DOE/EA-1814

FINAL
ENVIRONMENTAL ASSESSMENT

FOR

CITY OF MONTPELIER COMBINED HEAT AND POWER AND DISTRICT ENERGY SYSTEM

MONTPELIER, VERMONT

U.S. Department of Energy
Office of Energy Efficiency and Renewable Energy
Golden Field Office

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COVER SHEET

RESPONSIBLE AGENCY: U.S. Department of Energy

TITLE: *Final Environmental Assessment for City of Montpelier Combined Heat and Power and District Energy System* (DOE/EA-1814)

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ABSTRACT: The U.S. Department of Energy (DOE) is proposing to provide Federal funding through the Community Renewable Energy Deployment Program to the City of Montpelier for the design, permitting, and construction of a combined heat and power (CHP) and district energy system. The proposed project would include the operation of a new biomass renewable energy facility located on the site of the existing State Boiler Plant with a system of distribution pipes that would deliver heat to a complex of both State-owned and City-owned municipal buildings and schools.

DOE has authorized Montpelier to use a percentage of the Federal funding for preliminary activities, which include preparing this EA, conducting analyses, and agency consultations. Such activities are associated with the Proposed Action and do not significantly impact the environment or represent an irreversible or irretrievable commitment by DOE in advance of DOE completing the NEPA process for the proposed project.

This EA analyzes the foreseeable environmental impacts of the proposed project and the alternative of not implementing this project (the No-Action Alternative), including the construction of a new heat plant and district energy system within a 100-year floodplain.

AVAILABILITY: This EA is available for review on the DOE Golden Field Office Reading Room Website, http://www.eere.energy.gov/golden/Reading_Room.aspx, and the DOE NEPA Website, http://nepa.energy.gov/DOE_NEPA_documents.htm.

ACRONYMS AND ABBREVIATIONS

APE	area of potential effect
BGS	Department of Buildings and General Services (Vermont)
CFR	*Code of Federal Regulations*
CHP	combined heat and power
CRED	Community Renewable Energy Deployment (Program)
DOE	U.S. Department of Energy
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NEPA	*National Environmental Policy Act*
NHPA	*National Historic Preservation Act*
NRHP	*National Register of Historic Places*
PM_n	particulates with an aerodynamic diameter less than or equal to a nominal *n* micrometers
Recovery Act	*American Recovery and Reinvestment Act of 2009* (also ARRA)
U.S.C.	*United States Code*
VANR	Vermont Agency of Natural Resources

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1. INTRODUCTION

1.1 National Environmental Policy Act

The *National Environmental Policy Act* [42 United States Code (U.S.C.) 4321 *et seq*.; NEPA], the Council on Environmental Quality NEPA regulations [40 *Code of Federal Regulations* (CFR), Parts 1500 to 1508], and the U.S. Department of Energy (DOE) NEPA implementing procedures (10 CFR Part 1021) require that DOE consider the potential environmental impacts of a Proposed Action before making a decision to implement that Action. This requirement applies to decisions about whether to provide Federal financial assistance to government and private entities.

In compliance with these regulations, this Environmental Assessment (EA)

- Examines the potential environmental impacts of the Proposed Action and the No-Action Alternative;
- Identifies unavoidable adverse environmental impacts of the Proposed Action;
- Describes the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity; and
- Characterizes any irreversible and irretrievable commitments of resources that would be involved should DOE decide to implement its Proposed Action.

DOE must meet these requirements before it can make a final decision to proceed with any proposed Federal action that could cause adverse impacts to human health or the environment. This EA provides DOE and other decision-makers the information needed to make an informed decision about the installation, operation, and eventual decommissioning of the proposed project. The EA evaluates the potential individual and cumulative impacts of the proposed project. For purposes of comparison, this EA also evaluates the impacts that could occur if DOE did not provide funding (the No-Action Alternative), under which DOE assumes the project would not proceed. The EA does not analyze other action alternatives.

1.2 Background

The Community Renewable Energy Deployment (CRED) Program received funding through the *American Recovery and Reinvestment Act of 2009* (Pub. L. 111-5, 123 Stat. 115; ARRA or Recovery Act). The Federal CRED Program represents a DOE priority to support the planning and installation of community-scale renewable energy projects by accelerating widespread commercialization of clean renewable energy technologies across the United States, diversifying the nation’s energy supply options, and increasing national security and improving the environment.

Through competitive grants, the Federal CRED Program helps communities rapidly plan and deploy renewable energy systems that will provide clean, reliable, and affordable energy supplies for their communities, create jobs, and new economic development opportunities. The projects demonstrate how multiple renewable energy technologies, including solar, wind, biomass, and geothermal systems, can be deployed to supply clean energy to communities. The Federal CRED Program empowers local communities to make strategic investments to meet the nation's long-term goals for increased energy efficiency and energy independence, leadership on climate change, and improved local air quality by

supporting the planning and deployment of community renewable energy projects in communities nationwide.

DOE has awarded the City of Montpelier, Vermont, one of five competitive grants funded under the Federal CRED Program, and is now considering whether to authorize the City to use this Federal funding to design, permit, and construct a combined heat and power (CHP) plant and district energy system to provide heat to State and City facilities in Montpelier (proposed project). The City is collaborating with the State of Vermont to develop the Montpelier CHP District Energy Project. This project would include the design and construction of a new biomass-fueled heat plant to be located on the site of the existing State Boiler Plant in Montpelier (Figures 1-1 and 1-2). The biomass-fueled and back-up oil-fired boilers would provide a combination of steam and hot water that would be distributed via existing steam pipes and new hot water supply and return pipes to a complex of State, City, and school buildings. Electricity would be generated to increase the overall efficiency of the system and this electricity would be used to offset that consumed by the State buildings.

The proposed project would provide the security and economic benefits of increasing energy efficiency and reliance on locally harvested wood rather than fossil fuels, and would supply reliable and affordable heating solutions for buildings within Montpelier. The award to the City for this project is $8 million. Including recipient cost share, the total cost of the City's proposed project would be $20 million.

Elements of the Montpelier CHP District Energy Project are located in flood zones or floodplains. Pursuant to Executive Order 11988, *Floodplain Management*, each Federal agency is required, when conducting activities in a floodplain, to take actions to reduce the risk of flood damage; minimize the impacts of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. Regulations issued by DOE that implement this Executive Order are contained in 10 CFR Part 1022, "Compliance with Floodplain and Wetland Environmental Review Requirements." These regulations require DOE to prepare a floodplain assessment for any proposed action in the base floodplain, which is the 100-year floodplain. The regulations also state that whenever possible, DOE must accommodate requirements of the Executive Order through the applicable NEPA procedures. Accordingly, it is DOE's intent that this EA meets the requirements for a floodplain assessment, as described in Section 3.2.2.5 of this EA, as well as meeting requirements under NEPA.

In compliance with NEPA regulations, this EA examines the potential environmental impacts of DOE's Proposed Action (authorizing the expenditure of Federal funding for the Montpelier CHP District Energy Project) and the No-Action Alternative, under which DOE assumes the proposed project would not proceed. This Final EA provides DOE with the information needed to make an informed decision about whether authorizing the City of Montpelier to use its Federal funds for the proposed project might result in significant environmental impacts.

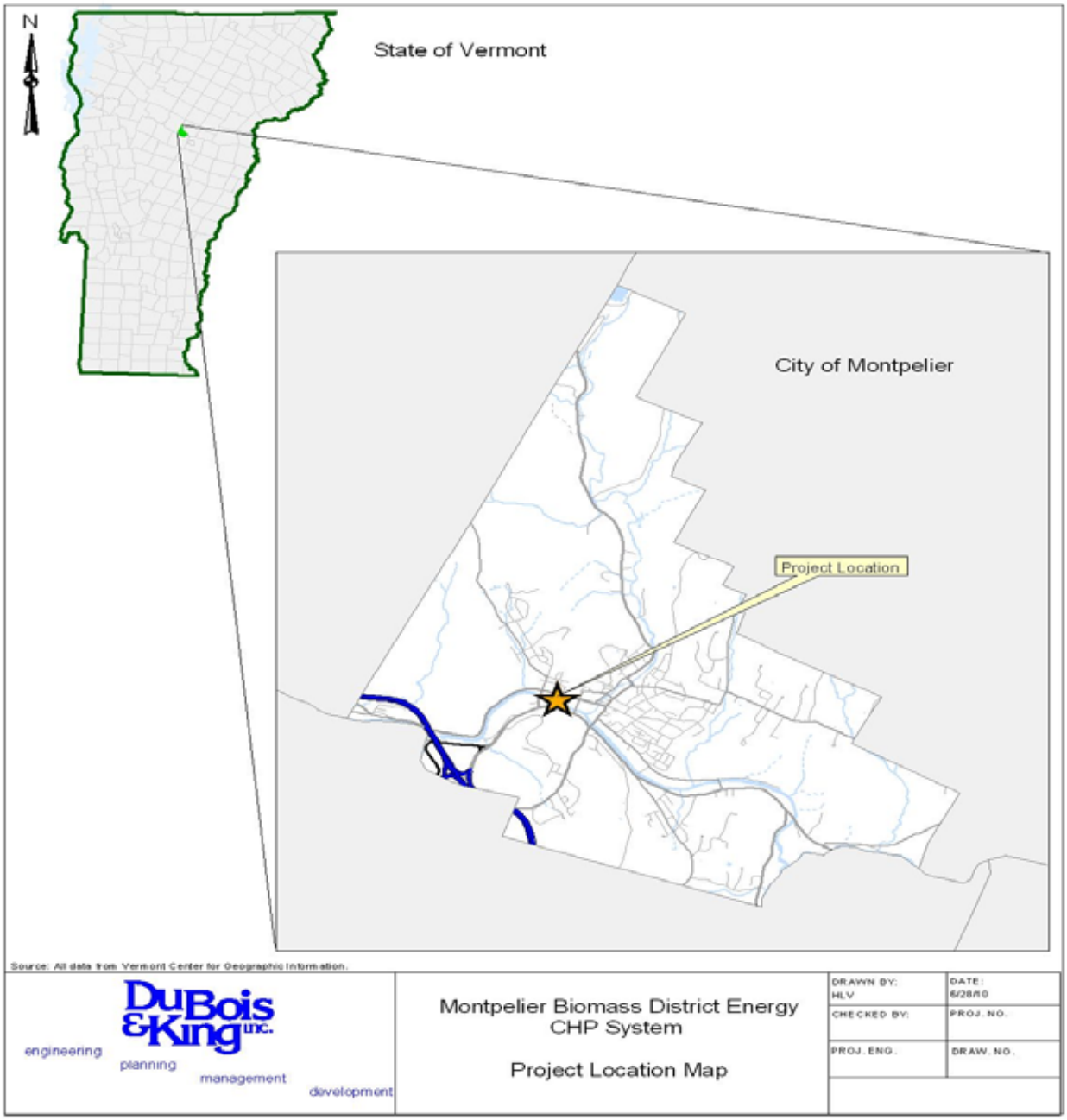

Figure 1-1. Proposed Project Location

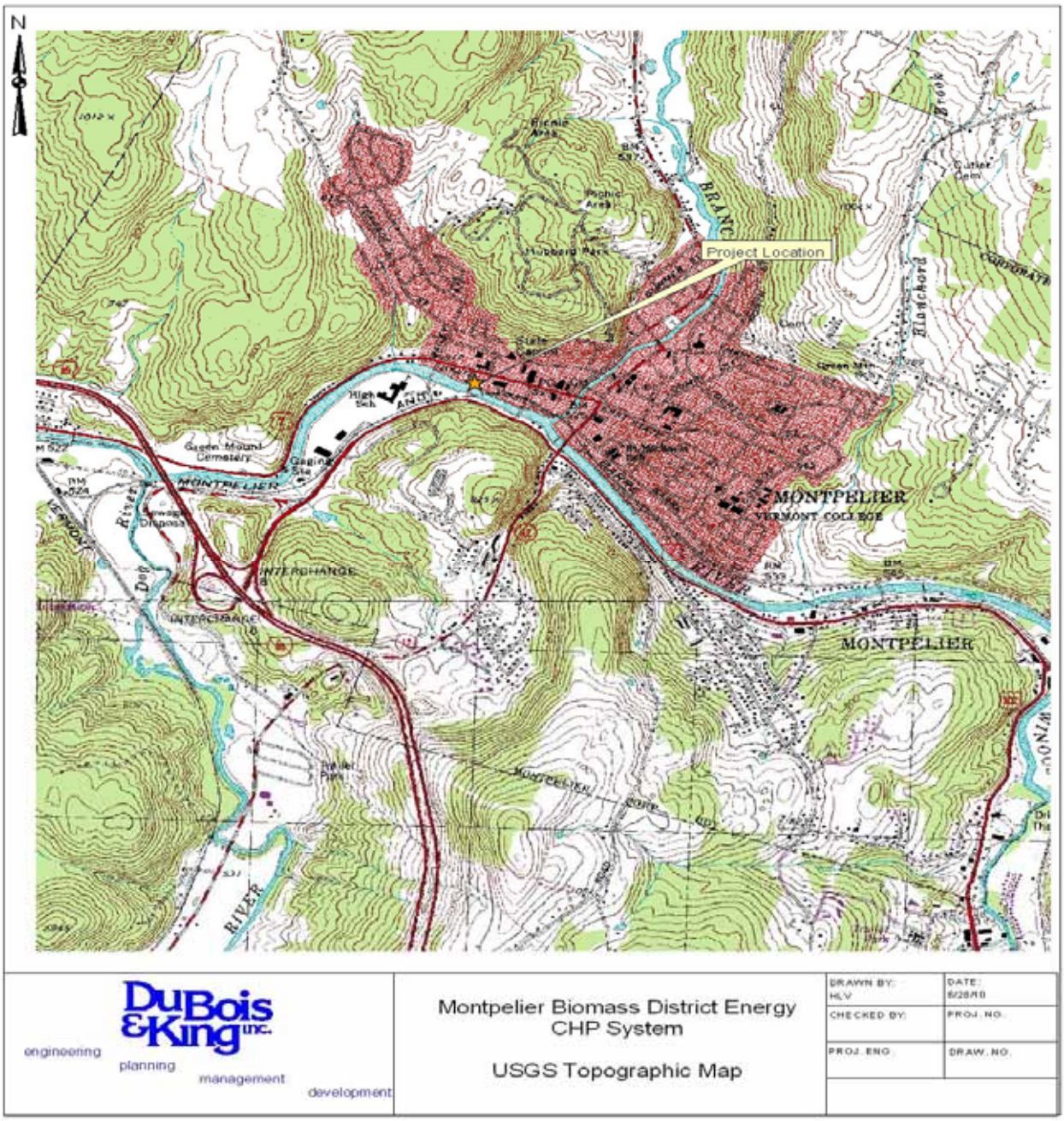

Figure 1-2. Topographic Map of the Project Area

1.3 Purpose and Need

1.3.1 DOE'S PURPOSE AND NEED

DOE's purpose and need is to ensure that Federal CRED funds are used for activities that meet congressional statutory aims to improve energy efficiency, reduce dependence on imported oil, decrease energy consumption, create and retain jobs, and promote renewable energy. Authorizing the expenditure of Federal funding as part of the CRED Program would advance a number of the objectives to assist U.S. cities, counties, states, territories, and American Indian tribes to develop, promote, implement, and manage energy efficiency and conservation projects and programs designed to:

