air pollution control devices. Describe the impacts on air quality.

CMEC was issued a MPCA Air Quality Permit in 1996, when the facility began operations. The permit was amended in 1998 and 2000. The proposal to add a wood gasification process to the existing facility would allow the proposer to run the TO at a lower cost than would be the case if they used natural gas. Because construction of the proposed project was considered and is authorized by the CD, no new permits would be required from the MPCA. However, the CD requires that CMEC submit a new air quality permit application within 180 days after the last piece of pollution control equipment is installed. The facility would continue to be considered a minor source under federal air quality regulations.

**Sources of Air Emissions**

The existing DDGS dryer exhaust stack and emissions from the ethanol load-out area would be routed to the TO where VOC destruction takes place. The waste heat generated from the combustion process would be used to create steam for a variety of uses in the facility.

Wood hauled to the facility for gasification will have a moisture content of less than 30 percent. The wood receiving operation will be enclosed in a building which will be fitted with a bin vent filter to capture displaced air and particulates. The wood fuel storage silo will also have a bin vent filter to capture displaced air and particulates during the filling process.

During the wood ash load out process, water will be mixed with the ash to make a slurry. This will effectively eliminate dust or particulate emissions from this part of the operation.

The building that will be used to house some of the gasification equipment is currently used for DDGS storage. The DDGS will go into the newly constructed silos to make the building available for the gasification equipment. Conveying the DDGS directly from the dryer/cooling process to the silos will reduce dust and particulate matter inside the building.

With the exception of VOC's, all criteria pollutant emissions are projected to increase due to the emissions generated from the gasification of the wood waste, however, the facility's total emissions from all criteria pollutants will remain under the 95 tons per year (TPY) cap imposed as part of the CD. These combustion products are discharged to the atmosphere via a common freestanding vent stack downstream of the induced draft fan.

CMEC would be a minor source with respect to both the prevention of significant deterioration and the Title V Permitting process. Emissions for criteria pollutants are predicted to be as follows:

| **Total Potential Facility Emissions – Pre Modification<br>Central Minnesota Ethanol Coop** | |
|---|---|
| **Pollutant** | **Emissions (TPY)** |
| Particulate Matter | 27.3 |
| Particulate Matter less than 10 Microns | 27.3 |
| Carbon Monoxide | 20.2 |
| Nitrogen Oxides | 50.8 |
| Volatile Organic Compounds | 200 |
| Sulfur Dioxide | 0.45 |

| **Total Potential Facility Emissions – Post Modification<br>Central Minnesota Ethanol Coop** | |
|---|---|
| **Pollutant** | **Proposed Emissions (TPY)** |
| Particulate Matter | 30 |
| Particulate Matter less than 10 Microns | 30 |
| Carbon Monoxide | 60 |
| Nitrogen Oxides | 78 |
| Volatile Organic Compounds | 75.6 |
| Sulfur Dioxide | 7.45 |

**24. Odors, noise, and dust.** Will the project generate odors, noise or dust during construction or during operation? ☒ Yes ☐ No

If yes, describe sources, characteristics, duration, quantities or intensity and any proposed measures to mitigate adverse impacts. Also identify locations of nearby sensitive receptors and estimate impacts on them. Discuss potential impacts on human health or quality of life. (Note: fugitive dust generated by operations may be discussed at item 23 instead of here.)

**Odors**

Odor complaints have been related to the exhaust from the spent grain (DDGS) dryer. The TO will be treating the DDGS dryer exhaust, substantially reducing any odor impacts. Most of the odors created during the production of ethanol will be destroyed in the TO.

The wood gasification process would not, in and of itself, cause odor problems. The gasification process is totally enclosed and any gas generated is exhausted to the TO. Emissions from the gasification process will be routed to the TO for destruction. The TO is capable of destroying 95 percent of all emissions from the gasification process. Neighboring residents should not be subjected to odors that would normally be emitted from the burning of wood.

**Noise**

Significant noise impacts to surrounding neighbors are not anticipated. Noise generated from the TO and gasification process will remain within the building. Since the nearest receptor is a resident, the Guidance to Noise Control in Minnesota designates the site as a Class 1 noise area. To meet state noise standards, the following noise levels would not be exceeded at the nearest receptor:

| | L50 (DBA) | L10 (DBA) |
|---|---|---|
| Day | 60 | 65 |
| Night | 50 | 55 |

During construction of the new equipment and silos, there will be noise from heavy equipment during daylight hours. The machinery will be equipped with the appropriate mufflers to reduce noise impacts. The construction activity will be temporary in nature, lasting less than one year. Once the facility is operational, additional noise would be generated by increased truck traffic to and from the facility, though this additional traffic noise is not expected to be significant.

