LEONARD, STREET AND DEINARD

PROFESSIONAL ASSOCIATION

August 24, 2004

Matthew B. Seltzer
612-335-7116
matthew.seltzer@leonard.com

Mr. Robert A. Schroeder, Chair
Minnesota Environmental Quality Board
658 Cedar Street, Room 300
St. Paul, MN 55155

RE: Application of Invenergy Cannon Falls, LLC for a Site Permit for the Cannon Falls Energy Center Simple Cycle Natural Gas Power Plant

Dear Mr. Schroeder:

Delivered herewith is the Application of Invenergy Cannon Falls, LLC for a Site Permit for the Cannon Falls Energy Center, simple cycle natural gas power plant. The nominal generating capacity of the facility will be 357 MW. This Application is submitted under Minnesota Rule 4400.2000 for review under the alternative permitting process.

We look forward to working with the Board and the staff as the permitting process goes forward.

Very truly yours,
Leonard, Street and Deinard, P.A.

MATTHEW B. SELTZER

MBS/kaa
Enclosures

MINNESOTA ENVIRONMENTAL QUALITY BOARD

SITE PERMIT APPLICATION FOR THE PROPOSED

CANNON FALLS ENERGY CENTER

DOCKET NO. 04-85-PPS-Cannon Falls EC

August, 2004

Prepared For:

Invenergy Cannon Falls, LLC
233 South Wacker Drive
Suite 9450
Chicago, IL 60606
Phone (312) 707-9044
Fax: (312) 707-9045
Contact: Joel Schroeder

Prepared by

URS Corporation
122 South Michigan Avenue
Suite 1920
Chicago, IL 60603
Contact : Julie Spapperi
Phone : (312) 939-1000
Fax (312) 939-4198

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TABLES

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TABLE 1-1
Application Content Requirements Cross Reference
Cannon Falls Energy Center

ITEM	APPLICATION SECTION
PROJECT REQUIREMENTS (Minn. Rules 4400.1150, Subp. 1)	
A. A statement of proposed ownership of the facility as of the day of filing and after commercial operation.	2.1
B. The precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated.	2.2
C. At least two proposed sites for the proposed large electric power generating plant and identification of the applicant's preferred site and the reasons for preferring the site.	Not required under the alternative review process (See Section 1.3.1 and 2.6)
D. A description of the proposed large electric power generating plant and all associated facilities, including the size and type of the facility.	2.3, 2.7
E. The environmental information required under subpart 3.	See Environmental Information Below
F. The names of the owners of the property for each proposed site.	2.5
G. The engineering and operational design for the large electric power generating plant at each of the proposed sites.	2.7
H. A cost analysis of the large electric power generating plant at each proposed site, including the costs of constructing and operating the facility that are dependent on design and site.	2.8
I. An engineering analysis of each of the proposed sites, including how each site could accommodate expansion of generating capacity in the future.	2.7, 2.9
J. Identification of transportation, pipeline, and electrical transmission systems that will be required to construct, maintain, and operate the facility.	3.0
K. A listing and brief description of federal, state, and local permits that may be required for the project at each proposed site.	11.0
L. A copy of the Certificate of Need for the project from the Public Utilities Commission or documentation that an application for a Certificate of Need has been submitted or is not required.	1.3.4

ITEM	APPLICATION SECTION
HIGH VOLTAGE TRANSMISSION LINE ROUTE REQUIREMENTS (Minn. Rules 4400.1150, Subp. 2)	
A. A statement of proposed ownership of the facility at the time of filing the application and after commercial operation.	To be submitted with transmission line route permit application
B. The precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated.	To be submitted with transmission line route permit application
C. At least two proposed routes for the proposed high voltage transmission line and identification of the applicant's preferred route and the reasons for the preference.	To be submitted with transmission line route permit application
D. A description of the proposed high voltage transmission line and all associated facilities including the size and type of the high voltage transmission line.	To be submitted with transmission line route permit application
E. The environmental information required under subpart 3.	To be submitted with transmission line route permit application
F. Identification of land uses and environmental conditions along the proposed routes.	To be submitted with transmission line route permit application
G. The names of each owner whose property is within any of the proposed routes for the high voltage transmission line.	To be submitted with transmission line route permit application
H. United States Geological Survey topographical maps or other maps acceptable to the chair showing the entire length of the high voltage transmission line on all proposed routes.	To be submitted with transmission line route permit application
I. Identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share the right-of-way with the proposed line.	To be submitted with transmission line route permit application
J. The engineering and operational design concepts for the proposed high voltage transmission line, including information on the electric and magnetic fields of the transmission line.	To be submitted with transmission line route permit application
K. Cost analysis of each route, including the costs of constructing, operating, and maintaining the high voltage transmission line that are dependent on design and route.	To be submitted with transmission line route permit application
L. A description of possible design options to accommodate expansion of the high voltage transmission line in the future.	To be submitted with transmission line route permit application
M. The procedures and practices proposed for the acquisition and restoration of the right-of-way, construction, and maintenance of the high voltage transmission line.	To be submitted with transmission line route permit application

ITEM	APPLICATION SECTION
N. A listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line.	To be submitted with transmission line route permit application
O. A copy of the Certificate of Need or the certified HVTL list containing the proposed high voltage transmission line or documentation that an application for a Certificate of Need has been submitted or is not required.	To be submitted with transmission line route permit application
ENVIRONMENTAL INFORMATION REQUIREMENTS FOR BOTH SITE AND ROUTE (Minn. Rules 4400.1150, Subp. 3)	
A. A description of the environmental setting for each site or route.	4.1
B. A description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation, and public services.	4.2 - 4.7, 5.0
C. A description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining.	6.0
D. A description of the effects of the facility on archaeological and historic resources.	7.0
E. A description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna.	8.0
F. A description of the effects of the facility on rare and unique natural resources.	9.0
G. Identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route.	10.0
H. A description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigative measures.	10.0

ABBREVIATIONS AND ACRONYMS

AERA	Air Emissions Risk Analysis
AST	Aboveground Storage Tanks
ASTM	American Society for Testing and Materials
BIA	Bureau of Indian Affairs
BOP	Balance of Plant
CAM	Compliance Assurance Monitoring
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CTG	Combustion Turbine Generator
dBA	Decibels on the A Scale
DLN	Dry Low NO_X
EMT	Emergency Medical Technician
EQB	Minnesota Environmental Quality Board
ESA	Environmental Site Assessment
° F	Degrees Fahrenheit
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Association
FERC	Federal Energy Regulatory Commission
FIRM	Federal Insurance Rate Map
sq ft	Square Feet
gpd	Gallons Per Day
GRE	Great River Energy
HAP	Hazardous Air Pollutant
HHV	Higher Heating Value
ISHQ	Inhalation Screening Hazard Quotients
kV	Kilovolt
LEPGP	Large Electric Power Generating Plant
MDNR	Minnesota Department of Natural Resources
M/E	Mechanical/Electrical
MISO	Midwest Independent System Operator
MMBtu	Million British Thermal Units
MMcf	Million Cubic Feet
MPCA	Minnesota Pollution Control Agency
msl	Mean sea level
MW	Megawatt
$\mu g/m^3$	Microgram Per Cubic Meter
NAAQS	National Ambient Air Quality Standards
NAC	Noise Area Classification
NNG	Northern Natural Gas
NO_X	Nitrogen Oxides
NPDES	National Pollutant Discharge Elimination System
NPV	Net Present Value
NSP	Northern States Power

NWI	National Wetland Inventory
OWS	Oil and Water Separator
PM/PM_{10}	Particulate Matter
PPA	Purchased Power Agreement
PSD	Prevention of Significant Deterioration
Psia	Pounds Per Square Inch Absolute
Psig	Pounds Per Square Inch Gauge
PUC	Minnesota Public Utilities Commission
PWL	Power Levels
RCRA	Resource Conservation and Recovery Act
REC	Recognized environmental condition
RFP	Request for Proposal
SDS	State Disposal System
SHPO	State Historic Preservation Office
SO_2	Sulfur Dioxide
SWPPP	Stormwater Pollution Prevention Plan
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Compound
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

Invenergy Cannon Falls LLC ("Invenergy Cannon Falls") submits this application for a site permit to the Minnesota Environmental Quality Board ("EQB") pursuant to the Minnesota Power Plant Siting Act (Minnesota Statutes 116C.51 through 116C.697) and Chapter 4400 of the Minnesota Rules.

Invenergy Cannon Falls proposes to develop, construct, and operate a Large Electric Power Generating Plant ("LEPGP"), as defined in the Minnesota Power Plant Siting Act ("Act"). The Act requires that the proposed LEPGP obtain a site permit from the EQB prior to construction. Because the plant will be fueled primarily by natural gas, the project is eligible for review under the alternative permitting process, following the procedures of Minnesota Rules 4400.2000 through 4400.2950.

Pursuant to Minnesota Rules 4400.2100, this application contains all of the information required for an LEPGP site permit. Table 1-1 cross-references the 4400.2100 content requirements with the corresponding sections of the application.

1.1 BACKGROUND

The Minnesota Public Utilities Commission ("PUC") approved the resource planning process proposed by Northern States Power Company d/b/a Xcel Energy, in Docket E-002/RP-00-787, *In the Matter of Northern States Power Company's Application for Approval of its 2000-2014 Resource Plan,* Order Approving Xcel Energy's 2000-2014 Resource Plan. A part of this approved process included a solicitation of proposals to increase Xcel Energy's supply portfolio by 1,000 megawatts ("MW"). To meet this objective, Xcel Energy ("Xcel") issued an All Source Request for Proposals ("RFP") dated December 6, 2001. The RFP outlined the baseload and peaking supply needs of Xcel's supply portfolio beginning in 2005 and extending into the year 2009.

In response, Invenergy LLC ("Invenergy") submitted a proposal on March 15, 2002 to supply approximately 357 megawatts ("MW") of peaking capacity. Xcel selected the project based on Invenergy's March 15 response to the All Source RFP. In June of 2004, Northern States Power

("NSP") and Invenergy Cannon Falls executed a purchased power agreement ("PPA"). The terms of the PPA require Invenergy Cannon Falls to develop and construct a combustion turbine power plant with a capability of 357 MW prior to May 2006. With the entire output of the Cannon Falls Energy Center ("Facility") dedicated to meet the PUC-approved need, Invenergy Cannon Falls will not be required to file for a Certificate of Need pursuant to Minnesota Statutes 216B.243; 216B.2422, subd.5(c). For more information, see section 1.3.4.

1.2 PROJECT OVERVIEW

To meet the terms of the PPA, Invenergy Cannon Falls proposes to develop, construct, and operate a natural gas-fired simple cycle power plant ("Project") to be called the Cannon Falls Energy Center ("Facility"). The Project will be located on an approximately 55-acre site in the Business Park North district approximately 600 feet west of Cannon Industrial Boulevard in Cannon Falls, Minnesota.

The Facility, which is scheduled to begin operation on or before May 2006, will be capable of generating approximately 357 MW of electricity during peak demand periods. The Facility will consist of two dual fuel simple cycle combustion turbines. The combustion turbines will primarily fire natural gas with low sulfur distillate oil as a backup fuel. To control emissions of nitrogen oxides ("NO_x") while firing natural gas, the combustion turbines will be equipped with dry low NO_x combustors. The proposed Facility and associated facilities and equipment are described in greater detail in Section 2.0 and throughout the application.

To export electricity to the transmission grid, either Northern States Power ("NSP") or Great River Energy ("GRE") will construct interconnection facilities. The Midwest Independent System Operator ("MISO") is conducting a study to determine the appropriate method of interconnection. The methods under consideration include interconnecting with the existing 161 kiloVolt ("kV") transmission line running on the site's western property boundary and building a new 115 kV line from the Facility site to the Cannon Falls Substation located approximately two miles southwest of the Facility site. If a new transmission line is constructed, it would likely be built adjacent to the existing 161 kV line. NSP or GRE will submit any required transmission line permit applications.