- Reduce fossil fuel emissions;
- Reduce the total energy use of the eligible entities;
- Improve energy efficiency in the transportation, building, and other appropriate sectors; and
- Create and retain jobs.

Congress enacted the Recovery Act to create jobs and restore economic growth through measures that, among other things, modernize the nation's infrastructure and improve energy efficiency. Provision of CRED funds for the proposed project would partially meet these goals.

1.3.2 STATE OF VERMONT'S PURPOSE AND NEED

Through the CRED Program, the State can empower local communities to make strategic investments to meet the nation's long-term goals for increased energy efficiency and energy independence, leadership on climate change, and improved local air quality by supporting the planning and deployment of community renewable energy projects in communities nationwide. The Montpelier CHP District Energy Project would help the State achieve the goals of this program.

1.4 Public and Agency Involvement

1.4.1 PUBLIC SCOPING PROCESS

In preparation of this EA, DOE sent notices of public scoping to stakeholders and interested parties including tribes with historic ties to the region; local, State, and Federal agencies, including the Governor of Vermont, Vermont Division of Historic Preservation, U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service, Vermont Agency of Natural Resources (VANR); and other potentially interested public entities, individuals, and organizations to solicit public comment (see Appendix A). DOE also published a scoping letter on the DOE Golden Field Office Public Reading Room Website to solicit comments. The scoping letter described the proposed Montpelier CHP District Energy Project and requested assistance in identifying potential issues to be evaluated in this EA.

To obtain scoping comments from residents of Montpelier and the surrounding area, DOE held a public meeting at the Montpelier City Hall on August 3, 2010. DOE posted a notice for the meeting in a local newspaper, the *Times Argus*, on July 15, 2010, and listed on the City's website for obtaining more information. Representatives of DOE and the City of Montpelier presented project details, obtained comments, and answered questions from the public. Approximately 20 members of the public attended this meeting.

In response to the scoping letter, DOE received three comment letters, as described below.

- The River Management Program of VANR Department of Environmental Conservation reviewed the proposed project and indicated its opinion that the project represents a "Critical Facility" as defined by the Federal Emergency Management Agency (FEMA) and 10 CFR Part 1022, "Compliance with Floodplain and Wetland Environmental Review Requirements." DOE has prepared a floodplain impacts analysis to evaluate the risk of flooding at the proposed facility (see Section 3.2.5 of this EA).

- The U.S. Army Corps of Engineers responded with an explanation of its jurisdiction, which includes areas below the ordinary high water mark of the Winooski River or other stream and wetlands. The letter also directed DOE and the City of Montpelier to minimize waterway and wetland impacts to the maximum degree practicable. Section 3.1 of this EA clarifies that the project would not result in impacts to wetlands or water resources.

- The VANR Department of Forests, Parks and Recreation provided comments related to the availability and harvesting of wood fuel and the greenhouse gas benefits that the proposed project would realize. Section 3.2.2.2 of this EA includes a discussion of wood harvesting that includes an analysis of the project's impact on air emissions.

1.4.2 DRAFT ENVIRONMENTAL ASSESSMENT

DOE posted the Draft EA on the DOE Golden Field Office Reading Room Website (http://www.eere.energy.gov/golden/Reading_Room.aspx) and DOE NEPA Website (http://nepa.energy.gov). DOE sent postcards to the individuals listed in Appendix A of this EA to notify them of the EA's availability on the web and to announce a 15-day public comment period on the Draft EA. DOE published a Notice of Availability in the *Times Argus*. DOE received two comments on the Draft EA (Appendix C), which are summarized below.

The Vermont Agency of Natural Resources noted the proximity of the project to the State-threatened Eastern Pearlshell mussel (Margaritifera margaritifera), a cold water species, and was unclear whether there would be any discharge of effluent water that may result in increased water temperatures in the Winooski River. The proposed CHP District Energy Project is a closed system in which water is heated and circulated. No warm effluent water would discharge to the Winooski River.

The Vermont Department of Buildings and General Services (BGS) commented that the heat loads and load shape may not initially support the electrical power generation component of the project. In addition, BGS stated that the boiler size would be optimized to the final heat load and load shape and may result in smaller boilers without the power component and the currently engineered reserve capability. Without the power component and smaller boilers, the potential impacts to air emissions would be less than the full project analyzed in the EA. No change was made to the EA analysis as the current analysis bounds the potential impacts. The BGS noted that the building size may be subject to minor changes in response to final boiler configuration but that no change in total building volume was expected. BGS also stated that the efficacy of using No. 2 fuel oil rather than No. 6 was being examined. No. 2 fuel oil would result in lower air emissions. DOE added a statement to Section 2.2.2 stating that No. 2 fuel oil was being evaluated but that the evaluation of impacts in the EA was based on continued use of No. 6 fuel oil.

2. DOE PROPOSED ACTION AND ALTERNATIVES

This chapter describes DOE's proposed action, the proposed Montpelier CHP District Energy Project that the City is advancing (Section 2.2), and the No-Action Alternative (Section 2.3) considered in this EA.

2.1 DOE's Proposed Action

DOE's Proposed Action in this EA is to authorize the City of Montpelier to expend Federal funds to design, permit, and construct a district energy system, as described in the following section. DOE has authorized the City of Montpelier to use a percentage of its Federal funding for preliminary activities, which include preliminary design, environmental studies, preparation of the EA, and permitting. These activities are associated with the Proposed Action and do not significantly impact the environment nor represent an irreversible or irretrievable commitment by the DOE in advance of the conclusion of the EA for the proposed Montpelier CHP District Energy Project.

2.2 City of Montpelier's Proposed Project

The City of Montpelier would use Federal funding to facilitate the design, permitting, and construction of the Montpelier CHP District Energy Project in collaboration with the State of Vermont. That project would involve the replacement of the State Boiler Plant with a biomass-fueled CHP heat plant and installation of a district energy system to heat government buildings in Montpelier.

2.2.1 BACKGROUND

Montpelier is Vermont's capital city and is located in Washington County in the central part of the state. Montpelier is accessed by road via Interstate 89, US Route 2, and Vermont Route 12. Additional access is available by passenger rail and commercial rail freight service. The Winooski River and the North Branch are prominent features of the community. These two rivers intersect within the project area, as seen in Figure 2-1.

The State Boiler Plant, located at 122 State Street in downtown Montpelier, Vermont, is owned and operated by the State of Vermont and provides steam to heat 17 State buildings in downtown Montpelier. The heat plant has three boilers, two of which were installed as coal-fired boilers in 1946. Since that time, one of the coal-fired boilers was retrofitted to burn wood chips and the other to burn No. 6 oil. The third boiler, which is also oil-fired, was installed in 2005 and remains in good condition. The heating load requirements of the buildings being served by this plant is estimated at 25 million British thermal units (Veolia 2010).

The proposed CHP plant would be located within the State Capitol Complex and behind buildings adjacent to the south side of State Street (Figure 2-1). The Winooski River runs along the southern border of the project area. The site includes parking and access drives that surround the existing State Boiler Plant, some of which would be removed as part of the project. The existing chimney on the site would remain and be reused for both the new oil- and wood-burning boilers. Access to the site would be through existing driveways on State Street. A schematic layout of the proposed plant is shown in Figure 2-2.

Figure 2-1. Location of Proposed Facilities and Distribution Piping

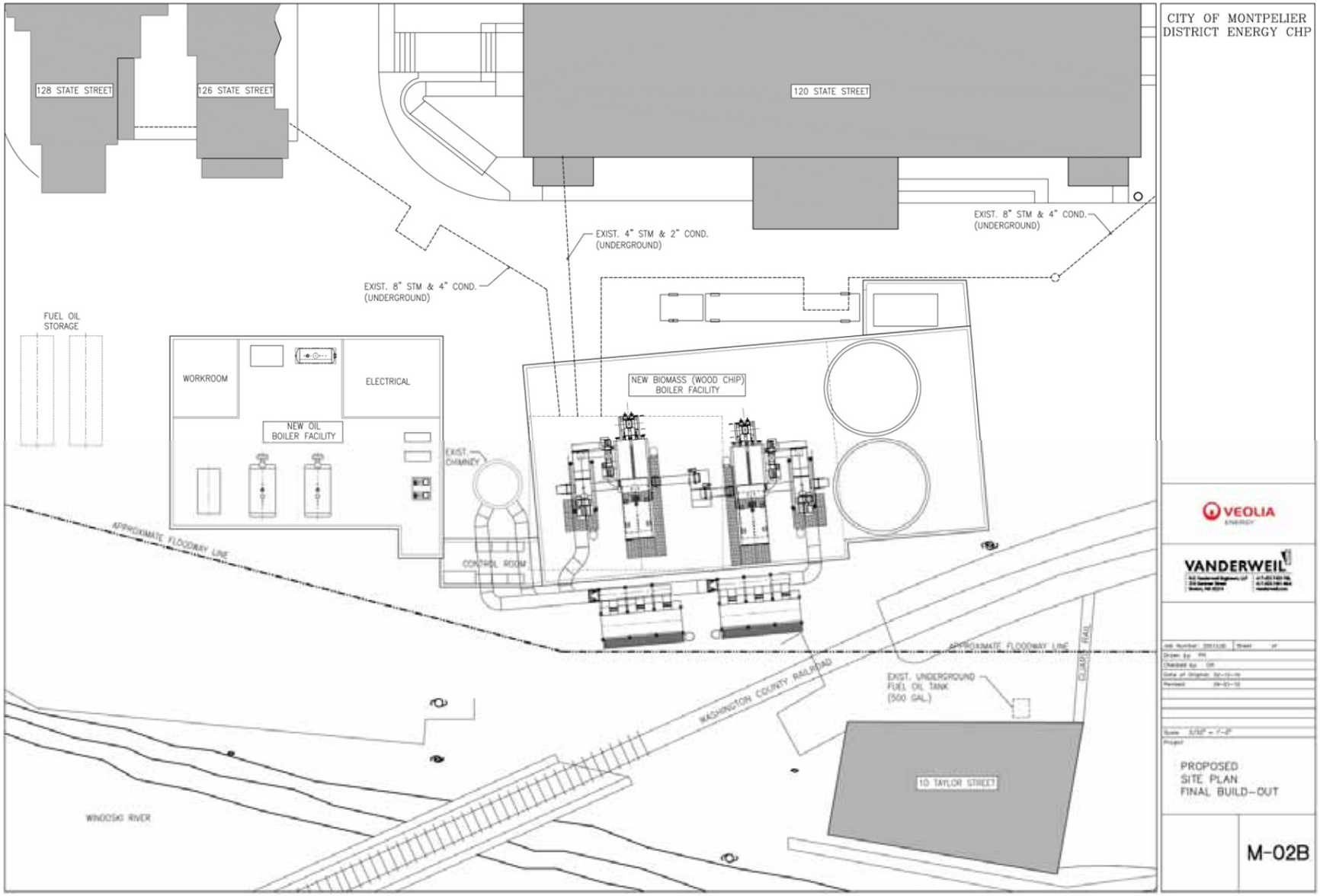

Figure 2-2. Schematic of New CHP Plant

The CHP plant would provide at least 41 million British thermal units of heat (Veolia 2010). This would meet the heating requirements of the 17 State-owned buildings currently serviced by the State Boiler Plant and 5 City-owned buildings. The five City-owned buildings will be connected to the proposed district energy system through the buildings' existing boiler systems. The new plant would also be capable of providing at least 8.4 million British thermal units of additional capacity for use in other buildings to be connected to the district energy system in the future (Veolia 2010).