**Dust and Particulates**

As previously stated, particulates and dust would be controlled throughout the production process. Wood would be handled in a building fitted with filters that would remove particulates. Wood ash would be mixed with water to make a slurry, thereby eliminating dust problems during load-out.

**25. Nearby resources.** Are any of the following resources on or in proximity to the site?

a. Archaeological, historical, or architectural resources? ☐ Yes ☒ No
b. Prime or unique farmlands or land within an agricultural preserve? ☒ Yes ☐ No
c. Designated parks, recreation areas, or trails? ☐ Yes ☒ No
d. Scenic views and vistas? ☐ Yes ☒ No
e. Other unique resources? ☐ Yes ☒ No

If yes, describe the resource and identify any project-related impacts on the resources. Describe any measures to minimize or avoid adverse impacts.

A 1995 EAW review confirmed the availability of these resources. A request for an updated review was submitted to the SHPO. The results of the review are attached in Attachment 1.

**26. Visual impacts**. Will the project create adverse visual impacts during construction or operation? Such as glare from intense lights, lights visible in wilderness areas and large visible plumes from cooling towers or exhaust stacks? ☐ Yes ☒ No
If yes, explain.

The exhaust from the wood gasification vent stack would be routed to a 75-foot TO. When the ambient temperature is above 60 degrees, the exhaust plume will likely not be visible. During colder weather, the steam plume will be visible at a reduced distance when compared to the existing steam plume from the DDGS dryer.

**27. Compatibility with plans and land use regulations.** Is the project subject to an adopted local comprehensive plan, land use plan or regulation, or other applicable land use, water, or resource management plan of a local, regional, state or federal agency? ☐ Yes ☒ No
If yes, describe the plan, discuss its compatibility with the project and explain how any conflicts will be resolved. If no, explain.

Not applicable.

**28. Impact on infrastructure and public services.** Will new or expanded utilities, roads, other infrastructure or public services be required to serve the project? ☒ Yes ☐ No
If yes, describe the new or additional infrastructure or services needed. (Note: any infrastructure that is a connected action with respect to the project must be assessed in the EAW; see *EAW Guidelines* for details.)

As part of the proposed project, electric utilities would need to be upgraded. New roads would be constructed on the ethanol plant property so that wood ash can be easily trucked away from the property and wood can be easily delivered. Natural gas usage at the plant will be eliminated.

**29. Cumulative impacts.** Minn. R. 4410.1700, subp. 7, item B requires that the RGU consider the "cumulative potential effects of related or anticipated future projects" when determining the need for an environmental impact statement. Identify any past, present or reasonably foreseeable future projects that may interact with the project described in this EAW in such a way as to cause cumulative impacts. Describe the nature of the cumulative impacts and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to cumulative impacts (or discuss each cumulative impact under appropriate item(s) elsewhere on this form).

There are no other projects related to this that would cause cumulative impacts. The CMEC has no plans to expand at this time.

**30. Other Potential Environmental Impacts.** If the project may cause any adverse environmental impacts not addressed by items 1 to 28, identify and discuss them here, along with any proposed mitigation.

Not applicable.

**31. Summary of issues.** List any impacts and issues identified above that may require further investigation before the project is begun. Discuss any alternatives or mitigative measures that have been or may be considered for these impacts and issues, including those that have been or may be ordered as permit conditions.

None.

**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 connected actions or phased actions, as defined at Minn. R. 4410.0200, subps. 9b and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

**Name and Title of Signer:**

**Beth G. Lockwood, Supervisor, Environmental Review Unit**
**Environmental Review and Operations Section**
**Regional Division**

**Date:**

The format of the Environmental Assessment Worksheet was prepared by the staff of the Environmental Quality Board at Minnesota Planning. For additional information, worksheets or for *EAW Guidelines*, contact: Environmental Quality Board, 658 Cedar St., St. Paul, MN 55155, 651-296-8253, or at their Web site http://www.mnplan.state.mn.us