To supply natural gas to the Facility, the Northern Natural Gas Company ("NNG") will construct a 12-mile natural gas pipeline lateral connecting the Facility to an existing NNG interstate pipeline which runs south to north through Farmington, Minnesota approximately 12 miles northwest of the Project site. NNG will own and operate the connecting pipeline lateral and will apply for and obtain all necessary permits and approvals. As NNG will operate and construct the pipeline lateral as part of its interstate pipeline system under the authority of the Federal Natural Gas Act, United States Code, Title 15, Section 717, et. seq, the pipeline is not subject to the gas pipeline route permit requirements established under Minn. Stat. Sec. 116I.015 subd. 2, as implemented through Minnesota Rules 4415.0020 subp. 3.

As a peaking service project, the Facility will operate primarily during periods when electrical demand is highest. These periods are typically the hottest days of summer and the coldest days of winter. The total number of hours a peaking facility typically operates is small: 150 to 800 hours per year. However, unlike a baseload generating facility, a peaking facility must be available to start and ramp quickly with limited advanced notice. A facility designed for peaking service reduces the need to operate base load generating facilities under fluctuating loads when they would be less efficient.

The proposed Facility is described in greater detail In Section 2.0.

1.3 REGULATORY PROCESS

The Power Plant Siting Act (Minnesota Statues 116C.51-116C.697) requires that persons proposing to construct a LEPGP or high voltage transmission line obtain approval from the Minnesota Environmental Quality Board ("EQB") for a specific site for the plant or specific route for the transmission line. The rules adopted by the EQB are found at Minnesota Rules, Chapter 4400 and are intended to locate large electric generating facilities in an orderly manner while minimizing adverse human and environmental impacts.

1.3.1 Alternative Review

The proposed Facility is eligible for review under the alternative permitting process because it is a large electric power generating plant that is fueled by natural gas (Minnesota Rules 4400.2000,

Subp.1.B). Invenergy Cannon Falls notified the EQB in writing on August 5, 2004 of its intent to submit a site permit application for review under the alternative permitting process as provided for in the Minnesota Rules.

Under the alternative permitting process, a shorter environmental assessment is required instead of an environmental impact statement, the applicant is not required to propose alternative sites, a more informal hearing is required instead of a contested case hearing, and a final decision must be made by the EQB within six months of receiving a complete application as compared to 12 months under the full permitting process (Minnesota Statutes 116C.575 and Minnesota Rules *Chapter 4400*).

1.3.2 Site Permit Application Requirements

As required under Minnesota Rules 4400.1150, the site permit application for the Facility includes information on the following (see Table 1-1):

- Ownership of the plant;
- Name of company that will hold site permit;
- Current ownership of the proposed site;
- Alternative sites considered and rejected;
- Description of the plant and associated equipment;
- Engineering and operational design;
- Cost of construction and operation;
- Potential for site expansion and increased generating capacity;
- Transportation, pipeline, and electrical transmission systems required for construction and operation of the plant;
- Federal, state, and local permits required for the Project;
- Environmental setting of the proposed site;
- Effects on public health and safety, displacement, noise, aesthetics, socioeconomic conditions, cultural values, recreation, and public services;
- Effects on agriculture, forestry, tourism, and mining;

- Effects on archaeological and historic resources;
- Effects on air and water quality resources and flora and fauna;
- Effects on rare and unique natural resources; and
- Mitigation of potential human and environmental impacts.

1.3.3 Environmental Assessment

For LEPGPs that are to be reviewed under the alternative review process, the EQB will prepare an environmental assessment of the potential human and environmental impacts associated with the proposed Project and methods of mitigating those impacts. Under the alternative review process, an environmental assessment worksheet or environmental impact statement is not required.

As part of the scoping process for the environmental assessment, the EQB will hold a public meeting at which any person may propose alternative sites or suggest specific human or environmental impacts that should be addressed in the environmental assessment. From the day of the public meeting, the public will have at least seven days to submit comments regarding the scope of the environmental assessment. A suggested alternative site will be included in the scope of the environmental assessment only if the chair of the EQB determines that evaluating the proposed site will aid the EQB in making a final decision on the site permit application.

After the chair determines the scope of the environmental assessment, the EQB will complete the environmental assessment. The content of the environmental assessment is described in Minnesota Rules 4400.2750, Subpart 4. Once completed, a public hearing, conducted by EQB staff, will be held. The EQB will issue a final decision on the site permit within six months of the time the application is determined by the chair to be complete, although, the EQB may extend this time limit for up to three months for just cause or upon agreement of the applicant.

1.3.4 Certificate of Need

NSP will purchase all of the electricity generated by the Cannon Falls Energy Center according to terms negotiated under the PPA. The PUC has ruled that electricity sold under these terms is not subject to Certificate of Need filing requirements (Order Granting Exemption from Filing

Requirements and Limiting Scope, *In the matter of the Application of Calpine Corporation for a Certificate of Need for a Large Electric Generating Facility,* MPUC Docket No. IP-6345/CN-03-1884, Order dated February 6, 2004). Invenergy Cannon Falls, therefore, will not be required to file for a Certificate of Need from the PUC for the Facility under Minnesota Statutes 216B.243; 216B.2422, subd.5(c).

2.0 PROJECT DESCRIPTION

2.1 OWNERSHIP

The proposed Facility will be constructed, owned, and operated by Invenergy Cannon Falls LLC.

The following person should be contacted regarding any information presented in this application:

Joel Schroeder, Project Manager
Invenergy LLC
233 South Wacker Drive, Suite 9450
Chicago, Illinois 60606
(312) 707-9044
Fax: (312) 707-9045

2.2 PERMITTEE

Invenergy Cannon Falls LLC will be the permittee. Invenergy LLC, Invenergy Cannon Falls LLC's parent company, headquartered in Chicago, Illinois is a developer, owner and operator of power generation and energy delivery assets.

2.3 SIZE AND TYPE

Invenergy Cannon Falls proposes to construct two General Electric 7FA combustion turbine generators ("CTGs"), each with a nominal capacity of 175 MW. The two simple cycle gas-fired CTGs and associated auxiliary equipment will be operated for peak electric service. The CTGs will be equipped with dry low. NO_x combustors to limit the concentration of NO_x exiting each

CTG emission stack. Distillate fuel oil with a sulfur content not in excess of 0.05 percent by weight will be used as a backup fuel.

Associated equipment will include the following:

- One 750,000-gallon distillate fuel oil aboveground storage tank;
- Two combustion turbine generator trains;
- One natural gas conditioning system; and
- One fire protection system including diesel fire pump.

Natural gas will be supplied to the Facility through a new connection to a NNG interstate pipeline. NNG will construct an approximately 12-mile natural gas pipeline connecting to the existing 30-inch interstate pipeline that runs south to north through Farmington, Minnesota approximately 12 miles northwest of the Project site. NNG will own and operate the pipeline and will apply for and obtain all necessary permits and approvals. Since NNG is a FERC-regulated interstate pipeline, NNG will not be required to file a separate application from the EQB for a pipeline route permit.

The electrical output of the Facility will tie into either GRE or NSP transmission systems. The tie-in will be to either a 115 kV or 161 kV transmission line depending on the results of an interconnection study being performed by the MISO. See Section 3.3 for more information on the electric transmission tie-in.

2.4 SITE LOCATION

The proposed Facility will be located on a site of approximately 55 acres in the Business Park North area in Cannon Falls, Minnesota in Goodhue County. Figures 1 and 2 show the Project site boundaries, which are located approximately 600 feet west of Cannon Industrial Boulevard, 850 feet north of Holiday Avenue, and approximately 300 feet northwest of County Highway 29. The site shares its western boundary with the boundary separating Goodhue County and Dakota County. The property is located within Township 112 North, Range 17 West, in the northwestern ¼ of Section 6.

The City of Cannon Falls has zoned the Business Park North district I-1R for restricted light industry uses (see Figure 3 for a map of the City of Cannon Falls' zoning districts.). Several commercial/industrial facilities are located adjacent to the Project site's southern boundary, including a hunting products manufacturer, a fertilizer supplier, and a costume manufacturer and wholesaler. At the southwest corner of the project site is Newscapes Landscape Supply. To the east along Cannon Industrial Boulevard are several small industrial sites. The closest residential dwelling is located approximately 1,400 feet southwest of the proposed location of the power generating equipment within the Project site boundaries. The nearest residential subdivision lies approximately one-mile to the southeast.

2.5 PROPERTY OWNER

Invenergy Cannon Falls has an option to purchase the property on which the Facility will be located from Mr. Lance Crombie of Northfield, Minnesota. Invenergy Cannon Falls will exercise the purchase option once the Project is issued all necessary permits and approvals for construction and operation.

2.6 ALTERNATIVE SITES CONSIDERED AND REJECTED

As mentioned in Section 1.1, Invenergy Cannon Falls responded to an RFP issued by Xcel to supply 357 MW in peaking capacity. Prior to submitting its proposal to Xcel, Invenergy Cannon Falls screened potential sites for the Project based on several criteria. Since the proposed Cannon Falls Energy Center qualifies for the alternative permitting process, Invenergy Cannon Falls is not required to propose alternative sites. However, Invenergy Cannon Falls considered at least 5 alternatives to the proposed site.

Potential alternatives sites were screened on the following screening criteria:

- Sufficient land available to construct and operate a generating facility of this size;
- Distance to and availability of infrastructure (gas, water, electric transmission);
- Avoidance of environmentally sensitive areas;
- Compatibility with surrounding land uses and existing zoning; and
- Community acceptance and support.

The All Source RFP included a map of existing electrical substations and their potential to handle additional power. Invenergy Cannon Falls targeted the most favorable substations for interconnection then contacted state and local economic development officials to identify suitable areas around these substations for development of the Facility. Areas within or around Chisago County, Wayne County, Kohlman Lake, Red Rock, Gleason, Parker Lake, and the Cannon Falls area were considered. The Cannon Falls area was the only area evaluated that met all of the screening criteria.

2.7 ENGINEERING AND OPERATIONAL DESIGN

Invenergy Cannon Falls proposes to construct two General Electric 7FA CTGs, each with a nominal capacity of 175 MW. The two simple cycle duel fuel CTGs and associated auxiliary equipment will be operated for peak electrical service. The CTGs will be equipped with dry low NO_x combustors to control the concentration of NO_x exiting each of two CTG emission stacks while operating on natural gas. Distillate fuel oil with a sulfur content not in excess of 0.05 percent by weight will be available as a backup fuel supply. Combustor water injection will be used to control the formation of NO_x when combusting fuel oil. Figure 4 shows a Project site layout of the proposed CTGs and auxiliary equipment. Figure 5 shows a project layout aerial overlay of the site.

Associated equipment will include the following:

- One 750,000-gallon distillate fuel oil aboveground storage tank;
- Two combustion turbine generator trains;
- One natural gas conditioning system; and
- One fire protection system including diesel fire pump.

2.7.1 Combustion Turbine Generators

The 7FA CTG has a maximum firing capacity of approximately 2,000 MMBtu/hr (higher heating value or HHV) at low temperature ambient conditions. When firing distillate fuel oil, the CTG has a maximum firing capacity of 2,100 MMBtu/hr (HHV) at low temperature ambient

conditions. The exhaust gas from each CTG will be directed to a 75-foot high exhaust stack. Figure 6 shows a process flow diagram for a simple cycle combustion turbine.