2.2.2 NEW CHP PLANT

The proposed CHP plant would consist of two primary buildings: one for the biomass boilers, wood chip storage, and material handling, and one for the oil-burning (back-up) boilers (Veolia 2010). The biomass-boiler building would be approximately 11,500 square feet and would house two new 600-horsepower wood chip-burning boilers and wood chip storage. That building would be approximately 40 feet high on the side where the boilers would be located and 65 feet high where two 300-ton wood-storage silos would be located. Each silo would be approximately 32 feet in diameter by 60 feet tall. The oil-boiler building would house the oil-burning boilers and hot water conversion and distribution systems, and would be approximately 5,500 square feet and 30 feet high. The two 400-horsepower boilers would consist of one new boiler and one five-year-old boiler that would be relocated from the existing plant.

As part of this project, a 400-kilowatt, steam-driven turbine would be installed to generate an estimated 1.1 million kilowatt-hours of electricity, based on eight months of operation per year and supplying heat to existing State and City buildings. If the full capacity of the plant was used for eight months per year, electrical generation could increase to 1.35 million kilowatt-hours with a 400-kilowatt turbine. This application of CHP technology would be used to offset electrical energy used by the State complex by providing electricity to the existing electrical distribution system under a group net-metering agreement with the local utility supplier.

Current plans are to construct the new CHP plant in phases so that the supply of heat and power to State buildings would not be disrupted. The oil-boiler building would be built in the first phase of construction to the west of the existing State Boiler Plant. After those boilers are connected to the existing steam distribution system and operational, the State Boiler Plant would be demolished and the new biomass-boiler building and associated infrastructure would be built in its place. Electrical lines and transformers in the area also would be removed in phases to ensure that electricity to nearby buildings would not be disrupted.

The CHP plant would include two new 20,000-gallon, double-walled fuel oil storage tanks to be located under the existing parking lot, west of the oil-boiler building (Figure 2-2). In addition, a new 650-kilowatt standby power generator would be installed in the oil-boiler building to provide power for the facilities in the event of a utility outage.

Fuel for the CHP system would primarily be from wood chips, with a back-up supply of No. 6 fuel oil. The BGS is evaluating the efficacy of using No. 2 fuel oil, which would result in lower air emissions. However, for analysis of potential impacts in this EA, DOE assumed that the CHP would continue to use No. 6 fuel oil. The system is estimated to require approximately 12,200 green tons of wood chips annually. A fuel wood availability assessment concluded that timber growth within 30 miles of Montpelier exceeds harvest levels by over 650,000 green tons per year with all current and historic markets (INRS 2010).

2.2.3 DISTRIBUTION SYSTEM

The State buildings are currently served by a steam distribution system from the State Boiler Plant, and the steam pipes to those buildings would continue to be used for the Montpelier CHP District Energy Project. A new hot water distribution network would be installed to the east and west of the heating plant to provide hot water service to City-owned buildings (Figure 2-1). The new distribution lines would consist of two hot water pipes—a supply run and a return run. The distribution system would be designed to allow future connections up to the full capacity of the CHP plant. Current plans are to install the distribution system under existing roads or within existing utility right of ways.

2.2.4 REQUIRED AGENCY PERMITS AND APPROVAL TYPES

Construction and implementation of the Montpelier CHP District Energy Project would require permits and approvals from various regulatory agencies. Table 2-1 provides a summary of the permits and approvals that would be required prior to construction of the facility.

Table 2-1. Federal, State, and Local Permits and Approvals

Agency	Permit Type or Approval
Federal	
Section 106	Project required to comply with Memorandum of Agreement
State	
Public Service Board	Section 248 – Certificate of Public Good
VANR – Department of Environmental Conservation, Water Quality Division	Various permits pertaining to the control and treatment of storm water during construction and operation phases of an industrial activity
VANR – Department of Environmental Conservation, Management Division	Approval of the removal and replacement of underground storage tank(s)
VANR – Department of Environmental Conservation, Air Pollution Control Division	New Source Permit/Operating Permit
Local	
Vermont Capitol Complex Commission	Architectural and aesthetic review required for structures within the capitol complex construction after 1974.
City of Montpelier – Planning Department	Various approvals associated with Zoning Permit, Conditional Use Approval, and compliance with Design Control and Floodplain Overlay District regulations

2.3 No-Action Alternative

Under the No-Action Alternative, DOE would not authorize the City of Montpelier to use Federal CRED Program funds to design, permit, and construct the Montpelier CHP District Energy Project. As a result, construction of the proposed project would be delayed while the City looked for other funding alternatives, or abandoned altogether if other funding could not be obtained. Furthermore, reductions in fossil fuel use that would have resulted by displacing current oil consumption by the state and municipal buildings would not occur, and DOE's ability to achieve its objectives under the CRED Program and the Recovery Act would be impaired.

Although the proposed project might proceed if DOE did not provide Federal funding, it is assumed for purposes of this EA, the project would not proceed without it. If the proposed project did proceed without Federal funding, the potential impacts would be essentially identical to those under the Proposed Action. However, in order to allow a comparison between the potential impacts of a project as implemented and the impacts of not proceeding with a project, DOE assumed for purposes of this analysis that if Federal assistance for this project was withheld, final design and construction of the Montpelier CHP District Energy Project would not occur.

3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

This chapter of this EA examines in detail the potential environmental impacts of the proposed project and the No-Action Alternative on affected environmental resource areas.

3.1 Considerations Not Carried Forward for Further Analysis

Consistent with NEPA implementing regulations and guidance, DOE focuses the analysis in an EA on topics with the greatest potential for significant environmental impact. For the reasons discussed below, the Montpelier CHP District Energy Project would not have any measurable effects on the following resources; therefore, these resources are not carried forward for further analysis.

3.1.1 LAND USE

The CHP plant would be constructed at the location of the State Boiler Plant. The State of Vermont owns the existing plant, which has been operational for over 50 years. Installation of the new plant would not disrupt the primary land use, which is the operation of a utility facility within the Capitol Complex. Construction of the CHP plant would result in the loss of parking, which is discussed in greater detail in Section 3.2.6.2. Construction of a district energy project is included in the Montpelier Master Plan (Montpelier 2010) and all project elements would comply with City zoning ordinances (Montpelier 2008). As such, there would be no adverse impacts to surrounding land uses.

3.1.2 WATER RESOURCES

The CHP plant and distribution system would be located in areas that have impervious surfaces and no changes to drainage patterns would result from this project. Thus, the project would not cause an increase in storm water runoff. The new facilities would be designed to comply with current Vermont storm water discharge regulations, which would improve the quality of storm water runoff in the project area (VANR 2002). The potential impacts of constructing the proposed project within the 100-year floodplain of the Winooski River are discussed in Section 3.2.5.2.

3.1.3 WETLANDS

DOE reviewed National Wetland Inventory maps and identified no wetlands within the proposed project area (VANR 2010). All project elements would be installed in previously disturbed and developed areas. The hot water distribution pipes crossing the Winooski River would be hung from the existing Bailey Street Bridge. The pipes crossing the North Branch of the Winooski River would either be hung from the existing Langdon Street Bridge or directly bored under the river and, thus, would not impact wetlands or water resources.

3.1.4 BIOLOGICAL RESOURCES

Installation of the proposed project within a fully developed urban setting would not result in loss of habitat or harm to any plant or animal species. In addition, indirect impacts, such as those resulting from degradation of air quality and water resources, would be minimal. DOE obtained a list of species protected under the *Endangered Species Act* (16 U.S.C. 1531 *et seq*.) that might occur in the state of Vermont from the USFWS Northeast Region website, as required by the New England Field Office (see Appendix B). No Federally protected species occur in Montpelier or elsewhere in Washington County (USFWS 2010). Therefore, DOE concludes that the proposed project would not affect Federally listed threatened and endangered species.

3.1.5 SOILS AND GEOLOGY

All project elements would be installed in previously disturbed and developed areas, and the installation would not impact geological or soil resources.

3.1.6 VISUAL IMPACTS

The smokestack at the State Boiler Plant would be retained and the new CHP plant would be larger than, but similar in appearance to, the existing plant. Thus, the view of the CHP plant as an industrial, power-generating facility housed in simple utilitarian buildings would not change and the new facility would be consistent with the existing visual landscape Visual impacts from the proposed project, as they relate to other historic properties within the project area, are discussed as part of the evaluation of cultural and historic resources (Section 3.2.3.2).

3.1.7 NOISE

Although there would be a temporary increase in noise during construction of the CHP plant and installation of the distribution system, operation of the facility would not result in changes to the existing sound levels and there would be no long-term adverse impacts.

3.1.8 UTILITIES

Some overhead power lines and other utilities would have to be relocated temporarily or otherwise modified during construction. With the exception of some new or modified electrical equipment and other utilities in the immediate vicinity of the new CHP plant, the Montpelier CHP District Energy Project would not require permanent modifications to existing utilities or other infrastructure.

3.1.9 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

The Montpelier CHP District Energy Project would have a small beneficial impact on the local economy, as a more efficient system would be developed to provide heat to government and commercial facilities.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations,* directs Federal agencies to address environmental and human health conditions in minority and low-income communities. The evaluation of impacts to environmental justice is dependent on demonstrating that high and adverse impacts from the proposed project are not disproportionately borne by any low-income or minority groups in the affected community. According to the 2000 Census, 9.8 percent of individuals living in Montpelier had an income that was below the poverty level and 3.4 percent were classified as minorities (Census 2000). There will be no high and adverse impacts to any members of the community; therefore, there would be no adverse and disproportional impacts to minority or low-income populations.

3.1.10 HUMAN HEALTH AND SAFETY

Construction and operation of the proposed project would involve common industrial practices such as trenching and installation of a pipeline, operation of heavy equipment, and production of hot water and electricity. Although these activities have inherent risks to workers and the public, there are well-developed industry standards that would be implemented to minimize those risks. A comprehensive health and safety management system, which is designed to protect employees from workplace hazards and injury, will be implemented during operation of the district energy plant. The City’s health and safety plan will comply with both Federal and State Occupational Safety and Health Administration regulations.

Therefore, DOE anticipates that the health and safety risks of the proposed project would be low and similar to those experienced at other heat and energy production facilities.

3.1.11 INTENTIONAL DESTRUCTIVE ACTS

DOE considers intentional destructive acts (i.e., acts of sabotage or terrorism) in all its EAs and environmental impact statements (DOE 2006). Construction and operation of the proposed project would not involve the transportation, storage, or use of radioactive, explosive, or toxic materials. The Montpelier CHP District Energy Project would not offer any particularly attractive targets of opportunity for terrorists or saboteurs to inflict adverse impacts on human life, heath, or safety.

3.2 Considerations Carried Forward for Further Analysis

This section of the EA examines in detail the potential environmental impacts of the proposed project on the following resource areas:

- Air quality
- Harvesting wood products
- Cultural and historical resources
- Waste management and hazardous materials
- Floodplains
- Traffic, transportation, and parking

3.2.1 AIR QUALITY

This section describes ambient air quality conditions in the Montpelier area; discusses the air quality conformity requirements that apply to this EA; and describes the potential environmental impacts resulting from emissions of regulated pollutants associated with the proposed project.

3.2.1.1 Affected Environment

Air quality is a function of the concentrations of pollutants in ambient air. To this end, the U.S. Environmental Protection Agency (EPA) promulgated the National Ambient Air Quality Standards (NAAQS) for “criteria pollutants” to protect human health and welfare. Primary standards are set to protect human health, including the health of people with respiratory or cardiovascular illnesses and other sensitive human populations such as the elderly and children. Secondary standards are set to protect human welfare by preventing reduced atmospheric visibility, damage to vegetation and soils, and damage to building exteriors. The criteria pollutants include lead, nitrogen dioxide, particulate matter, ozone, sulfur dioxide, and carbon monoxide. There are two standards for particulate matter, one for particulates with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}) and one for particulates with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$).

Table 3-1 summarizes current ambient air quality standards for these substances. All areas in the country are required to meet the NAAQS. Should an area not meet any one of the NAAQS, the state in which that area is located is required to file a state implementation plan with the EPA to outline corrective steps to improve air quality and attain compliance with the NAAQS. Air quality in Vermont currently is in attainment with all NAAQS (EPA 2010), which means that the levels of these pollutants in the air are below the EPA standards.

Table 3-1. National Ambient Air Quality Standards

Contaminant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon monoxide	10,000 µg/m^3	8-hour	None	
	40,000 µg/m^3	1-hour	None	
Lead	0.15 µg/m^3	Rolling 3-month average	(a)	
	1.5 µg/m^3	Quarterly average	(a)	
Nitrogen dioxide	100 µg/m3	Annual	(a)	
	188 µg/m^3	1-hour	None	
PM_{10}	150 µg/m^3	24-hour	(a)	
$PM_{2.5}$	15.0 µg/m^3	Annual	(a)	
	35 µg/m^3	24-hour	(a)	
Ozone	0.075 ppm	8-hour	(a)	
Sulfur dioxide	196 µg/m^3	1-hour	None	
	80 µg/m^3	Annual	(a)	
	365 µg/m3	24-hour	None	
	None	3-hour	1,300 µg/m3	

Source: 40 CFR 50.4 through 50.13.
a. Same as primary standard.
µg/m^3 = micrograms per cubic meter.
ppm = parts per million.

Figure 3-1 shows concentrations of criteria air contaminants measured at ambient air quality monitoring stations operated by the Vermont Air Pollution Control Division (APCD 2010). Monitoring stations are located in Burlington, Rutland, Underhill, Bennington, and Brattleboro. The highest value for each criteria air contaminant measured was selected for the purposes of the analysis in this EA. The figure below shows concentrations as a percent of the respective NAAQS, with the number at the top of the bar the actual value of the air contaminant measurement. As shown, all concentration levels of air contaminants are less than the NAAQS.