Steam injection may also be used to provide power augmentation for the CTG. When high ambient temperatures result in the greatest peak demands, a simple cycle combustion turbine may suffer power output losses of 15 to 20 percent. The lower inlet air density at high ambient temperatures reduces mass flow through the combustion turbine and thereby reduces power production capability. Injecting steam into the combustor increases the total mass through the combustion turbine, thus increasing the maximum power production capability. If power augmentation capability is installed, a small heat recovery steam generator to produce steam for power augmentation will be installed in the combustion turbine exhaust system to capture waste heat, which would otherwise be exhausted up the stack.

2.7.2 Natural Gas Conditioning System

The Facility will use a proposed 9 MMBtu/hour natural gas-fired water bath gas heater to preheat the natural gas before it enters the combustion chamber. The natural gas is preheated prior to combustion as the equipment manufacturer requires a minimum level of superheat (degrees above the natural gas dewpoint temperature) which is not met by the natural gas delivered by NNG. The heater will operate only when a combustion turbine is operating on natural gas.

2.7.3 Fire Protection System

The Facility will be equipped with one centrifugal electric pump, one jockey pump, and one back-up diesel-fueled fire water pump if it is determined that the City of Cannon Falls' water supply system will not have the capacity to provide adequate flow and pressure to the Facility's underground fire water header. The header will supply water to yard hydrants and installed sprinkler deluge systems. If required, a jockey pump will maintain water pressure in the fire water distribution header.

A 290-horsepower diesel-fired emergency fire water pump will operate the plant's fire equipment in emergencies when the electric fire water pump cannot operate. However, the diesel fire water pump will be operated (typically only a few hours) on a monthly basis to maintain the

integrity and operational readiness of the equipment. Invenergy Cannon Falls expects to operate the water pump under non-emergency conditions less than 100 hours per year. Small amounts of air pollutants will be released when the diesel fire water pump's diesel engine, which is equipped with an exhaust stack, burns diesel fuel.

If, after review, it is determined that the City of Cannon Falls' water system cannot reliably provide adequate water flows for fire protection, a water tank will be constructed on site with a dedicated fire water capacity sufficient to meet applicable state and local fire codes.

2.7.4 Small Diesel Fuel Storage Tanks

The Facility will store diesel fuel for the emergency fire water pump and the emergency generator in aboveground storage tanks with secondary containment. These tanks will have a storage capacity of less than 1,000 gallons. Due to the low volatility of the diesel fuel, potential volatile organic compound (VOC) emissions are expected to be negligible.

2.7.5 Primary Fuel Supply: Natural Gas

The Facility will burn natural gas in the CTGs and low sulfur distillate fuel oil as a backup. Natural gas will be transported from a NNG interstate pipeline that runs south to north through Farmington, Minnesota approximately 12 miles northwest of the Project site (Figure 7). NNG will construct and operate the 12-mile pipeline lateral that will interconnect the Facility to the NNG interstate pipeline. NNG will construct, own, and operate the pipeline lateral and will apply for and obtain all necessary permits and approvals.

The pipeline lateral will be designed to deliver up to 95 million cubic feet (MMcf) of natural gas per day at a nominal operating pressure of 500 to 900 pounds per square inch gauge (psig). Each CTG is expected to combust approximately 1.74 MMcf of natural gas per hour.

2.7.6 Backup Fuel Supply: Low Sulfur Distillate Fuel Oil

The CTGs will combust low sulfur distillate fuel oil as a backup fuel supply. Invenergy Cannon Falls proposes to install a 750,000-gallon fixed roof aboveground storage tank to store low sulfur distillate fuel oil. Due to the low vapor pressure of the fuel oil [0.03 pounds per square inch absolute (psia)], potential fugitive VOC emissions will be negligible.

The fuel oil storage tank will be of the "tank-within-a-tank" design. The design uses a ring wall foundation for tank support. The outer tank will provide secondary containment greater than the capacity of the inner tank. Secondary containment provided by the annular space will, in the event of a break in the inner tank wall, prevent any contamination from reaching the surrounding environment. The annular space between the inner and outer tank walls will be equipped with sensors to alert plant personnel in the event of a breach of the inner tank wall. The tank will be filled by tanker truck from one of two truck unloading stations. Fuel oil from the storage tanks will be pumped to the combustion turbines as needed. The unloading area will have a containment capacity greater than 110% of the capacity of a tanker truck to safely contain any oil spills from the delivery tanker trucks.

To minimize rainwater or snowmelt in the containment area, Invenergy Cannon Falls will construct a canopy over the unloading facilities. Any rainwater or snowmelt falling within the unloading area will be routed to the Facility's oil-water separator (OWS) before being discharged to the city sewer system. Invenergy Cannon Falls will comply with all applicable state and federal requirements governing aboveground storage and spill control.

Low sulfur fuel oil is available from a supply terminal operated by Flint Hills Resources in Hastings, Minnesota. Flint Hills can supply low-sulfur fuel oil to generating plants. This or other fuel suppliers will transport fuel to the Facility using their own fleets or independent tanker lines. Tanker truck access to the site will be from either State Highway 20 or County Highway 29 to a new or improved site access road to be developed as part of the Project.

2.7.7 Service Water System

The operation of the Facility will require service water for general maintenance activities such as washing equipment and Facility areas, demineralized water for compressor washing and combustion injection, and potable water for domestic use and eye wash stations. Process water requirements will be limited to the water needed for steam injection for power augmentation, water injection while combusting fuel oil, and evaporative inlet cooling. Figure 8 shows a water usage flow diagram for the Facility.

The City of Cannon Falls will provide water to the Facility from its existing water system. A water line will be extended approximately 1,200 feet from the existing 12-inch water line located near Holiday Avenue. When the CTGs are operating at full load on natural gas, the Facility will require less than 90,000 gallons per day for the operation of the evaporative coolers and domestic uses. The Facility will require, at maximum output, 720,000 gallons of water per day when operating and when injecting steam for power augmentation or injecting water to control NO_x when operating on fuel oil. Additionally, when the Facility is operating on natural gas and at part load, it will require water only for domestic purposes. For domestic uses only, the plant will require less than 3,000 gallons per day. As a peaking unit, much of the Facility's operation is expected to be at part load while following the system electrical demand.

2.7.8 Demineralization System

Steam injection for power augmentation and water injection for NO_x control while combusting fuel oil require the use of demineralized (demin) water. To produce this demin water, Invenergy Cannon Falls will contract with a water treatment company to supply mobile demin trailers. Water received from the City of Cannon Falls will be piped into the demin trailers where it will be treated further with an ion-exchange process prior to using it for power augmentation, water injection, and compressor water wash activities. After a trailer's capacity to produce demin water is exhausted, the water treatment company will return the trailer to an offsite facility for regeneration of the resin. Having the resin regenerated offsite allows Invenergy Cannon Falls to avoid onsite use and storage of resin regeneration chemicals.

2.7.9 Demineralized Water Storage Tanks

A demin water storage tank will be constructed onsite to provide demin water for Facility operations during periods when the mobile demin trailers are being regenerated. This storage tank will have a capacity of approximately 750,000 gallons of demin water, enough to supply the Facility for approximately 24 hours at full load operation with either steam injection or water injection.

2.7.10 Chemical Use

As a simple cycle generating facility, the Cannon Falls Energy Center will use and store on site only a small number of chemicals. Table 2-1 lists the chemicals a simple cycle generating

facility typically uses. The chemicals include mineral oil and sulfur hexafluoride for insulating transformers and switchyard equipment, lubrication oil for lubricating CTG bearings, diesel fuel for operating the fire water pump, and various liquid detergents for washing the CTGs.

All chemical storage areas will have appropriate secondary containment (i.e., concrete floors, concrete curbing, etc.). Areas that have the potential for oil or lubrication spills will also be protected by containment structures (i.e., concrete floors, concrete curbing, etc.). Lockable drain valves will be used where appropriate. Where present, floor drains will be directed to an oil/water separator, holding tanks or chemical collection/treatment facilities.

Table 2-1
Chemicals Typically Used at a Simple Cycle Natural Gas-Fired Generating Facility

Chemical	Use	Quantity Stored Onsite	Form/Type
Mineral insulating oil	Transformer systems	25,000 gallons	Insulating Fluid
Sulfur hexafluoride (SF6)	Switchyard breaker electrical insulating gas	300 pounds	Insulating Gas
Lubrication oil	CTG auxiliary systems	15,000 gallons	CTG bearing lubricating oil
Distillate fuel oil/diesel fuel	Backup fuel for combustion turbine and for backup fire pump	750,000 gallons	Diesel Fuel
Various detergents	Combustion turbine off-line wash	200 gallons	Liquid
Carbon dioxide	CTG generator purge system and fire protection	6,000 pounds	Compressed gas
Hydrogen	CTG generator cooling	6,000 pounds	Compressed gas

2.7.11 Wastewater Collection/Treatment Systems

Wastewater generated by the Facility will be discharged to the City of Cannon Falls' sanitary sewer and then treated by the City's treatment plant. Water collected in the fuel oil containment area will be collected in a sump and sent to the oil water separator prior to discharge to the sanitary sewer. Rain water collected in transformer and equipment containment basins where oil

contamination is unlikely will be pumped to the oil water separator prior to discharge to the sanitary sewer or will be administratively controlled and discharged to the ground. Administratively controlling the discharge of collected rain water requires an operator to inspect the collected rain water for an oil sheen prior to opening a valve to discharge collected rainwater to the ground. Most of the Facility's sewer discharge will be sanitary waste, blowdown from the evaporative cooler, and rainwater collected from containment basins.

The Cannon Falls Waterworks Facility treats approximately 500,000 gallons of wastewater per day and has the capacity to treat 1 million gallons per day, which is sufficient for handling the volume and composition of wastewater generated by the Facility.

2.7.12 Other (Ancillary) Structures/Buildings

The Facility will have ancillary equipment and structures required for safe and reliable operation of the plant.

2.7.12.1 Plant Buildings

The Facility will have an administration control building that will house operation, warehousing, maintenance, and management functions. The building will likely be a pre-engineered structure supported on reinforced concrete foundations and with approximately 6,000 square feet of floor space. Approximately 10 parking stalls for employees and visitors will be located next to the building.

A Mechanical/Electrical ("M/E") building will be constructed to house the balance of plant ("BOP") equipment. The M/E building will provide weather protection for the BOP control system, motor control centers, fire pump equipment, water pumps, and air compressors. The building will have approximately 2,100 square feet of floor space.

A generation building to be located around the CTGs is being considered to provide an appearance more closely resembling a manufacturing facility than a combustion turbine plant. The building would provide additional shelter from the elements for the equipment and operation and maintenance crews, but is not necessary for the safe and reliable operation of the Facility. If

installed, the generation building would enclose the generator, the combustion turbine, and some auxiliary equipment.

2.7.13 Transformers

Each CTG will be connected to a step-up transformer. The CTG will generate electricity at 18 kiloVolts ("kV"), and the step-up transformer will increase the voltage to the transmission voltage, 115 kV or 161 kV depending on the outcome of MISO's interconnection study. The output of the step up transformers will be connected to the Facility's 115 kV or 161 kV collector bus.

An auxiliary ("aux") transformer will be connected to the collector bus to provide auxiliary power to the Facility. The aux transformer will convert the 115 kV or 161 kV of electricity to 4.16 kV, which will power the Facility's auxiliary equipment.

2.7.14 Switchyard

Each transformer will be equipped with a breaker on the high side (115 or 161 kV) of the transformer. The high side breaker will control the connection of each transformer to the collector bus. The collector bus will aggregate the output of the two CTGs for delivery to the transmission system. The collector bus will terminate with an A-frame type dead end structure. The interconnection provider's interconnection facilities will connect to the dead end structure.

The collector bus, circuit breakers, disconnect switches, and relay and metering equipment will be installed in the Facility's switchyard. The Facility's switchyard will be a fenced area approximately 125 feet wide by 250 feet long.

2.7.15 Transmission

The electrical output of the Facility will tie into either NSP 115 kV transmission system or GRE 161 kV transmission systems depending on the results of an interconnection study currently being conducted by the MISO. See Section 3.3 for more information on the electric transmission tie-in.

2.8 COST ESTIMATE AND DESIGN LIFE

Design and construction costs for the Cannon Falls Energy Center are estimated to be between $90 million and $110 million. This cost estimate includes engineering, procurement of equipment, site preparation, building construction, equipment installation, plant start-up and testing, and other costs associated with development and construction of the Facility. The Facility is expected to have a useful life of at least 30 years.

2.9 FUTURE SITE EXPANSION AND GENERATING CAPACITY POSSIBILITIES

Invenergy Cannon Falls has no current plans for expansion of the Facility.

3.0 INFRASTRUCTURE NEEDS AND CONNECTIONS

3.1 TRANSPORTATION

The Business Park North area is served by State Highway 20 and County Highway 29. New or at least improved road access to the Facility will likely be required before construction can begin. A new access road would likely connect the southwestern portion of the site with Holiday Avenue. A secondary access road for occasional use, or possibly emergency use, may be built to allow access to and from Cannon Industrial Boulevard, east of the site.

3.2 GAS PIPELINE

To supply natural gas to the Facility, the NNG will construct a pipeline lateral connecting the Facility to an existing NNG interstate pipeline. The pipeline lateral will originate at the existing 30-inch NNG mainline near Farmington, Minnesota and extend approximately 12 miles southwest to the Facility. NNG will construct a meter station on the Facility's property to measure the amount of natural gas delivered to the Facility.

3.3 ELECTRIC INTERCONNECTION

Invenergy Cannon Falls has submitted an interconnection request to the MISO for the Facility. The MISO is studying how the project interconnection will impact the existing transmission system.

An existing 161 kV transmission line runs along the western boundary of the Project site. This line, the Spring Creek – Cannon Falls line, is owned by GRE. The line runs approximately 2 miles southwest of the Project site to the NSP Cannon Falls Substation. The Project will interconnect to the transmission system with one of two configurations. The two configurations are described as follows:

- Configuration 1 – The 161 kV Spring Creek – Cannon Falls line would be reconfigured to loop into a switching station that GRE would build at the Project site. The existing line will be broken and connected to the new switching station built at the Project site. The switching station would contain the needed breakers and isolation to interconnect the Project to the transmission system. With this option, a new transmission line between the Facility and the Cannon Falls substation would not likely be needed; however reconductoring a portion of the existing 161 kV line and upgrading the Cannon Falls substation may be necessary.

- Configuration 2 – A 115 kV transmission line would be constructed parallel to the existing Spring Creek – Cannon Falls line and travel parallel to the existing line southwest into the Cannon Falls Substation where it would interconnect to the 115 kV bus in the substation (Figure 9). Further analysis will determine whether the existing right-of-way will be wide enough to accommodate the new transmission line. Modifications to the Cannon Falls Substation will likely be required to interconnect the new 115 kV transmission line into NSP's transmission system.

Either NSP or GRE would construct the interconnection facilities and obtain the necessary approvals and permits. MISO, NSP, and Invenergy Cannon Falls will select the optimal configuration once the MISO completes the interconnection study.

3.4 WATER AND SEWER

The City of Cannon Falls draws its municipal water supply from wells in the Prairie du-Chien bedrock aquifers. The city's water system includes a 12-inch diameter supply line that runs along Holiday Avenue approximately 1,000 feet south of the Project site's southern boundary. Water

lines also extend north along Cannon Industrial Boulevard, approximately 900 feet due east of the site (Figure 10). A lateral service line connection to the city's water lines will be constructed to supply potable water to the Facility. With the capacity to supply 4.3 million gallons per day of water and current water usage averaging approximately 600,000 gallons per day, the City is expected to have adequate capacity to meet the Facility's water supply needs.

An existing 8-inch sanitary sewer line also runs in the same right-of-way as the water line that would serve the Project site (Figure 10). A lateral service line connection with capacity to handle discharges from the Facility will be constructed. The City of Cannon Falls wastewater treatment plant (WWTP), which operates under NPDES Permit MN0022993, is located approximately two miles southeast of the proposed Project site and has sufficient capacity to treat wastewater flow from the Facility. All discharges will be authorized by the City of Cannon Falls and subject to any appropriate discharge limits and monitoring requirements.

Invenergy Cannon Falls will negotiate an interconnection agreement or service contract with the City of Cannon Falls. The water and sewer connections shall be constructed and paid for in accordance with this agreement or contract.

3.5 OTHER UTILITIES

Invenergy Cannon Falls will contact local utility companies to discuss installation of service connections for telephone, gas (for space heating), and electricity. Where possible, any new construction will follow existing easements to help reduce costs and minimize local impacts.

4.0 EFFECTS ON HUMAN ENVIRONMENT

Invenergy Cannon Falls selected the proposed site for the Facility with the objective of minimizing effects on the surrounding community. This includes avoiding displacement of residents or businesses, preventing or mitigating noise effects, and eliminating impacts on recreation areas, and cultural values or archaeological historical sites. Potential alternative sites were screened on the following screening criteria:

- Sufficient land available to construct and operate a generating facility of this size;
- Distance to and availability of infrastructure (gas, water, electric, transmission);
- Avoidance of environmentally sensitive areas;
- Compatibility with surrounding land uses and existing zoning; and
- Community acceptance and support.

4.1 ENVIRONMENTAL SETTING

The Cannon Falls site is approximately 55 acres in size and is zoned for restricted light industry uses. The site is currently used as farmland. Several commercial/industrial facilities are located along Holiday Avenue and Cannon Industrial Boulevard, including an environmental services company, a hunting products manufacturer, a fertilizer supplier, and a costume manufacturer and wholesaler. The Spring Creek – Cannon Falls transmission line runs along the western boundary of the site as shown in the lower left photo in Figure 11. The site also contains four previously excavated depression areas, two of which are shown in the upper left and upper right photos of Figure 11. Among the commercial/industrial buildings near the site are the Clean Harbors facility (bottom center photo in Figure 11) and Midwest of Cannon Falls (lower right photo).

4.1.1 Geology and Soils

The area on which the Project site is located is shown on the Cannon Falls, Minnesota Quadrangle 7.5-minute topographic map published by the United States Geological Survey. The elevation of the site is approximately 870 feet mean sea level (msl). The closest surface water body is Pine Creek, an intermittent stream northeast of the property. The Cannon River is located approximately one mile south of the Project site.

The United State Department of Agriculture Soil Conservation Service published a soil survey for Goodhue County in 1976. In the survey, the soil underlying the Project site is mapped as Biscay loam, Dickinson sandy loam (0-2% slope and 2-6% slope), Fairhaven silt loam (0-3% slopes), and Waukegan silt loam (0-3% slopes). Figure 12 shows the soil types present at the site.

Local well boring logs indicate that the uppermost bedrock beneath the Project site is located at approximately ten feet below grade. The top bedrock layer consists of Prairie du Chien Group and the St. Peter Sandstone. The Prairie du Chien consists of dolostone formations with a few thin sandstone beds and sandstone at the base of the formation. The Prairie du Chien has a thickness of approximately 260 feet. The St. Peter Sandstone consists of medium to fine-grained massive well-sorted quartz sandstone. A thin clay layer at the base retards vertical water movement.

The area within the Project site is relatively flat and covers approximately 55 acres. Four small depression areas are present on the site. Depression Area 1 is located in the west central portion of the site and drops approximately 3 feet in elevation. Scrub vegetation is present in this area. The second depression (Area 2) is in the northwest corner of the site and is filled with heavy brush and trees. The third depression (Area 3) is located in the south central portion of the site and has sparse vegetation. Depression Area 4 is located approximately 1,500 ft due south of Area 1. Figure 13 shows the location of the four depression areas and also identifies the commercial facilities, residences, and other structures located near the Project site.

4.1.2 Subsurface Investigation

A geotechnical evaluation of a portion of the Project site was conducted in November 2000. The purpose of the evaluation was to report the soil and groundwater conditions in the subsurface and to recommend methods of foundation and earthwork design and construction for a proposed new building for the site. Only the findings that relate to the soil and groundwater conditions are discussed in this site permit application.

The subsurface evaluation was based on eight soil borings drilled on a portion of the southwest corner of the Project site. Representative soil samples recovered from the soil borings were submitted to a laboratory for analysis, testing, and classification by a geotechnical engineer.

At the time of the subsurface sampling, the site was a harvested cornfield. The surface elevations were relatively level, ranging from 868 feet to 870 feet msl. The geological history of the soils

sampled in the borings were in deposition as outwash during the latter stages of the Wisconsinan glacial period.

In each of the soil borings, a surficial layer of topsoil about 1.5 feet thick was present. Each layer consisted of dark brown clayey silt with organics and roots. Underlying the topsoil was a layer of firm to stiff brown silty clay to clayey silt. This layer extended to a depth of approximately 3 feet. Underlying the clayey silt were granular soils consisting of brown fine to medium sand, sand with gravel, and silty sand extending to the termination depth of the borings. The n-values in the sand ranged from about 10 to 33.* Groundwater was present at depths of 14 feet in each of the deeper borings.

4.1.3 Potential Environmental Conditions

A Phase I Environmental Site Assessment ("ESA") was performed to evaluate whether hazardous substances or petroleum products are or were used on or near the Project site and whether their use may have resulted in significant environmental impacts, also known as recognized environmental conditions ("RECs"). The ESA was conducted in conformance with the scope and limitations of American Society for Testing and Materials ("ASTM") Practice E 1527.

The Phase I assessment found no evidence of RECs within the boundaries of the Project site. One site near the Project site was considered a historical REC. The property located at 211 Holiday Avenue was listed in the RCRA and State Spills databases under the name of Clean Harbors Environmental Services Inc. The Clean Harbors facility is located less than one half-mile southeast of the Project site. The spills listing indicated that two reportable spills had occurred at the facility. On October 6, 2003, contaminated soil near barrels and containers was discovered. The spill file was closed on October 6, 2003. The second spill, occurring on April 8, 2004, involved a 9-ounce PCB spill on a paved surface. The spill file for the second incident was closed April 9, 2004. No violations were reported. The Clean Harbors facility is also listed in the

* The n-value characterizes the relation between the percentage of water in a soil and the percentages of inorganic clay and humus in the soil. The n value is helpful in predicting whether a soil can be grazed by livestock or can support other loads.

RCRA database as a ten-day hazardous waste storage facility. Because of the listings of the facility in both the RCRA and State Spills databases and its proximity to the Project site, the Phase I ESA considered the facility a historical REC.

4.2 DISPLACEMENT

The Project site is zoned for restricted light industry land use. Some residential dwellings are located within the zoning boundaries. The closest residential dwelling is located approximately 1,400 feet southwest of the proposed Facility and associated equipment.

Neither the construction nor operation of the Cannon Falls Energy Center will require the physical displacement of any residence or business. No existing or planned adjacent properties or land uses should be adversely affected by the Project.

4.3 NOISE

Operation of the Facility is expected to comply fully with noise standards established by the State of Minnesota.

Construction and operation of the Facility would add new noise sources in and around the Project site and could affect existing noise levels. During construction, operation of large diesel- and gasoline-powered construction equipment (e.g., backhoes, dozers, delivery trucks, generators, and compressors) would cause noticeable but temporary increases in ambient noise levels. During typical operation of the plant, air flow through the combustion air intakes and exhaust gases discharging from the stacks would be the primary sources of noise. Secondary sources of noise would include low-frequency noise from transformers and noise from auxiliary pumps and ventilation and cooling equipment.