Air Quality Conformity and Permitting

According to *Clean Air Act General Conformity Requirements and the National Environmental Policy Act Process* (DOE 2000), Section 176(c)(1) of the *Clean Air Act* requires Federal agencies to ensure that their actions conform to applicable state implementation plans for achieving and maintaining the NAAQS for criteria pollutants. Because the proposed project would occur in an area that is in attainment with all the NAAQS, a detailed conformity analysis is not required (DOE 2000).

The Vermont Air Pollution Control Division within the VANR, Department of Environmental Conservation implements air quality laws and regulations resulting from the *Clean Air Act*. The State Boiler Plant is currently regulated by a minor source operating permit (#AOP-050052, DEC#BR96-0115). This permit describes the terms for meeting all applicable State air pollution control regulations. The permit also lists one Federal regulation that currently applies to the facility: 40 CFR Part 60 Subpart (D)(c), "Standards of Performance for Small Industrial-Commercial Institutional Steam Generating Units."

On June 4, 2010, EPA proposed changes to 40 CFR Part 63, "National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial and Institutional Boilers." If adopted as proposed, the rule will be applicable to the proposed boilers and will establish minimum Federal emission limits for carbon monoxide (100 parts per million) and particulate matter (0.03 pound per million British thermal unit heat input). The proposed CHP plant would meet these emission limits and all related requirements.

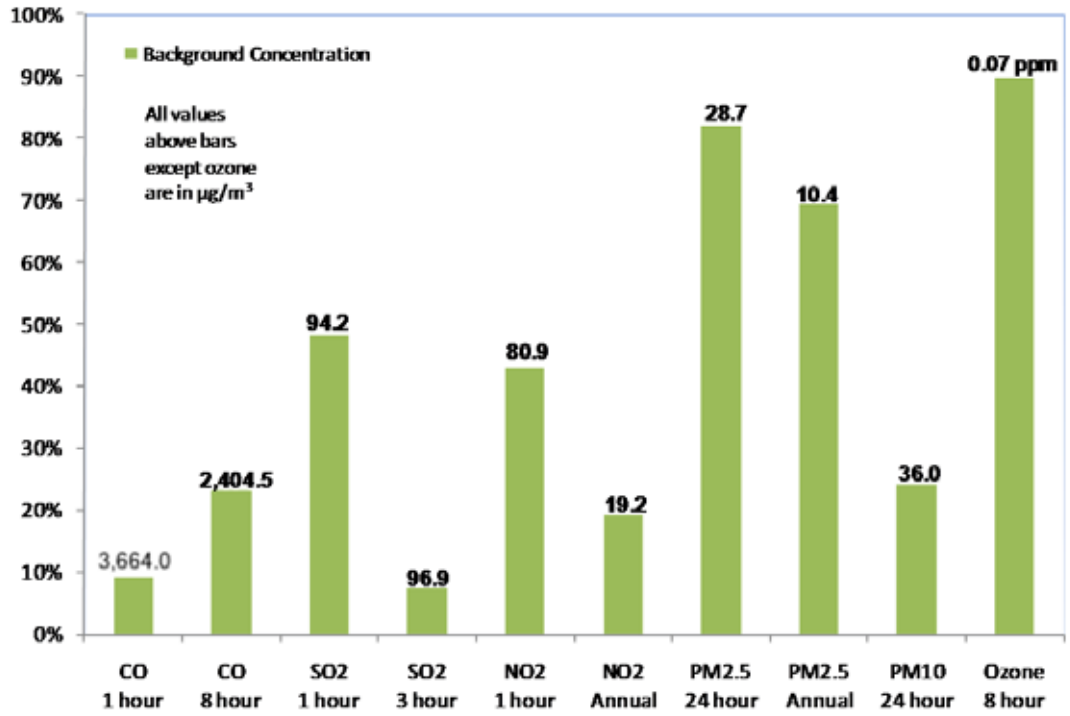

Figure 3-1. Highest Criteria Pollutant Levels in Vermont

In Vermont, the threshold for determining whether an emission source is minor or major is 50 tons per year for all pollutants except hazardous air pollutants. For hazardous air pollutants, there are two thresholds: 10 tons for each hazardous air pollutant and 25 tons for all hazardous air pollutants combined.

Existing Direct Emissions

Table 3-2 summarizes existing emissions from the State Boiler Plant boilers. The table shows emissions of nitrogen oxides, sulfur dioxide, carbon monoxide, PM_{10}, $PM_{2.5}$, volatile organic compounds, and hazardous air pollutants. The existing emissions are based on current permit limits (4,500 tons per year of wood chips and 400,000 gallons per year of No. 6 oil).

Table 3-2. Existing Boiler Emissions

Pollutant	Existing Emissions (tons per year)
Nitrogen oxides	19.0
Sulfur dioxide	16.2
Carbon monoxide	13.2
PM_{10}	14.2
$PM_{2.5}$	9.4
Volatile organic compounds	0.6
Hazardous air pollutants	0.7

3.2.1.2 Environmental Impacts to Air Quality

The proposed project would replace old boilers with new, more-efficient, and cleaner-burning equipment, resulting in fewer emissions produced per quantity of fuel burned. Therefore, the net total direct

emissions of regulated pollutants from the CHP plant's boilers would decrease despite an increase in the amount of fuel consumed.

The *Feasibility Study for the City of Montpelier District Energy CHP System* (Veolia 2010) estimated that wood chip consumption would increase from 4,500 to 12,200 tons per year. For the analysis conducted in this EA, DOE assumed that consumption of No. 6 oil would increase from 400,000 to 546,000 gallons per year. This estimate of oil consumption was extrapolated using the existing ratio of wood and fuel oil usage at the State Boiler Plant and the above estimate of future wood consumption. According to the Feasibility Study (Veolia 2010), fuel consumption at the State Boiler Plant is 43 percent oil and 57 percent wood. Assuming this ratio of oil to wood is used in the new CHP plant, and based on the use of 12,200 tons of wood chips per year, an equivalent amount of fuel oil on a British thermal unit basis is 546,400 gallons per year.

Because oil would be used primarily as a backup source of fuel, it is likely that much less fuel oil would be consumed at the CHP plant. However, for the purposes of this EA, DOE also assumed an increase in oil usage to generate a conservative estimate of air emissions. The analysis below indicates, that despite this conservative approach of increasing biomass and oil fuel usage, the proposed project would not require a Federal Title V (major source) permit.

This section of the EA addresses the reduction in direct boiler emissions, elimination of emissions from heating equipment in buildings joining the district-heating network, reduction of emissions produced by power plants in the ISO New England electrical grid by production of over 1 million kilowatt-hours of electricity from the new, modern, well-controlled plant, and emissions produced by construction equipment during the construction phase of the proposed project and fuel delivery trucks once the project was operating.

Direct Boiler Emissions

Table 3-3 summarizes future emissions from the Montpelier CHP District Energy Project boilers, based on assumed limits of fuel use (12,200 tons of wood chips and 546,400 gallons of No. 6 oil per year). Emissions from the boilers were estimated using EPA AP 42 emission factors (EPA 2003) and the emission limits for PM_{10}, $PM_{2.5}$, and carbon monoxide for industrial, commercial, and institutional boilers in 40 CFR Part 63. The net change in emissions represents the difference between the future and existing maximum emissions, as shown in Table 3-2 above.

Table 3-3. Future Boiler Emissions

Pollutant	Future Emissions (tpy)	Net Change in Emissions (tpy)	Major Source Threshold (tpy)	Major Source Threshold Exceeded?
Nitrogen oxides	26.9	7.9	50	No
Sulfur dioxide	19.9	3.7	50	No
Carbon monoxide	7.8	-5.4	50	No
PM_{10}	5.7	-8.5	50	No
$PM_{2.5}$	2.8	-6.6	50	No
Volatile organic compounds	1.0	0.4	50	No
Hazardous air pollutants	2.4	1.7	10/25	No

tpy = tons per year.

Based on the assumption that use of both wood chips and fuel oil would increase, emissions from the proposed project would increase for some pollutants and decrease for others (Table 3-3). Total direct emissions would decline by approximately 7 tons. These decreases are due to the replacement of old boilers with newer, cleaner-burning boilers that have advanced combustion technologies and efficient

emission controls. Therefore, the proposed project would cause an overall reduction in direct emissions despite an increase in the quantity of wood and oil burned. As discussed below, the project would qualify as a "minor source"; therefore, it would not require a Federal Title V (major source) permit.

Replacement of District Building Emissions

A number of buildings would be added to the heating district due to expanded heat output capacity from implementation of the proposed project. The increase in heating capacity resulting from increased wood chip usage would initially displace a minimum of approximately 128,000 gallons of fuel oil per year. This is the amount of fuel oil used in 1999 by the five City-owned buildings that would initially be connected to the district-heating network as part of the proposed project (City Hall, fire department, police station, Union Elementary School, and Montpelier High School). A maximum of approximately 535,000 gallons per year of heating oil would be displaced if the full capacity from wood chip combustion was utilized by connecting additional buildings to the district-heating network. As shown in Table 3-4, this would result in a reduction of emissions of between 3.8 and 16.2 tons per year.

Table 3-4. Total Emissions Displaced by Adding Facilities to the Montpelier District Energy System

Pollutant	Emissions Displaced @ 128,000 Gallons (tons/year)	Emissions Displaced @ 535,000 Gallons (tons/year)
Nitrogen dioxides	1.2	4.8
Sulfur dioxide	2.3	9.5
Carbon dioxide	0.3	1.3
PM_{10}	0.0	0.1
$PM_{2.5}$	0.0	0.1
Volatile organic compounds	0.0	0.2
Hazardous air pollutants	0.0	0.2
Total	**3.8**	**16.2**

Table 3-5 shows the net change in emissions resulting from operating the new boilers and from initially adding the five City-owned buildings to the heating district under the proposed project. Table 3-6 shows the net change in emissions resulting from implementing the new boilers and from adding the maximum potential number of buildings (discussed above) to the heating district.

Table 3-5. Net Change in Emissions Resulting from New Equipment and Minimum Displaced Building Emissions (tons/year)

Pollutant	Existing Boiler Emissions	Maximum Emissions of Proposed Boiler System	Avoided Building Emissions with Minimal # of Buildings Joining	Net Change in Emissions with Minimal # of Buildings Joining
Nitrogen oxides	19.0	26.9	2.3	5.6
Sulfur dioxide	16.2	19.9	1.2	2.6
Carbon monoxide	13.2	7.8	0.3	-5.7
PM_{10}	14.2	5.7	0.0	-8.5
$PM_{2.5}$	9.4	2.8	0.0	-6.6
Volatile organic compounds	0.6	1.0	0.0	0.4
Hazardous air pollutants	0.7	2.4	0.0	1.6

Table 3-6. Net Change in Emissions Resulting from New Equipment and Maximum Displaced Building Emissions (tons/year)

Pollutant	Existing Boiler Emissions	Maximum Emissions of Proposed Boiler System	Avoided Building Emissions with Maximum # of Buildings Joining	Net Change in Emissions with Maximum # of Buildings Joining
Nitrogen oxides	19.0	26.9	9.5	-1.6
Sulfur dioxide	16.2	19.9	4.8	-1.1
Carbon monoxide	13.2	7.8	1.3	-6.7
PM_{10}	14.2	5.7	0.1	-8.6
$PM_{2.5}$	9.4	2.8	0.1	-6.7
Volatile organic compounds	0.6	1.0	0.2	0.2
Hazardous air pollutants	0.7	2.4	0.2	1.5

Electricity Grid Emissions

DOE used the Resource Systems Group's Time-Matched Marginal Model to estimate air emissions reductions from electric power generating stations (power plants) in the regional electrical grid (New England ISO) from electrical generation provided by this project. The DOE Loan Guarantee Program Office uses the Time-Matched Marginal Model to evaluate the environmental benefits of applications. These emissions reductions are not included in the previous table because they are not localized emissions and would, therefore, not necessarily be emitted into the airshed immediately surrounding the city of Montpelier.

For the purposes of this EA, DOE assumed the 400-kilowatt backpressure steam turbine to be installed at the proposed project would generate 1.1 million kilowatt-hours of electricity in a year. It is also assumed electrical generation would follow the anticipated seasonal heat generation patterns for the plant (Veolia 2010). Based on the type of fuels used to generate electricity in the ISO New England service area, the generation of 1.1 million kilowatt-hours of electricity by the proposed project would displace 1 ton of nitrogen oxides and particulate matter, 2 tons of sulfur dioxide, and 779 tons of carbon dioxide (the model does not generate estimates of carbon monoxide) within the ISO New England service area.

Fugitive Emissions

Fugitive dust would be emitted during deliveries of wood chips to the CHP plant. With proper engineering and operational oversight, these emissions would be kept to a low level by transferring wood chips directly from the delivery vehicles into the wood chip storage facilities. For example, wood chips would be directly transferred from a "live bottom" trailer to a wood chip storage bin. The trailer would be parked adjacent to the storage bin door, creating a space that is not exposed to cross winds. The live bottom of the trailer would move the chips directly into the storage bin. Once the transfer was completed, the storage bin door would be closed and the outdoor portion of the wood chip delivery area would be swept clean. This would prevent fugitive dust from being entrained during high winds or when delivery trucks drive through the area.

There would be no fugitive emissions from the wood chip storage facility because it would be fully enclosed.

Truck Emissions

Truck emissions would be produced during wood chip and fuel oil deliveries as trucks accessed the site. Engine emissions would occur onsite if engine power was required to unload the trailers. The number of fuel oil deliveries would likely remain unchanged given this project's focus on using biomass to generate energy. However, the number of wood chip deliveries would increase for the same reason.

There are currently two to three loads of wood chips delivered per week. To supply the estimated annual 12,200 tons of wood fuel, 530 total truck deliveries would be required. On average, this would mean 2.3 trucks per day, resulting in a small increase in vehicle emissions associated with the proposed project. Under the full build-out of the proposed project, up to seven deliveries per day would be needed on peak days of maximum continuous operation. However, with five days of onsite fuel storage it is more likely that the plant would draw from the onsite fuel storage rather than increase deliveries to this level of activity except under extreme conditions (i.e., prolonged cold temperatures).

Construction Emissions

Emissions would be generated during the 16-month-long construction phase. Construction activities would occur intermittently over the 16-month construction period. Fugitive dust would be the most important source of construction emissions. The City would use standard construction practices to control emissions of fugitive dust, such as washing or sweeping paved areas with large amounts of dust and covering truck beds.

3.2.1.3 No-Action Alternative

Under the No-Action Alternative, the State Boiler Plant would continue to operate using the existing boilers and all electricity would be obtained from the regional grid. Under this alternative, there would be no beneficial decrease in regional emissions of pollutants from the use of the more-efficient, cleaner-burning equipment; from the decreased use of boilers at individual buildings that would be connected to the district energy system; and from replacement of electricity from the regional grid by electricity generated by the CHP system.

3.2.2 HARVESTING WOOD PRODUCTS

This section describes the availability of biomass material needed to provide fuel for the Montpelier CHP District Energy Project and describes the potential impacts to forest resources from harvesting the biomass material. Because there is sufficient capacity of wood within Vermont to support the proposed project, the analysis is limited to the State of Vermont.

3.2.2.1 Affected Environment

Biomass fuel for the proposed project would primarily be in the form of green wood chips, which can come from two sources. Wood chips used for biomass fuel may be the byproduct of sawmill activities that produce material that cannot be made into lumber. Wood chips are also produced in the forest, with large mobile chippers that are used to turn low-grade cull wood into a saleable commodity.

Based on the U.S. Department of Agriculture's definition of timberland, the State of Vermont has approximately 4.4 million acres of forested land that is classified as "timberland" (BERC 2009). It is estimated that 86 percent of this land is privately owned and that half of the privately owned land is enrolled in Vermont's Use Value Appraisal Program, also called "Current Use" or "Land Use" Program (BERC 2010a). Under this program, landowners are required to implement an approved forest management plan at ten-year intervals. Each plan requires that the land be managed according to accepted forest management standards. There are approximately 750,000 acres of managed timberland within 25 miles of Montpelier (BERC 2008).

3.2.2.2 Environmental Impacts from Harvesting Wood Products

The proposed project would require as much as 12,200 green tons of wood chips annually. This assumes an average moisture content of 45 percent and an average British thermal unit value of 4,625 per pound

(as fired), which are typical values for this region (INRS 2010). The forested lands surrounding Montpelier have an abundance of low-grade wood suitable for chip fuel. Demand and harvesting of low-grade wood in Vermont is less than half of the amount currently grown annually. For example, within 30 miles of Montpelier, timber growth exceeds harvest levels required to support all current and historic markets by over 650,000 green tons per year (INRS 2010). In addition, much of the infrastructure in the form of foresters, loggers, chippers, sawmills, and trucking operations, exists in the region surrounding Montpelier and has the capacity to serve the proposed project. Therefore, there are sufficient timber resources available to provide biomass fuel for the proposed project. The increase demand for wood chips may have beneficial or negative impacts depending on site-specific forest conditions and methods used to harvest. In forestland that is overgrown or overstocked, selective removal and thinning of forest stands may actually improve the growth rate and health of the remaining trees. Excessive harvesting may decrease the value of the forest stand as wildlife habitat, watershed protection, an aesthetic resource, or may decrease soil fertility. Therefore, impacts will be minimized by matching the harvesting regime to the management objectives of each forest stand (Evans et al. 2010; Forest Guild Biomass Working Group 2010).

The City of Montpelier does not own sufficient forested lands to fuel the proposed project and it is unlikely that a single source will provide all of the required wood chips. The City would establish contracts with suppliers as necessary to provide the required biomass. Stipulations would be incorporated in supplier contracts to ensure that biomass material was harvested in a way that minimizes environmental impacts and promotes sustainability of forest resources. Vermont has published guidelines (*Accepted Management Practices for Maintaining Water Quality on Logging Jobs in Vermont*) that represent standard measures used to protect soil and water resources from degradation due to wood harvesting (VT DFPR 1987). In addition, biomass harvest guidelines are available and would be incorporated as necessary into contracts to minimize environmental impacts (Evans et al. 2010; Forest Guild Biomass Working Group 2010).

Because the CHP plant would generate electricity, operations there would be subject to Vermont's Section 248 review process, administered by the Public Service Board, and a Certificate of Public Good would be required. This process incorporates public hearings and requires that the Board consider impacts on aesthetics, historic sites, air and water purity, the natural environment, and the public health and safety. As part of this process, there is precedent for applying the "Policy for Whole Tree Harvesting" (BERC 2010a). This policy requires foresters to review each Vermont-based logging site and ensure that conditions are being met to protect forest regeneration, water quality, wildlife habitat, and aesthetic considerations. Administrative review is required and must be approved by a Vermont State Biologist. DOE, therefore, concludes that there would be sufficient requirements placed on wood harvesters by the City through supplier contracts, as well as sufficient regulatory oversight by the State, to ensure that wood harvesting would not have substantial adverse effects on forest resources.

3.2.2.3 No-Action Alternative

Under the No-Action Alternative, there would be no change in the availability of wood products in the region for use by other projects, no potential for an increase in wood harvesting to meet to demand for wood chips for the proposed project, and no potential for impacts to forest resources from an increase in wood harvesting.

3.2.3 CULTURAL AND HISTORICAL RESOURCES

3.2.3.1 Affected Environment

This section describes the existing cultural resources conditions in the area of the proposed project site. The area of potential effect (APE) for cultural resources includes the entire Montpelier Historic District and the area outside of the District that will be disturbed for the installation of new hot water distribution pipes. Cultural resources are historic properties as defined by the *National Historic Preservation Act* (16 U.S.C. 470 *et seq*.; NHPA), cultural items as defined by the *Native American Graves and Repatriation Act*, archaeological resources as defined by *Archaeological Resources Protection Act*, sacred sites as defined in Executive Order 13007 to which access is afforded under *American Indian Religious Freedom Act*, and collections and associated records as defined in 36 CFR Part 79. The following summarizes the historic background of the area (from Kenny and Crock 2010), followed by the status of cultural resources inventories and consultations as required by Section 106 of the NHPA.

Historical Background

Montpelier was permanently settled by Euro-Americans by Colonel Jacob Davis of Brookfield, Massachusetts, who established a homestead on the North Branch of the Winooski River in 1787. Essential services soon followed with the construction of a sawmill in 1788 and a gristmill in 1789, both on the falls of the North Branch. These were followed by the settlement of skilled craftsmen and professionals including a physician and blacksmith by 1790, followed in the 1790s by a lawyer, minister, carpenter, millwright, brick maker, and clothier. In 1791, the population of Montpelier was recorded as 118 people (in 17 households). By 1800, the population had risen to 890 people, and the meadows along the lower half-mile of the North Branch had developed into a settlement containing a score or two of houses and as many as 100 inhabitants, 2 stores, 2 taverns, 2 lawyers, and the unusual assortment of mechanics. The town became the state capital in 1807. In 1840, the population was recorded as 3,725 people. The first rail connection was made by the Central Vermont Railway in 1849. Montpelier's industry turned increasingly to the manufacture of machinery in the 1860s and granite dressing in the 1870s. By the early 20th century, Montpelier was the third largest insurance center in New England.

Buried Cultural Resources

As part of a natural travel corridor through the Green Mountains, the area along the floodplains of the Winooski River has high potential for containing evidence of American Indian occupation, especially sites from the Late Archaic, Woodland, and Contact periods. The Vermont Division of Historic Preservation's Environmental Predictive Model for Locating Precontact Archeological Sites indicates that various key sensitivity factors may be found within the proposed project area, specifically level terrain, river confluence, and floodplain, all of which are environmental criteria known to have attracted American Indian habitation (Kenny and Crock 2010). A review of the Vermont Archaeological Inventory, maintained by the Vermont Division of Historic Preservation, indicated that there is one previously reported precontact American Indian site, which consists of a lone projectile point find.

There are two areas of archaeological sensitivity within the APE. These areas have the potential to contain significant archaeological resources that are eligible for inclusion in the *Vermont State Register of Historic Places* and *National Register of Historic Places* (NRHP). The APE might intersect sensitive areas, but this depends on the project's final alignment and the depth of historic fill. These areas include:

- The Langdon Meadow – This portion of the project area is located on the Winooski River floodplain on the south side of the river, north of the entrance to Montpelier High School. The area is sensitive because of important American Indian archaeological sites.

- State Office Building Parking Lot – This area is located on the west side of and behind the 1948 State Office Building. This portion of the proposed project area may contain important American Indian archaeological sites and historic deposits capped by fill and the parking lot.

Historic Properties

The APE includes the entire Montpelier Historic District, with particular attention to properties adjacent to the distribution lines, including the sidewalk and landscape features adjacent to areas where the line is proposed, and the site of the existing and proposed heating plants. The approximately 250-acre Historic District was amended with new structures in 1989. In 2009, the District was updated and amended for a second time with additional resources nominated and new photographs of each resource included (Pritchett 2010).

There are two historic properties in the Montpelier Historic District (and within the proposed project's APE) that would be directly impacted by the proposed project: the Bailey Avenue Bridge, on which the distribution line would be hung, and the existing Boiler Plant at 122 State Street, which would be removed and replaced with new facilities. The NRHP descriptions of these two resources follow:

- Bailey Street Bridge over Winooski River, c. 1959 – Steel and concrete span on four concrete abutments with recent rehabilitation adding a steel guard railing and historic styled street lights on concrete outriggers from the deck. Originally listed as non-contributing due to age, it is now fifty-years-old and represents a good example of a mid-20th century concrete deck highway bridge.

- 122 State Street, State of Vermont - boiler plant, c. 1960 – The boiler plant was listed as a non-contributing site in 1978. This brick veneer, one-story, flat-roofed boiler plant has a large brick smoke stack. It has tall, multi-pane steel industrial sash, a large rear loading dock; a one-story brick addition; and a one-story shed roofed frame addition. This modern boiler plant will become significant over time as part of the state complex but is presently non-contributing due to age.

Although the NRHP nomination states that the Boiler Plant was built in 1960, information on Sanborn Fire Insurance maps and consultation with employees at the State of Vermont Maintenance Division indicate that the structure was built in 1946 and thus is eligible for listing in the NRHP (Pritchett 2010).

3.2.3.2 Environmental Impacts to Cultural and Historical Resources

Buried Cultural Resources

To avoid the archaeologically sensitive Langdon Meadow area, the distribution line to Montpelier High School would be placed within the existing paved roadway or associated road fill and all staging would be done in developed areas (e.g., parking lot areas at the high school). If the Langdon Meadow area could not be avoided, an archaeological Phase I survey for buried cultural resources would be conducted in the area prior to project construction.

Within the State Office Building parking lot, it is possible that construction would occur in areas entirely comprising historic fill or that have been disturbed for construction of the existing office buildings and heating plant and, therefore, have no buried cultural resources. However, there is uncertainty about the depth and location of such historic fill, and some excavations could occur within buried but previously undisturbed alluvial deposits. Therefore, in areas within and adjacent to the State Office Building parking lot where installation of the distribution lines would require new trenches that would not follow previously disturbed trench corridors, mechanical trenching would be monitored by a professional archaeologist. If information from soil borings or initial excavations indicated that all trenching and other excavations would occur within historic fill, archaeological monitoring in advance of project construction would not be necessary.

Because most or the entire ground disturbance required for installation of the distribution lines would be within road right-of-ways, much of the area has already been affected by the installation of several generations of city services (water, sewer, and gas) as well as many individual hook-ups. It is unlikely that buried archaeological resources would be encountered in other areas during construction of the proposed project. In addition to previous ground disturbances related to buildings and/or services, various areas within the project area have suffered flood damage that could affect the potential for and integrity of archaeological deposits.

Historic Properties

As shown in Figure 2-1, the Montpelier CHP District Energy Project would extend through a large portion of the downtown area of Montpelier. The new heating plant and most of the approximately 2-mile length of distribution line would be within the Montpelier Historic District, which was listed in the NRHP in 1978. Only the small section of the distribution line that extends from Bailey Avenue to Montpelier High School is outside of the Historic District. The proposed project would require the demolition of the State Boiler Plant, which is eligible for listing in the NRHP. Demolition of this building would result in an adverse effect as defined in the implementing regulations of the NHPA (36 CFR Part 800). DOE, the City of Montpelier, and the State of Vermont BGS have signed a Memorandum of Agreement (MOA) with the Vermont State Historic Preservation Officer to mitigate the adverse effects of this project on historic properties (see consultation letter in Appendix B). The MOA identifies the following measures that would be implemented to minimize impacts:

- Photographic documentation of the State Boiler Plant would be completed by the City and the State prior to demolition of that facility in accordance with the *Vermont Division for Historic Preservation Photographic Documentation Requirements for Historic Structures* (http://www.historicvermont.org/programs/photodocumentation.htm).