The City of Cannon Falls has no local ordinance regulating noise levels from land activities. However, standards established by the State of Minnesota (Minnesota Rules 7030.0040) limit increases in sound levels resulting from new land uses. These standards are grouped by Noise Area Classification (NAC), as listed in Minnesota Rule 7030.0050. The most stringent standard applies to land use classifications (NAC 1) that include the most sensitive noise receptors:

households, medical service providers, cultural and recreational activities, etc. The least stringent standard applies to land uses (NAC 3) that would include the proposed Facility and other industrial activities such as manufacturing, transportation, and agriculture. Table 4-1 lists noise standards by NAC. Note that because noise emissions from the proposed Facility would generally be steady state (non-fluctuating), the predicted L_{10} and L_{50} sound levels would be equivalent to each other. Therefore, the L_{50} represents a more restrictive performance standard.

Noise area classifications apply at the location of the noise receptor, not at the property boundary of the noise source. Further, the noise rules require that a municipality with authority to regulate land use prevent new land uses defined in the NAC categories from being established where the noise standards shown in Table 4-1 would be exceeded if the new land use is permitted.

Table 4-1
Minnesota Noise Standards by Noise Area Classification
Cannon Falls Energy Center

Receptor Noise Area Classification	Daytime dBA		Nighttime dBA	
	L_{50}	L_{10}	L_{50}	L_{10}
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Noise limits are in decibels on the A scale, abbreviated dBA.
L_{50} is the sound level exceeded for 50% of the time and is considered the "average" sound level.
L_{10} is the sound level exceeded for 10% of the time
Daytime: 7 am – 10 pm
Nightime: 10 pm – 7 am

4.3.1 Existing Noise Environment

The Facility will be located in an area zoned for restricted light industry land use. Most of the noise receptors in the immediate vicinity of the Project site would be classified as either NAC 2 or 3. As shown in Figure 14, the nearest sensitive noise receptor is a residence located approximately 1,400 feet southwest of the proposed Facility. Additional residential properties lie to the southeast of the site, near State Highway 20, as identified in Table 4-2 and shown in Figure 14.

4.3.2 Noise Modeling

Noise levels from the proposed Project were predicted to evaluate whether the new plant would affect noise levels at nearby residences or NAC 1 receptor. The noise modeling is presented in a

Table 4-2
Nearest Sensitive Noise Receptors
Cannon Falls Energy Center

Position	Description	Distance to Facility*
Residence 1	Near intersection of County Highway 29 and Holiday Avenue	1,400 ft
Residence 2	West Side of State Highway 20	2,000 ft
Residence 3	Intersection of Holiday Avenue and Cannon Industrial Boulevard	1,600 ft
Residence 4	Southeast Side of State Highway 20	2,200 ft
Residence 5	Southeast Side of State Highway 20	2,100 ft

*Distance from the nearest noise-sensitive receptor to the location of the noise producing equipment on the Project site

noise level evaluation study for the Facility. The study is included in a report contained in Appendix A.

A three-dimensional acoustical model was developed using SoundPlan® 6.2, based on site plan and general arrangement drawings to predict noise levels at off-site residential receptors. Sound power levels (PWL) for all major pieces of equipment were estimated using octave band data from manufacturers, in-house field data, and data from industry-standard prediction algorithms.

Equipment power levels were adjusted for the reduction of sound by distance (geometrical spreading); the molecular absorption of sound by air (air absorption); and the absorption and reflection of sound by the ground (ground effect). Sound power levels were further modified by the effects of shielding, (i.e., tank farms, buildings, equipment, etc.) and by changes in source levels with direction (directivity) to estimate off-site noise levels.

4.3.3 Noise Modeling Results

Project noise levels are expected to range from about 45 to 50 dBA at the nearest receivers given the proposed acoustical design of the Facility, as shown in Table 4-3. Although minor changes to

the general arrangement of the Facility may occur as the detailed design is finalized, significant changes in predicted noise levels are not expected.

Noise emissions at the nearest receptors are expected to range from 45 dBA to 50 dBA based on the proposed acoustical design of the plant. Therefore, Facility noise levels are expected to fully comply with limits established by the State of Minnesota, (60 dBA during daytime hours; 50 dBA during nighttime hours).

4.3.4 Noise From Facility Construction

The operation of large diesel- and gasoline-powered equipment will produce the most noticeable changes in ambient noise during the site-clearing and earthmoving phase of project construction. Noise levels generated by the large earth moving equipment during this phase could range from 75 to 95 dB(A) as measured near the equipment. Material handling equipment (concrete mixers and cranes, for example) could generate noise at levels as high as 85 dBA. Construction of an industrial facility such as a power plant is typically and unavoidably noisier than operation of the facility. However, the sources of construction noise are generally intermittent and short term, ceasing once the plant is built and fully tested.

Table 4-3
Predicted Facility Noise Levels (With Controls)
Cannon Falls Energy Center

Position	Description	Predicted Noise Level (L_{50} - dBA)	Distance to Project Equipment
Residence 1	Intersection of County Highway 29 and Holiday Avenue	47.4	600 ft
Residence 2	West Side of State Highway 20	44.6	1,500 ft
Residence 3	Intersection of Holiday Avenue and Cannon Industrial Boulevard	45.4	1,300 ft
Residence 4	Southeast Side of State Highway 20	48.3	1,900 ft
Residence 5	Southeast Side of State Highway 20	49.5	1,800 ft

4.3.5 Noise During Facility Operation

The primary sources of noise from a plant designed for operation in simple cycle mode are the air flow through the combustion air intakes and exhaust gases discharging from the stacks. Secondary sources of noise include low-frequency noise from transformers and noise from auxiliary pumps and ventilation and cooling equipment.

The specific type and amount of noise control needed to achieve compliance with the State of Minnesota noise control standards will be selected during the detailed design phase of the Facility. A successful mitigation program will likely consist of the following components:

- Combustion Turbine Exhaust Silencers;
- Combustion Turbine Air Intake Silencers; and
- Low-Noise Fuel Gas Metering Station.

4.4 AESTHETICS

The Facility site is located in the Business Park North district of the City of Cannon Falls at an approximate elevation of 870 feet msl. The surrounding area within a 3-mile radius ranges in elevation from 860 feet msl to approximately 950 feet msl. Local areas of higher topography in the vicinity of the Project site are found in the Richard J. Dorer Memorial Hardwood State Forest to the east.

The area immediately surrounding the Project site is characterized by light density industrial development. Views to the immediate south and east are dominated by several commercial and industrial facilities, with farm and commercial traffic visible on County Highway 29, Holiday Avenue, and Cannon Industrial Boulevard. Other features visible in the surrounding area include flat farmland to the north and west, with an electric transmission line running north to south. The proposed Facility's exhaust stacks will be the tallest structures on the site and will be visible from Highways 52, 29, and 20.

The Facility will be compatible with the visual character of the adjacent light industrial land use by maintaining a low profile, using consistent coloring on equipment and buildings, and maintaining a clean and neat site appearance.

Invenergy Cannon Falls will light the Project site in a manner similar to other industrial sites. For nighttime lighting the Facility will use full cutoff lighting, in which the light source is shielded and the light is directed downward and prevented from spreading horizontally. Invenergy Cannon Falls will determine the appropriate locations for lights during the project design phase.

4.5 SOCIOECONOMIC IMPACTS

Invenergy Cannon Falls expects that the proposed Facility will provide economic benefits for the City of Cannon Falls and Goodhue County. No adverse social or economic effects are anticipated. By employing a primarily local and regional workforce of approximately 150 workers for Facility construction, the Project should help stimulate the area's economy in the short-term construction period (approximately 12 months) and would also likely assist businesses through the procurement of construction materials from local suppliers. This, in turn, would likely generate sales and income tax revenue for the City of Cannon Falls and Goodhue County. See Tables 4-4 through 4-7 for estimates of peak construction employment by segment, salary by construction crew, operating staff, and statewide economic benefit.

Table 4-4
Quarterly Peak Employment By Segment During Construction*
Cannon Falls Energy Center

Period	Structural/ Civil Craft	Elec.	Mech	Misc. Craft	Const. Mgmt. and Support	Indirect Const. Labor	Oper Staff	Start-Up Labor	Total
Pre-Mobilization	0	0	0	0	0	0	0	0	0
2005 - 2nd Quarter	4	1	0	10	5	5	0	0	15
2005 - 3rd Quarter	39	44	51	10	10	20	0	0	174
2005 - 4th Quarter	13	47	84	0	10	20	4	10	198
2006 - 1st Quarter	0	19	28	0	10	7	4	10	78
2006 - 2nd Quarter	0	0	0	0	2	0	4	4	10
Peak Employment	39	47	84	10	10	20	4	10	

Based on Peak Daily Craft Count calculated on the basis of a five day per week, 8 hours per day for a May 2006 commercial operaton date. Actual craft count may be different.

Table 4-5
Total Estimated Salary by Construction Crew ($2004)
Cannon Falls Energy Center

Crew	Total
Site Work	$0.2 MM
Concrete Work	$2.0 MM
Arch & Metals	$0.8 MM
Piping	$1.8 MM
BOP/Mech. Equipment	$1.8 MM
Turbine Erection	$2.4 MM
Electrical/I&C	$4.3 MM
Insulation	$0.2 MM
Painting	$0.2 MM
Construction Management	$1.4 MM
Indirect Labor	$2.0 MM
Startup Labor	$0.5 MM
Total	**$17.6 MM**

Table 4-6
Estimated Operating Staff by Shift
Cannon Falls Energy Center

Personnel	Day Shift	2nd	3rd	Total
Plant/Site Manager	1	0	0	1
Operations/Maintenance	1	2	0	3
Clerk	1	0	0	1
Total	3	2	0	5

Table 4-7
Cumulative Economic Benefit (Statewide)
Cannon Falls Energy Center

	Million ($2004)
Construction	
Wages	$17.6 MM
Capital Investment	$82.4 MM
Subtotal Construction	$100 MM
Operation (20 years) NPV	
Wages	$2.5 MM
O&M	$7.5 MM
Subtotal Operation	$10 MM
Cumulative Impact	**$110 MM**

4.6 RECREATION

No public or private recreation areas are located in the immediate vicinity (within one mile) of the Project site. Nor are any recreation areas located within the 1-IR restricted light industrial zoning district in which the Project site is located. Several parks and outdoor recreation areas are located within 10 miles vicinity of the Project site, the most important of which are described in the following (see Figure 15).

The Cannon Valley Trail is a 19.7-mile long trail that runs from downtown Cannon Falls to Red Wing, Minnesota. The trail is open year round for bicycling, walking, and other wheeled recreational devices. The Project site is approximately 1.5 miles from the nearest point on the trail. Neither construction nor operation of the Facility is likely to affect use of the Cannon Valley Trail.

There are four parks within the downtown Cannon Falls area: East Side Park; Hannah's Bend Park; Minnieska Park; and Riverside Park. All of these parks are within one to two miles of the Project site. Two other parks within the vicinity of the proposed Project site are the Lake Byllesby Regional Park and the Goodhue County Park, both of which are located adjacent to Lake Byllesby. Neither construction nor operation of the Facility is expected to affect use of these parks.

4.7 PUBLIC SERVICES

Public services in the Cannon Falls area will be adequate for the construction and operation of the Facility. These services include transportation, water and sewer, waste collection and disposal and fire and police.

4.7.1 Transportation System

4.7.1.1 Surface Transportation

As mentioned in Section 3.1, the Business Park North district, including the Project site, is served by State Highway 20 and County Highway 29. New or at least improved access to the Facility site will probably be required before construction can begin. A new access road would

likely connect the southwestern portion of the site with Holiday Avenue. A secondary access road for occasional use, or possibly emergency use, may be built to allow access to Cannon Industrial Boulevard east of the site.