- The existing chimney at the State Boiler Plant would be retained.

- The City and the State would ensure that the new power plant building is designed in a manner that complies with the National Park Service (NPS 1992), the construction guidelines in *The Montpelier Cityscape Workbook* (Wade et al. 1976), and any requirements of the Vermont Capitol Complex Commission. The building would be designed and constructed with materials, massing, and design elements compatible with the surrounding environment and historic resources that are part of the Montpelier Historic District.

- The City and the State would ensure that a qualified archeological monitor is onsite during excavations that are (1) below the existing fill adjacent to the State Boiler Plant between the railroad tracks and State Street and (2) outside of existing streets or buried utility line corridors to identify and record any cultural resources discovered during such excavations.

The City of Montpelier determined that demolition of the State Boiler Plant is necessary as that facility has outlived its useful life and efficiency as a heating plant and the current equipment does not support the expanded energy district. Two of the three boilers were installed in 1946 and have since been converted to burn oil and wood chips. These two boilers would be replaced by new systems, and the third boiler was installed in 2005 and would continue to be used. In addition, the boilers are below the flood level, which is a safety hazard for the plant employees. Flood-proofing the existing brick building would be difficult, and would not be completely effective, due to the multiple wall penetrations that are needed for piping and other mechanical equipment. Therefore, retaining this existing structure and attempting to retrofit it for modern use is not a practical or safe option.

Retaining the chimney would mitigate the loss of the historic plant and is included as one of the stipulations in the MOA. The approximately 160-foot-tall chimney is not only the most visible component of the City Boiler Plant from many vantage points in the Historic District, it is also a component of the facility that remains in good condition, as it is inspected annually and the City repairs it as necessary.

Impacts of the proposed project to the Bailey Street Bridge would be minor, as the distribution line would be attached along the outside edges of the deck or underneath the deck and would not be easily visible from the public right-of-way. The distribution piping may be visible from yards or parking lots behind historic properties along State Street.

Impacts to other historic resources within the APE would be minor. The site would continue its historic function as the location of the heat plant for State- and City-owned buildings. Constructing a modern facility on this site that is compatible with the surrounding historic resources would preserve the historic context of the site and the setting of the surrounding Historic District. The new buildings would be designed to be compatible with the surrounding historic resources, and would be constructed with traditional materials such as bricks and concrete; therefore, the facility would not be out of character with the surrounding resources in the Historic District when viewed from Memorial Drive and Bailey Street Bridge. Views of the proposed project from the rear elevation of 120 State Street would be prominent; however, these views would comprise only a portion of the viewshed from windows at the back of 120 State Street and would not substantially interfere with views to the east and west of the Winooski River and its historic bridges at Taylor Street and Bailey Avenue.

3.2.3.3 No-Action Alternative

Under the No-Action Alternative, there would be no changes to structures within the Montpelier Historic District and no disturbances to buried archeological resources.

3.2.4 WASTE MANAGEMENT

This section describes the current and expected waste management and contaminated material handling procedures at the proposed project site.

3.2.4.1 Affected Environment

The proposed project would be located in downtown Montpelier and would include new heat distribution pipes installed under city streets. Fuel oil currently is stored at the State Boiler Plant in one 20,000-gallon underground storage tank, which is registered with the Vermont Underground Storage Tank Program. This 20,000-gallon tank replaced two 12,000-gallon underground storage tanks that were installed in 1946 and closed by removal in 1990. Both removed tanks were listed as fair condition upon removal. No evidence of fuel release was reported to the Vermont Underground Storage Tank Program at the time of removal. The existing storage tank is listed as having leak protection and no releases have been reported.

Figure 3-2 shows locations in the vicinity of the new CHP plant and distribution system where existing subsurface contamination has been identified (active hazardous sites) or subsurface contamination was identified and remediated or determined to be limited to the property (closed hazardous sites). The following is a discussion of areas of potential concern along each section of the proposed hot-water distribution system.

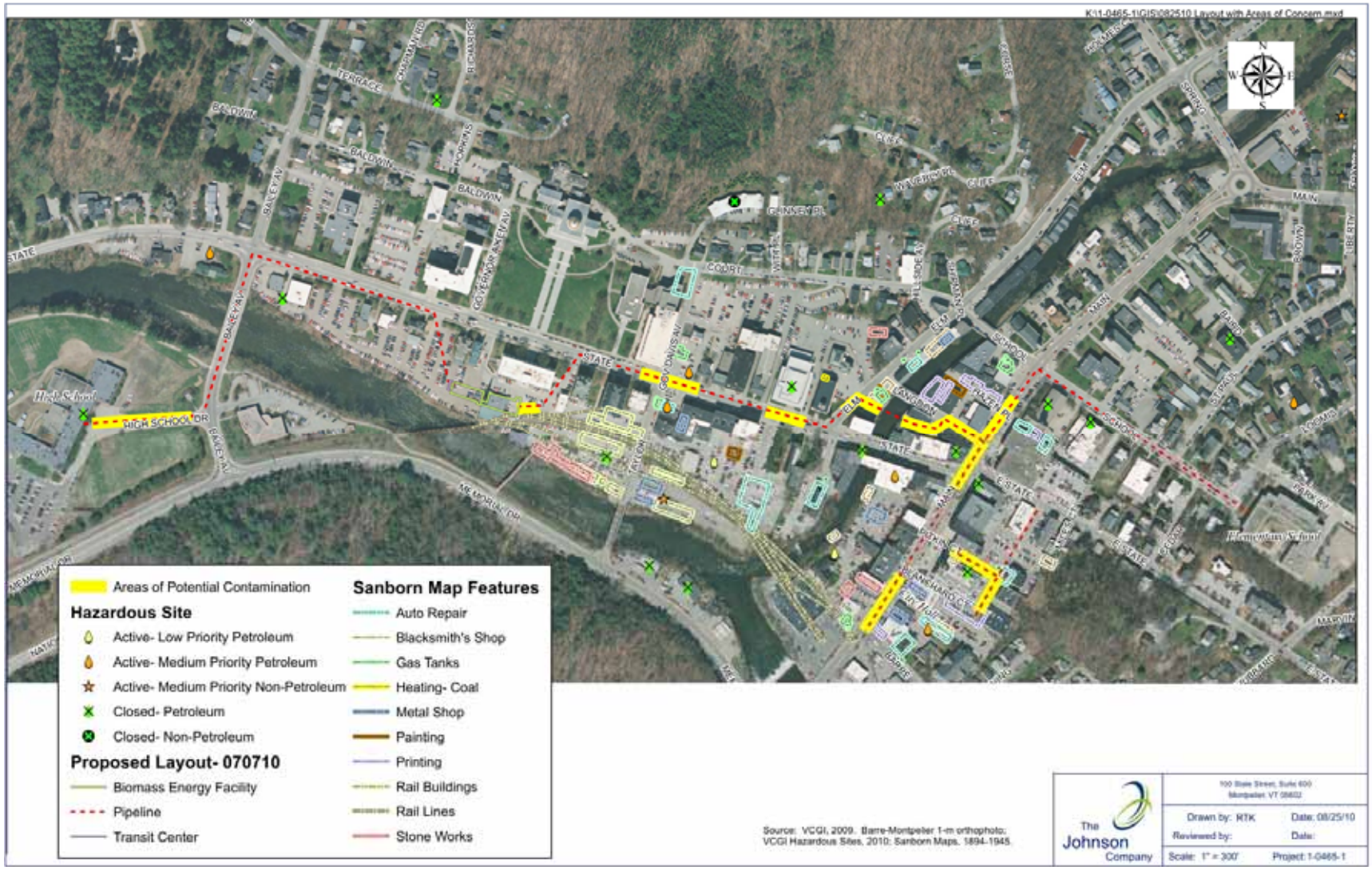

Figure 3-2. Areas of Potential Contamination

State Street (west of proposed building), Bailey Avenue, and High School Drive

One closed petroleum site is located near the junction of Bailey Avenue and State Street, but it is likely that contamination from this site would have migrated south toward the Winooski River and away from State Street. A closed petroleum site is located at the high school and the potential exists for the route of the distribution system to have been impacted by the release.

State Street (east of proposed building) to Elm Street

The southern edge of the route of the distribution system leaving the proposed boiler plant may have been impacted by underground storage tank filling activities at the boiler building or by contaminant migration from the hazardous sites to the east-northeast. The area between the junction of Taylor Street/Governor Davis Avenue and State Street may have been impacted by gas stations on both sides of the street, where petroleum contamination has been identified. North of State Street, the property uses have largely been limited to hotels, the post office, and courthouse. As such, the only area of potential concern approaching Elm Street is the closed petroleum site at the post office.

Elm Street to the North Branch Winooski River Crossing

The eastern side of Elm Street was historically industrial, hosting multiple machine shops, blacksmith shops, and gas stations. Any of these potential sources of contamination, which could include petroleum, chlorinated volatile organic compounds, polynuclear aromatic hydrocarbons, and metals, could impact the proposed piping route through this area.

North Branch Winooski River Crossing to Main Street

The proposed route between the eastern edge of the North Branch Winooski River and Main Street is located south of several former printing facilities, which could have released petroleum and chlorinated volatile organic compounds. Because the printing shops appear to have been associated with the Times-Argus Newspaper offices located on the same block, it is unlikely that volatile organic compounds (which historically have been associated with yellow printing ink rather than the black ink used by newspapers) were released at these facilities.

Main Street

The combination of former small industrial buildings, including auto repair and printers, and the closed petroleum sites at the northern end of Main Street indicate the potential for petroleum contamination in the proposed route in this area. At the southern end of Main Street between Blanchard Court and Barre Street, the former stone works, gasoline stations, and metal shops present a risk of petroleum and chlorinated volatile organic compound contamination in this area.

Pitkin Court and City Buildings East of Main Street

There is a closed petroleum site on Pitkin Court and a former gasoline tank at the eastern end of Pitkin Court; therefore, this area has been selected as an area of potential concern for petroleum contamination along the piping route.

3.2.4.2 Environmental Impacts Related to Waste Management

Construction-related debris generated during the construction of the proposed project would be removed and disposed of offsite in accordance with applicable regulations.

The proposed project would include installation of two new 20,000-gallon, double-wall fuel oil underground storage tanks. The existing 20,000-gallon fuel tank is 20 years old and would not be reused. The construction contractor would follow all local, State, and Federal guidelines during the removal and installation of the underground storage tanks.

Contaminated soil may be encountered during construction of the proposed building and excavation to install distribution piping. All work during planning and construction would follow procedures outlined in the State of Vermont's "Guidance for Construction of Public Works Projects in Areas where Contamination is Suspected or Known" dated March 2002 to ensure that contaminated soil would be addressed according to guidelines, minimizing health and safety risks and limiting delays (WMD 2002).

The construction contractors would prepare a health and safety plan to address all work performed in areas of known or suspected contamination. All workers who might contact contaminated soil, including excavator operators, transporters, and laborers likely to handle soil, would be required to meet hazardous waste and emergency response training requirements of the Occupational Safety and Health Administration regulations.

The proposed project would generate wood ash as a result of biomass combustion. Approximately 85 cubic yards of ash is currently produced in a heating season (Voisin 2011). Using a similar ratio between wood burned and ash produced, it is estimated that the proposed project would produce approximately 290 cubic yards of waste ash. The ash waste would be disposed of offsite. The ash is in demand by local farms for use as fertilizer for their agricultural operations (Voisin 2011). However, there is also adequate capacity at local landfills in the event that local agriculture does not fully reuse the ash waste.

3.2.4.3 No-Action Alternative

Under the No-Action Alternative, no new waste materials would be generated and the potential to encounter hazardous materials during heating pipe installation would not occur. The existing State Boiler Plant would continue to operate and generate minor amounts of waste from the use of biomass fuel.

3.2.5 FLOODPLAINS

This section includes an evaluation of the potential floodplain impacts as a result of the proposed project. In addition to meeting requirements for environmental evaluation under NEPA, it is the intent of this section, along with the project description elements of Chapters 1 and 2, to meet DOE's obligations for a floodplain assessment under 10 CFR Part 1022, "Compliance with Floodplain and Wetland Environmental Review Requirements."

3.2.5.1 Affected Environment

FEMA produces Flood Insurance Rate Maps (FIRMs) that cover most of the United States and identify areas that might be prone to flooding. Specifically, FEMA's maps show the extent of regulatory floodways and flood waters for a 100-year flood, which is identified as the base flood or flood that has a 1 percent chance of being equaled or exceeded in any given year (FEMA 2007, 2010). A flood of this magnitude, or greater, would be expected to occur once (on average) within any 100-year period. FEMA defines a regulated floodway as the channel of a river or other watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height (FEMA 2010).

Preliminary FIRMs have recently been developed for Washington County, Vermont, which include new flood data for the Winooski River through Montpelier. Figure 3-3 shows the regulated floodways in Montpelier and areas that would be inundated by the 100-year flood. The Montpelier CHP District Energy Project would be located within downtown Montpelier, almost all of which lies within the 100-year floodplain (i.e., flood zones) of the Winooski River and the North Branch of the Winooski River.

Throughout its history, the city of Montpelier has experienced several large flood events, the most recent occurring in March of 1992 as a result of an ice jam.