Major equipment items such as the combustion turbine, generator, and large transformers will be shipped to site by rail. Although the site is not currently served by rail, a rail siding is located approximately one mile south of the Project site. The equipment could be offloaded at this or other sidings in the region and transported to the site on special oversized load trailers. During operation, the Facility will not require rail service.

At this time, no other public transportation improvements will be required for construction or operation of the Facility.

4.7.1.2 Air Transportation

The nearest major airport is the Minneapolis-St Paul International Airport, approximately 35 miles north of the Project site. Other local- or regional-use airports include the Stanton Airfield, in Stanton, Minnesota approximately 4 miles southwest of the site and the Faribault Municipal Airport, located approximately 25 miles southwest of the site.

4.7.2 Water and Sewer Services

As mentioned in Section 3.4, the City of Cannon Falls is expected to have adequate capacity to supply water and sanitary sewer services to the Project site.

4.7.3 Waste Collection and Disposal

The Cannon Falls Energy Center will privately contract with local waste haulers for collection and disposal of all nonhazardous solid wastes generated at the facility. In the unlikely event that wastes generated during maintenance activities are determined to be hazardous as defined by the Resource Conservation and Recovery Act (RCRA), they will be managed in accordance with applicable requirements. Invenergy Cannon Falls should be categorized as a conditionally exempt small quantity generator (CESQG), as the quantity of hazardous waste generated by the Facility is not anticipated to exceed 200 pounds per month.

4.7.4 Fire and Police Protection

The City of Cannon Falls' police force consists of five full-time officers, assisted by 15 reserve members for crowd and traffic control.

The Cannon Falls Volunteer Fire Department provides emergency response for the city. Twenty-three local emergency medical technicians (EMT) staff the two city ambulances. The team, all EMT-certified through the state, answer almost 400 calls per year. A rescue squad consisting of specially trained firefighters also accompanies the EMTs on emergency calls involving vehicle accidents and major medical emergencies. Invenergy Cannon Falls will contact the fire, police and EMTs during construction to review the Facility and hazards and coordinate emergency responses specific to the Facility.

All of the city's emergency services can be reached by dialing 911.

5.0 EFFECTS ON PUBLIC HEALTH AND SAFETY

5.1 AIR EMISSION SOURCES

The Project will consist of two General Electric 7FA CTGs, each with a nominal capacity of 175 MW. The two simple cycle dual-fueled CTGs and associated auxiliary equipment will be operated for peaking service. Distillate fuel oil with a sulfur content not in excess of 0.05 percent by weight will be used as a backup fuel supply.

5.1.1 Air Pollutants Emitted

Invenergy Cannon Falls will apply for a construction permit from the Minnesota Pollution Control Agency ("MPCA") prior to construction of the Facility. The Project will potentially emit the following regulated air pollutants: nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM/PM_{10}), and volatile organic compounds (VOC) and hazardous air pollutants (HAP). The emission estimates are based on firing natural gas at an operating load of 100%, 4,292 hours of operation per year, and an ambient temperature of 45° F. Table 5-1 summarizes the potential air pollutant emissions for the proposed Project.

Table 5-1
Potential Air Pollutant Emissions
Cannon Falls Energy Center

Air Pollutant	Annual Emissions (tons/year)
Particulate Matter (PM/PM_{10})	75.7
Carbon Monoxide (CO)	138.8
Nitrogen Oxides (NO_x)	246.8
Sulfur Dioxide (SO_2)	59.9
Volatile Organic Material (VOC)	12.0

Table 5-2 summarizes the potential HAP emissions for the proposed Project.

5.1.2 Emission Control Measures

The CTGs will be equipped with dry low NO_x ("DLN") combustors to control the concentration of NO_x exiting each CTG emission stack. DLN combustor technology premixes air and a lean fuel mixture that significantly reduces peak flame temperature and thermal NO_x formation.

Distillate fuel oil is also proposed for use in the CTGs as a back-up fuel supply. This fuel will be limited to a sulfur content of 0.05% by weight or less. When operating on distillate fuel oil, the combustion turbines will use water injection to control emissions of NO_x.

5.1.3 Compliance Testing

Compliance with the limitations on combustion turbine emissions shall be determined through stack testing as specified by the MPCA in the air permit for the Facility.

Once initial compliance is demonstrated, future compliance will be achieved by recording the fuel combusted and demonstrating compliance with the annual air pollutant emission rate limitations.

5.1.4 Criteria Pollutant Impacts

The proposed Facility will not trigger Prevention of Significant Deterioration (PSD) applicability for any individual regulated criteria air pollutant. However, a voluntary air quality impact assessment will be performed to determine the effect of air emissions from the Facility on ambient air quality.

Table 5-2
Potential Hazardous Air Pollutant (HAP) Emissions
Cannon Falls Energy Center

Hazardous Air Pollutant	Total HAP Emissions Combustion Turbines (tons/yr)	Total HAP Emissions Water Bath Gas Heaters (tons/yr)	Total HAP Emissions Proposed Facility (tons/yr)
Arsenic	-	2.3e-06	2.3e-06
Beryllium	-	1.4e-07	1.4e-07
Cadmium	-	1.3e-05	1.3e-05
Chromium	-	1.6e-05	1.6e-05
Cobalt	-	9.7e-07	9.7e-07
Lead	-	5.8e-06	5.8e-06
Manganese	-	4.4e-06	4.4e-06
Mercury	-	3.0e-06	3.0e-06
Nickel	-	2.4e-05	2.4e-05
Selenium	-	2.8e-07	2.8e-07
Benzene	1.2e-01	2.4e-05	1.2e-01
Dichlorobenzene	-	1.4e-05	1.4e-05
Formaldehyde	8.0e-01	8.7e-04	8.0e-01
Hexane	1.9e+00	2.1e-02	1.9e+00
Naphthalene	1.2e-02	7.1e-06	1.2e-02
Acetaldehyde	5.0e-01	-	5.0e-01
Acrolein	1.7e-01	-	1.7e-01
Ethylbenzene	1.3e-01	-	1.3e-01
Xylenes	1.9e-01	-	1.9e-01
Toluene	5.1e-01	3.9e-05	5.1e-01
2-methylnaphthalene	3.8e-05	-	3.8e-05
Acenaphthene	2.0e-04	-	2.0e-04
Acenaphthylene	1.1e-04	-	1.1e-04
Anthracene	2.4e-04	-	2.4e-04
Benz(a)anthracene	1.6e-04	-	1.6e-04
Benzo(a)pyrene	1.0e-04	-	1.0e-04
Benzo(b)fluoranthene	2.3e-04	-	2.3e-04
Benzo(e)pyrene	3.9e-06	-	3.9e-06
Benzo(k)fluoranthene	8.0e-05	-	8.0e-05
Benzo(b +k)fluoranthene	3.5e-05	-	3.5e-05
Benzo(g,h,i)perylene	9.9e-05	-	9.9e-05
1,3-butadiene	9.2e-04	-	9.2e-04
2-chloronaphthalene	2.0e-06	-	2.0e-06
Chrysene	1.8e-04	-	1.8e-04
Dibenzo(a,h)anthracene	1.7e-04	-	1.7e-04
Fluoranthene	3.1e-04	-	3.1e-04
Fluorene	4.2e-04	-	4.2e-04
Indeno(1,2,3-cd)pyrene	1.7e-04	-	1.7e-04
Perylene	5.1e-06	-	5.1e-06
Phenanthrene	2.3e-03	-	2.3e-03
Propylene oxide	3.5e-01	-	3.5e-01
Pyrene	2.0e-04	-	2.0e-04
Total Combined HAPS	**4.7e+00**	**2.2e-02**	**4.68**

5.1.4.1 NAAQS Modeling

Emissions of NO_x, CO, PM_{10}, and SO_2 were modeled with the use of representative databases, the ISCST3 dispersion model, and with five years of hourly meteorological data. The predicted maximum concentrations of each pollutant were compared against the National Ambient Air Quality Standards (NAAQS) to show whether the Project will cause or contribute to an exceedance of the NAAQS for the pollutants modeled. The results of the air quality impact assessment are reported in Table 5-3.

5.1.5 Air Emissions Risk Analysis

Invenergy Cannon Falls prepared an Air Emissions Risk Analysis ("AERA") that includes an assessment of cancer risks and non-cancer hazard indices associated with emissions from the proposed Facility. The assessment follows the MPCA's AERA Guidance, Version 1.0 and was limited to air toxic emissions from combustion of distillate fuel oil in the CTGs. Screening results obtained with the Risk Assessment Screening Spreadsheet ("RASS") showed acceptable

Table 5-3
Maximum Predicted Concentrations of Regulated Air Pollutants
Cannon Falls Energy Center

Pollutant/Averaging Period	Maximum Predicted Concentration* ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Does Maximum Predicted Concentration Exceed NAAQS?
NO_2			
Annual	23.0	100	No
PM/PM_{10}			
24-Hour	61.0	100	No
Annual	23.9	50	No
SO_2			
3-Hour	299.9	1,300	No
24-Hour	118.0	365	No
Annual	7.8	80	No
CO			
1-Hour	222.9	40,000	No
8-Hour	78.5	10,000	No

Source: Air Permit Application To Construct, Proposed Electric Generation Plant, Cannon Falls Energy Center, August, 2004
*Represents maximum concentration over 5-year period.

levels of cancer risks and hazard indices for all chemicals potentially emitted from the Facility. The results of the AERA risk calculations are shown in Tables 5-4 to 5-8.

Table 5-4
Inhalation Health Benchmark Values
Cannon Falls Energy Center

Chemical Name	Acute Air Concentration ($\mu g/m^3$)	Chronic Non-cancer Reference Concentration ($\mu g/m^3$)	10^{-5} Cancer-based Air Concentration ($\mu g/m^3$)	Unit Risk Value for Carcinogens ($\mu g/m^3$)	Toxicity Value Reference
Arsenic	0.19	0.03	0.00	4.3E-03	Cal EPA
Beryllium	–	0.02	0.00	2.4E-03	IRIS
Benzene	1000	30	1.28	7.8E-06	HRV, Cal EPA, HRV
Cadmium	–	0.02	0.01	1.8E-03	Cal EPA
Chromium Compounds	–	0.008	0.00	1.2E-02	IRIS
Formaldehyde	94	3	0.77	1.3E-05	Cal EPA
Lead	–	–	0.83	1.2E-05	Cal EPA
Manganese	–	0.2	–	–	HRV
Mercury	1.8	0.3	–	–	IRIS
Naphthalene	200	9	–	–	HRV
Nickel	11	0.05	0.04	2.6E-04	Cal EPA
Nitrogen dioxide (NO_2)	470	–	–	–	Cal EPA
Polycyclic Aromatic Hydrocarbons (PAH)	–	–	0.01	1.1E-03	Cal EPA
Selenium	–	20	–	–	Cal EPA

Source: Source: Air Permit Application To Construct, Proposed Electric Generation Plant, Cannon Falls Energy Center, August, 2004

HRV = MDH Health Risk Value

Cal EPA = California EPA Office of Environmental Health Hazard Assessment

IRIS = EPA Integrated Risk Information System

Table 5-5
Maximum Hourly and Annual Air Toxics Concentrations
Cannon Falls Energy Center

Pollutant	Maximum One Hour Concentration CTGs Firing Distillate Fuel Oil ($\mu g/m^3$)	Maximum Annual Concentration CTGs Firing Distillate Fuel Oil ($\mu g/m^3$)
Arsenic	0.01	8.7E-06
Beryllium	3.1E-04	2.4E-07
Benzene	0.078	6.3E-05
Cadmium	4.8E-03	3.8E-06
Chromium Compounds	1.1E-02	8.7E-06
Formaldehyde	4.9E-01	3.9E-04
Lead	1.4E-02	1.1E-05
Manganese	7.9E-01	6.2E-04
Mercury	1.2E-03	9.4E-07
Naphthalene	2.7E-03	2.2E-06
Nickel	4.6E-03	3.6E-06
Nitrogen dioxide (NO_2)	162.9	0.13
Polycyclic Aromatic Hydrocarbons (PAH)	4.0E-02	3.1E-05
Selenium	2.5E-02	2.0E-05

Source: Source: Air Permit Application To Construct, Proposed Electric Generation Plant, Cannon Falls Energy Center, August, 2004

Table 5-6
AERA Risk Calculations I
Cannon Falls Energy Center

	Inhalation Screening Hazard Quotients (ISHQ) and Cancer Risks for Individual Substances CTGs Firing Distillate Fuel Oil			
Chemical Name	**Acute ISHQ**	**Subchronic Noncancer ISHQ**	**Chronic Noncancer ISHQ**	**Cancer ISHQ**
Arsenic	5.3E-02	–	2.6E-04	3.4E-08
Benzene	5.0E-05	–	1.3E-06	3.1E-10
Beryllium	–	–	1.2E-05	5.9E-10
Cadmium	–	–	1.7E-04	6.2E-09
Chromium Compounds	–	8.9E-04	9.9E-04	9.5E-08
Formaldehyde	2.7E-03	–	6.7E-05	2.6E-09
Lead	–	–	–	1.2E-10
Manganese	–	–	2.8E-03	–
Mercury	6.1E-04	6.4E-06	2.9E-06	–
Naphthalene	1.6E-04	–	2.8E-06	–
Nickel	3.8E-04	–	6.6E-05	8.6E-10
Nitrogen dioxide (NO_2)	3.8E-01	–	–	–
Polycyclic Aromatic Hydrocarbons (PAH)	–	–	–	3.2E-08
Selenium	–	–	9.8E-07	
Totals	4.4E-01	9.0E-04	4.4E-03	1.7E-07

Source: Source: Air Permit Application To Construct, Proposed Electric Generation Plant, Cannon Falls Energy Center, August, 2004

Table 5-7
AERA Risk Calculations II
Cannon Falls Energy Center

	Chronic Screening Non-inhalation Pathway Hazard Quotients and Cancer Risks for Individual Substances CTGs Firing Distillate Fuel Oil			
Chemical Name	**Farmer Non-cancer**	**Farmer Cancer**	**Resident Non-cancer**	**Resident Cancer**
Arsenic	–	–	–	–
Benzene	–	–	–	–
Beryllium	–	1.6E-09	–	4.6E-10
Cadmium	–	6.2E-08	–	1.2E-08
Chromium Compounds	–	2.5E-10	–	–
Formaldehyde	–	–	–	–
Lead	–	2.3E-10	–	–
Manganese	–	–	–	–
Mercury	2.9E-06	–	–	–
Naphthalene	–	–	–	–
Nickel	–	–	–	–
Nitrogen dioxide (NO_2)	–	–	–	–
Polycyclic Aromatic Hydrocarbons (PAH)	–	9.5E-06	–	–
Selenium	–	–	–	–
Totals	2.9E-06	9.5E-06		1.2E-08

Source: Source: Air Permit Application To Construct, Proposed Electric Generation Plant, Cannon Falls Energy Center, August, 2004

Table 5-8
AERA Risk Calculations III
Cannon Falls Energy Center

	Chronic Screening Total Hazard Quotients and Cancer Risks (Inhalation + Non-inhalation) for Individual Substances - CTGs Firing Distillate Fuel Oil			
Chemical Name	**Farmer Non-cancer**	**Farmer Cancer**	**Resident Non-cancer**	**Resident Cancer**
Arsenic	2.6E-04	3.4E-08	2.6E-04	3.4E-08
Benzene	1.3E-06	3.1E-10	1.3E-06	3.1E-10
Beryllium	1.2E-05	2.2E-09	1.2E-05	1.0E-09
Cadmium	1.9E-04	7.5E-08	1.9E-04	2.0E-08
Chromium Compounds	9.9E-04	9.5E-08	9.9E-04	9.5E-08
Formaldehyde	6.7E-05	2.6E-09	6.7E-05	2.6E-09
Lead	—	3.5E-10	–	1.2E-10
Manganese	2.8E-03	–	2.8E-03	–
Mercury	5.7E-06	–	2.9E-06	–
Naphthalene	2.8E-06	–	2.8E-06	–
Nickel	6.6E-05	8.6E-10	6.6E-05	8.6E-10
Nitrogen dioxide (NO_2)	–	–	–	–
Polycyclic Aromatic Hydrocarbons (PAH)	–	9.5E-06	–	3.2E-08
Selenium	9.0E-07	–	9.0E-07	–
Totals	4.4E-03	9.7E-06	4.4E-03	1.8E-07

Source: Air Permit Application To Construct, Proposed Electric Generation Plant, Cannon Falls Energy Center, August, 2004

5.2 PUBLIC WATER SUPPLY

No groundwater wells will be installed on the site to serve the Facility. The CTGs will use dry cooling for generator and lube oil cooling. Limited amounts of water will be needed for evaporative inlet air cooling, water injection while operating on fuel oil, steam injection during power augmentation, and turbine wash and other maintenance activities. All water, including potable water (for drinking water, showers, toilets, sinks, and other incidental water needs), will be supplied by the Cannon Falls municipal water supply system through a lateral service line.

5.3 TRAFFIC

The Project site is served by State Highway 20 and County Highway 29. New or at least improved access to the Project site will probably be required before construction can begin. Other significant roadways within the vicinity of the Project site include U.S Route 52, less than a mile west of County Highway 29.

According to the Minnesota Department of Transportation, traffic volume on State Highway 20 just north of the junction with County Highway 29 averages 3,500 vehicles per day. County Highway 29 averages 2,300 vehicles per day, based on traffic volume information published in the Goodhue County Transportation Plan for 2004.

During construction of the Facility, traffic on local roadways (including Holiday Avenue and Cannon Industrial Boulevard) will increase due to movement of construction equipment, workers' vehicles, and deliveries of building materials to and from the Project site. If temporary lane closings are necessary to accommodate oversized or slow-moving vehicles, the construction contractor will coordinate these events with both the City of Cannon Falls and the Goodhue County Highway Department. Potential mitigation measures that could be used to minimize potential transportation impacts during construction include the following:

- Scheduling of construction shifts so that much of the construction-related traffic occurs outside of peak commuting hours;
- Staggering of construction shifts start and finish times by trade; and

- Scheduling, to the maximum extent possible, delivery of construction materials outside of peak commuting hours.

During Facility operations, a limited number of service vehicles, tanker trucks, and employee vehicles will be required; therefore, the impact on traffic flows should be minimal.

5.4 AIRCRAFT

The Facility is not expected to need permits from state or federal aviation authorities for any tall structures. The nearest public-use airport to the Project site is the Stanton Airfield, in Stanton, Minnesota. The Stanton Airfield is approximately four miles southwest of the Project site (see Figure 16). The next closest airport, the Faribault Municipal Airport, is located approximately 25 miles southwest of the proposed Project site.

Federal Aviation Administration ("FAA") regulations on obstructions to navigable airspace (14 CFR 77) require notification of the FAA Administrator of any proposed construction "of more than 200 feet in height above the ground level at its site [Section 77.13(a)(1)]." The regulations also require notifying the Administrator of any proposed structure whose height exceeds an imaginary surface extending 20,000 feet from the nearest airport runway at a slope of 100 feet horizontal to each 1-foot vertical. If the structure is within 10,000 feet of an airport's runway and the airport's longest runway is no greater than 3,200 feet, the slope is reduced to 50 to 1 [Section 77.13(a)(1)(i)]. No structures associated with the proposed Project will exceed 200 ft in height and no structure will have a height that exceeds any FAA-defined imaginary surface. Therefore, notification of the FAA will not be necessary.

The Minnesota Statutes give the Minnesota Department of Transportation the authority to control new construction of high structures near airports (Minnesota Statutes, Chapter 360.80). A permit is required for new structures over 500 feet in height within one-mile of an airport. The Facility's exhaust stacks will not exceed 75 feet and will therefore not require a high structures permit.

6.0 EFFECTS ON LAND-BASED ECONOMIES

As described in the following, the Cannon Falls Energy Center is not expected to have any significant economic effect on agriculture, forestry, tourism or mining. The City of Cannon Falls has designated the site for restricted light industrial use. The current property owner will be adequately compensated for the purchase of the land.

6.1 AGRICULTURE

The Project site would be converted from agricultural land to an industrial land use. This means that approximately 55 acres of farmland currently used for growing soybeans will be lost as a source of crops. Since a number of adjacent properties have previously been converted for industrial land use, it appears unlikely that the conversion of the Project site to industrial land use could cause the property values of surrounding properties to diminish. Potentially, adjacent land values could increase if converted to industrial use.

6.2 FARMLAND EXCLUSION RULE

The developed portion of the Project site will not be subject to the prime farmland exclusion rule contained in Minnesota Rules 4400.3450 Subpart 4. The farmland exclusion rule does not apply to areas located within home rule charter cities. Since the City of Cannon Falls is a home rule charter city and the Project site occupies an area within the City, the rule does not apply to the Project site. Additionally, subpart 4 states that "no large electric power generating plant site may be permitted where the developed portion of the plant site covers more than 0.5 acres of prime farmland per megawatt of net generating capacity." If the developed portion of the Project site is conservatively assumed to be 35 acres and the net generating capacity is assumed to equal the nominal generating capacity of the Project (357 MW), the developed portion will occupy no more than 0.1 acres of prime farmland per megawatt of net generating capacity. Since this is less than the number of acres of prime farmland per megawatt the farmland exclusion rule allows for development of a generating facility, the Project site will not therefore be subject to the rule.

6.3 FORESTRY

The Facility will not displace any forestry resources and will therefore not adversely affect the forestry economy.

6.4 TOURISM

Tourism in Cannon Falls and Goodhue County will not be affected by construction and operation of the Project. No recreation areas or tourist attractions will be affected by the Project.

6.5 MINING

The proposed site for the Facility is located on the outer part of a region in which many crushed stone operations are also located. The site itself contains one or more "borrow pits" where minerals (sand or gravel) were previously excavated for use in nearby construction projects. It is unlikely that the site will be used for this purpose once the proposed Project is completed. Although the site will no longer be a potential source of minerals and could negatively affect the value of the property, the effect will probably be very minimal and offset by the potential benefits of new generating capacity in the region.

7.0 ARCHAEOLOGICAL AND HISTORIC RESOURCES

The Minnesota Historical Society State Historic Preservation Office ("SHPO") was requested to determine the effect of the Project on cultural resources, including historic or archaeological resources, for compliance with the Minnesota Statutes, 138.40, Subdivision 3. After reviewing information on historic places listed on national and state registers and on known or suspected archaeological properties, the SHPO concluded that the Project will not affect archaeological or historic properties. Appendix B includes a copy of the response letter from the SHPO.

Local tribal organizations and the Bureau of Indian Affairs Midwest Regional Office were also requested for information about the possible effect of the Project on Native American tribes or reservations. Invenergy Cannon Falls has received no response from these agencies. Appendix B includes copies of the written requests to the tribal organizations and the Bureau of Indian Affairs.

8.0 EFFECTS ON THE NATURAL ENVIRONMENT

The construction and operation of a new generating facility would be expected to have some impact on the natural environment, including air, land, water, and biological resources. However, the impacts of the proposed Facility will all be minor or will be mitigated as appropriate.