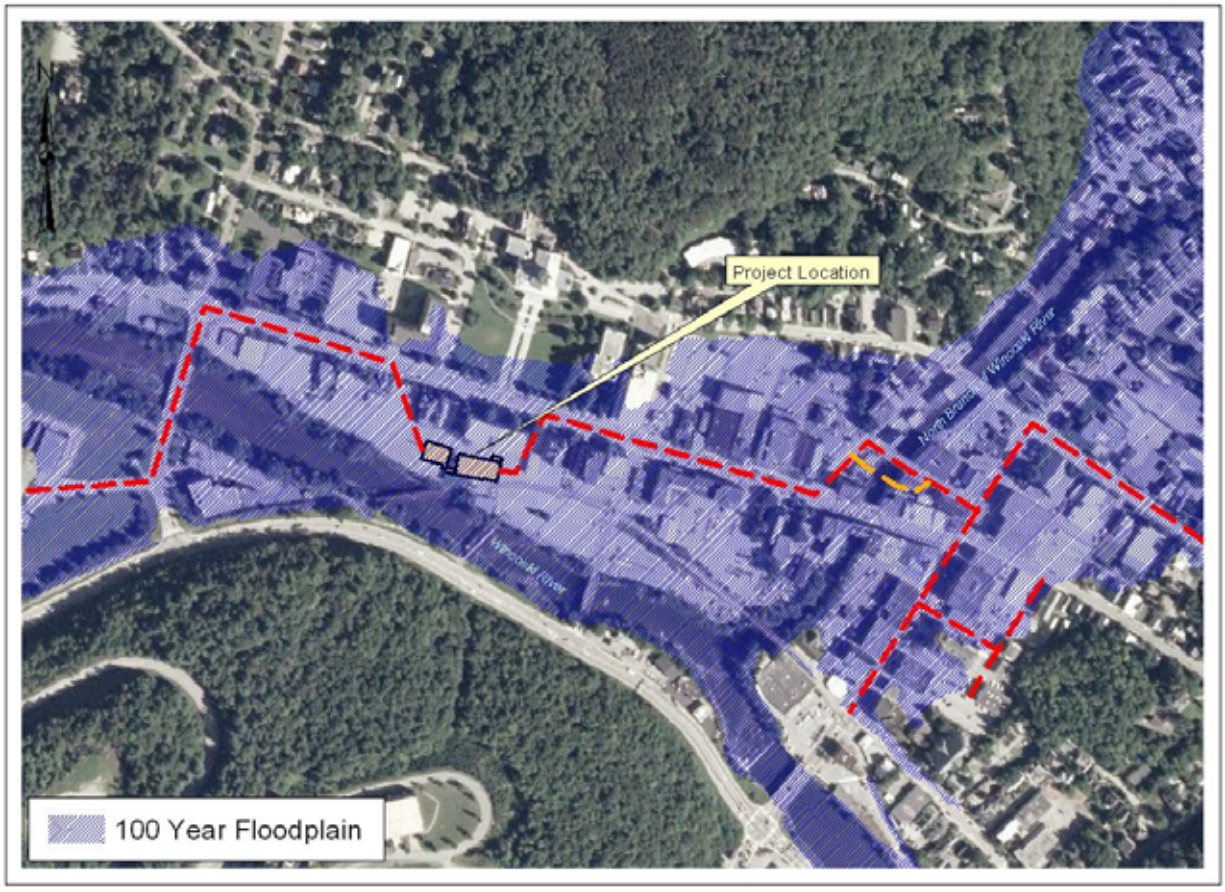

Figure 3-3. Areas Within Downtown Montpelier Inundated by the 100-Year Flood (dark blue areas indicate the designated floodway)

3.2.5.2 Environmental Impacts Related to Floodplains

The proposed project would be located outside of the designated floodway (Figure 3-4). A portion of the existing Boiler Plant is located within the floodway of the Winooski River. By removing this intrusion into the floodway, the proposed project would improve the hydraulic capacity of the floodway.

As required by DOE floodplain regulations (10 CFR Part 1022), DOE evaluated alternatives for the proposed project. However, because the existing hot water distribution lines that support State facilities originate at the existing boiler plant, DOE determined that it would not be practicable (as defined in 10 CFR Part 1022) to locate the boiler plant in a new location. Therefore, design alternatives were considered to minimize the risks of flooding by flood-proofing and modifying the building design.

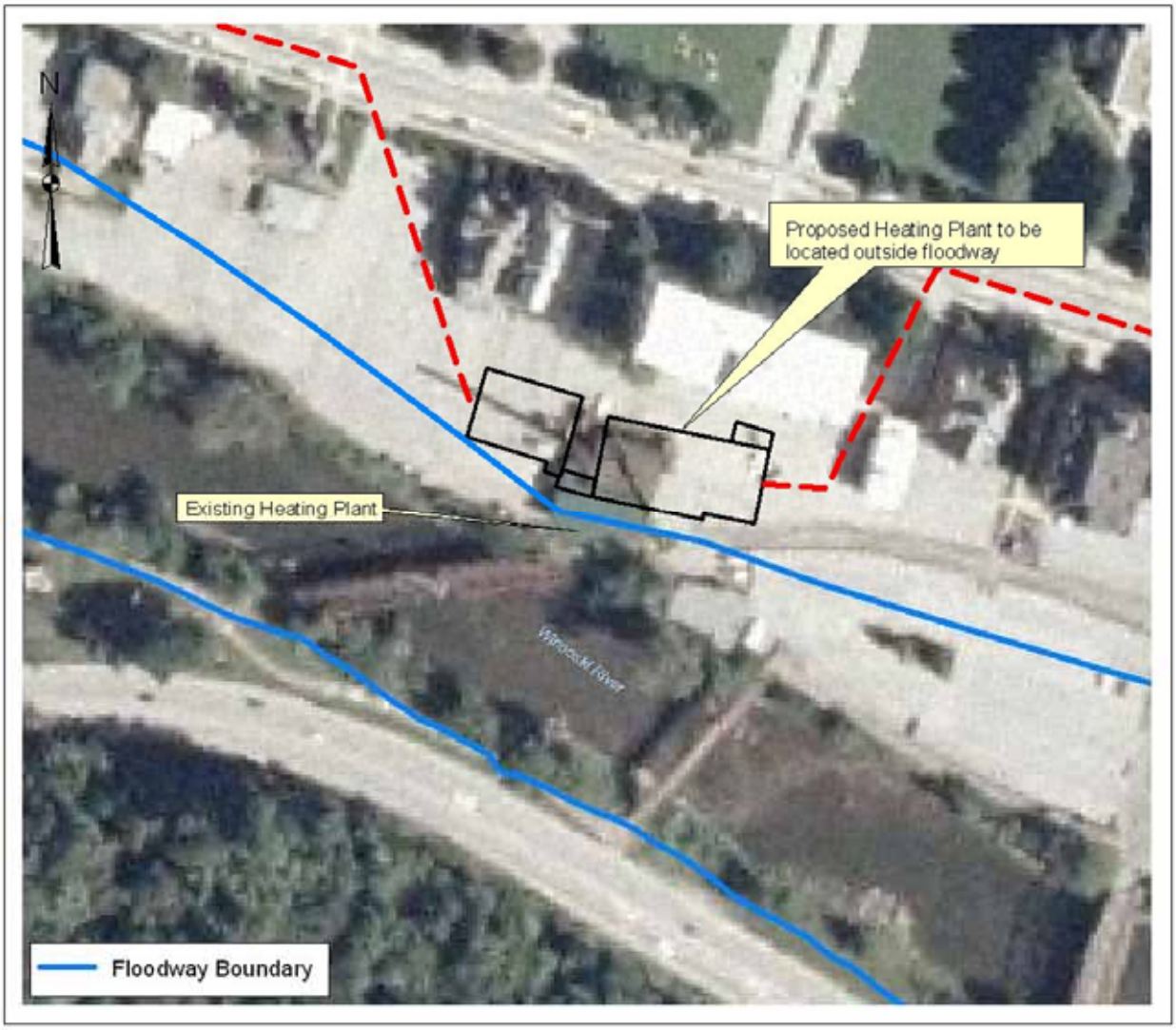

Figure 3-4. Regulated Floodway Boundary adjacent to Heating Plant

The entirety of the proposed project would be located within the Special Hazard Flood Area (or 100-year floodplain). As such, the proposed project would be designed to comply with the City's regulations for development within a flood hazard area. The buildings would be designed in accordance with FEMA's National Flood Insurance Program building standards, including flood-proofing the proposed buildings. These measures include designing all access points into the building, such as doors and windows, to be at least 1 foot above the base flood elevation. The boilers, which are currently located below grade, would be relocated above the flood zone. This would alleviate the unsafe condition that currently exists due to boilers and employees operating below grade in a flood zone. Flood-proofing the heating plant and locating the boilers above the flood zone would minimize the risk of damaging the facilities of the proposed project if the Winooski River flooded.

Because the new heating plant would be larger than the State Boiler Plant (Figure 3-4), the Montpelier CHP District Energy Project would result in a small loss of floodwater storage area within the 100-year floodplain, which could cause an increase in the elevation of floodwater in the area. Any increase in the elevation of floodwater resulting from the presence of the larger facility would be small, and associated impacts of flooding would be minor, because the new heat plan would be small relative to existing

structures in the area and because the floodplain within and near the City of Montpelier is unconfined. The proposed project would be constructed in an area with existing buildings and paved surfaces, so it would not result in a change in impermeable surfaces or floodwater runoff. Therefore, the proposed project would be designed to minimize potential harm to or within the floodplain, would not increase the risk or severity of flooding of other properties, and would not affect the natural and beneficial floodplain values in the area.

3.2.5.3 No-Action Alternative

Under the No-Action Alternative, any adverse effects from the small loss of floodwater storage within the 100-year floodplain would not occur. In addition, the beneficial effects resulting from the removal of the existing State Boiler Plant from the floodway, flood-proofing the heating plant, and moving the boilers to an above-grade location would not occur.

3.2.6 TRAFFIC, TRANSPORTATION, AND PARKING

This section describes the existing traffic conditions and possible impacts to traffic resulting from the proposed project.

3.2.6.1 Affected Environment

The proposed project would be located in downtown Montpelier, Vermont's state capital (Figure 2-1). Roads in the project area are described below.

State Street
State Street is two lanes wide with parking and sidewalks on both sides of the road through the project area. Adjacent land use include business, commercial, retail, government and parking. The intersections with Bailey Avenue and Main Street are signalized.

Main Street
Main Street is primarily a two-lane road with parking and sidewalks along both sides through the project area. Adjacent land use includes business, commercial, City government including City Hall and parking. A turn lane is provided at the intersections of Main and Barre streets and Main and State streets. The Main Street/State Street and Main Street/US Route 2 intersections have traffic signals. Behind City Hall, are a large public parking lot and other City government buildings, all accessible by Main Street.

US Route 2
US Route 2 parallels State Street along the south side of the Winooski River. Bailey Avenue, Taylor Street, and Main Street bridge the Winooski River and are the primary access points to the downtown area from the west, including Interstate 89. Each of these intersections has traffic signals.

Bailey Avenue
Bailey Avenue connects US Route 2 to State Street at the western end of the business district. The access to the Montpelier High School is on Bailey Avenue on the south side of the Winooski River.

Local Streets
The project area also includes segments of Elm Street, Langdon Street, and School Street. These are primarily two-lane roadways with sidewalks and parking on both sides. The adjacent land use includes business, government, and parking. Langdon Street bridges the North Branch of the Winooski River, as does Main Street.

Table 3-7 lists traffic volumes for some roads within the project area.

Table 3-7. Traffic Volumes

Traffic Route	Volume (average daily trips)[a]
US Route 2, Main Street to Bailey Avenue	16,300
State Street, Bailey Avenue to Elm Street	8,100
State Street, Elm Street to Main Street	6,800
Main Street, State Street to Barre Street	11,500
Main Street, Barre Street to US Route 2	11,800

a. Values are based on 2008 data from the Vermont Agency of Transportation (Vtrans 2008).

The Green Mountain Transit Agency provides local bus service within the city and surrounding area. Greyhound Lines, Inc. provides regional and long distance bus service, with one stop at City Hall. The Washington County Railroad track runs through the parking lot directly adjacent to the State Boiler Plant. There is currently no passenger rail service on this rail line. The rail line was inactive for some time, but was recently reactivated for freight traffic.

The State Boiler Plant and the site of the proposed project are located at 122 State Street. The facility is bounded by the Winooski River and the Washington County Railroad track to the south and by State employee/public parking lots on the other three sides. The site and parking area are accessed by a number of drives along State Street and from Taylor Street.

The State Boiler Plant receives an average of two truckloads of biomass and one tanker load of fuel oil per week during the peak period of cold weather. Over the remainder of the heating season, the Plant receives one truck of biomass and less than one tanker load per week of fuel oil (BGS 2010).

Utilities located within the local street right-of-way include water, sanitary sewer, storm sewer, electricity, steam lines to State offices, and telecommunications.

3.2.6.2 Environmental Impacts to Traffic, Transportation, and Parking

Construction Phase Impacts

Construction of the proposed project would cause a temporary decrease in the availability of parking in the State Capital Complex area. During the demolition of the existing boiler building and construction of the new buildings, parking would be restricted at the existing parking lot between 118 State Street and just west of 128 State Street on the north side of the railroad. Visitors to the adjacent buildings would still have use of the street parking on State Street. However, with more limited spaces available in the parking lot, some visitors and some employees would need to seek parking in more distant locations or utilize temporary parking as described below.

Temporary parking would be accommodated at the number of alternate locations including:

- Montpelier High School (summer only)
- Montpelier recreation fields parking areas
- Other area State building parking lots
- Montpelier Park and Ride
- Adjacent private property

The City would coordinate with Green Mountain Transit to facilitate bus service to the temporary parking areas during construction. Employees would be notified well in advance of construction and provided information on alternative parking arrangements.