8.1 AIR QUALITY

The secondary NAAQS are intended to protect the public welfare from adverse effects of airborne pollutants. This protection extends to visibility, plants, soils, and animals. As discussed in Section 5.1.4, predicted concentrations of NO_x, CO, PM_{10}, and SO_2 resulting from the proposed Project will not cause or contribute to a violation of the NAAQS. Other potential air pollutant emissions (sulfuric acid mist and VOC) associated with the Project are not expected to result in exceedances of the NAAQS. Compliance with the secondary NAAQS will ensure no adverse impacts to visibility, plants, soils, or animals in the vicinity of the proposed Project.

8.2 LAND

The Project is not expected to cause adverse or harmful environmental effects to the soils or geology of the Project site. Neither construction nor operation of the Facility is likely to result in the release of pollutants to the subsurface.

As discussed in Section 8.3.5, Invenergy Cannon Falls will implement stormwater management controls during construction to manage runoff, prevent erosion and sedimentation, and control release of pollutants into stormwater discharges. This includes using best management practices to prevent erosion and sedimentation. To prevent release of pollutants into stormwater during operation of the Facility, Invenergy Cannon Falls will implement storm water pollution prevention measures will include storage of chemicals indoors or within appropriate containment areas, good site housekeeping practices, and proper disposal of any waste materials.

8.3 WATER RESOURCES

8.3.1 Floodplains

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps indicate no floodplains within the Project site (see Figure 17). The closest floodplain area is approximately one-half mile to the south along the Cannon River.

8.3.2 Shoreland Protection Areas

No streams are located on or near the Project site.

8.3.3 Wetlands

No wetlands will be disturbed by construction or operation of the Facility. An inspection of the Project site identified four areas with potential wetlands, but none of these areas qualify jurisdictional wetlands under the relevant regulatory standards. The areas were reviewed on-site and are designated as Areas 1 through 4 (see Figure 17).

Area 1 appeared to be an excavated depression, approximately 80 feet by 50 ft and 4 to 5 ft deep with steep side slopes (see Appendix C for Wetland Determination Data Forms). Two boxelder saplings were observed along the west edge of the depression at the top of the slope. The vegetation within the depression varied and included giant ragweed, thistle, grasses, and a few forbs. There was no sign of inundation or standing water in the depression. A hand auger boring to 14 in showed a surface layer of clay with many distinct mottles over course sand. Saturation was noted in the sand layer at roughly 8 in.

Area 1 could narrowly meet the wetland criteria (soils and hydrology). Only a more detailed survey could eliminate the possibility. It was determined, however, from a communication with the landowner that the depression had been excavated with no intent to create a wetland. If Area 1 is a wetland, it is exempt from the State of Minnesota's Wetland Conservation Act and would be considered an isolated wetland by the United States Army Corps of Engineers. The area therefore would not require permits or replacement if impacted by the Project

Area 2 is a wooded patch that is identified as a wetland on the National Wetland Inventory (NWI) map (see Appendix C for Wetland Determination Data Forms). The Goodhue County Soil Survey shows an old creek channel draining to the east along the north property line. The wooded area is the only remaining evidence of the old creek channel. The old channel had been tiled and the surface is now planted with soybeans. A segment of a shallow surface drainageway was evident within the wooded area, however, no recent signs of water flow or drainage were observed. The area was used to store conveyor equipment and abandoned farm equipment. The understory was dominated by wood nettle, stinging nettle, honeysuckle, prickly ash, and Virginia creeper. The overstory trees were primarily boxelder. A hand auger boring found no evidence of hydrology with the soil very dry to 20 in. The soil was dark with few faint mottles between 12 and 20 in. The vegetation and hydrology of Area 2 do not meet the wetland criteria.

Area 3 is planted with soybeans, but showed signs of stress due to temporary inundation, which was likely the result of a heavy rainfall event (more than 3 in) in mid-June 2004 (see Appendix C for Wetland Determination Data Forms). Area 3 showed remnants of irrigation pipe. There was no water present in the hand auger boring down to 30 in. The soils were brown with many faint mottles and sandy loam texture. Course sand was encountered at 24 in. This area does not meet the wetland criteria because of a lack of wetland hydrology and soils.

Area 4 is also planted with soybeans (see Appendix C for Wetland Determination Data Forms). The topography of the area was irregular with a 1- to 2-ft drop along the outer perimeter. The area was approximately 20 ft wide by 200 ft long. Like Area 1, Area 4 had been excavated. The area does not meet the wetland criteria for vegetation or hydrology.

Based on a site visit and a review of aerial photography, the Goodhue County Soil Survey, and the NWI map, Invenergy Cannon Falls determined that none of the potential wetlands on the Project site meet the definition of a wetland. Therefore, no wetlands will be disturbed by construction or operation of the Facility.

8.3.4 Groundwater

No groundwater wells will be installed on site to serve the Facility. Limited amounts of water will be needed for evaporative inlet cooling, water injection while operating on fuel oil, steam injection during power augmentation, and turbine wash and other maintenance activities. All water, including potable water (for drinking water, showers, toilets, sinks, and other incidental water needs), will be supplied by the Cannon Falls municipal water supply system through a new lateral service line.

8.3.5 Stormwater Management

Approximately 75 percent of the 55-acre site will be disturbed during site grading and construction activities. Impervious surfaces will include buildings and structures, power generation equipment, concrete equipment pads, storage tanks, paved areas, and access and service roads, all of which will affect site drainage. There will also be hard-packed gravel surfaces in various places. Other areas of the Project site will be landscaped as appropriate with grass, trees, and shrubs. Stormwater runoff from the Project site will be managed as described in the next section.

8.3.5.1 Erosion and Sediment Control

Construction activities that disturb one acre or more of land must obtain a combined National Pollutant Discharge Elimination System ("NPDES") State Disposal System ("SDS") permit from the MPCA. The Project's construction contractor will implement a Stormwater Pollution Prevention Plan ("SWPPP") that uses best management practices to prevent erosion and minimize polluted and sediment-laden runoff.

The construction of the Facility will disturb approximately 40 acres of land. An unknown number of acres will be disturbed for construction parking, contractor trailers, laydown of equipment and materials, and soil stockpiles. The area will be restored after construction is completed, and portions of the site will be reseeded with vegetation that could serve as a food source for wildlife.

Soil erosion and sedimentation control measures will be constructed and maintained for the duration of the construction activities at the site. Most of the site runoff will enter a sediment basin. Local sediment control measures, such as inlet protection, graveled access roads, temporary and permanent seeding, rock outlet protection, and other measures, will be used to minimize the sediment transported to the sediment basin.

A combination of control measures will be implemented to retain sediment from disturbed areas during construction. Erosion/sediment controls to be implemented during initial construction activities are listed as follows:

- Maintain a vegetative buffer zone between disturbed areas and the stormwater outfall;
- Construct and maintain a graveled access road;
- Construct berms and/or ditches and sequence placement of fill in order to contain and/or route runoff from fill areas to the sediment basin; and
- Construct and maintain a silt fence along the toe of the fill area boundary slopes.

Erosion/sediment controls to be implemented during later construction activities are listed as follows:

- Contain and/or route stormwater from the fill area to sediment basin; and
- Maintain existing vegetative buffers, inlet protection, and silt fences.

As a permanent stabilization measure to be implemented during construction, vegetative cover will be established on the fill area side slopes by sodding or hydroseeding with mixtures that include native grasses depending on local requirements.

8.3.5.2 Storm Water Pollution Prevention Plan for Industrial Activities

A SWPPP for industrial activities will be prepared for the Facility in compliance with coverage under the NPDES/SDS Stormwater Permit for Industrial Activity. The plan will identify potential pollutant sources at the proposed Facility, outline operating procedures for material handling activities, and describe controls and best management practices that will be

implemented to minimize pollutants in stormwater runoff. In addition to the stormwater management provisions, best management practices will also include storage of chemicals indoors or within appropriate containment areas, good site housekeeping practices, and proper disposal of any waste materials.

8.3.6 Temporary Dewatering

Temporary site dewatering of the near surface groundwater may be required to facilitate excavation of building foundations and underground utility installation work. If dewatering is required, appropriate permits will be obtained from the Minnesota Department of Natural Resources (MDNR). Temporary dewatering is expected to have a minimal impact on groundwater levels outside of the Project site.

8.4 BIOLOGICAL RESOURCES

The Project site was cleared and cultivated for farmland use over 50 years ago. The effect of the proposed Project on wildlife and vegetation is expected to be minimal. As cultivated land is removed from production, food sources for various mammal and bird species will be eliminated. Following construction, only a portion of the Project site will be covered by impervious surfaces. The remaining portions of the site would be reseeded with vegetation that could serve as a food source for wildlife.

9.0 RARE AND UNIQUE NATURAL RESOURCES

In correspondence with the United States Fish and Wildlife Service (USFWS) and the Minnesota Department of Natural Resources (MDNR), Invenergy Cannon Falls requested information about possible threatened and endangered plant and animal species that could be affected by construction or operation of the Cannon Falls Energy Center. MDNR searched the Minnesota Natural Heritage database for known occurrences of rare species and natural communities within a one-mile radius of the Project site. Although MDNR found six such occurrences, none of the six are located on the proposed Project site and none are likely to be adversely affected by the Project. Appendix D includes a copy of the response letter from MDNR.

The USFWS responded that no federally threatened or endangered species are known at the Project site area and agreed that the proposed Project would not impact such species or their critical habitat. See Appendix D for a copy of the response letter from USFWS.

A site inspection was performed in conjunction with the Phase I Environmental Site Assessment. Except for boxelder trees observed in the northwest corner of the site, the Project site is almost entirely farmland and is planted with soybeans. Little if any cover would be available for wildlife, making it an unlikely habitat for endangered, threatened, or rare species.

10.0 UNAVOIDABLE ADVERSE EFFECTS AND MITIGATIVE MEASURES

The construction and operation of a new generating facility will unavoidably result in some environmental effects. This section discusses mitigative measures that will be implemented to address unavoidable effects from the Facility.

10.1 AIR QUALITY

The proposed Project will have the potential to emit regulated air pollutants, including, NO_x, CO, SO_2, PM/PM_{10}, and VOC. The simple cycle combustion turbines will use dry low NO_x combustors to control NO_x emissions. Firing natural gas will minimize SO_2 and PM/PM_{10} emissions. Limitations on fuel use will allow the Facility to be permitted as minor source of all regulated air pollutants.

10.2 LOSS OF FARMLAND

The Project site would be converted from agricultural land use to industrial land use. This means that approximately 55 acres of otherwise productive farmland will be lost. The amount of farmland removed from production is small, however, and the land use conversion should generate economic benefits to the surrounding community.

10.3 EFFECT OF NEW NOISE SOURCE

Based on the proposed acoustical design of the Project, Facility noise levels are expected to range from approximately 45 dBA to 49.5 dBA at the nearest residential receptors. Since the

Minnesota Noise Rules would require that the Project not cause noise levels at the nearest residential receptor to exceed 60 dBA during daytime hours or 50 dBA during nighttime hours, the Project is expected to fully comply with the state's established noise standards.

To ensure that the Project complies with the standards, the Facility will be designed and equipped with exhaust silencers, air intake silencers, and a low-noise gas metering station.

10.4 POTENTIAL FOR STORMWATER RUNOFF

With the increase in impervious surface areas resulting from construction of the Project, Invenergy Cannon Falls and its construction contractor will implement whatever steps are necessary to effectively manage runoff, prevent erosion and sedimentation, and control release of pollutants into stormwater discharges. This includes using best management practices to prevent erosion and to minimize polluted and sediment-laden runoff, restoring construction laydown areas to their original condition after construction is completed, and developing a construction stormwater pollution prevention plan for erosion control. Following construction, the Project will implement a stormwater pollution prevention plan for industrial activities.

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11.0 PERMITS AND APPROVALS

The proposed Project will require federal, state, and local permits and approvals for construction and operation. Appendix E contains a table listing permits and approvals that are believed to be applicable to the Project as of the date this site permit application was submitted to the EQB.

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