Installation of the distribution lines would cause temporary disruptions to traffic and the loss of some parking in downtown Montpelier. The City would develop a detailed Phasing and Traffic Control Plan during the design and construction phase of the project, conforming to the Manual of Uniform Traffic Control Devices. The City would require that the contractor maintain one lane of traffic at all times during construction unless otherwise approved in advance by the City. Flaggers, barriers, and signals would be required to control traffic through the construction areas. The plan would also include a public notification/outreach section, which would provide the public with advance notice of construction activities, street closures, expected delays, lane closures, and alternate routes. The public outreach program would also provide contact information where the public can receive up-to-date information or report problems or issues encountered and would be posted on the City's website.

The construction contractor would be required to phase work such that activities impacting school grounds or access to the school would be accomplished during periods when the school is not in session.

Operations Phase Impacts

The proposed project would receive an average of two to three deliveries of biomass per day and one tanker load of fuel oil per day during the coldest months (December, January, and February). The number of deliveries during March, April, May, October, and November would average between one and two truckloads of biomass per day and three and four tanker loads of fuel oil per week (Veolia 2010). There would be no change in the number of employee trips from the existing operations. The increase of up to four truck deliveries per day would not adversely affect the transportation system in downtown Montpelier, which currently handles between 6,800 and 16,300 vehicles per day (Table 3-7 above).

Approximately 30 parking spaces would be lost within the existing parking lot to accommodate the new CHP plant. Figure 3-5 provides a schematic rendering of how parking spaces would be altered as a result of the proposed project. Impacts to city streets associated with the distribution pipes would be limited to standard maintenance activities or repairs that are common to all utilities.

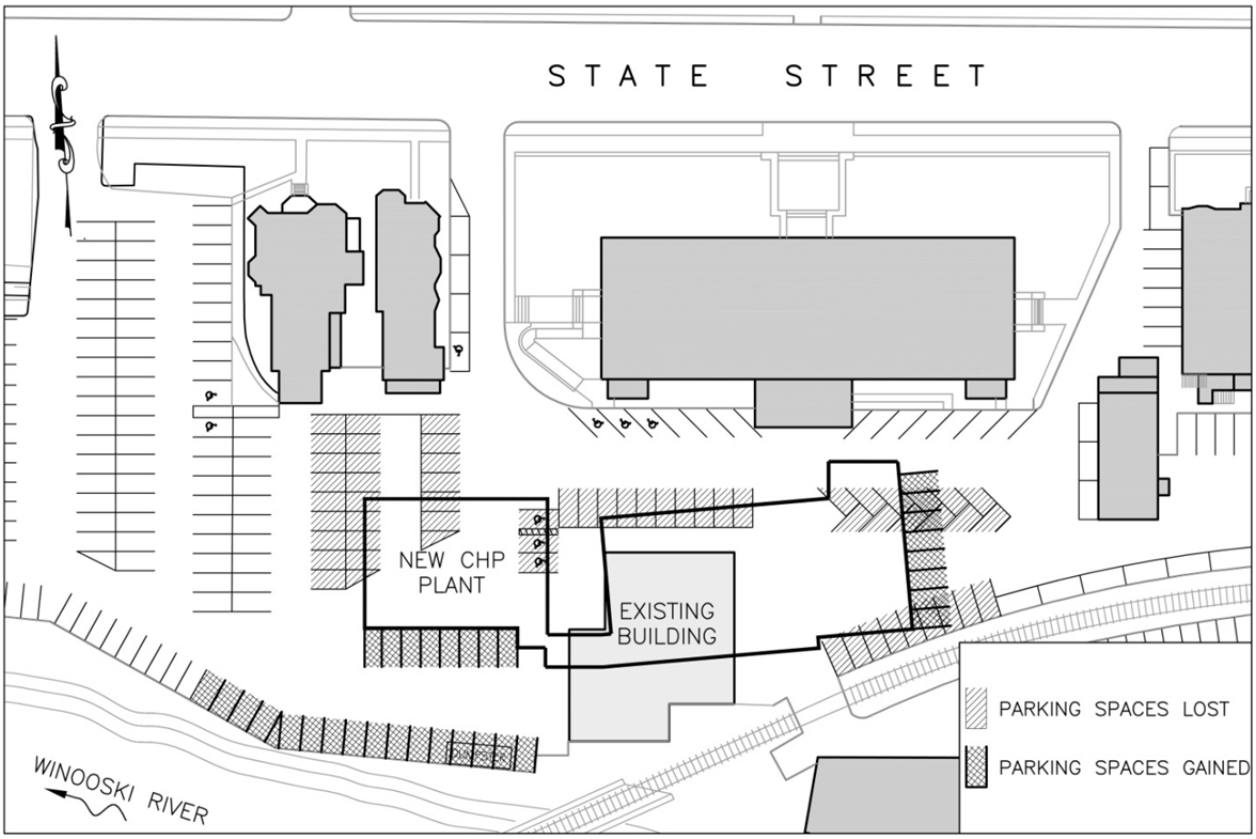

Figure 3-5. Schematic of Proposed Project Alterations to Parking

3.2.6.3 No-Action Alternative

Under the No Action Alternative, there would be no disruptions to traffic or loss of parking spaces.

3.3 Irreversible and Irretrievable Commitment of Resources

This section describes the major irreversible and irretrievable commitments of resources that can be identified at the level of analysis conducted for this EA. A commitment of resources is irreversible when its primary or secondary impacts limit the future options for a resource or limit those factors that are renewable only over long periods of time. Examples of nonrenewable resources are minerals, including petroleum, and cultural resources. An irretrievable commitment of resources refers to the use or consumption of a resource that is neither renewable nor recoverable for use by future generations. While an action may result in the loss of a resource that is irretrievable, the action may be reversible. Irreversible and irretrievable commitments of resources are primarily related to construction activities.

Resources consumed during construction of the proposed project, including fossil fuels and construction materials, would be committed for the life of the project. Nonrenewable fossil fuels would be irretrievably lost through the use of gasoline- and diesel-powered construction equipment during construction. The proposed CHP plant site and distribution pipe routes are located on land that has been previously developed and environmental resources have already been impacted. Reuse of this land would result in a temporary, but not irreversible, use for other projects. Long-term or permanent use of other resources would include the harvest and use of biomass fuel, which is an abundant renewable material in Vermont. The expenditure of Recovery Act funding from DOE would also be irreversible.

3.4 Unavoidable Adverse Impacts

Unavoidable adverse impacts associated with the project include:

- Long-term loss of approximately 30 parking spaces within the Capitol Complex;
- A small increase in noise levels during construction;
- Temporary traffic disruptions during construction;
- Demolition of the existing State Boiler Plant building, which is eligible for listing in the NRHP; and
- Construction of a structure within the floodplain and the associated loss of the floodwater storage area.

The impacts from construction noise and traffic disruptions would be temporary. Building demolition, loss of parking, and construction in the floodplain would result in long-term impacts. Overall, impacts of the proposed project on the environment and human health would be minimal.

3.5 The Relationship Between Local Short-Term Uses of the Human Environment and the Maintenance and Enhancement of Long-Term Productivity

Short-term use of the environment, as the term is used in this document, is that used during the life of the project, whereas long-term productivity refers to the period of time after the project has been decommissioned, the equipment removed, and the land reclaimed and stabilized. As the proposed project would be located at the same site as the existing State Boiler Plant, there would not be a change in land use. The short-term use of the site for the proposed project would not affect the long-term productivity of the area. If it was decided at some time in the future that the project had reached its useful life, components of the combined heat and power plant and distribution system could be decommissioned and the site would be available for other uses.

4. CUMULATIVE IMPACTS

Cumulative impacts are those potential environmental impacts that result "from the incremental impact of the action when added to other past, present, or reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

Because the impacts of the proposed project generally would be minor and localized, DOE focused this evaluation of cumulative impacts on activities within Montpelier. DOE also considered biomass availability for projects within the towns surrounding Montpelier.

4.1 Past, Present, and Reasonably Foreseeable Actions

The Montpelier CHP District Energy Project would be located in downtown Montpelier ,with the heating plant located in the midst of the State Capitol Complex and the distribution piping placed within several downtown streets. DOE reviewed information on past, present, and reasonably foreseeable future projects and actions that could result in impacts over the same period and in the same general location as the proposed project. Based on information provided by the State of Vermont Department of Buildings and General Services and the City of Montpelier, including the recently adopted Montpelier Master Plan (Montpelier 2010), DOE identified several projects that are reasonably foreseeable and are appropriate for inclusion in the cumulative impacts analysis. The locations of these in-town projects are shown in Figure 4-1 and described below.

National Life Biomass Heating Project

The National Life Group has recently completed converting its heating system to use biomass fuel to heat the 500,000-square-foot headquarters in Montpelier. National Life's offices are located outside of the downtown area, on a hill approximately 1,500 feet south of the proposed CHP plant. The project included the installation of two biomass boilers that will burn wood chips from local sources. The heating system renovation was completed in fall 2010.

There are several additional biomass heating projects located in the surrounding towns, including one public housing complex and seven public schools (BERC 2010b).

State Street Repaving Project

The Vermont Agency of Transportation has indicated its plans to resurface a portion of State Street in downtown Montpelier that includes the proposed pipe distribution route. Both projects are slated for the 2011 construction season.

State of Vermont – 133 State Street

The Department of Buildings and General Services intends to rehabilitate portions of the State office building at 133 State Street, which is located within the Capitol Complex. The project will primarily entail waterproofing the subgrade infrastructure; however, a portion of the existing parking lot will be temporarily disrupted.

Carr Lot Multimodal Transit Center

The City of Montpelier is proposing to construct a multimodal transit center with parking facilities, green space, and pedestrian linkages in downtown Montpelier. The project is located approximately 600 feet east of the proposed CHP plant on a vacant lot with access via Taylor Street and bound by the Winooski River and the North Branch of the Winooski River.

Figure 4-1. Locations of Projects Considered for Cumulative Impacts

Expanded Bike Path Network

The City of Montpelier is proposing two new sections of bike paths that would connect and extend the existing bike path facilities within the city. The first path would connect two existing sections, beginning at Taylor Street and heading east, traversing the "Carr Lot." The path would then cross an at-grade rail line and continue across the North Branch on a new prefabricated steel truss bridge, located just upstream from the existing railroad bridge. The path would continue to the east before terminating at the Main Street sidewalk. The second section of path that is proposed begins at Granite Street, east of the downtown area. This path would extend to the southeast, eventually terminating in a commercial area of the neighboring town of Berlin.

4.2 Cumulative Impacts Summary

4.2.1 AIR QUALITY

Operation of the National Life biomass boilers combined with the proposed project's biomass boilers is not expected to cause a cumulative increase in air emissions. The small overlap of emissions would be negligible, as the two sources are vertically separated by approximately 200 feet and have good dispersion characteristics due to the surrounding topography. In addition, both of these facilities are existing sources of emissions. The enhanced air pollution controls recently installed as part of the National Life biomass boiler project, along with those controls proposed as part of the Montpelier CHP District Energy Project likely would result in a reduction in total emissions from these two facilities. The air quality permitting for the proposed project would confirm this situation.

As described in *Montpelier Multi-modal Transit and Welcome Center Environmental Assessment* (FTA 2005), implementation of the Multimodal Transit Center may also result in a decrease in vehicle miles traveled regionally and thus provide an associated improvement in air quality. The combination of this transportation project, along with the National Life biomass projects and proposed project, would therefore not result in an adverse cumulative effect on air quality.

4.2.2 HARVESTING AND FUEL SOURCE IMPACTS

The demand for biomass fuel required for the proposed project, the National Life facility, and other biomass-fueled facilities would approach an estimated 26,000 green tons annually (BERC 2010b; RSG 2010; Veolia 2010). This is approximately 10 percent or less of the locally available biomass fuel. As described in Section 3.3.2.1 of this EA, it is estimated that the timber growth exceeds harvest levels by over 650,000 green tons per year with all current and historic markets (INRS 2010). In addition, much of the infrastructure in the form of foresters, loggers, chippers, sawmills, and trucking operations are already in place. Thus, the increase in demand for biomass fuel for all planned projects in the region would have little or no cumulative adverse effect on timber products.

4.2.3 TRANSPORTATION IMPACTS

Repaving State Street would cause a temporary increase in traffic congestion on that street. The City of Montpelier has initiated coordination with the Vermont Agency of Transportation to ensure a smooth sequencing of construction activities. Continued collaboration would be necessary to minimize temporary disruptions and adverse impacts to traffic and transportation associated with multiple construction projects.

Although a timeframe for work on the State Building at 133 State Street has not been established, the loss of available parking spaces may be exacerbated by a reduction in parking spaces as a result of the proposed project. As described in Section 3.2.2.6, the City and State would need to coordinate strategies to minimize the impacts associated with the lack of parking.

The Federal Transit Authority has identified a loss of parking spaces as a potential impact of constructing the Multimodal Transit Center (FTA 2005). However, subsequent to publication of the Transit Authority's report, existing parking on the site through the City's lease of the property has been discontinued and the loss of parking has already been realized.

Given the downtown location of the proposed project and its close proximity to existing infrastructure, there may be other projects that would occur concurrently with the proposed project resulting in disruptions to traffic and transportation.

If any of the planned activities occur concurrently, there could be a temporary cumulative increase in traffic congestion on some streets in Montpelier. The loss of parking spaces by the proposed project and other planned projects would cause a long-term impact to the availability of parking near the Capitol Complex and surrounding area.

5. REFERENCES

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